

The Open Group Guide

**Reference Implementation Guide for
FACE™ Technical Standard, Edition 3.0, Volume 3:
Data Architecture**



You have a choice: you can either create your own future, or you can become the victim of a future that someone else creates for you. By seizing the transformation opportunities, you are seizing the opportunity to create your own future.

Vice Admiral (ret.) Arthur K. Cebrowski



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The Open Group Guide

Reference Implementation Guide for FACE™ Technical Standard, Edition 3.0, Volume 3: Data Architecture

ISBN: 1-947754-57-7

Document Number: G209 (Volume 3)

Published by The Open Group, May 2020.

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Preface

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Acknowledgements

The Open Group gratefully acknowledges the contribution of the following people in the development of this Guide:

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- Howell Yee, MITRE Corporation

Referenced Documents

The following normative referenced documents are indispensable for the application of this Guide. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

(Please note that the links below are good at the time of writing but cannot be guaranteed for the future.)

- AV-2: FACE™ Glossary of Terms and Definitions, Edition 3.0.1 (G194), August 2019, published by The Open Group; refer to: www.opengroup.org/library/g194
- Clinger-Cohen Act (CCA), U.S. Federal Law, 1996 – formerly the Information Technology Management Reform Act of 1996 (ITMRA)
- Committee on National Security Systems (CNSS) 4009: Information Assurance (IA) Glossary, 2010
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- National Security Telecommunications and Information Systems Security Policy (NSTI SSP) No. 11: National Policy Governing the Acquisition of Information Assurance (IA) and IA-Enabled Information Technology (IT) Products, January 2000 (revised June 2003) – NSTISSC is now known as the Committee on National Security Systems (CNSS)
- Software Considerations in Airborne Systems and Equipment Certification, DO-178B, published by Radio Technical Commission for Aeronautics (RTCA) Inc., December 1992
- Software Considerations in Airborne Systems and Equipment Certification, DO-178C, published by Radio Technical Commission for Aeronautics (RTCA) Inc., January 2012
- U.S. Department of Defense Directive DoDI 8500.1, Information Assurance (IA), 2002
- U.S. Department of Defense Directive DoDI 8500.2: Information Assurance (IA) Implementation, 2003
- U.S. Department of Defense Military Standards: MIL-STD-498 (cancelled 1998) and MIL-STD-1553

1 Introduction

1.1 Background

Today's software intensive-systems are typically developed utilizing traditional methods and processes that do not adequately provide for the complexity of developing and integrating systems built with separately developed software components. The increase in system complexity, increased testing, security, and reliability requirements are driving the need for increased specificity of information that is exchanged between these components.

This increase in complexity of software-intensive systems causes designers to architect systems as reusable software components that are then "glued" together to achieve an overall systems implementation. This approach aids in software reuse, but can also lead to an increase in software integration costs and mismatch between components designed by different teams.

A new approach is required in order to advance software integration methods to enable disparate development, reduce integration problems, and aid in software reuse for the purpose of increasing system reliability, reduced schedule, and overall reduced cost of development and integration.

1.2 FACE Data Architecture Approach

The Future Airborne Capability Environment (FACE) Data Architecture was designed to address the need to advance software-intensive system integration. The approach employed is to develop a highly specified data modeling language, Configuration Control Board (CCB) managed Shared Data Model (SDM), Conformance Policy, and Conformance Test Suite (CTS). Together these elements constitute the FACE Data Architecture.

Ultimately, the FACE Data Architecture key objectives are to reduce software integration costs and time-to-field complex and reliable capabilities.

1.3 Scope of this Document

The Reference Implementation Guide for FACE Technical Standard, Edition 3.0 is provided as three volumes:

- Volume 1: General Guidance
- Volume 2: Computing Environment
- Volume 3: Data Architecture

This volume has been designed to:

- Provide guidance for the use of the FACE Technical Standard, Edition 3.0 Data Architecture and does not add or modify FACE Technical Standard, Edition 3.0 requirements

Note: In the event of conflict between the FACE Technical Standard and the FACE Reference Implementation Guide, the FACE Technical Standard takes precedence.

- Present best practices for development and usage of FACE Data Models
- Guide the data modeler through the process of developing FACE Data Models in a manner that is conformant to the FACE Technical Standard, Edition 3.0

References and descriptions to other published standards are presented at an overview level relative to the FACE Technical Standard, Edition 3.0 and are not intended to conflict with these referenced standards.

Note: This document is a support document for the FACE Technical Standard, Edition 3.0, which in the remainder of this document will be referred to as “FACE Technical Standard”. Any references to previous editions will be explicitly stated.

Reference Implementation Guide for FACE Technical Standard, Edition 3.0, Volume 1: General Guidance provides guidance and assistance for the following items:

- Designing and implementing PCS and PSSS Units of Conformance (UoCs)
- Use of Graphics Services
- Safety and Security considerations in UoC designs

Reference Implementation Guide for FACE Technical Standard, Edition 3.0, Volume 2: Computing Environment provides guidance and assistance for the following items:

- Developing UoCs in the Transport Services Segment (TSS), Input/Output Services Segment (IOSS), and Operating Services Segment (OSS) of the FACE Reference Architecture
- FACE OSS Profiles and Programming Language Run-times
- Injectable Interface and Life Cycle Management Services
- Programming Language Mapping Rules

1.4 How to Use this Guidance Document

This guidance document is written so the reader can get a quick start on understanding and creating data models. Chapter 2 should be read prior to reading any other sections. Once the basic structure and goals of the FACE Data Architecture are understood, the reader can then pick and choose which sections to read.

Appendix A can be referenced to aid in the understanding of specific terms used throughout this document.

For consistency, the examples build primarily from one example data model, except when a different example data model more clearly presents a concept. Section 2.3.1 describes the Graphical Notation used for all of the example models in this document.

The following typographic conventions are used throughout this document:

- *Metamodel Elements*
- *Important topic*
- “**Model Element**”

Best practices are identified as follows:

Best Practice: These are provided to aid the reader in useful and sometimes preferred modeling techniques, but should not be construed as the only approach to modeling that type of element.

Pitfalls are identified as follows:

Pitfall: These are provided to assist the reader by identifying an area that may cause confusion.

Notes are identified as follows:

Note: These are intended to provide additional details about the topic being discussed.

2 Data Architecture Overview

The purpose of this chapter is to introduce the reader to resources for FACE data modeling before progressing into a deeper study of the building blocks of the FACE Data Architecture. This chapter describes the philosophies supporting the need for data modeling (Section 2.1), an overview of the Data Architecture concepts (Section 2.2), and an introduction to the data model notation used throughout the document with references to examples (Section 2.3.1).

2.1 Why Data Modeling?

The obvious answer as to why data modeling is employed in the FACE Technical Standard is to achieve the goal of developing software-intensive systems that have a high level of complexity. It has been noted that the complexity of systems is growing at an alarming rate and will achieve a 10x complexity increase in the next 20 years. Our current development architectures are proving inadequate to achieve this increased complexity and achieve the reliability, safety, and security requirements being placed on these systems. A new approach is required in order to advance software integration methods to enable disparate development, reduce integration problems, and aid in software reuse for the purpose of increasing system reliability, reduced schedule, and overall reduced cost of development and integration.

The FACE Data Architecture is designed specifically to achieve its key objectives by developing an architecture supporting engineering design specifications for data and interfaces such that there are no ambiguities in these designs for the purpose of component integration. The specificity necessary for data type, units, precision, frame of reference, and the semantic description of *Entities* and *Associations* are captured in a machine-readable format. By providing for unambiguous semantic and measurement system descriptions of data elements, developers can specify information with sufficient specificity to increase interoperability of FACE Units of Portability (*UoPs*).

Another, yet very practical reason for data modeling is that the FACE Reference Architecture requires a FACE Data Architecture-conformant data model to provide a standard method for defining the data format and meaning for information sharing between software components. Data modeling is required to enable information sharing/interoperability between components (e.g., FACE UoPs).

The benefits of utilizing the FACE Data Architecture toward improving interoperability are:

- Unambiguous specification of data elements
- Unambiguous specification of information exchanged between UoPs
- Reusability of data model elements through the SDM, Domain-Specific Data Models (DSDMs), and UoP Supplied Models (USMs)
- Reduced data model development cost and schedule through reuse
- Reduced software component development cost and schedule through reuse

- Reduced integration cost and schedule through unambiguous specification of information exchanged between UoPs

The FACE Data Architecture is a key component of the FACE Technical Standard and is essential to designing systems and developing interoperable UoPs. The FACE Data Architecture eases the identification of horizontal interface mismatches often found during development/integration of a system composed of software from multiple suppliers. The data modeling language enables existing components to be made conformant to the FACE Data Architecture with minimal modification to interfaces by modeling the semantics of the information exchanged through the existing interfaces.

2.2 Overview of Data Architecture Concepts

The FACE Data Architecture is made up of a *data model language*, a common *SDM* that establishes foundational elements for modeling, and a *Conformance Policy* with accompanying data model CTS.

The *FACE Data Model Language* utilizes the Meta-Object Facility™ (MOF™) metamodel language as its foundation, two grammar-based languages, and Object Constraint Language (OCL)-defined constraints to define the structure and rules for construction, interaction of model elements, and software code generation. The FACE Data Architecture consists of four primary model groupings:

1. Data Model:
 - Conceptual Data Model (CDM)
 - Logical Data Model (LDM)
 - Platform Data Model (PDM)
2. UoP Model
3. Integration Model
4. Traceability Model

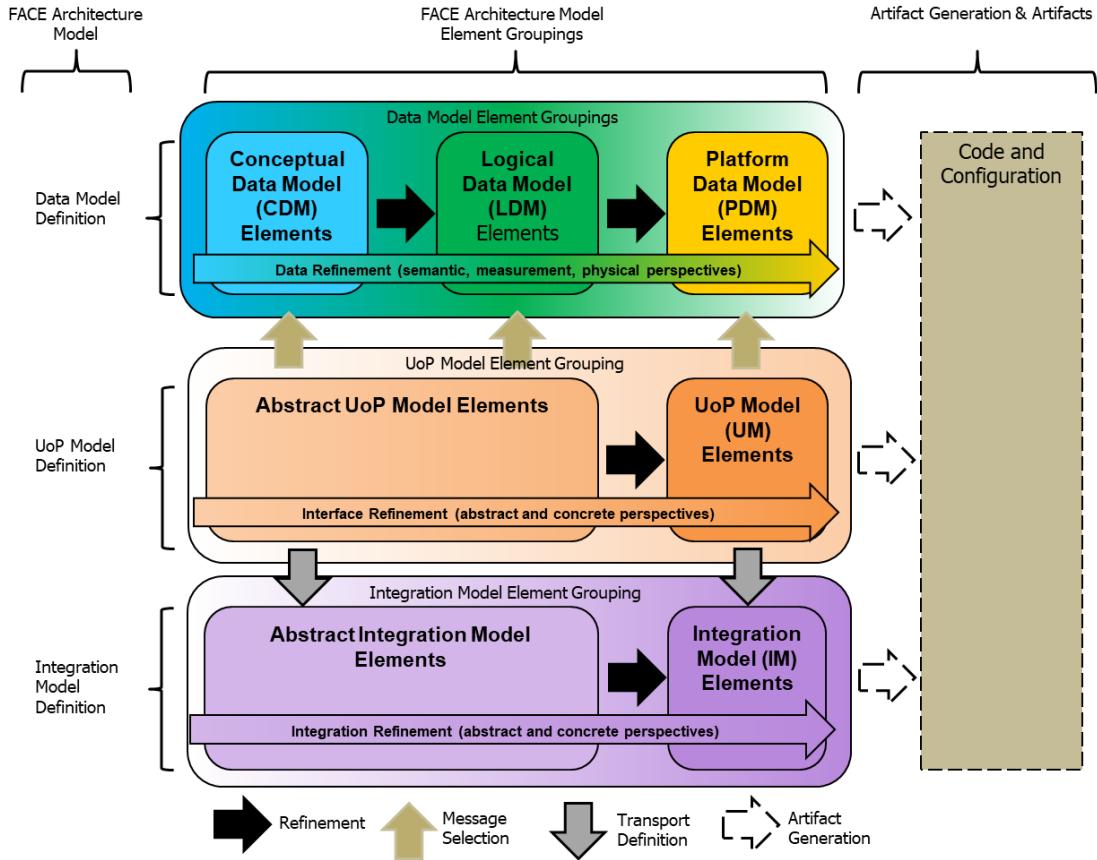


Figure 1: FACE Architecture Models without Traceability Model

Figure 1 shows the various constituent models that make up the FACE Data Architecture and the relationships between the models. The progression from left to right is from abstract to concrete. With each level of refinement, the degree of specificity increases moving the model closer to a complete definition of the software application solution required for generation of code.

The first of the Architectural Model elements, the Data Model, is used to define data elements with unambiguous specificity for use in the FACE Technical Standard. The Data Model is divided into three different data elements with unambiguous specificity for use by FACE UoPs or DSDMs, as defined by the FACE Technical Standard:

- The Conceptual Data Model (**CDM**) provides the semantic definition of the entities and their relationships characterized by *Observables*
- The Logical Data Model (**LDM**) adds measurement information to each characterization by defining value type, unit, measurement, and frame of reference (through the measurement system)
- The Platform Data Model (**PDM**) adds physical data type information to the logical measurement characterization

The UoP Model provides the definition of a software component and its defined interfaces.

Note: As of the FACE Technical Standard, Edition 3.0 the terms UoP and UoC are interchangeable. We use the term UoP in this guidance document since the metamodel contains “UoP”-named model elements.

The *Integration Model* provides a mechanism to describe the Transport Services Segment (TSS) integration details between two or more UoPs.

Lastly, the *Traceability Model*, not shown in Figure 1, provides a mechanism to trace model elements to an external model. Select elements from an existing model declared from the Data Model or UoP Model elements are decorated with a reference to standards-based model types. Since the Traceability Model does not directly contribute to the meaning of the data, it is not shown in Figure 1.

The *Shared Data Model* (SDM) establishes a foundation of core data elements used as building blocks to create all other data models. Because the SDM is CCB managed, it is reliable and provides confidence in the core modeling elements and utility of reuse and potential of reduced data conversion needs.

The *Conformance Policy*, and supporting data model CTS, maintains the integrity of FACE Data Models for the purpose of data model reuse and integration. Since the USM and DSDM must be validated as conformant in order to be placed in the FACE UoC library, developers can expect a certain level of data integrity in these models.

Note: The Conformance Policy and tests do not perform a qualitative analysis of data model elements. Conformance only means that the elements adhere to the structure and constraints of the FACE Data Architecture.

The *Domain-Specific Data Model* (DSDM) is a data model designed to the FACE Data Architecture requirements. It captures domain-specific semantics and generally does not contain UoP Models.

2.2.1 Data Model Language

2.2.1.1 Data Models

2.2.1.1.1 Data Entities and Associations

The *Entities*, *Associations*, their *Characteristics*, and the *Characteristic*'s data types, at all three model levels, provide context for and give meaning to the data required or provided by a UoP. Using this information in its entirety, it is possible to not only determine if the required data of one UoP is (or is not) equal to the provided data of another UoP in terms of implementation type and size, frame of reference, and value domain; it is also possible to determine if the provided and required data shares (or does not share) the same conceptual meaning. This determination is critical to supporting interoperability and being able to successfully integrate UoPs.

For example, consider that UoP A provides and UoP B requires a WGS-84 position tuple consisting of latitude, longitude, and height, each using metric units (radians and meters), and each implemented as floating point numbers. Without context, the information exchanged, although completely and unambiguously specified, does not provide enough detail to understand whether or not each of the position parameters refers to the same real-world concept: UoP A may be providing the position of a platform executing a mission, whereas UoP B may require the position of an enemy jamming radar frequencies. *Entities* and *Associations* provide this context, unambiguously providing meaning to the data exchanged.

By specifying this information for a UoP, the System Integrator can not only determine if the data is the same or different in terms of implementation size and type, frame of reference, and units, requiring a conversion if necessary, but can also determine if there is semantic mismatch and address it accordingly.

The **CDM** captures the semantic meaning of the data elements. It accomplishes this by defining *Observables* that are used to define the *Characteristics* of each *Entity*. *Entities* are related to each other via an *Association*. Like an *Entity*, an *Association* is described unambiguously through *Characteristic Compositions* and *Participant* entities in the *Association*. Lastly, the **CDM** allows definition of conceptual data *Views* (*Query*) based on those entities and *Characteristic Compositions*. Data *Views* (*Query*) are described below.

The **LDM** provides a mechanism to extend each conceptual element with information that supports particular logical processing requirements: *Units*, *Measurement* and *Coordinate Systems*, value *Domains* (e.g., Real, Natural Number), and *Constraints*. Each conceptual element can have many representations at the logical level based on the selection of each of these additional elements of information. Also, conversion relationships between logical elements may be specified in the **LDM**. This provides a mechanism for sharing data between components that have different algorithms and therefore different data representations. For example, the same conceptual element representing the concept of altitude could be represented as an integer number of meters above ground level and as a real number of feet above mean sea level. The fact that these two representations are linked to the same concept informs users that direct conversions between them are realizable. The existence of conversions between the *Units*, *Measurement* and *Coordinate Systems*, value *Domains* (e.g., Real, Natural Number), and *Constraints* defines the method of performing those conversions.

The **PDM** takes the **LDM** a step further by allowing each logical element to be further described with the specifics of the software implementation. The **PDM** defines the specific data type such as float or double used to represent the value type allowing the logical type to be represented for the specific processing need of a UoP.

Note: The data types are defined in the FACE Technical Standard with OMG IDL™; however, an implementation will likely generate source code for the UoP's programming language. In other words, IDL is not required to be generated, but is used for the definition of how code must be generated as defined by the FACE Technical Standard.

2.2.1.1.2 *Data Views*

Another concept to introduce is that of a *View*, supported by the FACE Data Architecture and covered in further detail in the Application Perspective sections in later chapters. A view is an abstract element in the metamodel whose function is to select a subset of a data model's entities and associations that are of interest. It assembles specific *Characteristics* of one or more *Entities* and preserves the context of each *Characteristic*. The primary utility of views is to assemble information that is necessary and useful for a particular purpose without imposing unique specifications and requirements of that purpose throughout the entire system, or on other systems.

Views created at the conceptual, logical, or platform level of the model have the same level of abstraction as other data model elements. They can also have relationships from a view in the **CDM** to one or more views in the **LDM**; that is, a view in the **LDM** can realize a view in the **CDM**. Similarly, a view in the **LDM** may be realized by one or more views in the **PDM**; that is,

a view in the **PDM** may realize a view in the **LDM**. It is also acceptable to have logical **Views** that are not realizations of conceptual **Views** and platform **Views** that are not realizations of logical **Views**. Because it is possible to have both conditions, it is necessary to decide when a logical **View** is independent, and when it is a realization of a conceptual **View**.

Views in the **CDM** are collections of **Characteristics**. They are a specification of a **View** that is to be realized by several corresponding logical **Views**. It is desirable to create a conceptual **View** when there are several logical **Views** that have identical conceptual content, but different representations of the concepts. The ability to indicate that each of the different logical **Views** *realizes* the same conceptual **View** clarifies the role that each logical **View** plays within the system and reduces the effort needed to map between the different logical **Views**. It is also useful to create conceptual **Views** to represent the conceptual interfaces of components or services. The most common use of such a view is to describe the information exchanges of an *AbstractUoP*.

Note: Conceptual and logical **Views** are not required for conformance validation. However, if they are modeled and subsequent layers of the model realize the **Views**, then conformance validation checks will be applied to the **Views** to ensure consistency.

2.2.1.1.3 Data Model Levels

The FACE Data Architecture divides the FACE Data Model into three levels: Conceptual, Logical, and Platform Data Models. These three levels of model provide for the incremental definition of data. The levels provide a separation of concerns that supports reuse of data models. Modeling first focuses on developing domain concepts (conceptual), then elaborating (logical and platform) until the UoP interfaces have been fully specified.

Note: This division of data models aligns with both Model-Driven Architecture[®] (MDA[®]) conventions and the Department of Defense Architecture Framework (DoDAF) metamodel.

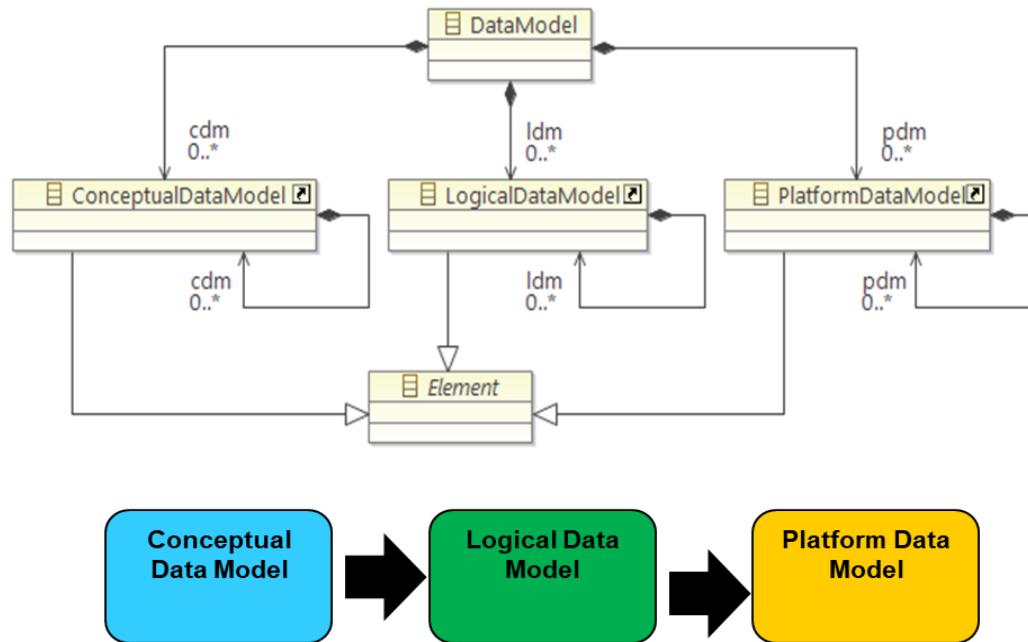


Figure 2: Metamodel Elements and their Progressions

The separation of the data model into three levels supports key interoperability requirements of the FACE Technical Standard and enables efficient transformation of existing components into FACE UoPs.

Each of the three levels of data models includes *Entities*, *Associations*, and *View* model elements. The *Entity* and *Association* elements provide a semantic description of the data elements through *Characteristics* and *Associations* between the *Entities*, whereas the *Views* provide a description of the data set that can be sent or received by a UoP. In the sections above, the Conceptual, Logical, and Platform Data Models were introduced. They are defined in more detail in the following sections.

2.2.1.1.4 *Conceptual Data Model (CDM)*

The *CDM* contains *CDM* elements such as *Domain*, *BasisEntity*, *Observables*, *Entity*, *Association*, and *View (Query)*. These elements allow modelers to define application *Domain* concepts, their *Characteristics*, and the relationships between them. *Observables* are used to type the *Characteristics* of *Entities* and *Associations*. The *CDM* also supports a method to define *BasisEntities* that can be used to specify *Domain* concepts.

The value of the *CDM* is the level of abstraction at which it is represented and that it provides the definition of each *Entity/Association*. As the most abstract of the three data models, it provides the most reuse. One way to think of the *CDM* is that of ontology. It is very similar in that the model of each *Entity* defines the *Entity* by specifying the *Characteristics* of the *Entity*.

2.2.1.1.5 *Logical Data Model (LDM)*

The *LDM* contains *LDM* elements such as: *Measurement System*, *Measurement*, *MeasurementAttribute*, *ValueType*, *Enumeration*, *Unit*, *Constraint*, *Conversion*, *Entity*, *Association*, and *View (Query)*. The main *LDM* elements are explicitly modeled as realizations of their *CDM* element counterparts. The *LDM* further refines the conceptual *Observables*, *Entities*, *Associations*, and *Views* defined in the *CDM*.

Refinement from the conceptual to logical level includes:

- Refining *Observables* to *Measurements* by specifying value type (e.g., real, integer) and unit (e.g., meter, feet), and frame of reference modeled by a *Measurement System* (e.g., WGS-84, ECEF)
- Selecting which *Conceptual Entity* and *Association Characteristic Compositions* and *Participants* to include in the logical representation of the *Entity/Association*
- Selecting which *Measurements* and *Entities* are used to type *Entity/Association Characteristic Compositions*
- Deciding if multiple refinements of *Characteristics* are required when more than one logical design is warranted for an *Entity/Association* (see Section 4.5.3.3.1)
- Refining *Views* by adding more details to the selection criteria

The value of the *LDM* is that it becomes more concrete and less abstract, which is of particular value to stakeholders who rely on detail, such as System Integrators and software implementers. At the logical level the model does lose some of its ability to be reused due to the *Characteristics* chosen for the *Entity/Association* and the *Measurements* chosen to represent those *Characteristics*.

2.2.1.6 Platform Data Model (PDM)

The **PDM** contains **PDM** elements such as: *IDLPrimitive*, *IDLStruct*, *Precision*; *Entity*, *Association*, *View* (*Template* and *Query*). Most **PDM** elements are explicitly modeled as realizations of their **LDM** element counterparts. The **PDM** further refines the logical *Measurements*, *Entities*, and *Associations* defined in the **LDM**.

Refinement from the logical to platform level includes:

- Refining logical *Measurement*, *MeasurementAxis*, and *ValueTypeUnit* elements to *IDLTypes* (*IDLPrimitives* and *IDLStructs*) to define their structure and physical type
- Selecting which *Logical Entity/Association Characteristic Compositions* and *Participants* to include in the platform representation of the *Entity/Association*
- Selecting which *IDLPrimitives*, *IDLStructs*, and *Entities* are used to type *Entity/Association Characteristic Compositions*
- Deciding if multiple refinements of *Characteristics* are required when more than one platform design choice is warranted for an *Entity/Association* (see Section 4.5.3.3.1)
- Refining *Logical Queries* into *Platform Queries* and *Templates* to define the structure of the information exchanged

IDLPrimitives supported by the **PDM** correspond directly to Interface Definition Language (IDL) data types and include: *IDLSequence*, *IDLArray*, *Boolean*, *Octet*, *Char*, *String*, *BoundedString*, *CharArray*, *Enumeration*, *[U]Short*, *[U]Long*, *[U]LongLong*, *Double*, *LongDouble*, *Float*, and *Fixed*. The FACE Technical Standard provides **PDM** to IDL bindings and mappings to each supported programming language.

The value of the **PDM** is that with the IDL types and query/template definitions, the model is starting to approach working code. At the platform level, the ability to reuse the model across multiple *Domains* is reduced significantly. This is expected as it is tied so closely to the implementation.

2.2.1.2 UoP Model

The UoP Model contains UoP Model elements such as *AbstractUoP*, *UnitOfPortability*, *ComponentFramework*, *PubSubConnection*, *ClientServerConnection*, and *Thread*. A UoP Model provides the means to formally specify the interfaces of a UoP in terms of data and communication *Characteristics*. These interfaces, modeled using the *Connection* model elements, reference platform *Views* that specify the data that passes through the interface. Connection model elements are representations of “logical” (in the traditional use of the word) connections and do not necessarily correspond to the actual communication channels for exchanging data.

The *AbstractUoP* element supports a platform-independent specification of the UoP by using *AbstractConnections* that reference either logical or conceptual *Views*.

The value of the UoP Model is that it provides a description of the FACE UoP in terms of its interfaces, and communication and implementation details that can be used during integration efforts. In the Integration Model, discussed below, a *UnitOfPortability* can be realized as a *UoPInstance*.

2.2.1.3 *Integration Model*

The Integration Model contains elements such as *UoPInstance*, *TransportChannel*, *IntegrationContext*; *TransportNode* (*ViewSource*, *ViewSink*, *ViewFilter*, *ViewTransformation*, *ViewAggregation*, *ViewTransporter*). An Integration Model provides the means to model the exchange of information between *UoPInstances*. An Integration Model captures data exchanges, view transformations, and integration of UoPs for documentation of integration efforts. An Integration Model relies on the UoP Models for expressing interconnectivity. The focus is on documenting UoP data exchange details.

Refinement from UoP Model to Integration Model includes:

- Refinement of *UnitOfPortability* elements as *UoPInstance* elements
- Selection of *Connection* elements for *UoPEndPoint* elements

The value of the Integration Model is that it provides a concrete view for the System Integrator to work through the integration of the FACE conformant component with other FACE conformant components. The Integration Model provides transparency into the information exchange and view transformations. This transparency also permits the System Integrator to create integration test artifacts.

Note: The Integration Model is not used for conformance and is therefore optional.

2.2.1.4 *Traceability Model*

The Traceability Model contains traceability elements such as *TraceableElement*, *TraceabilityPoint*, *UoPTraceabilitySet*, and *ConnectionTraceabilitySet*. The Traceability Model provides the means to define one or more *TraceabilityPoints* from the following model elements:

- Conceptual Data Model: *Entity*, *View* (*Query*)
- Logical Data Model: *Entity*, *View* (*Query*)
- Platform Data Model: *Entity*, *Query* *View* (*Template*)
- UoP Model: *AbstractUoP*, *AbstractConnection*, *UnitOfPortability*, *Connection*
- Traceability Model: *UoPTraceabilitySet*, *ConnectionTraceabilitySet*

A potential use of the Traceability Model is to provide additional detail or context when linked to an external *source*. Another use is to map between models in different tools, such as mapping a FACE Data Model element to a SysML model element.

Note: The Traceability Model is not used for conformance and is therefore optional.

2.2.2 **FACE Shared Data Model**

The FACE SDM provides the basis set of elements from which all USMs and DSDMs are built. The SDM is a repository of data elements that may be leveraged or extended by Software Suppliers developing UoPs. It is a set of managed elements that provides a common set of building blocks for all data models. It defines a set of *Observables* at the conceptual level. It also defines the *Units*, *Measurement* and *Coordinate Systems*, and related information needed to construct *Measurements* which are a *logical representation* of the conceptual *Observable*.

The SDM and its content are governed by the FACE Shared Data Model Governance Plan and managed by the FACE SDM CCB. In addition, a FACE subcommittee meets weekly to address requested changes to the SDM. The FACE Shared Data Model Governance Plan details the governed elements, SDM conformance requirements, and the process for maintaining and updating the SDM. The Governance Plan should be consulted for a complete list of managed elements and the process for SDM modification. When a new SDM CCB managed element is required for a DSDM or USM, a Change Request (CR) is submitted through the online FACE Problem Report/Change Request (PR/CR) tool. Requests are anonymous and will be worked into the subcommittee's weekly agenda as soon as reasonably possible. Requests should be as specific as possible and provide the subcommittee with enough information and context for making an informed decision. The subcommittee may respond to the submitters for additional information. If not addressed in three weeks by the submitter, the request will typically be considered abandoned and will be subsequently rejected.

The value of the SDM is that it establishes a common starting point or common semantic model from which all other models are built. The SDM focuses on engineering primitives that reduce ambiguity normally associated with textual representation. This allows the modeler to build on top of the more primitive elements to create a model for their domain or application.

Note: The SDM is coupled to a specific major edition of the FACE Technical Standard. Therefore, an SDM 3.0.x must be used for conformance to the FACE Technical Standard, Edition 3.0.x and an SDM 2.1.x must be used for conformance to the FACE Technical Standard, Edition 2.1.

2.2.2.1 Shared Data Model Organization

Packages in the SDM create a hierarchy of data model elements. Packages within the SDM are informational only. For example, the SDM groups *Observables* under one top-level package inside the *CDM*. *Observables* are further grouped into packages identified by common classifications. When an *Observable* is added it should be placed into an existing package if a reasonable one can be found. If an appropriate package cannot be found, then a new package can be created to hold the *Observable*.

The following examples of the SDM are extracted from the SDM 3.0. The SDM 3.0 release may reorganize elements.

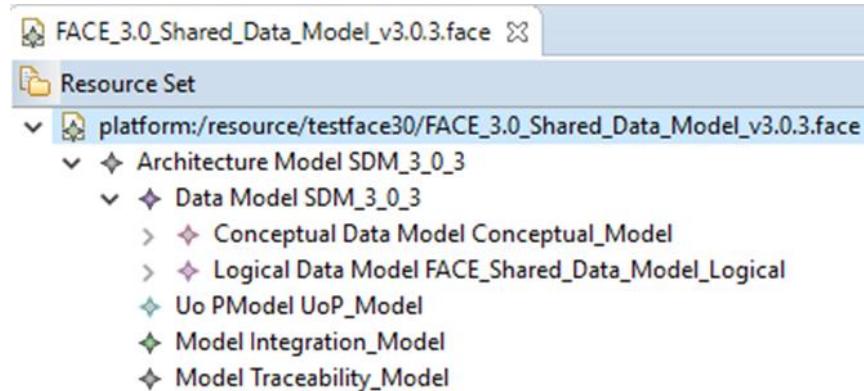


Figure 3: Sample FACE SDM 3.0 Organization

Figure 3 shows the top-level structure of the SDM. The SDM focuses on the Conceptual and Logical data elements and does not currently include Platform or UoP elements. These are described below.

2.2.2.1.1 *Conceptual Data Model Organization*

The Conceptual SDM consists mainly of *Observables*. The *Observables* are categorized by the concepts they portray. In many cases the *Observables* are aligned with concepts relating to the International System of Units (SI units). Figure 4 shows a snapshot of the Conceptual SDM.

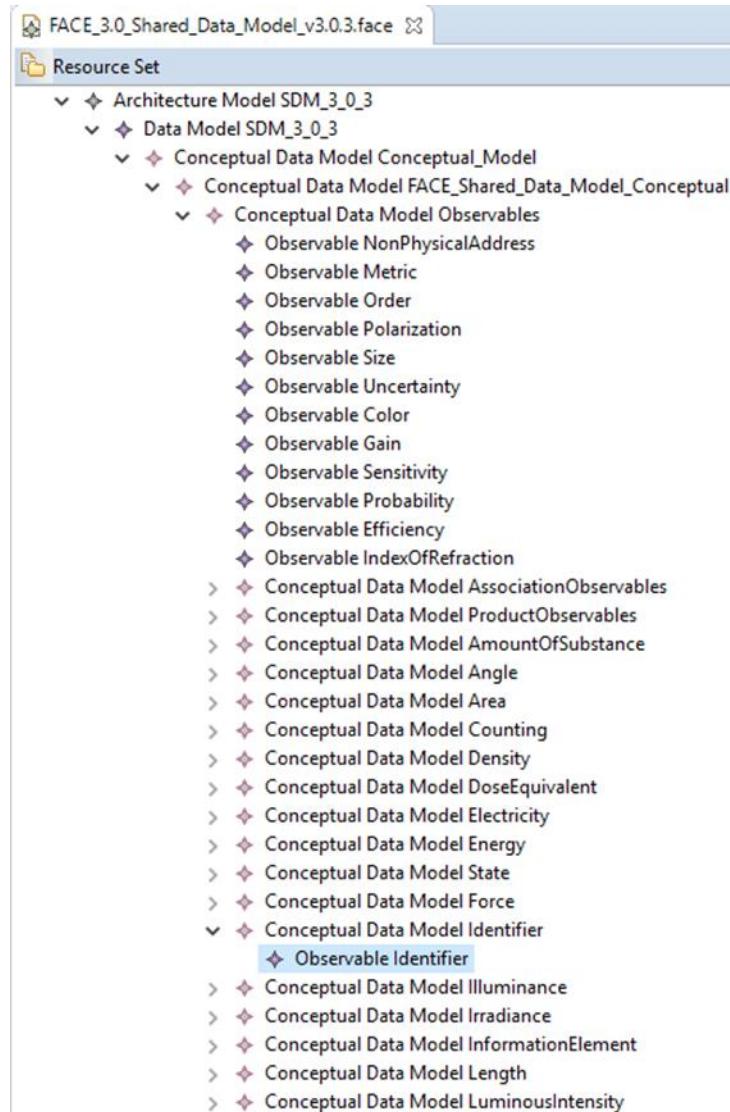


Figure 4: SDM Version 3.0.3 Sample Conceptual Data Model Organization

2.2.2.1.2 *Logical Data Model Organization*

The Logical SDM primarily consists of model elements that support the means to measure the conceptual *Observables*. The logical elements are categorized by metamodel type and then by the concepts they portray. These logical elements are divided into their metamodel type which relates to each elements role in the holistic measurement: *CoordinateSystems*,

LogicalValueTypes, *Units*, *ValueTypeUnits*, *Landmarks*, *ReferencePoints*, *Constraints*, *MeasurementSystems*, *Measurements*, and *Enumerations*. These types are defined by the FACE Metamodel in the FACE Technical Standard. The following diagrams provide a sample reference of the SDM logical structure. Figure 5 shows the top-level logical structure.

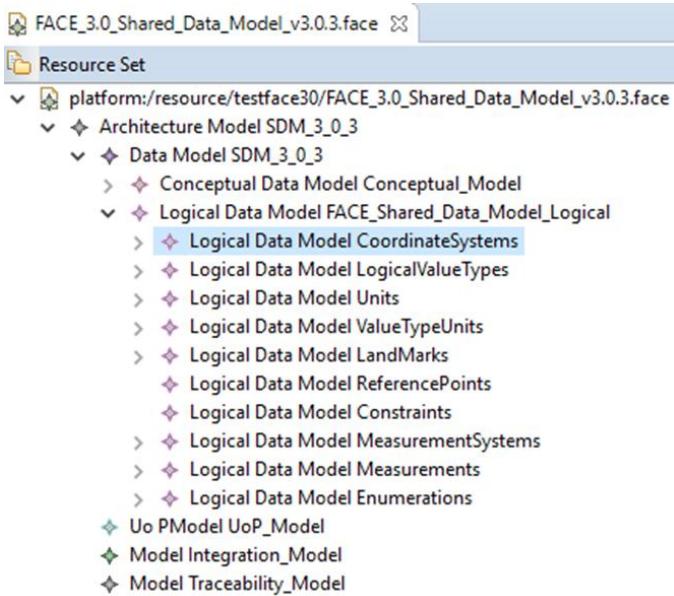


Figure 5: SDM Version 3.0.3 Sample Logical Data Model Organization

Figure 6 shows the expanded “CoordinateSystems” package from Figure 5. All of the elements that make up the “Cartesian” “*Coordinate System*” are contained in the Cartesian package.

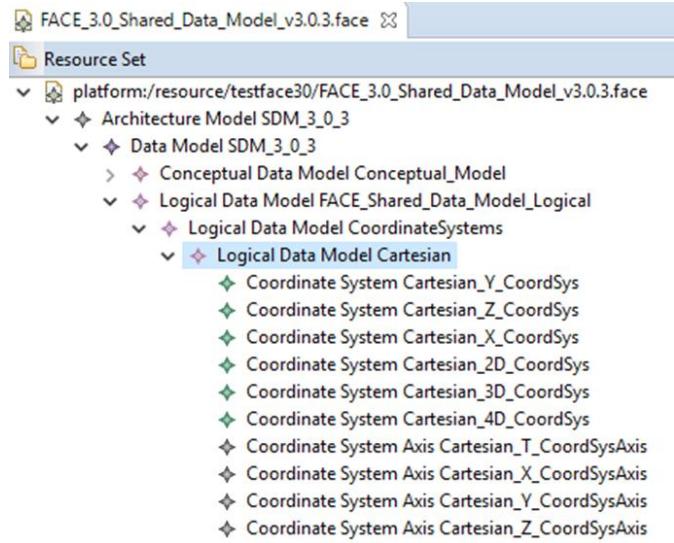


Figure 6: SDM Version 3.0.3 Sample Logical Data Model – Coordinate Systems

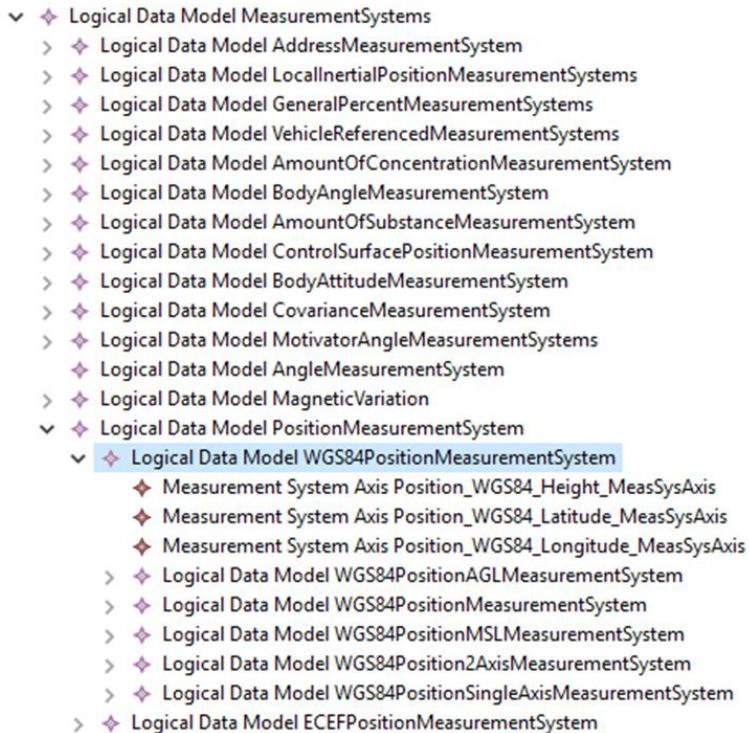


Figure 7: SDM Version 3.0.3 Sample Logical Data Model – Example Measurement Systems

Figure 7 shows an example of a measurement system expansion. These figures are a small example of the structure of the SDM *Measurement Systems* organization.

Note: Each package/folder is a data model as defined by the metamodel.

2.2.3 Conformance Policy

The *Conformance Policy* approach and rules are defined in the FACE Conformance Policy document. This Policy defines the rules used to verify conformance for USMs and DSDMs. The FACE CTS is used to validate the integrity of USMs or DSDMs. In fact, passing the CTS for a data model is key to gaining conformance of the data model.

Note: As stated above, the Conformance Policy and tests do not perform a qualitative analysis of data model elements. Conformance only means that the elements adhere to the structure and constraints of the FACE Data Architecture and not that the model is “good”.

See Section 7.4 for a further discussion of FACE Data Model conformance. The sections below also describe the UoP Supplied Model (USM) and DSDM conformance.

2.2.3.1 UoP Supplied Model (USM)

The FACE Technical Standard defines a USM as a data model supporting a Unit of Conformance (UoC). See the FACE Technical Standard §3.9.4.1 for a list of requirements to achieve USM conformance. Simply stated, the purpose of the USM is to define all of the data elements sent to and received by a UoP. The USM must adhere to and utilize a standard SDM and must adhere to FACE Shared Data Model Governance Plan.

To achieve conformance for a USM, it must:

- Adhere to the FACE Data Architecture language
- Meet the FACE OCL constraints, *Query*, *Constraints*, and, if applicable, the *Template Constraints*
- Follow the rules outlined in the FACE Shared Data Model Governance Plan
- Each USM must use a published SDM in its construction

2.2.3.2 *Domain-Specific Data Model (DSDM)*

The FACE Technical Standard defines a DSDM as: “*a data model designed to the FACE Data Architecture requirements. It captures domain-specific semantics and generally does not contain UoP Models.*” DSDMs are intended to capture common elements in a domain of interest. A domain of interest could be a community of interested parties (e.g., Unmanned Control System (UCS)) or a government program of record. In addition, industry could develop DSDMs that are used internally for their products as part of their business strategy.

Each community of interest that manages a DSDM must make decisions on what information is appropriate for their DSDM. DSDMs are intended to capture *Entity* and *Association* model elements relevant to a domain, providing a common context for users. Each community of interest makes decisions on whether *CDM*, *LDM*, and/or *PDM* elements should be included in the DSDM. For example, a DSDM constructed to capture the UCS model content would have *CDM* and *LDM* elements as they are defined by the UCS model. Another DSDM for capturing STANAG 4586¹ data would likely contain *PDM* elements since STANAG 4586 includes platform-level information in its message definitions.

To achieve conformance of a DSDM, it must:

- Adhere to the FACE Data Architecture language
- Meet the FACE OCL constraints, *Query*, *Constraints*, and the *Template Constraints* as applicable
- Follow the rules outlined in the FACE Shared Data Model Governance Plan
- Use an approved version of the FACE SDM in its construction

Note: Any elements from the FACE Data Architecture language may be used in a DSDM.

USMs that are constructed to a DSDM can be validated against the DSDM. USMs may not modify elements in the DSDM; they can only extend through the use of generalization and the addition of new elements and relationships. The FACE CTS is used to validate USMs against DSDMs.

2.3 Introduction to the Data Modeling Example

This section defines the style and notation used throughout this document to foster a common interpretation of the concepts and provide the readers with a credible example model from which to begin. The examples used in this document are sourced from a supplemental working model

¹ A NATO Standard interface of the Unmanned Control System (UCS) Unmanned Aerial Vehicle (UAV) interoperability.

based on a Relevant Operating Picture (ROP) domain content. Unless otherwise stated all example material is a direct reference into the sourced model.

2.3.1 Style Guide for the Examples

The FACE Data Model *does not define a graphical notation* for representing FACE Data Model elements. However, it is useful to view models graphically, so this guidance uses the following graphical notation for these examples.

The notation is divided into the various model types: Conceptual, Logical, Platform, UoP, and Integration Models. For the Microsoft® PowerPoint® graphical format for the example, see Chapter 8 for further information.

- The color of the element matches the model in which it is contained
The colors are those used in the FACE Technical Standard §3.9.1 and in Figure 1 above.
- The format of each element is the element type surrounded by angle brackets: << *Type* >>
- The *Name* assigned to the element chosen by the user
- A list of sub-elements; for example, *Rolename* : *Type*

Connectors are depicted with a line that varies in:

- Line style
- Optional decoration on each end of the line
- The type surrounded by angle brackets: << *Type* >>
- Multiplicity specifies the number of elements and is shown as (min ... max) where * represents infinity, and a single digit represents a matching minimum and maximum value

Figure 8 shows a simple *CDM* describing a dog ownership relationship between a Person and a Dog.

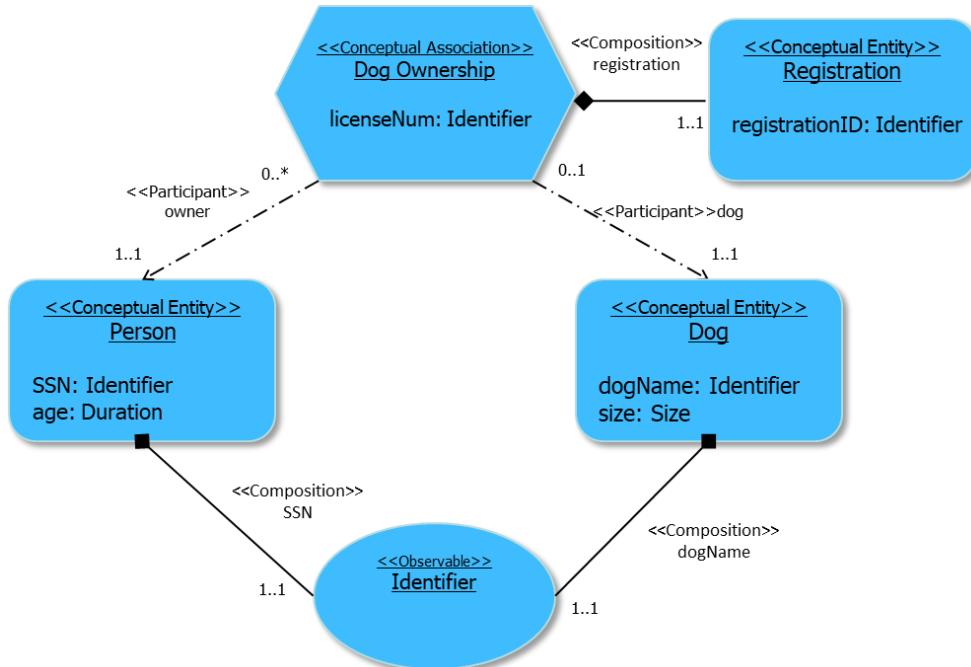


Figure 8: Example Conceptual Data Model

The following sections show the graphical notation elements divided into the different data model categories: Conceptual, Logical, Platform, UoP, and Integration.

2.3.1.1 Conceptual Data Model

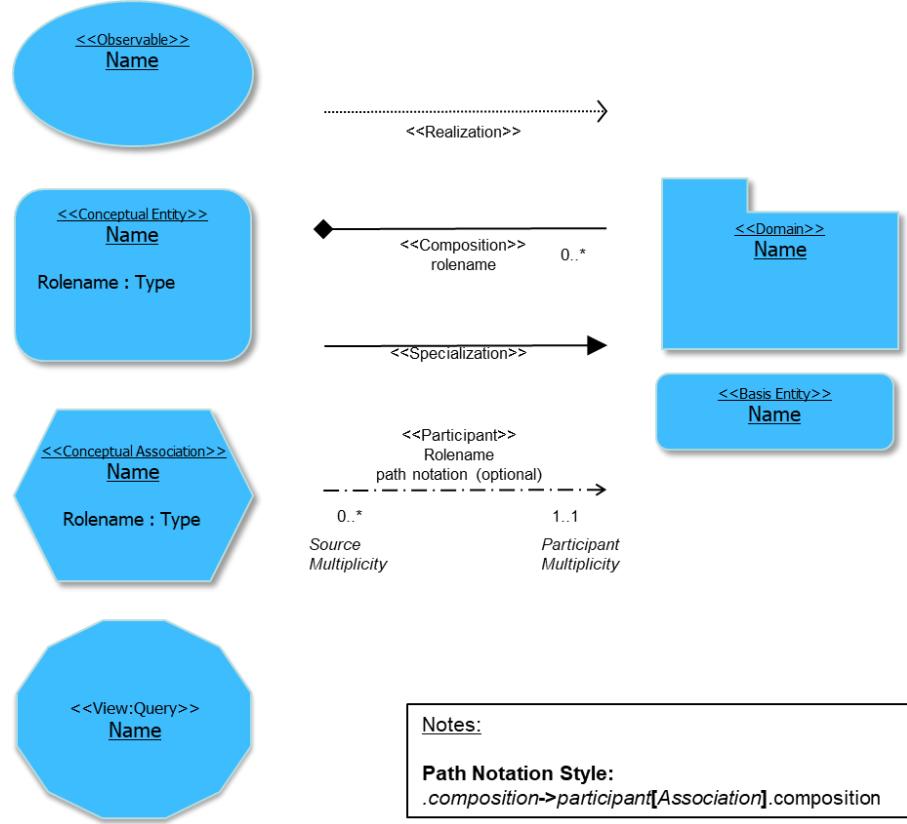


Figure 9: Conceptual Data Model Graphical Notation

2.3.1.2 Logical Data Model

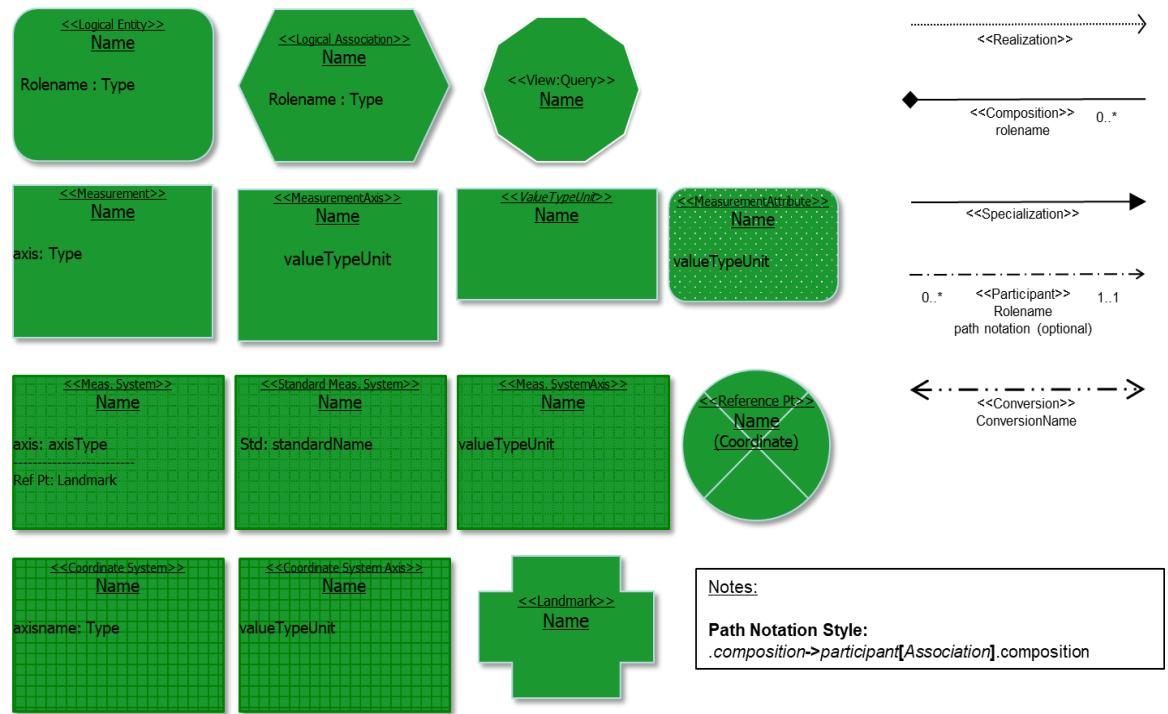


Figure 10: Logical Data Model Graphical Notation

2.3.1.3 Platform Data Model

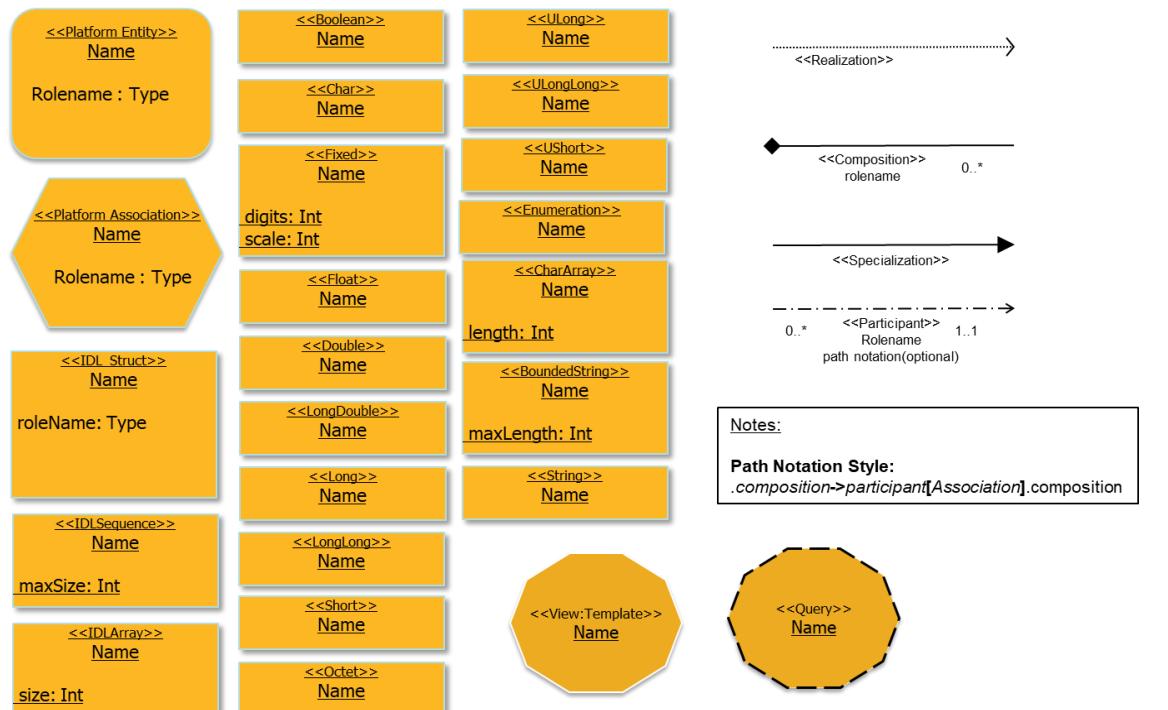


Figure 11: Platform Data Model Graphical Notation

2.3.1.4 UoP Model

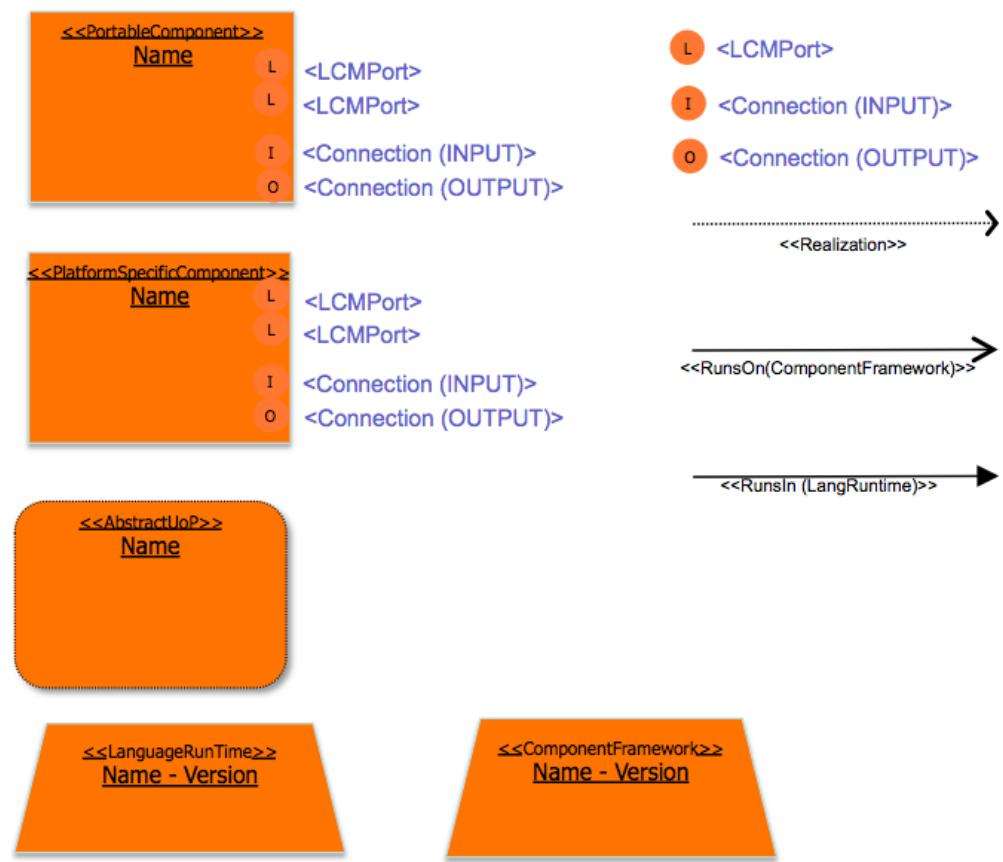


Figure 12: UoP Model Graphical Notation

2.3.1.5 Integration Model

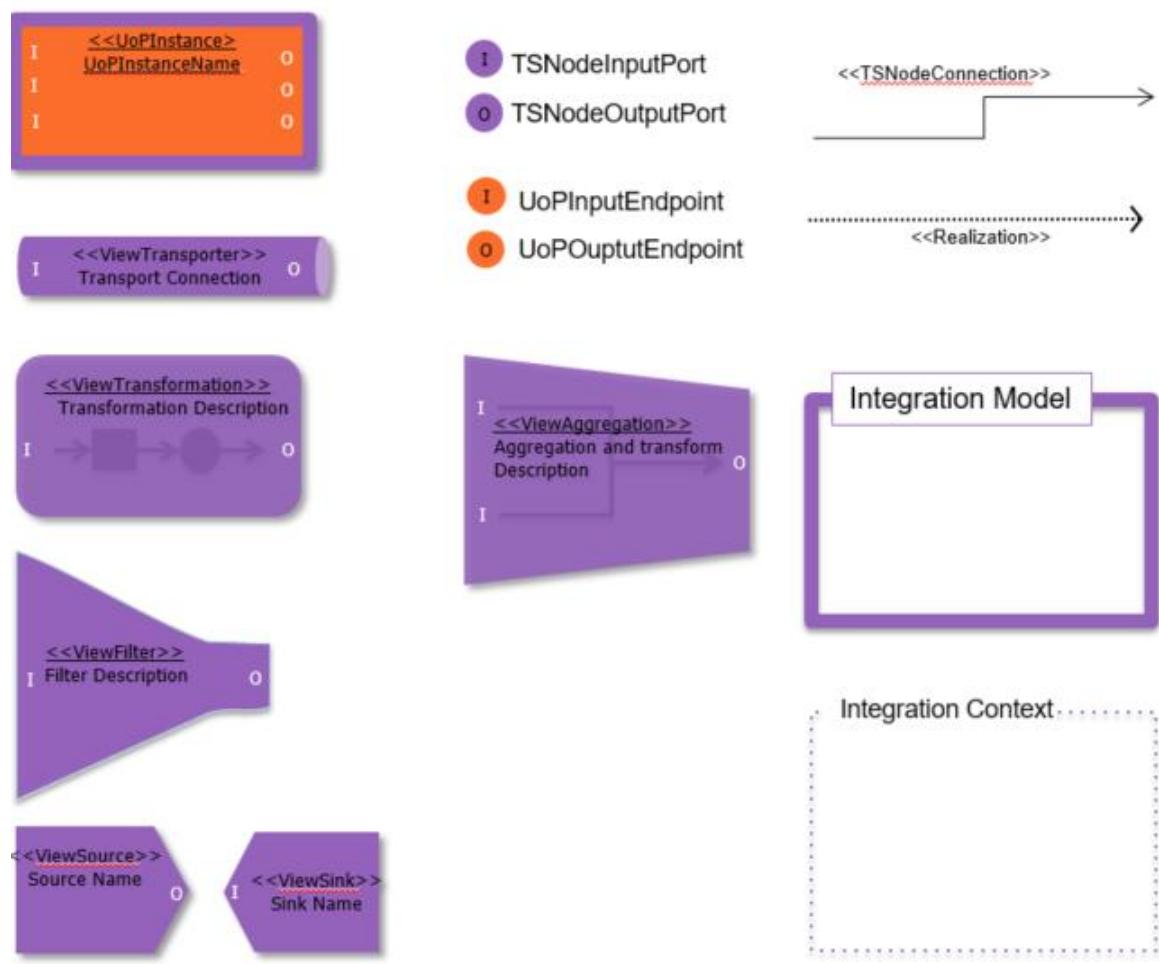


Figure 13: Integration Model Graphical Notation

2.3.2 Where to Find the Examples

The examples in the following sections of this document are sources from a supplemental working model based on ROP domain content. The example XMI® (.face) file used in this document is located in Appendix B.

3 Data Architecture Specification

A Data Architecture specification is a series of models that are effectively contained under a high-level Architecture Model which is defined as the top-level element of the metamodel. The overall structure of the Data Architecture separates the context and detail into smaller models as a means to simplify the development of each model and increase reusability of elements at each modeling level.

Figure 14 is a roles and relationships matrix which provides a notional picture of each sub-model's contribution to the specification. The rows in the table are color coded to match the color scheme used in the Data Architecture graphical notation described in Section 2.3. The Architecture Model is the overarching model for all sub-models, as shown by the leftmost column of Figure 14. Each column of the table highlights the principal application of detail separation in the architecture and each subsequent row in the table highlights the principal application of context separation.

		Data Architecture			
Architecture Model	Detail: ↓	Context: →	Observation Perspective	Entity-Association Perspective	Application Perspective
	Data Model	Conceptual Data Model (CDM)	Observables	Semantics	Query View
		Logical Data Model (LDM)	Measurements Measurement Systems	Refines with Measurements and Constraints	Refines Query View using LDM Entities
		Platform Data Model (PDM)	IDL Data Types	Refines with Types, Multiplicities, and Constraints	Refines the View refining the Query using PDM Entities Defines IDL style Template for DM Type code generation
	UoP Model				PCS, PSSS, Connections (link to Templates)
	Integration Model				TSS data transformation and linkage
	Traceability Model		External Model Traceability	External Model Traceability	External Model Traceability

Figure 14: Data Architecture Perspectives and Models

The perspectives, represented as columns in Figure 14, are described as:

- *Observation Perspective*: describes the leaf data elements used to type *Entity* and *Association Characteristics*
- *Entity-Association Perspective*: describes data elements that define the meaning and context of application concepts and their relationships
- *Application Perspective*: describes the application (or use) of data elements by software components supporting component interface integration

The concept of perspectives, although not a formal part of the data model specification, is used to focus on similar cross-cutting concepts across the different model levels.

This chapter introduces aspects of the Data Architecture shown in Figure 14.

Chapter 4 and Chapter 5 describe:

- The hierarchical nature of the architecture
- The separation of context described by the perspectives
- The separation of detail for the data model described by the nested models: Conceptual, Logical, and Platform, as referenced in Figure 14
- Model navigation and organizational concepts

Upon completion of these chapters, the reader should have a complete understanding of all the contributing parts of the Data Architecture and be ready to apply those concepts to the example model walk-through in Chapter 6.

4 Overview of Key Architectural Features

The Architecture Model is comprised of the four models: Data Model, UoP Model, Integration Model, and Traceability Model.

4.1 Data Model

The Data Model is the top model that focuses on decomposition of the information exchanged by a UoP. The intent is to develop a data-centric picture of the operational context for a UoP, separating the context and the detail into the appropriate sub-model's ease of maintainability, facilitating reusability and interoperability. The Data Model sub-models are covered in further detail later in this document.

4.1.1 Conformance

The Data Model is required to be evaluated for conformance. The CTS performs the evaluation on a USM and the versioned SDM upon which it is dependent.

Note: The conformance evaluation is performed on a USM in its entirety. This is an important distinction because the metamodel allows a USM to include multiple UoPs or broader scoped domain elements that are not referenced by the UoP under test. Should elements not directly contributing to a UoP under evaluation be in error, the USM as a whole will fail conformance.

4.2 UoP Model

The UoP Model is the prescriptive model that ties the Data Model aspects to the FACE Technical Standard. This model captures metadata with respect to characterization of the UoP in three functional areas: UoP requirements, defined interfaces, and Transport Service (TS) integration.

4.2.1 UoP Requirements

The FACE Technical Standard defines requirements for a UoP that must be met to satisfy conformance. These requirements identify *Characteristics* of the UoP with respect to care and feeding necessary to function within the architecture of a FACE system and readily identified by the FACE Conformance Verification Matrix (CVM). These UoP *Characteristics* provide details regarding the operating system interfaces, memory footprint, lifecycle requirements, communication channels, certification levels, and technical characteristics that enable informed decisions for performance and capabilities.

4.2.2 Transport Service Integration

The FACE Technical Standard defines that UoPs communicate to each other through a Transport Service (TS) and that a USM defines the information exchanged by the UoP. This is

true for both the Platform-Specific Services Segment (PSSS) UoPs and the Portable Component Segment (PCS) UoPs. In addition, UoPs can identify lifecycle management connections defined by the USM.

4.2.3 AbstractUoP

An *AbstractUoP* is defined in the FACE Technical Standard as follows: “*An AbstractUoP is used to capture the specification of a UoP.*” The *AbstractUoP* exists to allow the specification and procurement of a FACE UoP while still allowing innovation to occur in the design and implementation of the actual UoP. An *AbstractUoP* uses either *CDM Views* or *LDM Views* to capture the specification data to be exchanged by a *UnitOfPortability* implementing the specified *AbstractUoP*.

4.2.4 Conformance

While the *AbstractUoP* is not used for the FACE Conformance Program, UoPs can “realize” the *AbstractUoP* to identify that the UoP implements the specified *AbstractUoP*. This method can be useful for specification and procurement of UoPs without detailing their implementation. Whoever procures the software can evaluate the model to ensure the specification is met by the implemented software components.

If submitted, the CTS will verify the *AbstractUoP* for errors against the metamodel and OCL constraints. Should any of these constraints fail, the CTS results will reflect those failures and affect the conformance process. Therefore, the recommendation is to only submit the *AbstractUoP* as part of conformance if there are business reasons driving that decision.

4.3 Integration Model

To address integration between UoPs, the FACE Data Model Language provides elements for describing the high-level connectivity, routing, and transformations to be embodied in an instance of transport services called the Integration Model. An Integration Model consists of elements that provide the means to model the exchange of information between UoP instances. An Integration Model documents the data exchanges, view transformations, and integration of UoPs. This documentation is useful for UoP integration efforts. An Integration Model relies on UoP Model *Views* for expressing connection data.

The value of the Integration Model is that it provides a modeling capability for the System Integrator to work through the integration of FACE conformant components with other FACE conformant components. The integration model can be used to:

- Provide transparency into the information exchange, view transformation, etc.
- Enable the System Integrator to create integration test artifacts
- Develop configuration artifacts for a TS
- Construct TS *Type*-specific code for messages and data types used in an integration context

The Integration Model should contain two or more *UoPInstances* whose transport connections and data transformations are described through one or more *IntegrationContexts*.

Figure 15 shows an example of an Integration Model showing all Integration Model elements.

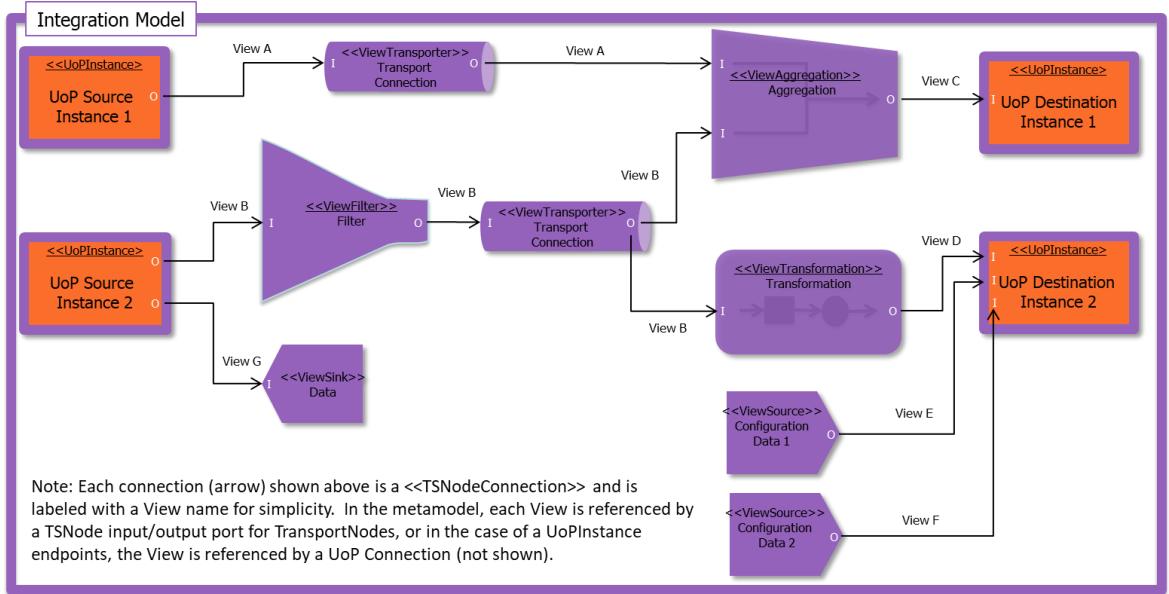


Figure 15: Integration Model Example

An Integration Model is constructed from the following primary model elements:

- **IntegrationContext**: a collection of all **TSNodeConnections** and **TransportNodes** that are part of a transport; it must have at least one **ViewTransporter** specifying that data is transported across a TS:
 - **TSNodeConnection**: connect UoPs through transport nodes (*Views* at each input and output of a transport node)
 - **TransportNode**: a node that performs some processing
- The following are types of **TransportNode**:
- **ViewSource**:
 - No Input Ports
 - 1 Output Port – Multiple connections per Port
 - **ViewSink**:
 - 1 Input Port – Multiple connections per Port
 - No Output Ports
 - **ViewAggregation**:
 - >1 Input Port – Multiple connections per Port
 - 1 Output Port – Multiple connections per Port
 - **ViewTransformation**:
 - 1 Input Port – Multiple connections per Port

- 1 Output Port – Multiple connections per Port
- *ViewFilter*:
 - 1 Input Port – Multiple connections per Port
 - 1 Output Port – Multiple connections per Port
- *ViewTransporter*:
 - 1 Input Port – Multiple connections per Port
 - 1 Output Port – Multiple connections per Port
- *UoPInstance*: a realization of a UoP containing *UoPInputEndpoints* and *UopOutputEndpoints*; it has 0 or more inputs and 0 or more outputs (one for each *UoPConnection*):
 - *UoPInputEndPoint*: each endpoint is an instance of a single UoP Input *Connection*; each endpoint can have only one connection
 - *UoPOutputEndPoint*: each endpoint identifies a single UoP Output *Connection*; each endpoint can have only one connection

4.3.1 Conformance

The Integration Model is not required as part of the FACE conformance process. It is a descriptive tool to aid integration activities. However, if submitted the CTS will verify the Integration Model for errors against the metamodel and OCL constraints. Should any of these constraints fail, the CTS results will reflect those failures and affect the conformance process. Therefore, the recommendation is to only submit the Integration Model as part of conformance if there are business reasons driving that decision. UoC providers can use the CTS to evaluate an Integration Model to determine a measure of goodness without including the Integration Model in the formal conformance process.

4.4 Traceability Model

The need to provide traceability or references from FACE Data Architecture content to external sources has been identified. This led to the introduction of traceability in the FACE Technical Standard, Edition 3.0. Each *TraceableElement* can have a reference provided along with a rationale for the trace. The reference is intended to be an unambiguous relation to another document or model (e.g., a standard, specification, or other modeling language element). This provides the recipient of the FACE Data Architecture Model with additional information about its containing context.

The types of *TraceableElements* are: *UnitOfPortability*, *Connection*, *AbstractUoP*, *AbstractConnection*, *Entity* (CDM/LDM/PDM), *View* (CDM/LDM/PDM), and *Query*. Each of these elements may have a reference to an external source and rationale provided when the model is constructed.

In addition, the Traceability Model provides the ability to group *UnitOfPortability* and *AbstractUoP* elements into a *UoPTraceabilitySet*. This set can then be traced, as a whole, to one or more external sources.

4.4.1 Conformance

Traceability is not considered as part of the FACE conformance process. It is informational only. However, if submitted the CTS will verify the Traceability Model for errors against the metamodel and OCL constraints. Should any of these constraints fail, the CTS results will reflect those failures and affect the conformance process. Therefore, the recommendation is to only submit the Traceability Model as part of Conformance if there are business reasons driving that decision. UoC providers can use the CTS to evaluate a Traceability Model to determine a measure of goodness without including the Traceability Model in the formal conformance process.

4.5 Model Perspectives

4.5.1 Overview

The model perspective paradigm is a means of looking at a cross-section of the complete data model by focusing on the common modeling tasks at each level in a vertical slicing approach. Model perspectives help the reader to better understand the flow of FACE modeling by grouping elements from different models based on the area of concern. The perspectives are described as:

- *Observation Perspective*: describes the leaf data elements which cannot be further decomposed and are used to type *Entity* and *Association Characteristics*
- *Entity-Association Perspective*: describes data elements that define the meaning and context of application concepts and their relationships
- *Application Perspective*: describes the application (or use) of data elements by software components supporting component interface integration

Figure 16 highlights how the perspectives cut across the architecture's various models and their relationship and usage of the various data models. The red box indicates the focus of the discussion in this section.

Data Architecture					
Architecture Model	Context: →		Observation Perspective	Entity-Association Perspective	Application Perspective
	Detail: ↓				
	Data Model	Conceptual Data Model (CDM)	Observables	Semantics	Query View
		Logical Data Model (LDM)	Measurements Measurement Systems	Refines with Measurements and Constraints	Refines Query View using LDM Entities
		Platform Data Model (PDM)	IDL Data Types	Refines with Types, Multiplicities, and Constraints	Refines the View refining the Query using PDM Entities Defines IDL style Template for DM Type code generation
	UoP Model				PCS, PSSS, Connections (link to Templates)
	Integration Model				TSS data transformation and linkage
	Traceability Model		External Model Traceability	External Model Traceability	External Model Traceability

Figure 16: Data Architecture with Perspectives

The following sections describe each perspective in further detail, identifying the model elements which are grouped in each perspective and how they contribute in the cross-cutting concepts of the perspectives.

4.5.2 Observation Perspective

The Observation Perspective is the vertical slice of the Data Architecture consisting of the lowest-level data items, measurements, and data types used for information exchange. This section focuses on “typed” elements of atomic data referred to as “leaf data items”. The items presented in the section are the conceptual model *Observables*, logical model *Measurements/Measurement Systems*, and platform model IDL types.

Data Architecture					
Architecture Model	Detail: ↓	Context: →	Observation Perspective	Entity-Association Perspective	Application Perspective
	Data Model	Conceptual Data Model (CDM)	Observables	Semantics	Query View
		Logical Data Model (LDM)	Measurements Measurement Systems	Refines with Measurements and Constraints	Refines Query View using LDM Entities
		Platform Data Model (PDM)	IDL Data Types	Refines with Types, Multiplicities, and Constraints	Refines the View refining the Query using PDM Entities Defines IDL style Template for DM Type code generation
	UoP Model				PCS, PSSS, Connections (link to Templates)
	Integration Model				TSS data transformation and linkage
	Traceability Model		External Model Traceability	External Model Traceability	External Model Traceability

Figure 17: Observation Perspective

The Observation Perspective provides for specifying increased detail at each layer of the model through *realization* of conceptual *Observables* to logical *Measurements* and logical *Measurements* to platform *IDLTypes*. Furthermore, when a platform data type *realizes* a logical *Measurement*, it must realize all *Compositions* in the *Measurement*.

Figure 18 shows the progression from an *Observable* to a *Measurement* to an *IDLType*.

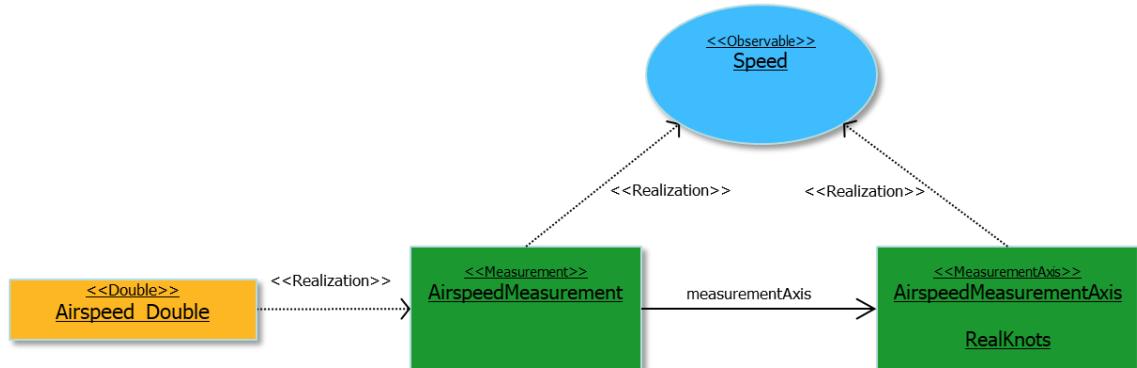


Figure 18: Observation Perspective Realization Progression

4.5.2.1 *Conceptual Observables*

The leaf data item intersecting with both the Observation Perspective and Conceptual Layer is the *Observable* defined by the FACE Data Architecture. An *Observable* is something that can be observed but not further characterized, and is typically obtained through measurements of the physical world. An *Observable* is independent of any specific data representation, units, or reference frame. For example, “distance” may be thought of as an *Observable* in that it can be measured, but at the conceptual level the nature of the measurement is not specified. The nature of the measurement is specified in the *LDM* which further defines or “*realizes*” the *Observables* by applying specific data such as reference frame. In this context, “*realizes*” is defined as a method to gradually develop an element by contributing ancillary attributes whose properties further the overall semantic meaning.

Observables are used to describe *Conceptual Entities* through the definition of their *Characteristics*. That is, the *Observable* defines core *Characteristics* of an *Entity* and defines the semantic meaning of the most fundamental *Entities* in your model. When we think in terms of the cross-cutting Observation Perspective we see that the *Observable* chosen sets the direction for detail discovery at the lower model layers. This is critical to understanding the semantics of the *Measurement* used to describe the details of the observation. By narrowing the focus to an abstract concept, the modeler can often better see similarities and differences, setting the basic vocabulary of the model in which the data item exists.

4.5.2.2 *Logical Measurements and Measurement Systems*

The leaf data items intersecting with both the Observation Perspective and Logical Layer are the set of elements to describe *Measurements* which are defined by the FACE Data Architecture. During the definition of any domain-specific data architecture, the data modeler will find the need to describe data in the form of *Measurements*. In the FACE Data Architecture all *Measurements* are required to be defined through a *MeasurementSystem*. The *MeasurementSystem* describes the overall system of measurement for a *Measurement*. It is the *MeasurementSystem* that provides an unambiguous description of the measurement’s component axes, the measurement’s orientation (i.e., handedness), and axes relationships through reference to a *CoordinateSystem*. The *MeasurementSystem* binds the *Measurement* to the real world through the use of *ReferencePoints* and *Landmarks*.

A *Measurement* provides the data type and unit. The *Measurement* also “*realizes*” an *Observable* in order to specify the type of observation being measured.

Note: The *Measurement* elements are not managed by the FACE CCB and therefore these elements provide the modeler with flexibility to override aspects of the underlying *MeasurementSystem*. However, the *Measurement* must still adhere to the core definition of the *MeasurementSystem*.

4.5.2.3 *Platform IDLTypes*

The leaf data items intersecting with both the Observation Perspective and Platform Layer are the *IDLTypes* defined by the FACE Data Architecture. The *IDLTypes* are directly traceable to the logical *Measurements*, and focus on language binding details for the data items. There are two subtypes of *IDLType*: Primitive and Struct. The *IDLPrimitive* aligns with the normative primitive data types for the standard programming languages, and the *IDLSyntax* is a construct for the modeler to build structured data as prescribed by the same standard programming languages.

4.5.3 Entity-Association Perspective

The Entity-Association Perspective is the vertical slice of the entities and relationships in the Conceptual, Logical, and Platform Data Models that describes the semantic definition of the *Entities*. The focus is on the discovery and semantic specification of *Entities*, *Associations*, and their *Characteristics* refining with additional details with each lower model level.

		Data Architecture			
Architecture Model	Detail: ↓	Context: →	Observation Perspective	Entity-Association Perspective	Application Perspective
	Data Model	Conceptual Data Model (CDM)	Observables	Semantics	Query View
		Logical Data Model (LDM)	Measurements Measurement Systems	Refines with Measurements and Constraints	Refines Query View using LDM Entities
		Platform Data Model (PDM)	IDL Data Types	Refines with Types, Multiplicities, and Constraints	Refines the View refining the Query using PDM Entities Defines IDL style Template for DM Type code generation
	UoP Model				PCS, PSSS, Connections (link to Templates)
	Integration Model				TSS data transformation and linkage
	Traceability Model		External Model Traceability	External Model Traceability	External Model Traceability

Figure 19: Entity-Association Perspective

The purpose of the Entity-Association Perspective is to build a contextual picture for the models' domain. The modeler must discover the definition of *Entities* that sufficiently describes "Things" (Things = ideas, concepts, etc.) and the relationships, be they association, composition, or generalization/specialization between "Things" in a single level. This contextual picture will be repeated at all model levels and linked across layer boundaries through realization relationships.

The realization linkage of *Entities* and *Associations* ensures the traceability of the data elements from the lower more specific model levels to the higher more abstract model levels. The traceability of data constructs within a FACE Data Model begins at the conceptual level. The *Observable*, *Entities*, and *Associations* are the top of the realization hierarchy for the individual data values, identifying the high-level abstractions or concepts to which the platform data values are traced, through the logical measurements.

Figure 20 shows an example slice for the Entity-Association Perspective and its intersection of the **CDM** and **LDM**. In this example, the **Entities** and **Associations** are the same; it's how the compositional **Characteristics** are typed at each layer where the refinement becomes evident. The curly brackets on left side of the diagram highlight the Aircraft refinement, showing each of the logical Aircraft's **Compositions** as realizing the conceptual Aircraft **Compositions**.

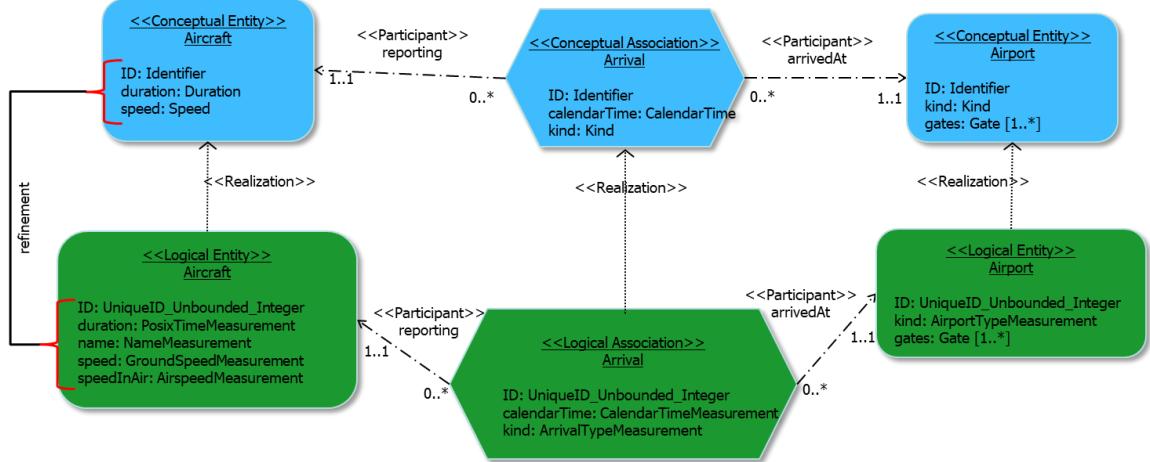


Figure 20: Conceptual to Logical Refinement

It is important to understand that the function of the model layers is to refine the semantic meaning of the elements modeled in the adjacent top layer. The **CDM** defines the semantics of the **Entities** and **Associations**. Lower-level models refine only the **Entities** attribute/characteristic information. They do not change the semantics or define new information. All logical elements, be they **Entities**, **Associations**, or **Characteristics** are influenced by the high-level decisions defining the Conceptual Layer.

The following sections focus on the refinement aspects of the **LDM** and introduce realization, the refinement mechanism, and explain how it impacts the logical Entity-Association Perspective with its characterizations.

4.5.3.1 Characteristics

A **Characteristic** is a feature/property/attribute of an **Entity** or **Association**. The Metamodel defines types of **Characteristics**: compositional and relationship participation. The compositional and relationship **Characteristics** are composed into an **Entity** or **Association** and contribute to its definition. A **Characteristic** in a compositional role of an **Entity** or **Association** does not exist outside of the **Entity** or **Association**. Relational **Participant Characteristics** identify **Entities** acting in an **Association**. In this role, participating **Characteristics** *do not* contribute to the definition for the **Entity**, but *do* contribute to the definition of the **Association**.

The lineage of the **Characteristics** for **Entities** and **Associations** within a FACE Data Model begins at the conceptual level; the modeling of **Conceptual Entities** and **Associations** is the top of the realization hierarchy setting the objects and relationships acting in the domain of the defined FACE Data Model. The **Characteristics** defined for **Conceptual Entities** and **Associations** prescribe the scope of **Characteristics** for any logically realized **Entity/Association**. Each of the **Characteristics** that are typed using **Observables** (as opposed to those typed using an **Entity**) must be considered for whether it needs to be measured and how it will be measured with respect to the Logical Layer. For the novice modeler, discovering the

semantics of the data can seem challenging; and even more so because conceptual constraints/recommendations like “single *Observable*” and “*Entity* uniqueness” have implications at the logical level, as shown in the following section.

4.5.3.1.1 Same Characteristic Measured Differently

Many times when considering the data, the modeler may find an object in the domain that seems to reflect the same property multiple times. This is a fairly common discovery when considering the system data when analyzing the interfaces. For example, an Interface Control Document (ICD) may define an Aircraft as having ground speed, true speed, or air speed. When considered from the data model perspective and defining a picture of the domain, it is understood that an Aircraft truly only has one speed. However, the single speed property of the Aircraft can be measured in multiple ways (i.e., true, ground, or air).

The FACE Data Model provides support for the concept of multiple measurement types through the ability of multiple *Measurement Compositions* in an *Entity* to “realize” a single *Observable*. Figure 21 shows an example of the Speed *Observable* composed in the Conceptual Aircraft *Entity* and how the Logical Aircraft *Entity Compositions* realize the *Observable* as *GroundSpeedMeasurement* named “speed” and *AirSpeedMeasurement* named “speedInAir”.

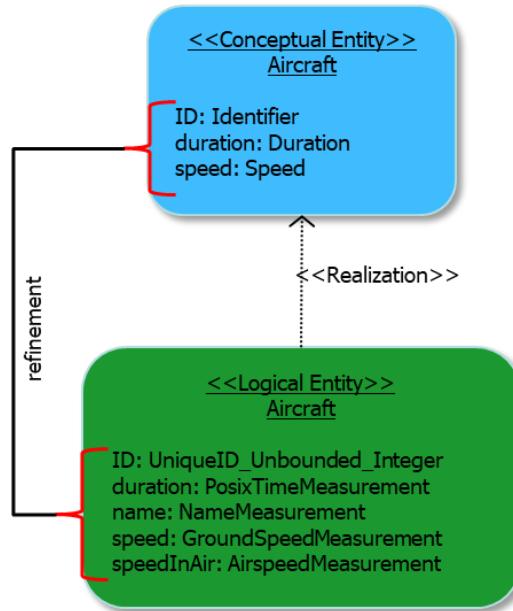


Figure 21: Single Speed Characteristic Measured Differently

Note: The modeler can only add *Characteristics* when realizing a specific *Characteristic* from the previous layer. Any added *Characteristic* must have a realization to the layer above. In Figure 21, it would be incorrect to add a *Characteristic* to the *Logical Entity* like *aircraft max altitude* or *aircraft engine horsepower*.

4.5.3.2 Realization

The *realization* concept can be a difficult relationship to understand in the modeling paradigm; however, careful consideration of the following dictionary definitions can help with understanding what realization means to data modeling:

- An act of becoming fully aware of something as fact
- The fulfilment or achievement of something desired or anticipated
- The result of a process

The term “realization” is used to denote the relationship between entities in the **CDM** and **LDM** or between the **LDM** and the **PDM**. More specifically, it denotes the relationship between **Entities/Associations** and **Characteristics** between model layers. So, a more complete definition we will use in this guidance document is:

“Realization” is the relationship between similar model elements across levels of abstraction.”

When an element **realizes** another more abstract element, it cannot conflict with the element it realizes. That is, it must adhere to the rules of **realization** as defined in the Metamodel and OCL constraints.

Examples of the various **realizations** used in the FACE Data Architecture are shown throughout the sections below.

Pitfall:	Don't confuse the concept of realization with that of generalization or specialization.
----------	--

4.5.3.3 *Entities and Associations*

Entities and **Associations** are the primary elements in the Entity-Association Perspective. **Entities** and **Association** models create the definition of the entities. The **CDM** describes the semantic definition of all **Entities** and is refined through the **Logical** and **Platform Entities** which provide a more detailed description of **Characteristics**.

The modeling of **CDM Entities** and **Associations** is the top of the **realization** hierarchy setting the objects and relationships acting in the domain of the defined data model. This layer is the high-level abstraction identifying the semantics or concepts to which the platform manifestation will be traced, through the Logical Layer.

Since the Conceptual Layer is intended to capture the most complete picture with respect to the semantic view of the **Domain**, this layer can portray a broader sense of the modeled **Domain** that can be narrowed logically through **realization**. There are two forms of **realization**: single realization and down-selection.

4.5.3.3.1 Single Realization

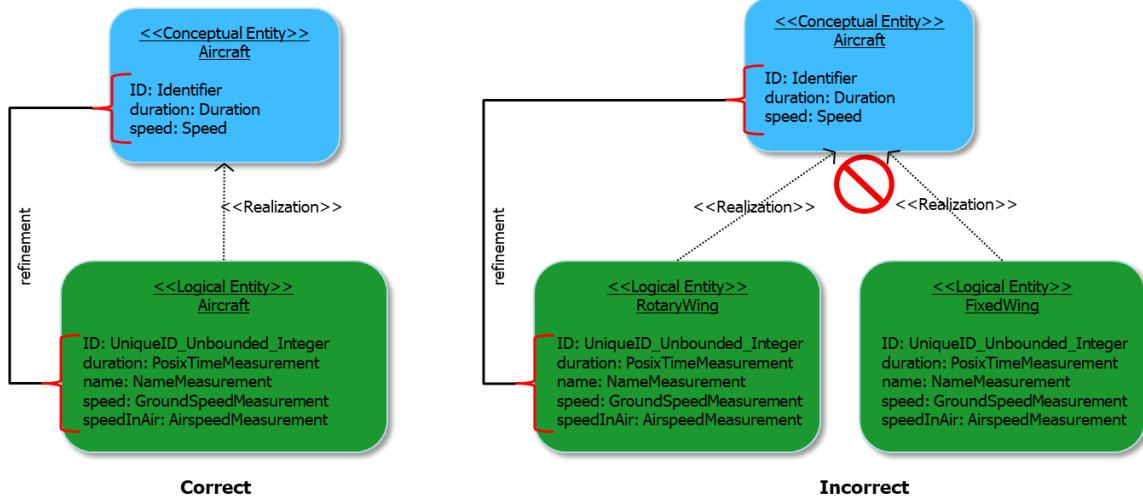


Figure 22: Single Realization, Not Specialized

Logical Entities and *Associations* must be *realizations* of a respective element in the Conceptual Layer, with the intent to add specific detail to refine the abstract representation. The practice of single *realization* means, that for any single model domain, each *Logical Entity/Association* that realizes a *Conceptual Entity/Association* will be unique in that no other realizing *Logical Entity/Association* has the same *Compositions*.

Best Practice: When modeling the Logical Layer, if an *Entity* or *Association* is required to complete the context, having only one *LDM Entity* or *Association* realizing the conceptual element reduces model complexity and ensures clarity.

It is appropriate to use multiple logical elements to realize a single conceptual element when different sets of logical choices (as defined by measurement types) apply to logical realization of *Entity* or *Association* definitions. An example is the case where all *Characteristics* are measured with SI units as opposed to US units, as shown in Figure 23.

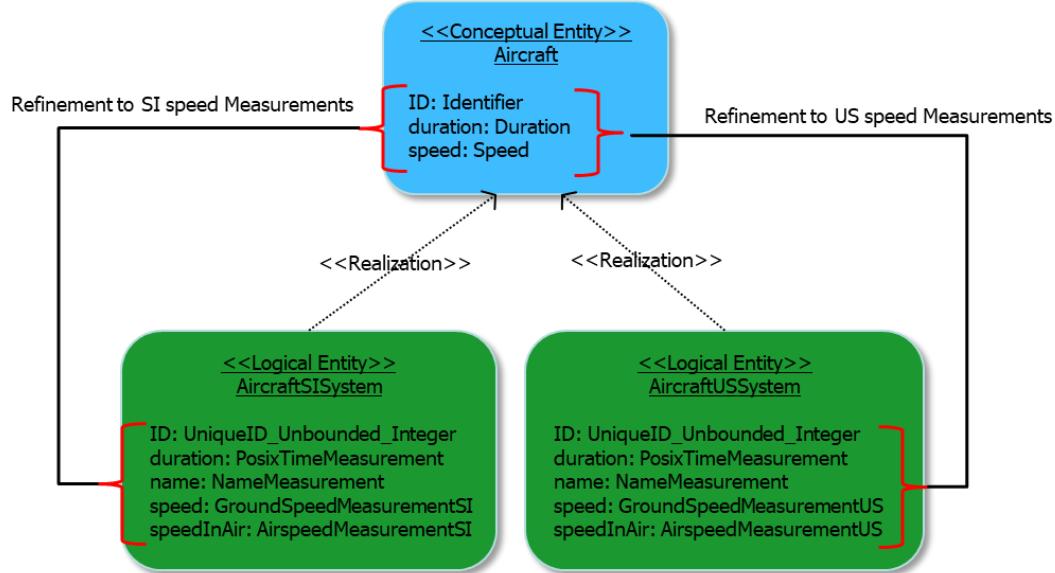


Figure 23: Multiple Realization

4.5.3.3.2 Down-Selection

The Conceptual Layer may capture *Entities* and *Associations* that are not realized at the Logical Layer. This happens when *Associations* are important to show the semantic meaning of *Entities* but are not directly used by a software component. In this situation, it is not unusual to drop the *Entity* between the Conceptual and Logical Layers where conceptual meaning does not add value to the logical. This process is known as down-selection. For *Entities* and *Associations*, down-selection is the process of leaving out some *Entity/Association* because that *Entity/Association* does not further contribute to the desire meaning for the current working model layer.

Figure 24 shows an example of down-selection. The *FixedWing Entity* provides context to the *CDM*, but in this situation it is not a contributing element to the scope of the *LDM* and therefore is not propagated in the logical or platform model levels.

Best Practice: Use down-selection to realize only those *Entities* and *Associations* necessary to capture the logical meaning for the current FACE Data Model.

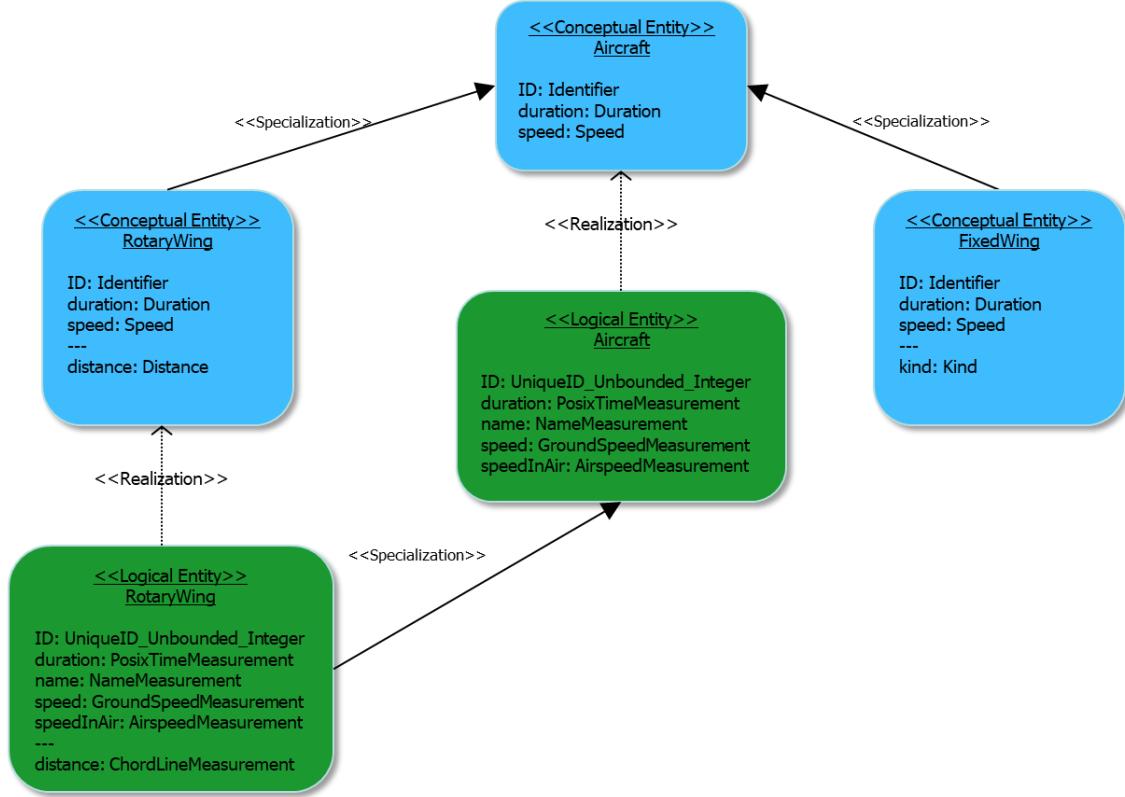


Figure 24: Down-Selection, Fixed Wing Entity

4.5.3.4 Specialization

An *Entity* can specialize a more abstract, or generalized, *Entity*. Through specialization, the more detailed (specialized) *Entity* “inherits” characteristics from the more abstract (generalized) *Entity*. Each *Entity* can specialize at most one *Entity*. Specialization contributes to the uniqueness of an *Entity*.

Note: The FACE 3.0 Metamodel no longer contains the FACE Technical Standard, Edition 2.1 form of generalization where a generalization metamodel element was created which generalized two or more *Entities*.

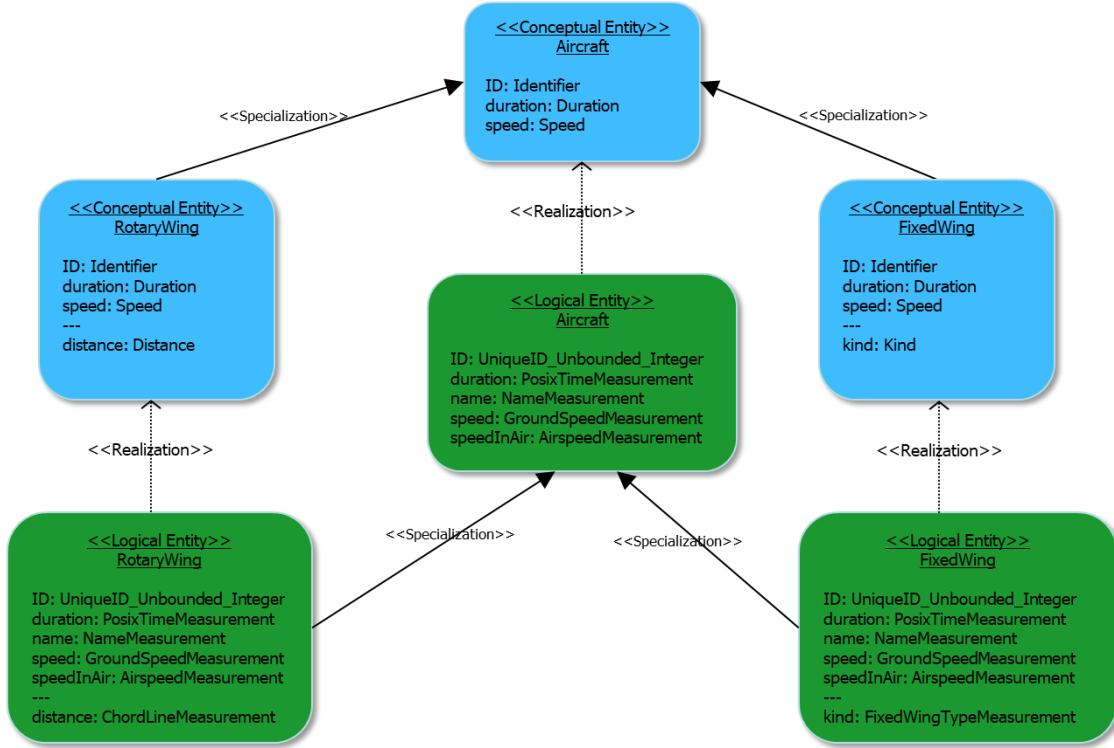


Figure 25: Specialized Entities of Aircraft

The specialization relationship ensures the specialized *Entity* inherits the *Characteristics* of the super type *Entity*. This removes the burden from the modeler to explicitly add those *Characteristics* to the specialized *Entity* as only the additional distinct *Characteristics* are modeled.

Note: Specialization in the FACE Data Architecture is not an “is-a” relationship nor does it imply polymorphism. It is simply a convenient means for construction.

4.5.3.5 Association Characteristic Participant Path

This section provides additional detail for describing *Associations*. Specifically, it describes how to use the *path* attribute of the *Participant* meta-class. The *path* attribute allows the data modeler to specify not only the model element participating in the *Association*, but additionally the absolute scope, or context, of the model element with respect to the wider data model.

The first part of this section defines the term “context” along with a few general examples, followed by a set of definitions, and examples specific to the FACE Data Architecture.

Note: The use of *Participant* paths is an advanced topic that may be referred to at a later date as readers become more familiar with modeling *Associations*.

4.5.3.5.1 Context

The Merriam-Webster's Collegiate Dictionary defines context as “*the parts of a discourse that surround a word or passage and can throw light on its meaning*”. If we replace “discourse” with “data model” and “word or passage” with “model element (or group of model elements)” we start to define what context of a model element means within the FACE 3.0 Metamodel:

The parts of a data model that surround a model element (or group of model elements) that throw light on its meaning.

For example, if our data model has a **Measurement** called circumferenceMeasurementRealFeet that has a **Value Type** of Real and **Units** of Feet. If we were to reference this **Measurement**, without any context (i.e., without other portions of the data model that surround it), then it would just be a circumference measurement.

In order to understand the context of the **Measurement**, we might ask questions such as: what is this **Measurement** the circumference of?

When we start to answer the questions of “composed into” or “associated with”, we are providing a context for one model element in terms of another (or set of) model elements. Consider the following answers to the question, each providing a different context for the circumference measurement:

1. It is the circumference of a piston
2. It is the circumference of a piston that is in an engine
3. It is the circumference of a piston that is in an engine of an aircraft
4. It is the circumference of a piston that is in an engine in a tank
5. It is the circumference of a piston that is currently undergoing depot maintenance by a field engineer
6. It is the circumference of a piston that was part of depot maintenance

Figure 26 and Figure 27 show references to the circumference measurement in various contexts. Figure 26 shows an example of no context and examples that reflect answers 1-3 above. Figure 27 shows an example of answers 4-6. Note that the dashed arrow labeled “<<Reference>>” is intended to represent a FACE path, either a FACE 2.1 **Characteristic Projection** path, FACE 2.1 **AssociatedEntity** path, or a FACE 3.0 **Association Participant** path.

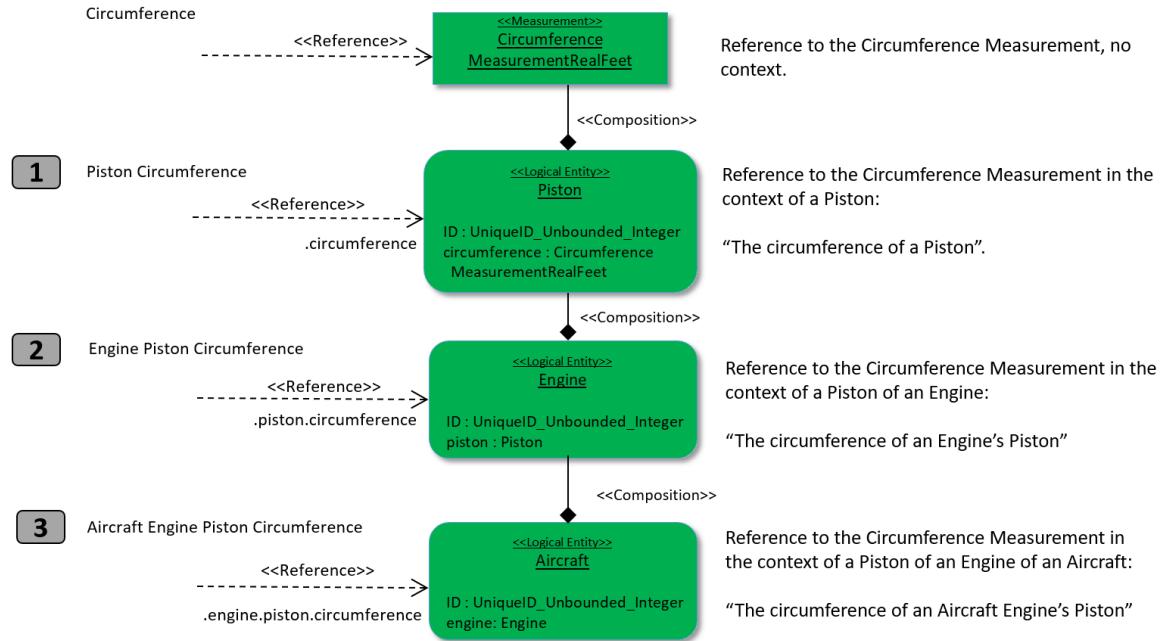


Figure 26: Context Examples 1 to 3

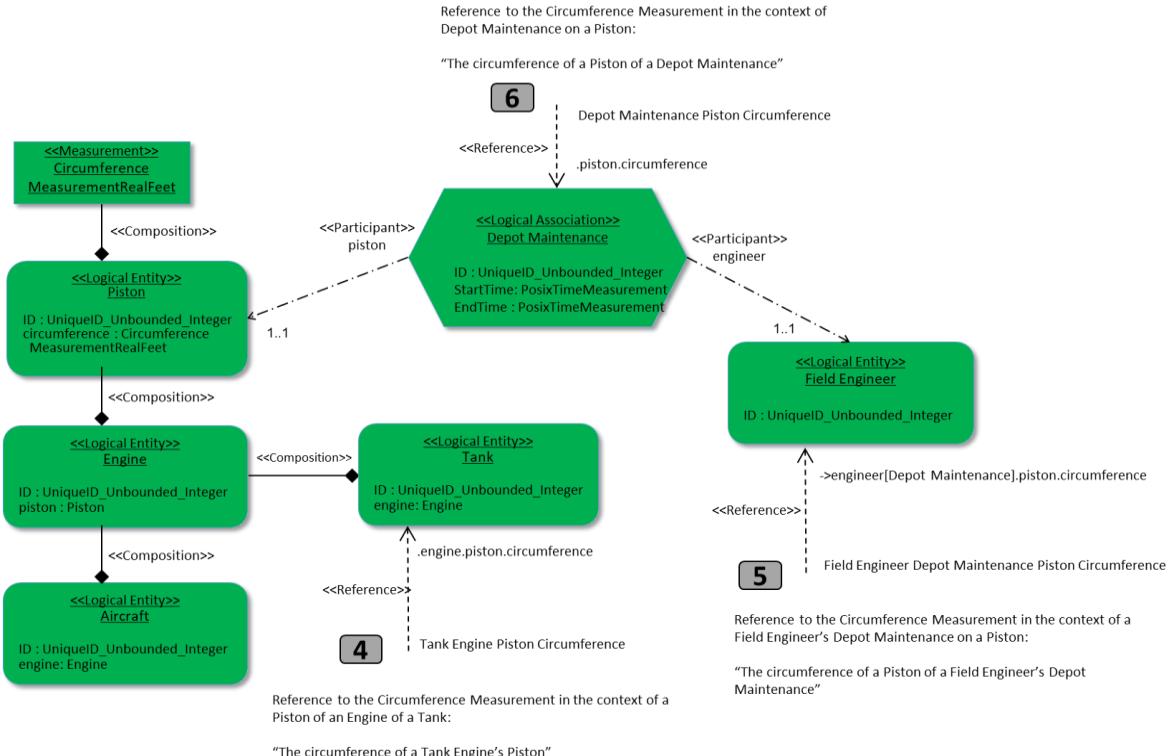


Figure 27: Context Examples 4 to 6

4.5.3.5.2 *Participant Paths*

The following terms are used to describe *Participant* paths.

Table 1: Participant Path Descriptions

Term	Meaning
Association (Meta-class)	An Association formalizes the relationship between two or more Participants and may contain one or more Characteristics that describe the relationship.
Participant (Meta-class)	Part of the definition of an Association, a Participant specifies a model element that contributes to the definition of the Association.
Type (Meta-class attribute)	<p>The “type” attribute of Participant references either:</p> <ul style="list-style-type: none"> • The Entity or Association that is participating in the Association (if Path is empty) • The beginning (sometimes called Anchor) for the Path that specifies the destination model element that is participating in the Association
Path (Meta-class attribute)	The “path” attribute of Participant consists of zero or one Path Node elements, the latter of which, when taken together in sequence with other Path Node elements, specify the model element participating in the Association. The Path provides an absolute scope to the participating model element from the Anchor through other elements in the model. The Path provides context of the model element participating in the Association.
Path Node (Meta-class)	Each Path Node captures a portion of a Participant’s Path. A Path Node is specialized as a Characteristic Path Node and Participant Path Node. A Path Node points to zero or one Path Node elements in order to terminate or continue the definition of a Path.
Characteristic Path Node (Meta-class)	Characteristic Path Node references a single Characteristic that contributes to the definition of a Path, used to specify a portion of the Path through a Characteristic Composition or Characteristic Participant.
Participant Path Node (Meta-class)	Participant Path Node references a single Participant that contributes to the definition of a Path, used to specify a portion of the Path backwards from the “type” of a Participant to the Association.
Anchor (informal term)	Informal name for the “type” attribute of the Participant meta-class when the Participant’s path is not empty. The Anchor is the model element at the beginning of a Participant’s Path. Graphically the Anchor is the model element that a Participant “points to”.

Figure 28 and Figure 29 show portions of the FACE 3.0 Metamodel relevant to the defined terms and subsequent discussion.

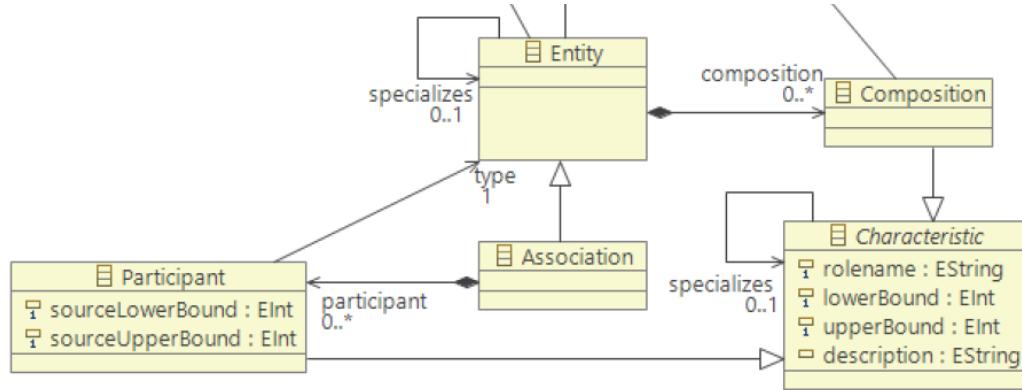


Figure 28: FACE 3.0 Metamodel: Entity, Association, and Participant

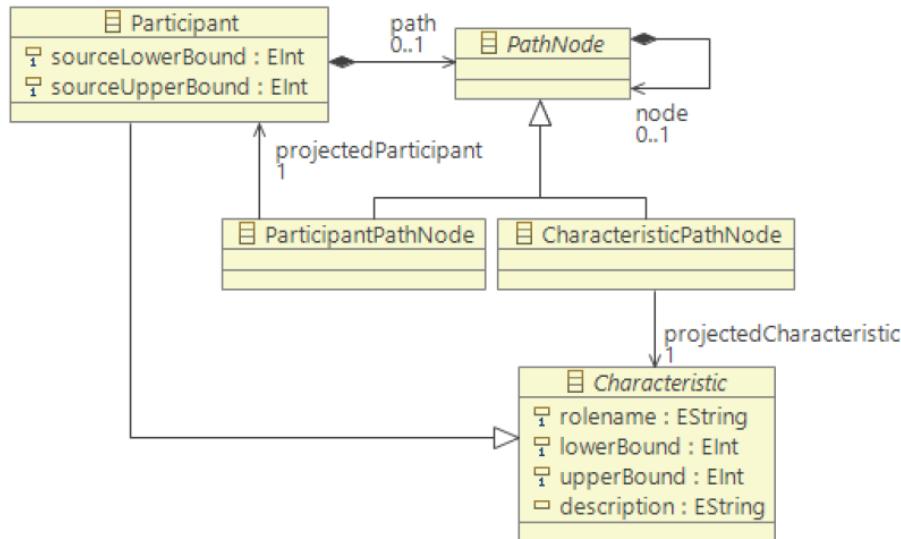


Figure 29: FACE 3.0 Metamodel: Participant and Path Nodes

4.5.3.5.3 Assumptions

A *Participant*'s “type” can be an *Entity* or an *Association*.

The final Path Node in a *Participant*'s path must be either a *Characteristic Composition* (of an *Entity* or *Association*) or a *Characteristic Participant* (an *Entity* or *Association*).

If the upperbound cardinality is greater than 1, a Characteristic Path Node must be the final.

4.5.3.5.4 Relevant FACE 2.1 Metamodel

Figure 30 shows a portion of the FACE 2.1 Metamodel relevant to this discussion.

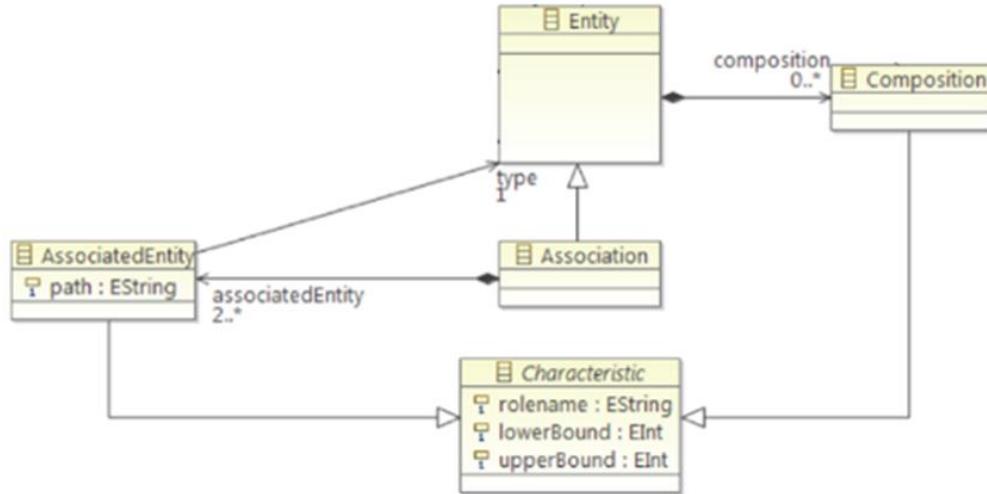


Figure 30: FACE 2.1 Metamodel: Association and Associated Entity

4.5.3.5.5 Example Model

Characteristic Path Node Example I

Consider a partial model that shows a single model element participating in an *Association*. In this example, the model element is the *Characteristic Composition* “ID” within the context of *Entity* E1.

For clarity, the example model is shown using both FACE 2.1 and FACE 3.0 nomenclature and a metamodel visualization. Figure 31 and Figure 32 exemplify the FACE 2.1-style solution, whereas Figure 33 and Figure 34 show the FACE 3.0 style.

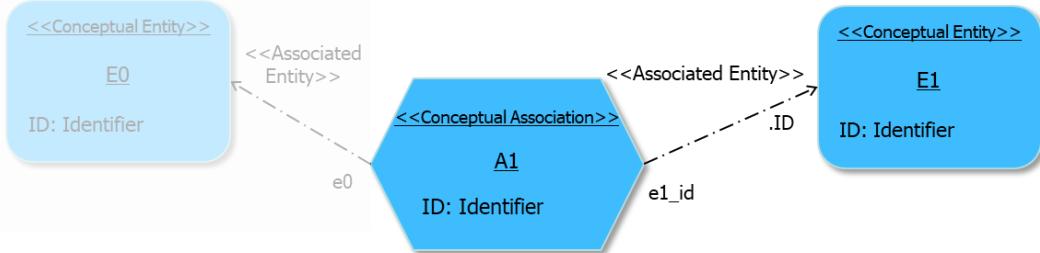


Figure 31: FACE 2.1 Model – Simple Path

One of the *Participants* in the *Association* A1 is the “ID” *Characteristic Composition* of *Entity* E1. The “type” (or the anchor) for the *Associated Entity* path is the *Entity* E1.

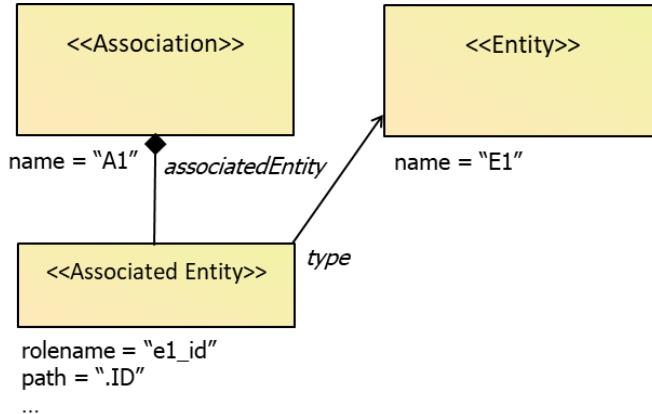


Figure 32: FACE 2.1 Metamodel Visualization – Simple Path

As with the previous example, one of the *Participants* in the *Association* A1 is the “ID” *Characteristic Composition* of *Entity* E1. It is not readily apparent from the FACE 3.0 diagram that the “ID” *Characteristic* is participating in the *Association*. The *Characteristic Path Node* must be considered in order to understand this.

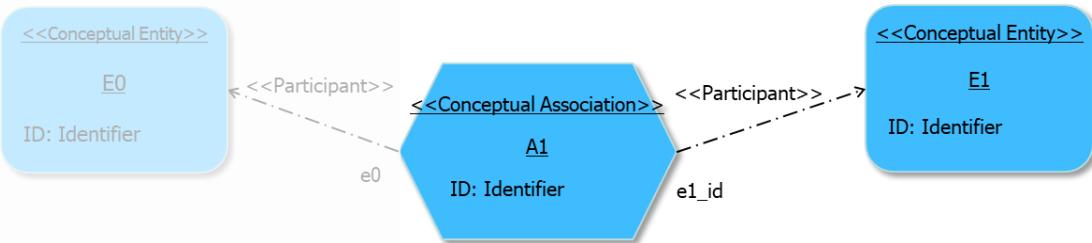


Figure 33: FACE 3.0 Model – Simple Path

The metamodel for the FACE 3.0 solution for specifying the path is shown below.

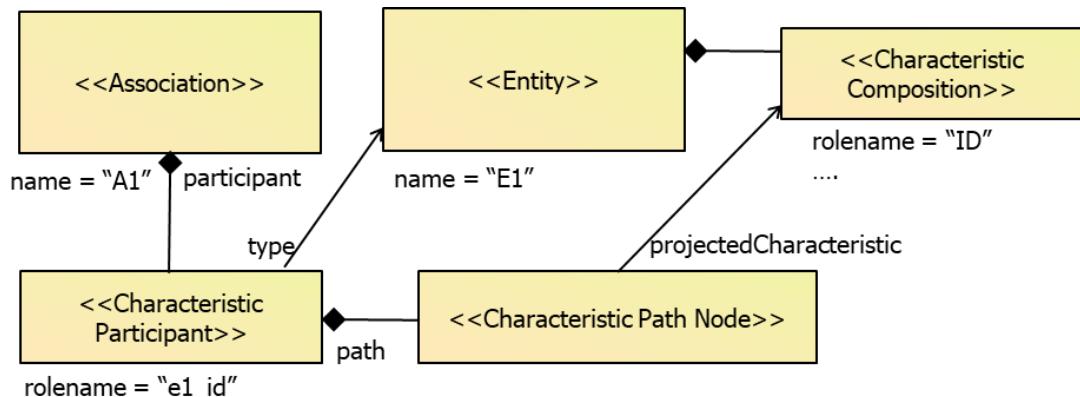


Figure 34: FACE 3.0 Metamodel Visualization – Simple Path

Note that in both 2.1 and 3.0, the “type” (or anchor) of the *Participant* path is the *Entity* E1. In the 2.1-style path specification, the Path *string* of “.ID” indicates that *Characteristic Composition* “ID” of *Entity* E1 is participating in the *Association* A1. The 3.0 approach indicates the same “ID” *Characteristic Composition* of the *Entity* E1 but uses instances of meta-

classes: the *Participant* composes a single *Characteristic* Path Node that references the *Characteristic Composition* “ID” of *Entity* E1.

Characteristic Path Node Example 2

Consider a slightly more complicated example where the context of the single model element participating in *Association* A1 is modified to include an additional *Association* A2. As with the previous example, the first two diagrams illustrate the FACE 2.1 solution, and the last two the FACE 3.0 solution.

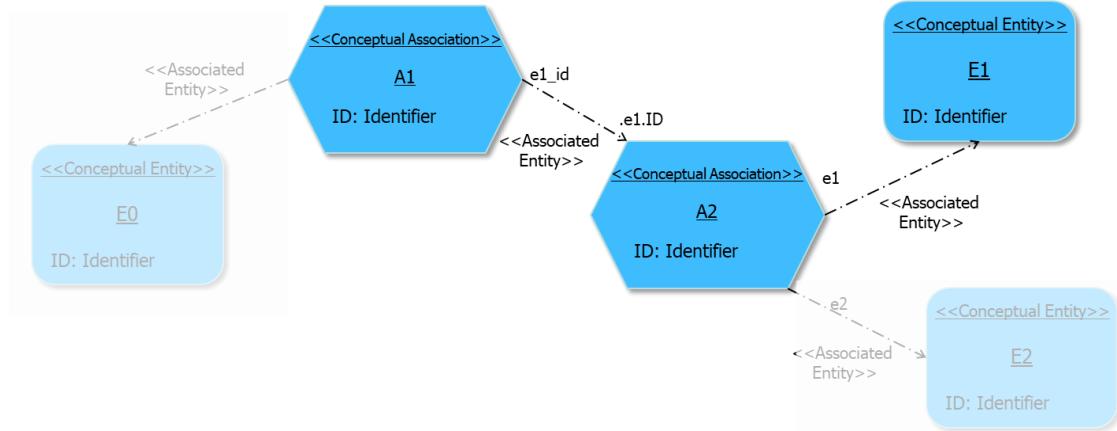


Figure 35: FACE 2.1 Model - Complex Path

In the metamodel visualization, another set of *Association* and Associated *Entity* instances are required. Note that the “path” for the Associated *Entity* from *Association* A1 now includes the *rolename* of the Associated *Entity* from *Association* A2 to *Entity* E1.

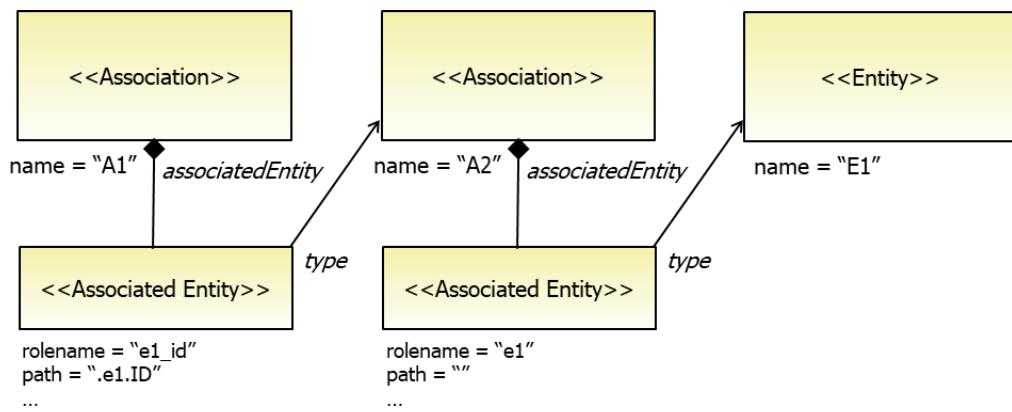


Figure 36: FACE 2.1 Metamodel Visualization - Complex Path

Once again, in the FACE 3.0 diagram, it is not obvious (other than by looking at the *rolename* of the A1 *Participant*) which model element is participating in the *Association* A1.

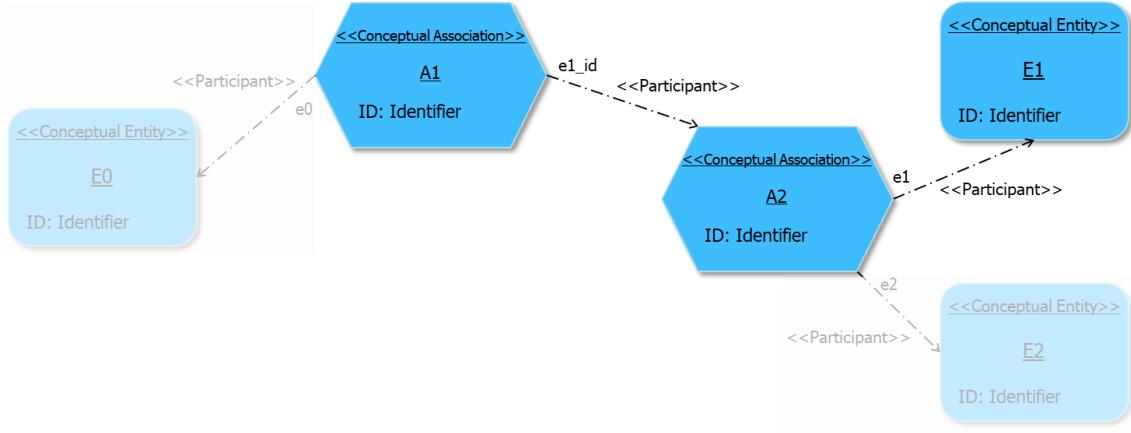


Figure 37: FACE 3.0 Model - Complex Path

The metamodel visualization shows this clearly: the *Characteristic Participant* “e1_id” of the *A1 Association* specifies a path by composing a *Characteristic Path Node* that points to the *Characteristic Participant* “e1” of *Association A2*. This Path Node in turn composes another that points to the *Characteristic Composition* “ID” of *Entity E1*.

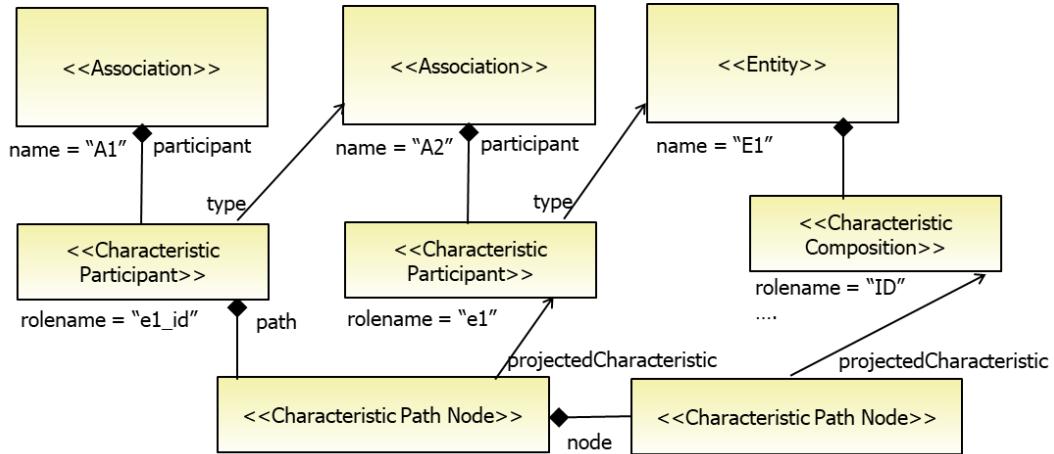


Figure 38: FACE 3.0 Metamodel Visualization - Complex Path

Participant Path Node Example 1

The previous sections showed examples of paths where the context is specified “forward” through one or more *Associations* to the model element that participates in the relationship. The meta-class *Participant Path Node* is used when the path traverses “backward” from the “type” of the *Participant* to the *Association*.

Figure 39 uses the same names for the *Associations* and *Entities* as the previous examples, but is quite different. The *Association* A1 now has a *Participant* (Associated *Entity* in the FACE 2.1 Metamodel) that is the ID *Characteristic Composition* of the A2 *Association* in the context of *Entity* E1.

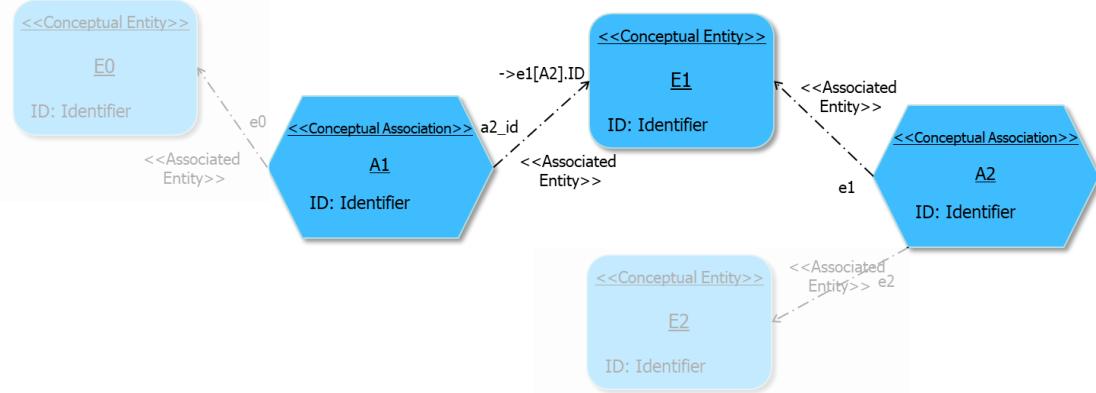


Figure 39: FACE 2.1 Model – Backward Traversal through Association

The related metamodel visualization for this is shown in Figure 40:

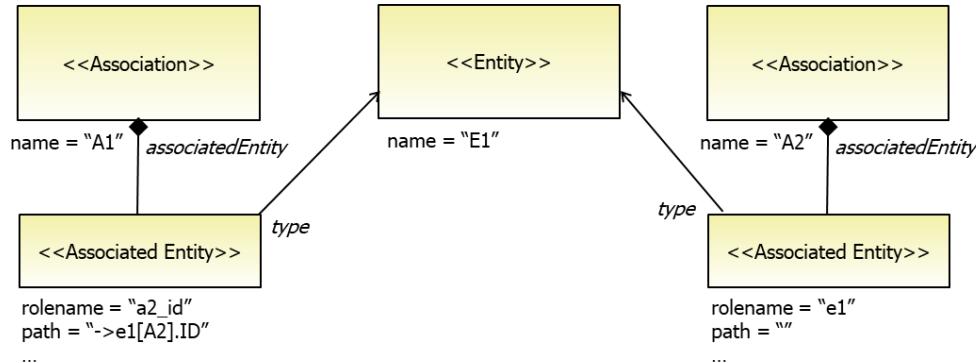


Figure 40: FACE 3.0 Metamodel Visualization - Backwards Traversal through Association

Now let's take a look at the FACE 3.0 model. This model is similar to the 2.1 model, with *Associated Entity* changed to *Participant*, and the path removed from the diagram.

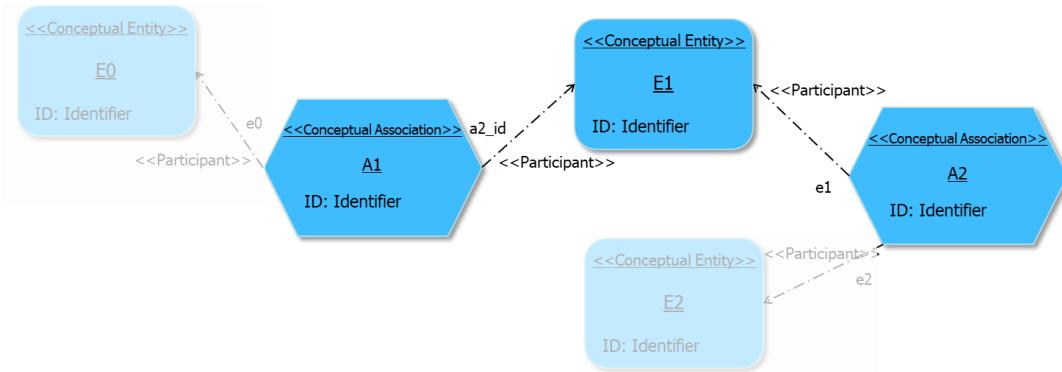


Figure 41: FACE 3.0 Model - Participant Path Node

In Figure 42, note the use of the meta-class *Participant* Path Node. It is used to traverse “backward” from the “type” of a *Participant* to the composing *Association*.

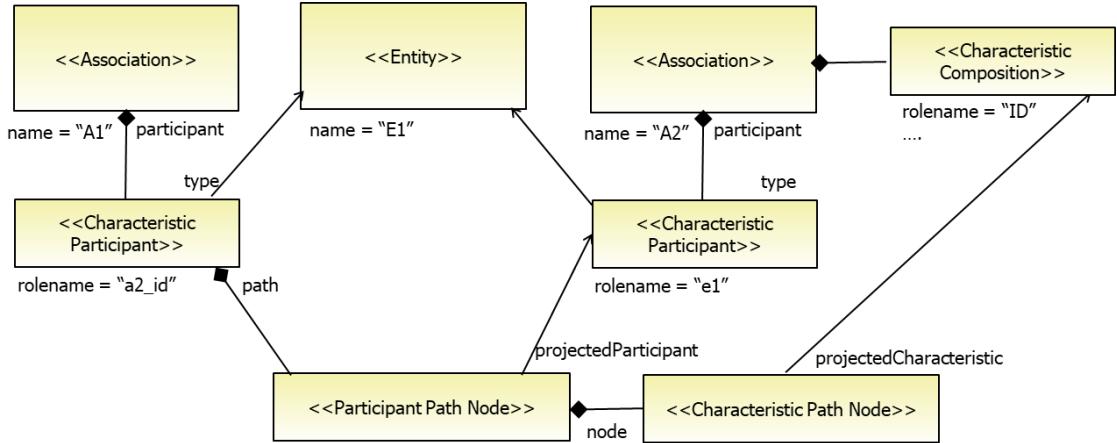


Figure 42: FACE 3.0 Metamodel Visualization - Participant Path Node

Participant Path Specification

As can be seen from the previous examples, FACE 2.1 paths are specified using a *string* meta-attribute of the Associated *Entity* meta-class, while FACE 3.0 paths are specified in terms of instances of meta-classes in the FACE 3.0 Metamodel (*Characteristic Path Node* and *Participant Path Node*).

In this section, we explain *Participant* paths in further detail and use the 2.1-style *string* specification on the diagrams for clarity, as shown in Figure 43.

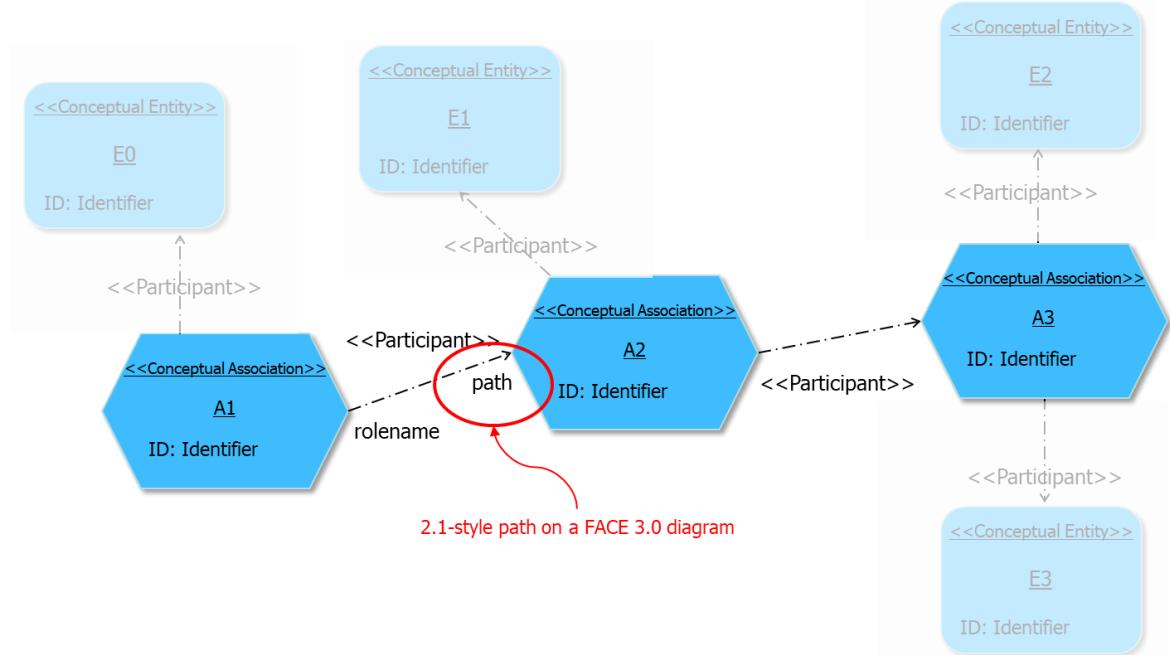


Figure 43: FACE 3.0-Style Diagram with 2.1 Path

In Figure 43 a single *Participant* is shown for both the A1 and A2 *Associations*. Note that the *rolename* is shown on the *Participant* line near the *Association*, while the path (if present) is

shown on the *Participant* line near the *Participant*'s “type”. When a path is not shown, as is the case on the *Participant* line next to the A3 *Association*, this indicates an empty path.

Example Model

Consider the following model.

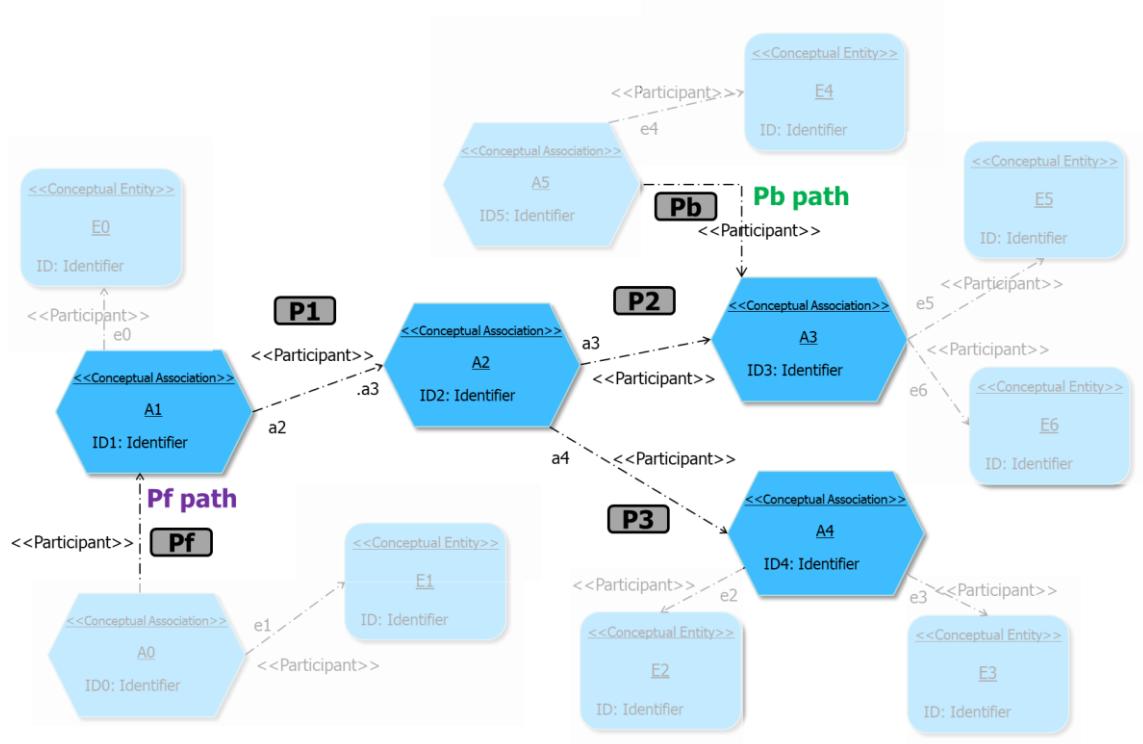


Figure 44: Example Model for Path Specification

Participant paths “Pf path” and “Pb path” represent to-be-specified paths used in this section to explain path specification. Pf is used to specify paths that are “forward” through the model, meaning that the path is specified with one or more *Characteristic* Path Nodes, whereas Pb is used to specify paths that are “backward” through the model, meaning that the path is specified with one or more *Participant* Path Nodes.

Implicit versus Explicit Participant Paths

The FACE Technical Standard, Edition 3.0 requires “explicit” *Participant* paths. This means that when specifying a path for Pf, and a *Participant* with a path is encountered (P1 for example), the path for Pf must call out each of the *Characteristics* explicitly to reach the ID3 *Characteristic of Association* A3 (see Explicit/Forward (Pf) cell). It cannot, for example, when encountering the path specified for P1, automatically assume P1’s path as part of its path in order to progress forward from A1 directly to A3 (see Implicit/Forward (Pf) cell).

Likewise, when specifying a path for Pb, the path must explicitly include the path “backward” to achieve the ID1 *Characteristic of Association* A1 (see Explicit/Backward (Pb) cell). It cannot assume, as part of its path, the path of *Participant* P1 to automatically progress backward from A3 to A1 (see Implicit/Backward (Pb) cell).

Table 2 illustrates this.

Table 2: Explicit *versus* Implicit Participant Paths

Implicit/Explicit	Forward (Pf Path)	Backward (Pb path)
Implicit (Dis-allowed)	.a2.ID3	->a2[A1].ID1
Explicit	.a2.a3.ID3	->a3[A2]->a2[A1].ID1

Path Honoring

Even though explicit pathing is required, the modeler is encouraged to specify paths that “honor” the semantics of the model in regard to *Participant* paths.

Using the example model provided in Figure 44, *Participant* P1 of *Association* A1 specifies that the model element participating in the *Association* is the *Association* A3 within the context of *Association* A2. This means that the *Association* A1 is defined by the *Participant* and that any path that follows P1 should “honor” the path defined by P1.

Forward Path

Consider Table 3 that presents several forward paths for *Pf path* along with their validity and explanation.

Table 3: Forward Path Examples

Path	Validity	Explanation
.a2.ID2	Invalid	The path does not honor the semantics of the model since Participant P1’s path requires following the a3 rolename of Participant P2.
.a2.a4.ID4	Invalid	The path does not honor the semantics of the model since Participant P1’s path requires following the a3 rolename of Participant P2.
.a2.a3.ID3	Valid	The path honors the semantics of the model since it includes Participant P1’s path.

Backward Path

Table 4 presents several backward paths for *Pb path* along with their validity and explanation.

Table 4: Backward Path Examples

Path	Validity	Explanation
->a3[A2].a4.ID4	Valid	The path honors the semantics of the model since Participant P2 is between A2 and A3.
->a3[A2].ID2	Valid	The path honors the semantics of the model since Participant P2 is between A2 and A3.

Path	Validity	Explanation
->a3[A2]->a2[A1].ID1	Valid	The path honors the semantics of the model since the path includes the (backward) path of Participant P1.

This is illustrated in Figure 45.

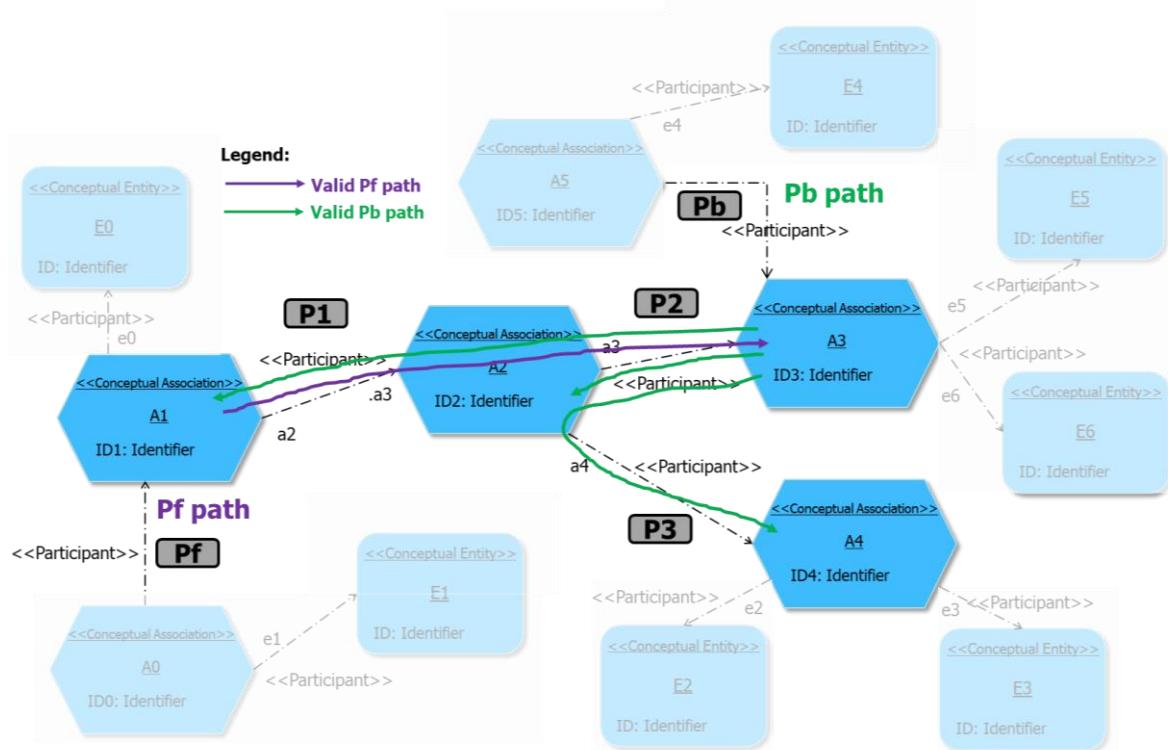


Figure 45: Graphic Representation of Valid Paths

OCL Constraint Issues

The OCL constraints for path validation are not consistent. Currently, the implicit paths are valid for forward paths (*Characteristic* Path Nodes) and explicit paths are valid for backward paths (*Participant* Path Nodes).²

4.5.4 Application Perspective

The Application Perspective is the vertical slice that describes the application (or use) of the data model to model software components and component interface integration. The modeling constructs, query and view, select the portions of the data model that are used to develop UoP interfaces: the UoP Model defines the software component, and the Integration Model describes the TSS connections between two more UoPs. The result of this perspective is the definition of UoPs sufficient to support code generation for UoP TSS message interfaces and TSS data transformations.

² Refer to the FACE Problem Report #228 that was created to address this issue: FACE PR/CR 228: CL Inconsistently Constrains Association Participant Paths (<https://ticketing.facesoftware.org>).

Data Architecture					
Architecture Model	Context: →		Observation Perspective	Entity-Association Perspective	Application Perspective
	Detail: ↓				
	Data Model	Conceptual Data Model (CDM)	Observables	Semantics	Query View
		Logical Data Model (LDM)	Measurements Measurement Systems	Refines with Measurements and Constraints	Refines Query View using LDM Entities
		Platform Data Model (PDM)	IDL Data Types	Refines with Types, Multiplicities, and Constraints	Refines the View refining the Query using PDM Entities Defines IDL style Template for DM Type code generation
	UoP Model				PCS, PSSS, Connections (link to Templates)
	Integration Model				TSS data transformation and linkage
	Traceability Model		External Model Traceability	External Model Traceability	External Model Traceability

Figure 46: Application Perspective

As we move down the levels of the Data Model for the Application Perspective, we see that the *Conceptual Queries* are realized by *Logical Queries* and then *Logical Queries* are realized by *Platform Queries*. However, note that while the *Conceptual* and *Logical Queries* are defined as *Views*, *Platform Queries* are not *Views*. The platform *Template* that references *Queries* as *boundQuery* and *effectiveQuery* elements is the actual *View* at the platform level. The reason for this structure was to maintain the relationship between UoP *Connections* and *Views*. Since the *Template* construct was added in the FACE 3.0 Metamodel to define the structure of the exchanged information, the *Template* had to be referenced by the UoP *Connections*.

The realization and construction of *Views* is described in Section 4.5.4.1.

4.5.4.1 Views

Views are a cross-model concept in the Application Perspective. *Views* describe the interfaces, or in metamodel terms the connections, for a UoP.

Views are used to describe a subset of data model elements that are to be used in an information exchange. *Views* focus on only those *Entities* and *Associations* between those *Entities* that are pertinent to the information exchange.

Conceptual and logical *Views* are created through a query language similar to the Structured Query Language (SQL) Data Query Language (DQL). While it is similar to SQL, note that it is *not* SQL and is defined within the FACE Technical Standard with a formal grammar, constraints, and a language description.

Pitfall:	The reader may try to think of these data model queries as selecting data from relational database tables. This is inadvisable as the data model queries are not executable, and do not select existing data. The data model queries are used to describe the data set that is desired for the information exchange.
----------	--

In the *PDM*, in addition to the *Platform Query*, the *View* defines the structure of an information exchange much like programming language structures such as the IDL “struct”. This is done using the *Template Language* that consists of a formal grammar, constraints, and IDL Language binding. The FACE Technical Standard specifies the formal grammar, the Data Model Language binding specification, and IDL generation from the Language. The *Template Language* constraints are located in the FACE Shared Data Model Governance Plan.

4.5.4.1.1 *Query Language*

The *Query* Language identifies a subset of the data model entities and relationships that are of interest for a query view for the purpose of defining the data that can be transported over an information exchange.

Note: The *Conceptual* and *Logical Queries* are optional, but when used must conform to the query grammar definition and query constraints.

In order to better understand the usage of queries we need to first look at the structure of queries described in the following section.

4.5.4.1.2 *Query Language Structure*

The data model *Query* Language is very similar to the SQL SELECT statement. A simple example of a query is:

```
select position, extents  
from RelevantOperatingPicture
```

This query selects the characteristics position and extents from the *Entity* named RelevantOperatingPicture. Keywords in the query are highlighted in bold.

The general form of a query can be thought of as several “clauses” in the form of:

```
SELECT select_clause  
FROM from_clause  
JOIN join_clauses  
WHERE where_clause  
ORDER BY order_by_clause
```

Each of the clauses is described below.

select_clause

The `select_clause` identifies a list of the characteristics contained in the *View*. Each characteristic is identified with the *Entity* or *Association* that contains it so there is no ambiguity.

from_clause

The `from_clause` identifies the *Entity/Association* that is the “focus” in the *Query*. The relationship between the additional *Entities* is defined with the `join_clause`.

join_clause

The `join_clause` identifies those *Associations* or *Characteristic Compositions* of *Entities* that are of interest to the query. It provides the link between *Entities* through *Associations* that specify that elements, *Compositions*, and *Associations* are referencing the same instance.

Note: The `join_clause` is very different from database SQL as there are no keys in the data model and joins are only valid across *Associations*.

where_clause

The `where_clause` further defines the data values that are acceptable to be sent or received over a UoP *Connection*. This can be thought of as a data filter; however, this information is not used at run-time to filter the actual values on the connection, but rather specifies what data values a UoP *will* send or receive.

order_by_clause

The `order_by_clause` further defines the data values that are acceptable to be sent or received over a UoP *Connection*. This can be thought of as a data filter; however, this information is not used at run-time to filter the actual values on the connection, but rather specifies what data values a UoP *will* send or receive.

Note: The FACE Technical Standard defines the formal EBNF for the *Query* Language.

4.5.4.1.3 *Query Language Syntax*

The following syntax provides a summary of the *Query* Language. The *Query* Language normative description is described in the FACE Technical Standard.

The notation used is as follows:

- Bold uppercase words are *Query* Language keywords; for example, **SELECT** or **WHERE** keywords
- Bold symbols are literal and must be supplied; for example, (subquery) means that a *subquery* must be surrounded by parenthesis
- The pipe | symbol means “or”; e.g., ALL | DISTINCT means ALL or DISTINCT
- Square brackets [] indicate optional data; e.g., [ALL | DISTINCT] means that either the ALL or DISTINCT keywords can be optionally specified

- expression indicates a complex definition that is described elsewhere; for example, whereexpression, subquery
- Parentheses () indicate zero or more elements inside the parenthesis
- Double slashes // indicate an inline comment to assist the reader
- /* */ indicate a block comment
- All other text is literal and unchanged; e.g., the asterisk “*”, the period “.”, the colon “:”, and the equal sign “=”
- entity is the name of the *Entity* in the data model
- characteristiccomposition is the *Composition* of an *Entity* or *Association*
- characteristic is the *Composition* or *Participant* of an *Entity* or *Association*
- enumerationlabel is an enumerations literal name in the data model
- alias is an identifier of the form: [a-zA-Z][_a-zA-Z0-9]*; for example, MyAlias5, anotheralias

Note: The asterisk means match zero or more of the previous item.

```

SELECT [ ALL | DISTINCT ]
      *
| entity.*
| [entity.]characteristiccomposition [AS alias]
| (, [entity.] characteristiccomposition [AS alias])

FROM entity [AS alias]

(JOIN entity [AS alias] ON [entity.]characteristic [= entity]
             (AND [entity.]characteristic [= entity]) )

[WHERE [NOT] whereexpression ([ AND | OR ] [NOT] whereexpression) ]

[ORDER BY [entity.]characteristic | alias [ ASC | DESC ]
         (,[entity.]characteristic | alias [ ASC | DESC ]) ]

whereexpression:
[entity.]characteristic [=|=!=|<>|<|>|<=|=|>=] [entity.]characteristic
| [entity.]characteristic [=|=!=|<>|<|>|<=|=|>=] enumerationlabel
| [entity.]characteristic | enumerationlabel
  [=|=!=|<>|<|>|<=|=|>=]
  [ ALL | SOME ] ( subquery ) | [EXISTS ( subquery )]
| [entity.]characteristic | enumerationlabel [NOT] IN subquery
| [entity.]characteristic | enumerationlabel [NOT] IN
  [entity.]characteristic ([, [[entity.]characteristic] )
```

Figure 47: Data Model Query Language Syntax

Note: All keywords like SELECT can only be all uppercase or all lowercase. Mixed-case keywords are not allowed. This is in contrast to the data model elements, such as

Entity and **Characteristics**, which are not case-sensitive. For example, “AIRCRAFT” is the same as “Aircraft”.

4.5.4.1.4 Query Language Examples

Figure 48 is a set of simple example queries based on the following model:

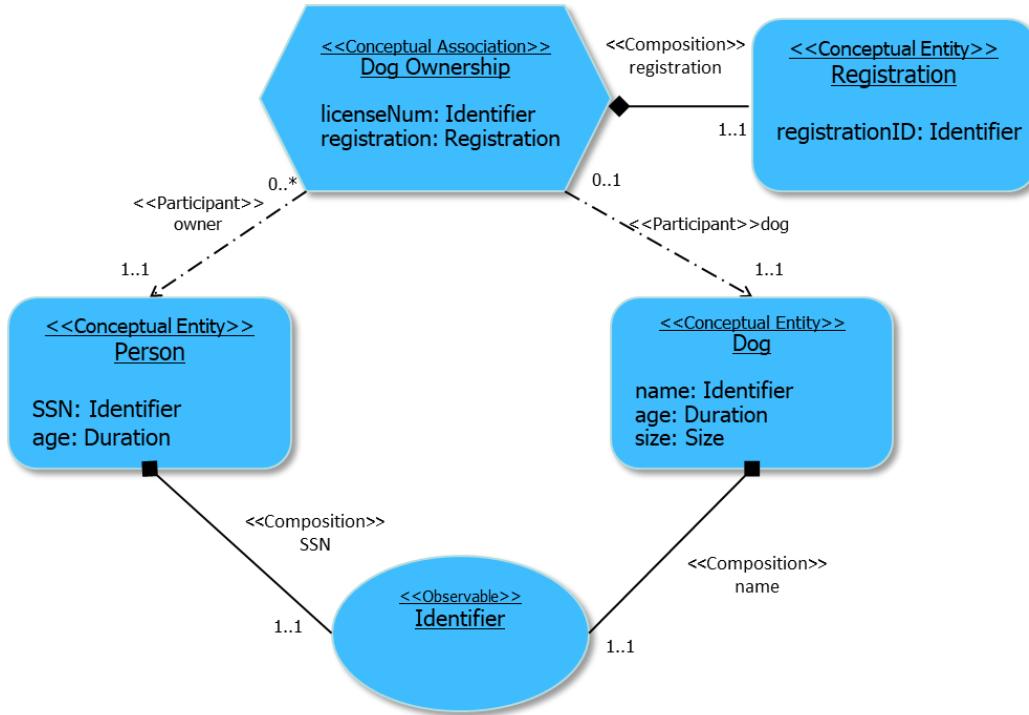


Figure 48: Dog Ownership Conceptual Model Example

The queries below are provided as a set of simple examples:

```

// One dog's name
select name from Dog

// One Person and each Dog the person owns
select Person.*, Dog.*
from Person
join DogOwnership on Dogownership.owner = Person
join Dog on DogOwnership.dog = Dog

// One Person, each Dog's name and age, and DogOwnership information
SELECT Person.*, Dog.name, Dog.age, DogOwnership.*
FROM Person
JOIN DogOwnership on DogOwnership.owner = Person
JOIN Dog on DogOwnership.dog = Dog
    
```

The example queries shown above only touch on the descriptive power of the query language.

Note: Notice that the only literal values that can be used in a query are **Enumeration** literals. All other comparisons are made relative to other characteristics.

The *Query* Language is supported at all data model levels: Conceptual, Logical, and Platform. *Query* Language *Constraints* differ at each model level, and are described below in more detail.

Conceptual View: Query

Queries in each data model level have somewhat different rules of construction and validation. For example, a *Conceptual Query* where _clause cannot specify an enumeration limitation like a *Logical Query*, but instead can only specify constraints in relation to other *Entity* characteristics. This is due to the level of detail available in the conceptual model *versus* the logical and platform models.

A *Conceptual Query* is optional in the data model; however, *Conceptual Queries* may be used to define information exchanges for an *AbstractUoP* to define its *AbstractConnections*.

Logical View: Query

Queries at the logical level define the logical *View*. *Logical Queries* can optionally realize a *Conceptual Query*. *Logical Queries* can provide more detail about the data set that is defined (selected) by the *Query*. This is due to the level of detail specified by logical characteristics and their typing of *Measurements*. For instance, *Enumeration* literals can be used in a where _clause to constrain the data set.

Note: The CTS does not perform any checks for consistency between the *Logical Query* and a realized *Conceptual Query*.

A *Logical Query* is optional because it does not add any significant information to a realizing *Platform Query*. However, *Logical Queries* can be used by an *AbstractUoP* to define its interfaces.

Platform View: Template and Query

Templates, which are exclusive to the *PDM*, define the platform *View*. *Templates* allow the modeler to define a hierarchy of data structures that specifies the format of the data a UoP sends and receives through *Connections*.

The data set on which the *Template* operates is defined by the *Template*'s *boundQuery*. Because of this relationship, *Platform Queries* are required for UoP *Connection* definitions. This is why the platform *View* can be thought of as being defined by the platform *Template* and *Query* combination.

Note: There is no check for consistency between the *Platform Query* and a realized *Logical Query*. Nor is there a check for consistency between the *Logical Query* and a realized *Conceptual Query*. Therefore, it is up to the modeler to ensure consistency so as to not confuse other persons using their model.

Platform *Templates* are defined more completely in Section 5.4.2.1.2.

5 Data Models – In Depth

5.1 Overview

This chapter focuses on the three model levels that constitute the data model portion of the Data Architecture. The FACE Data Model consists of the Conceptual, Logical, and Platform Data Models (**CDM**, **LDM**, and **PDM** respectively). Each level refines and enhances *Entity* model elements by providing additional detail to the elements at the level above. All three levels of the data model combine to provide a complete definition of each element. The roles of the models are:

- Conceptual – defines the semantic definition of all *Entities* and *Associations*
 - Is informational in nature
- Logical – refines these *Entities* and *Associations* by describing the characteristics with detailed frames of reference (called *Measurements* and *Measurement Systems*)
 - Is informational in nature
 - Exception is Enumeration Labels which is source for code generation
- Platform – establishes the specific platform details with language binding references
 - Is informational and functional in nature
 - Serves as the source for code generation of the TS Interface, with the exception of the Logical Enumeration labels

The remainder of this chapter examines the modeling tasks from a horizontal level approach, discussing elements and model features specific within each level.

5.1.1 Overarching Conventions

As the following sections break down points for consideration specific to each of the data model levels, there are a few naming conventions that are overarching and therefore outlined before delving into the model levels:

- Names must be unique within each model (Conceptual, Logical, and Platform)
- Name uniqueness for elements is case-insensitive
 - Do not use case to differentiate between different elements
- Names cannot contain spaces
- Naming conventions are left to the discretion of the modeler
 - SDM has identified naming conventions for CCB managed elements
 - SDM naming conventions can be as other examples for the modeler

5.2 Conceptual Data Model

This section describes the *Conceptual Data Model (CDM)* elements in more detail.

5.2.1 Observation Perspective

5.2.1.1 Observables

Observables represent things that can be observed such as the *Size*, *Angle*, *Count*, *Position*, or *Mass* of an item. The items are not always physical things and therefore their attributes are not always physical, such as an identifier for a mission or the tail number of an aircraft.

5.2.1.1.1 Naming Observables

Observable names must be unique within the scope of the entire data model and should reflect the type of observation they represent. That said, an *Observable* name should *not* describe how we represent or measure the *Observable*. For example, we wouldn't name the *Position Observable* *PositionDegrees* or *PositionWGS84* by appending units to the *Observable* name. In addition, avoid incorporating an *Entity* name into the *Observable* name, such as "RadioFrequency". In this case an *Entity* called Radio should be created and the Frequency *Observable* should be added as a *Characteristic* of the Radio *Entity*. Other invalid types of *Observables* would be those that are groups of things such as a *Pride* of lions or a *Herd* of cows.

5.2.1.1.2 Observables and Descriptions

The description of an *Observable* is used as a formal definition of the *Observable*. Therefore, great care should be taken in developing the description. All descriptions should be almost complete sentences less the initial article (e.g., drop the "the") and should end in a period. An example of a good description is: "Torque: Twisting force that tends to cause rotation."

The description should not contain references to any units or specific measurements that may be derived from the *Observable*.

For instance, the following shows a bad description and an improved description of an *Observable* representing Temperature.

Original Description

How hot or cold an item is where '0 degrees Celsius' represents the temperature at which water freezes.

Improved Description

Average kinetic energy of particles in an Entity (i.e., how hot or cold the item is).

In addition, the description should avoid implying implementation. For example, don't include implementation details in the textual description, such as "... done using text". The idea is to allow many *Measurement* references to each *Observable* in potentially unforeseeable ways.

Where possible, descriptions should use standard definitions. Examples of useful standards are SI, SAE AS-4UCS-3, and ISO 1151.

5.2.1.1.3 Description Pattern

The *Observable* description should contain the following information:

- Description of the *Observable* phenomena
- Description of the *Observable* in relation to other things such as the physical world
- Example usage of the *Observable*

For example: “Address – Unambiguous description of a location (e.g., an IP address).”

- Observed phenomena: the unique identifier of a location
- Relation to other things such as the physical world: the address space
- Example: an IP address

5.2.1.1.4 What Kind of Things can be Observables

The SDM contains the following types of *Observables*:

- Identifiers
 - Identifier
- Information Element
 - Kind
 - Description
- Counting
 - Count
 - Resolution
- Measureable with units
 - Position
 - Mass
 - LuminousIntensity
- Unclassified
 - Size
 - Order
 - Color

Observables should be discernable/representable. The expectation of use or defined purpose is captured when the *Observable* becomes a *Compositional Characteristic* on an *Entity* or *Association*.

5.2.2 Entity-Association Perspective

5.2.2.1 Entities

5.2.2.1.1 Criteria for Good Entities

An *Entity* should be a uniquely identifiable thing or concept. An architectural component is composed of *Characteristics* important for the described system. The level of detail or how far to decompose an *Entity* depends on the desired granularity of the semantics of the system. The data itself is determined by the characteristics of the *Entity*.

For example, if a component needs to communicate data about the position of an aircraft, a good *Conceptual Entity* would be an “Aircraft” with a “Position” *Observable*. It would not make sense to create a “Position” *Entity* in this case because the property of interest is about an aircraft.

When defining *Entities*, strive to identify the essential concept to be modeled rather than the role the item plays in the domain. For example, in a model of elements in a university domain, it may be tempting to create separate entities for teacher and student, but this would limit the use of those *Entities* to specific roles in the model or other models. Instead, a more appropriate *Entity* would be “person”. That *Entity* could then fill the role of student, teacher, administrator, coach, etc.

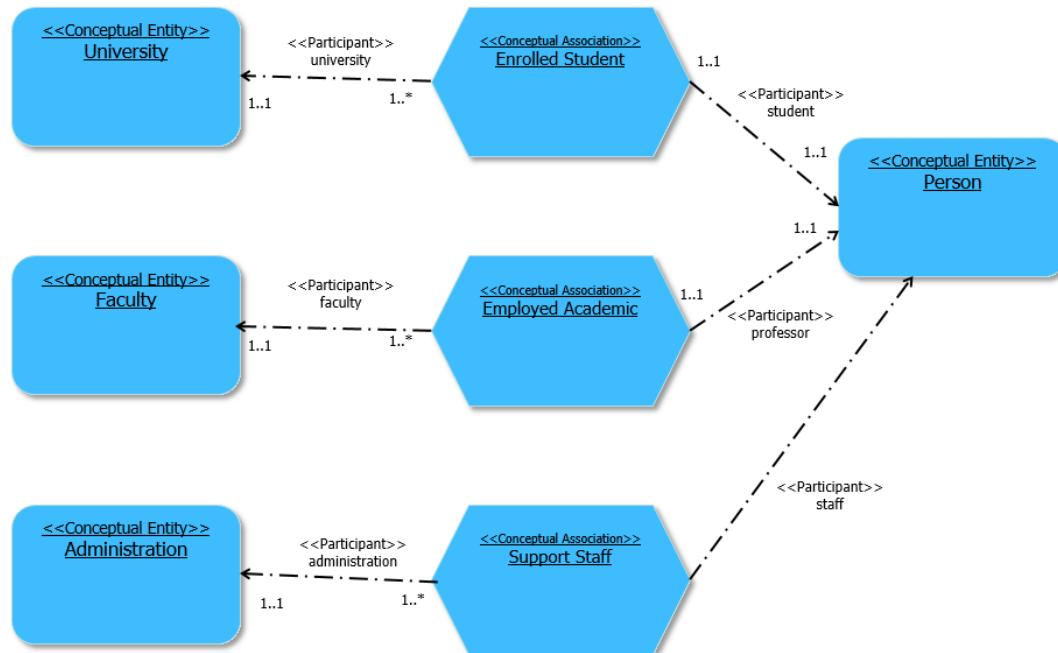


Figure 49: Person Entity Example

5.2.2.1.2 Naming Entities

Conceptual Entity names and descriptions help explain the concepts of a given domain and improve model quality. Names should be kept simple enough for a broader audience to quickly understand; contextual information should not be embedded in the name (e.g., the name should

be “*Engine*”, not “*InstalledEngine*”). Descriptions should be kept simple while still capturing the applicable definition of the *Entity*.

5.2.2.1.3 *Entity Uniqueness*

The purpose of the OCL “uniqueness” constraint is to make sure that every *Entity* that is defined is unique. The two *Entity* uniqueness differentiators are:

- Two *Entities* are composed of different characteristics
- Two *Entities* reference different *BasisEntities*

The best way to ensure *Entity* and *Association* elements are unique is to model the *Entity*, its characteristics, and its *Associations* is to develop a conceptual definition of the *Entities* in a more general and comprehensive way.

Pitfall: Sometimes attempts to satisfy the “uniqueness” constraint lead to artificially adding *Observables* to an *Entity*. This shortcut to *Entity* modeling is frowned upon. Instead, it is better to fully develop the *Entity* and *Association* elements or to reference a *BasisEntity* that is relative to the elements being modeled. Lastly, the application of the “uniqueness” constraint is optional. However, if this constraint is disabled it may be more difficult for other modelers to leverage the models you create as the definitions of the *Entities* are likely incomplete and ambiguous. After all, the purpose of developing a semantic data model is to clearly define “what” the data is describing without relying on textual descriptions to define the terms. The application of this constraint is potentially a reflection of quality and does not affect conformance.

5.2.2.2 *Associations*

5.2.2.2.1 *Criteria for Good Associations*

An *Association* is a specialized form of an *Entity* that is a relationship between two or more *Entities*. Therefore, the criteria for good *Association* names follows the same criteria as *Entities* discussed above.

5.2.2.2.2 *Naming Associations*

Conceptual Association names are dependent upon what the *Association* is accomplishing. Some examples of *Association* names are “*Installation*”, “*Propulsion*”, “*Proximity*”, and “*Correlation*”.

A math *equation* or operation almost always is indicative of an *Association*. Examples are average, error, minimum, and maximum.

A *Boolean* can often imply an *Association*. For example, if a message has a “*hasSensor*” field, this could imply that there is an installation relationship between a Sensor *Entity* and some other *Entity* which uses the sensor.

Commands are common in avionics systems. “Command” can be an *Association* attached to the *Entity* that is being commanded. It can be the delta between what the current and commanded value is, with the particular *Observable* being commanded. The following represents a Command/Control pattern:

- An *Association* attached to an *Entity* with a controllable *Observable*
- Current state is in the *Entity*; the *Association* is with the requirement

5.2.2.2.3 *Association Uniqueness*

An *Association*'s *Composition* uniqueness is determined not only by its *Composition*, but also by its participating *Entities*. In the FACE 2.1 Metamodel, these participating *Entities* are called “*Associated Entities*” and in the FACE 3.0 Metamodel, they are called “*Participants*”.

5.2.2.3 *Domains and BasisEntities*

5.2.2.3.1 *Domains*

The *Domain* model element categorizes a set of *BasisEntity* model elements. A *Domain* represents an area of knowledge, or subject matter, specific to practitioners within the *Domain*. *Domain* elements contain zero or more *BasisEntity* elements and provide the definition of the knowledge area to which the *BasisEntity* elements belong.

The figures at the end of this section exemplify the relationship between *Domain* and *BasisEntity* model elements. In Figure 50, the Military Operations *Domain* contains two *BasisEntity* elements, Event and Track. In Figure 51, the Shipping Industry *Domain* is additionally shown with a single *BasisEntity*, Vessel. Note that each *BasisEntity* is contained within a *Domain*, each *BasisEntity* is referenced by zero, one, or more *Conceptual Entities*, and that a *Conceptual Entity* can reference more than one *BasisEntity* in the same or different *Domain*. This is illustrated in Figure 51 as the MaritimeTrack's relationships. Figure 52 shows usage restrictions such as:

- *BasisEntity* elements cannot reference other *BasisEntity* elements
- *Conceptual Entity* elements cannot specialize *BasisEntity* elements

5.2.2.3.2 *BasisEntities*

A *BasisEntity* represents a domain concept that establishes a foundation (or basis) that a *Conceptual Entity* can reference to contribute to the *Entity*'s definition and uniqueness. A *BasisEntity* is defined by its name and description, but has no *Characteristics*. A *BasisEntity* can serve as a classification for the *Conceptual Entity* elements that reference them. No notion of inheritance or hierarchical structure is imposed (or implied) by this feature.

The *BasisEntity* has two significant use cases. *BasisEntity* model elements:

- Allow the modeler to specify that two or more *Conceptual Entities* are different even though they have the same set of *Characteristics*
- Allow the modeling of concepts that don't need further characterization for a *Domain*, but can be characterized at a later time

Pitfall:	<i>BasisEntity</i> is a CCB managed element and must be added as a contribution to the SDM using the CCB process. Attention should be taken in submitting <i>BasisEntity</i> elements to the SDM CCB to ensure ample time is allocated for approval or disapproval. The associated figures below illustrate the usage rules for how a <i>BasisEntity</i> contributes meaning to model elements that reference them.
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An *Entity* that references a *BasisEntity* functions the same as an *Entity* that does not reference a *BasisEntity*. In Figure 50, the Surface Track *Entity* references the *BasisEntity* Track and still acts as a generalization to the specialized *Entities* Ground Track and Maritime Track.

An *Entity* can reference more than one *BasisEntity* to provide its definition. An *Entity*'s referenced *BasisEntity* elements are not required to be in the same *Domain* and do not denote any hierarchical structure. This allows for flexibility in that any *Entity*, without regard to its *Characteristics* or relationships, can have its meaning based in different *Domain* elements. In Figure 51, the Maritime Track *Entity* has meaning as a Ship and a Track in the Military Operations *Domain* and as a Vessel in the Shipping Industry *Domain*.

A *BasisEntity* cannot be specialized by an *Entity*, nor can it have any *Characteristics* (*Composition* or *Participant*). It can only be referenced by an *Entity*. As such the *BasisEntity* Ship, shown in Figure 52, is in violation of the FACE Metamodel.

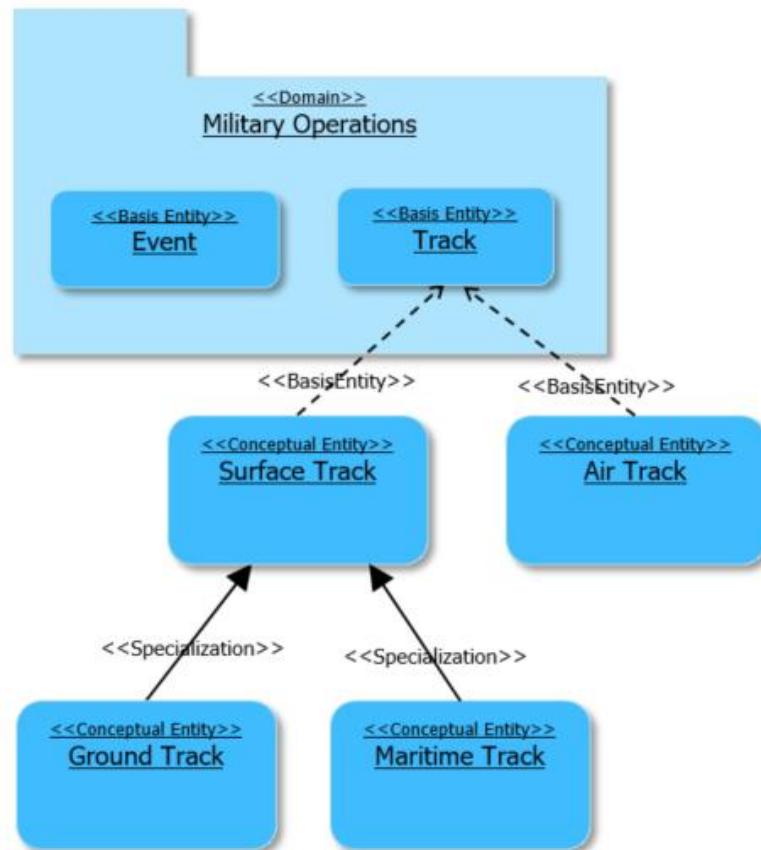


Figure 50: Domain and BasisEntity Elements Example 1

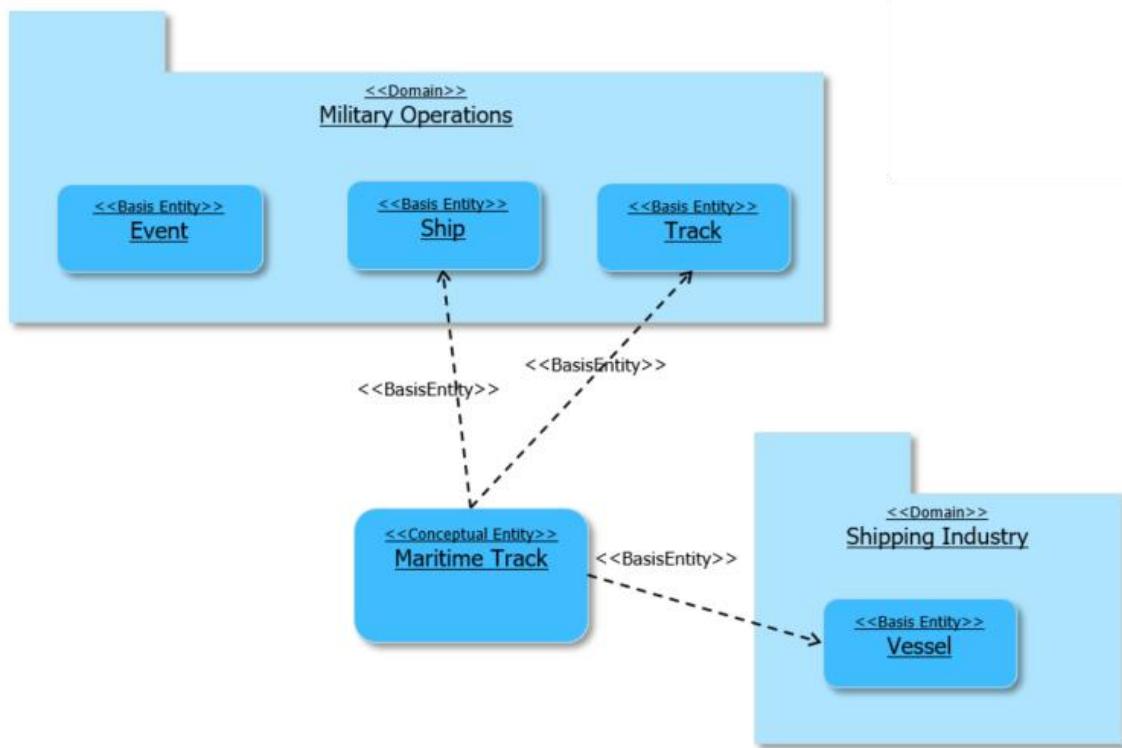


Figure 51: Domain and BasisEntity Elements Example 2

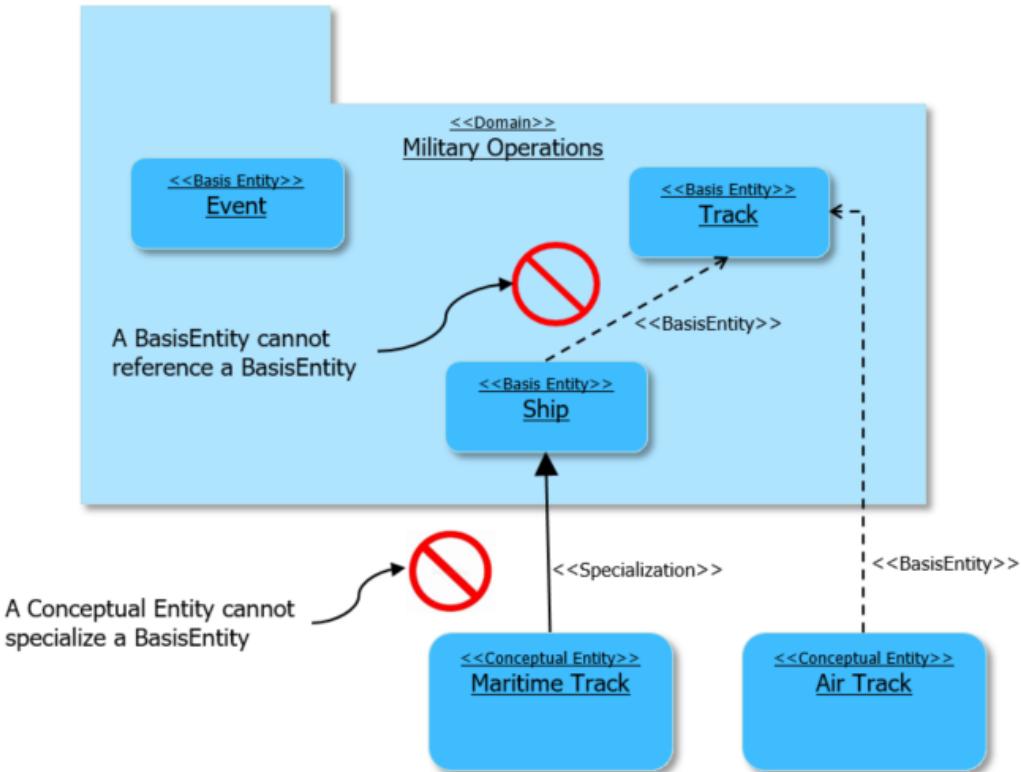


Figure 52: Domain and BasisEntity Elements Example 3

Note: The *BasisEntity* feature is suitable for addressing the challenges faced when strong adherence to the *Entity* uniqueness and Single *Observable* rules is required.

5.2.3 Application Perspective

5.2.3.1 Conceptual Queries

Conceptual Queries define the conceptual-level views. Conceptual *Views* and *Queries* are optional, but can be used to describe model subsets.

A conceptual *View* is “realizable” by a logical *View*, and a logical *View* is “realizable” by a platform *View*, which is then referenced by a *Connection*.

The conceptual *View* `where_clause` can be used for comparisons between different properties. Since the conceptual model does not have detailed data types like those defined in the logical model *Measurements*, only property comparisons are permitted.

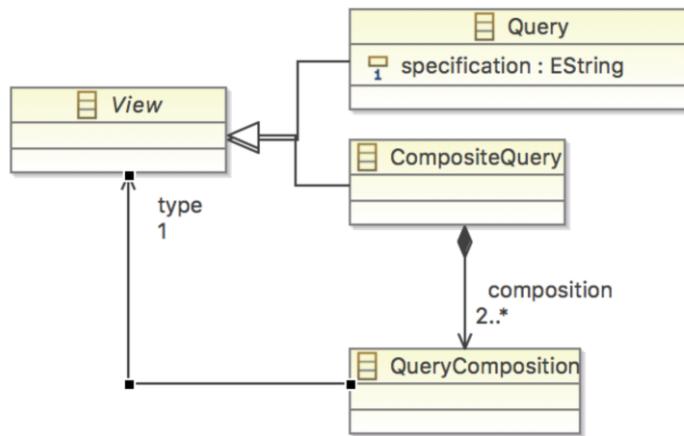


Figure 53: Conceptual View Metamodel

A composite *Query* is represented in the conceptual metamodel as a *CompositeQuery* and is a collection of two or more *Queries*. The “isUnion” attribute specifies whether the composed *Queries* are intended to be mutually-exclusive or not.

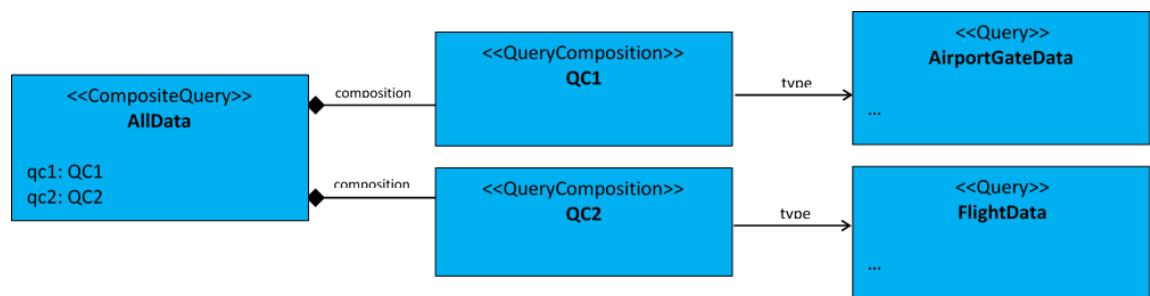


Figure 54: CompositeQuery Example

5.3 Logical Data Model

This section describes the *Logical Data Model (LDM)* elements in more detail. It focuses on the Entity-Association and Observation Perspectives.

5.3.1 Observation Perspective

5.3.1.1 Measurement and Measurement Axis

A *Measurement* adds additional detail to an *Entity*'s *Characteristic Compositions* by providing the data type and unit of the *Characteristic*. The *Measurement* also “realizes” an *Observable* in order to specify the type of observation being measured. This is very important to understanding a *Measurement*, especially when it contains multiple axes as axes “realize” their own *Observables* that can be different from the overall *Measurement*.

The *Measurement Axis* realization of an *Observable* is optional. Figure 55 shows an example where the modeler chose to show the *Observable* realization by the *MeasurementAxis* for *AirspeedMeasurementAxis* on the right. In the case where the *MeasurementAxis* does not explicitly realize an *Observable*, the *Measurement Observable* is the default. The left side of Figure 55 shows the visual realization representation when the *MeasurementAxis* realization is not explicitly drawn. Within a multi-axis *Measurement*, a *MeasurementAxis* is required to explicitly realize an *Observable* when the *Observable* does not correspond to the *Measurement*'s realized *Observable* as shown in Figure 56. Examples of these use cases are shown in the following figures.

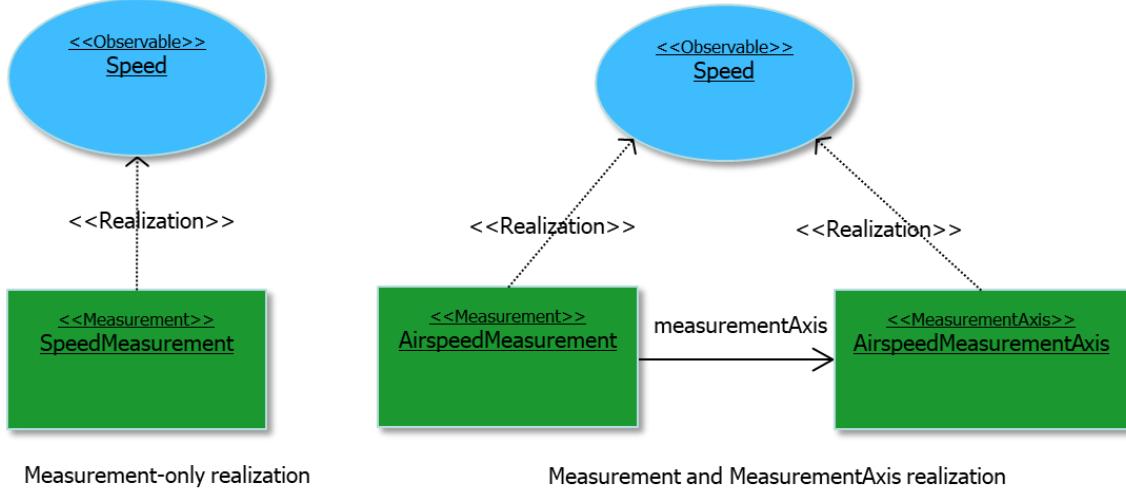


Figure 55: Measurement Realization with Single Axis

5.3.1.2 Measurement Identification Practice

As noted in earlier sections, the difference between conceptual levels and logical levels is refinement of the conceptual abstractions to logical measurable data by adding more specific detail such as units, data types, and a frame of reference. When creating a *Logical Entity-Association* model the modeler must identify how each *Entity*'s *Characteristics* are measured.

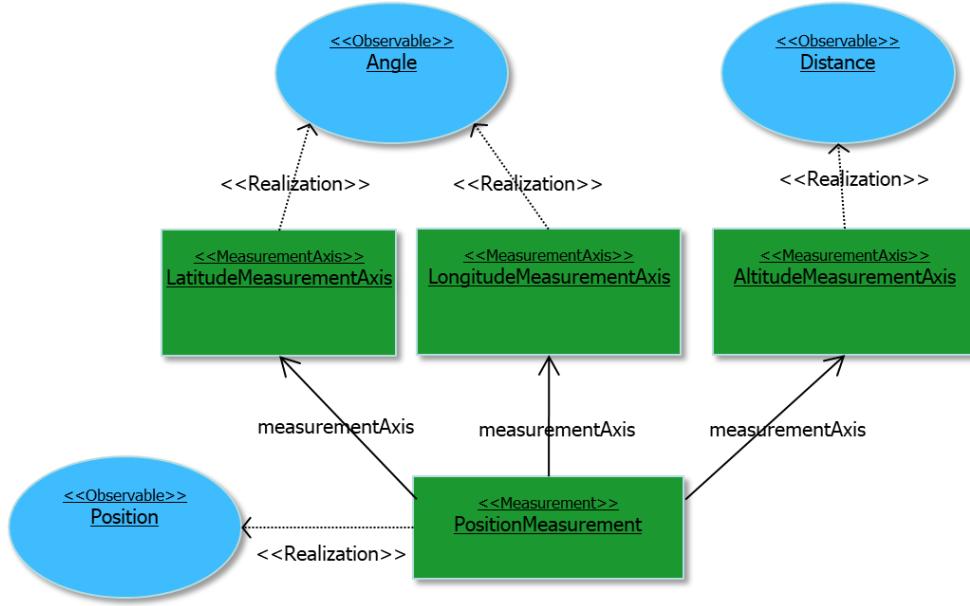


Figure 56: Measurement Realization with Multiple Axis

In this example two *MeasurementAxis* elements realize the Angle *Observable*, one realizes the Distance *Observable*, and the *Measurement* realizes the Position *Observable*.

Best Practice: As the discovery process leads to new detail which suggests limitations to the *Measurement Systems*, the suggested practice here is to delay the creation of the *Measurement System*. It is possible to create a new *Measurement* and *Measurement Axis*, complete the descriptions for both, and leave the other details incomplete. As the discovery and refinement process unfolds, decisions on *Measurements* could change and become unnecessary. This approach saves time and eliminates extra work for constructs later deemed not required. No problems are caused by deferring this work. Model checks and OCL will identify the deficient *Measurement Systems* identifying the elements needed to create a conformant data model.

5.3.1.3 *Measurement Attributes*

Measurement Attributes are used to describe *Measurement* data with metadata. For instance, a *Measurement*'s validity could be described with a *Measurement Attribute*. This might be used for a GPS *Measurement* prior to the acquisition of enough GPS satellites to produce an accurate Position *Measurement*. In effect, the *Measurement Attribute* gives the ability to relate additional *Characteristic* data that is closely aligned to the *Measurement*.

Figure 57 shows relevant portions of the logical and platform metamodel that capture *Measurement* attribute metadata.

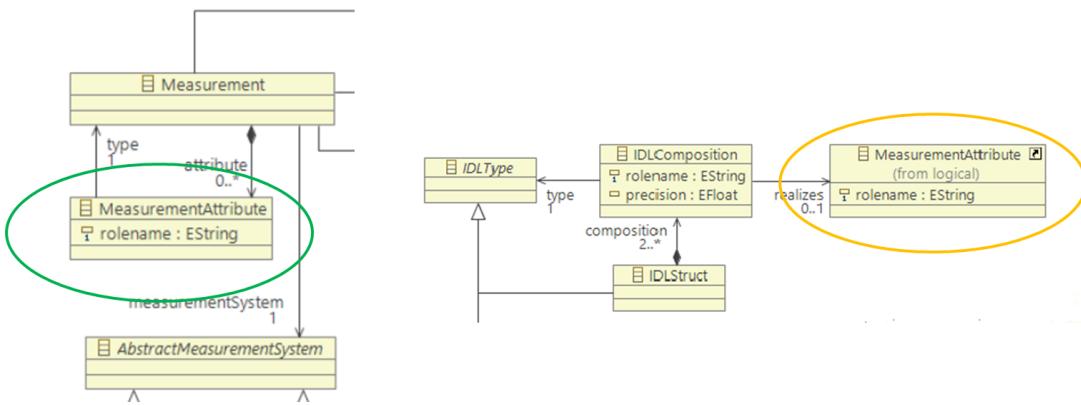


Figure 57: Relevant Logical and Platform Metamodel for Measurement Attributes

5.3.1.3.1 Metamodel Rules

The following sections summarize rules specified in the FACE 3.0 Data Architecture metamodel using identifiers in the form “MM-#”. These identifiers are used later in the document alongside examples.

Logical Metamodel Rules

- MM-1: A *Measurement Attribute* references a (single) existing *Measurement* as its “type”
- MM-2: A *Measurement* can compose zero, one, or more *Measurement Attributes*
- MM-2a: *Composition* means that a *Measurement Attribute* is owned by a single *Measurement* and is named for its usage within the *Measurement* using a role name

Platform Metamodel Rules

- MM-3: An IDL *Composition* realizes zero or exactly one *Measurement Attribute*

5.3.1.3.2 OCL Rules

The following sections summarize the rules specified in the FACE 3.0 Data Architecture OCL using identifiers in the form “OCL-#”. These identifiers are used later in the document alongside examples.

- OCL-1: A *Measurement* cannot use a *MeasurementAttribute* that references itself³
- OCL-2: A *Measurement* with *Measurement Attributes* is realized by an *IDLStruct*⁴
- OCL-2-1: Each *Measurement Attribute* is realized as one *IDLComposition* of the *IDLStruct*
- OCL-2-2: Every *MeasurementAttribute* of a *Measurement* must be realized⁵

³ See the FACE Technical Standard, §J.6, constraint “inv noCyclesInMeasurements”.

⁴ See the FACE Technical Standard, §J.6, constraint “inv idlCompositionsConsistentlyRealizeMeasurementAttributes”.

⁵ *Measurement Attributes* are part of the Observation Perspective and therefore require complement realization at a subsequent level.

- OCL-3: If an *IDLComposition* realizes a *MeasurementAttribute*, then the *IDLComposition*'s type is a consistent realization of the *MeasurementAttribute*'s type

5.3.1.3.3 Examples

The examples below are marked with numbered identifiers that correspond to the list numbers.

Measurement without Measurement Attribute

Figure 58 shows the Speed *Measurement* as it would appear without a *Measurement Attribute*:

1. The Speed *Measurement* has a single *Measurement Axis*.
2. The Speed *Measurement*, as a single-axis *Measurement*, is realized as an IDL primitive of type *Long*.

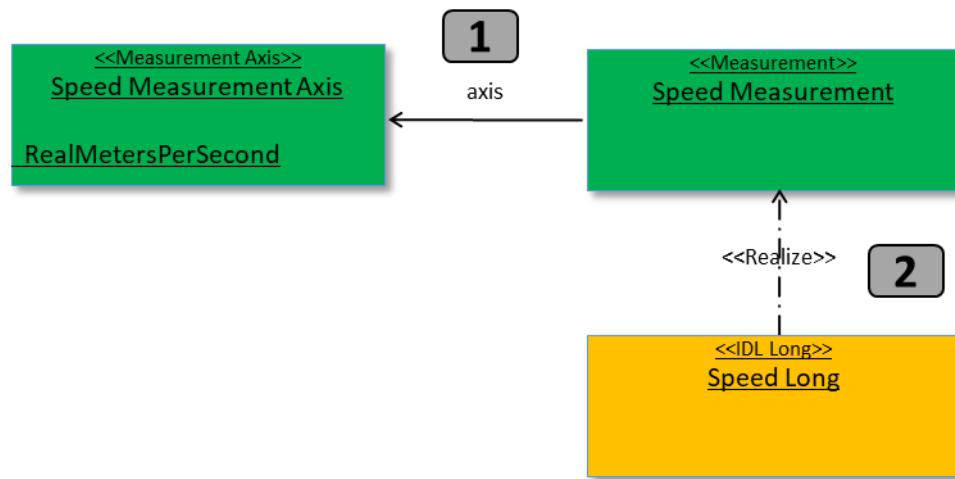


Figure 58: Speed Measurement – No Measurement Attribute

Measurement Using a Measurement Attribute

Once a *Measurement Attribute* is added to the Speed *Measurement*, the amount of modeling increases. The Speed *Measurement Axis* must now be *realized* at the platform level, and the Speed *Measurement* must be *realized* as an *IDLStruct*. Relate the numbered list items below to those in Figure 59.

1. The Speed Validity *Measurement Attribute* references the Validity *Measurement* to define its semantics (MM-1).
2. The Speed *Measurement* composes the Speed Validity *Measurement Attribute* (MM-2).
3. Since the Speed *Measurement* composes a *Measurement Attribute*, it is *realized* as an *IDLStruct* at the platform level (OCL-2).
4. Each *Measurement Attribute* of the Speed *Measurement* is *realized* as one IDL *Composition* of the *IDLStruct* (OCL-2-1). Every *Measurement Attribute* of the Speed *Measurement* must be *realized* (OCL-2-2).

5. The Validity IDL *Composition* type (Validity IDL *Boolean*) is a consistent realization of the Speed Validity's type (Validity *Measurement*) (OCL-3).
6. An IDL *Composition realizes* zero (0) or exactly one *Measurement Attribute* (MM-3).

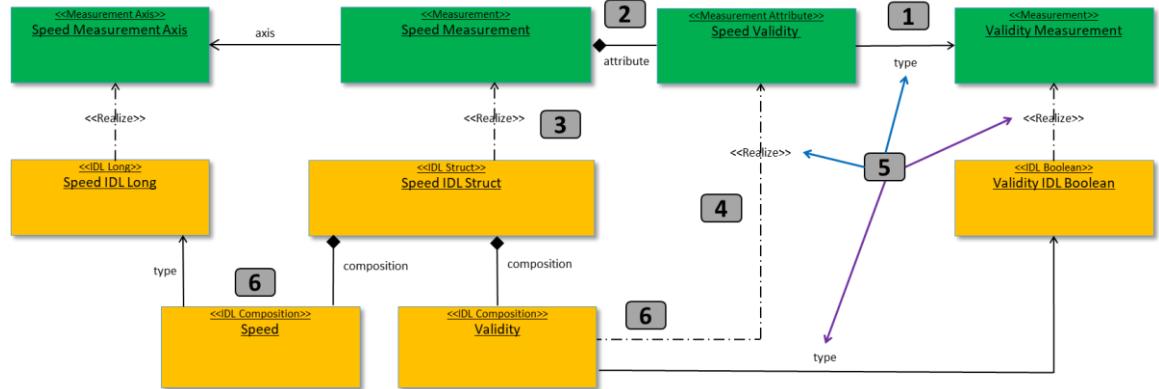


Figure 59: Speed Measurement with Single Measurement Attribute

Incorrect Use of Measurement Attribute – Case #1

In the following example, an incorrect use of a *Measurement Attribute* is shown.

- #1: A *Measurement* cannot use a *Measurement Attribute* that references itself (OCL-1).

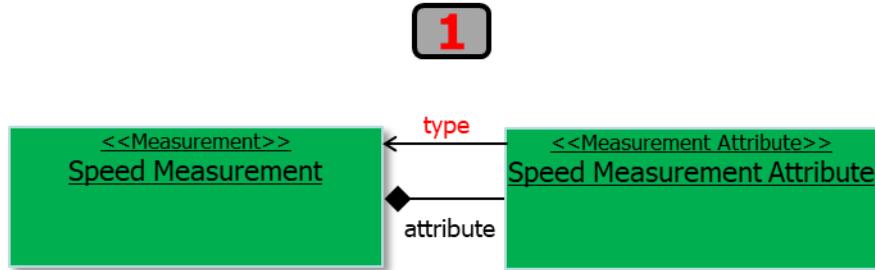


Figure 60: Incorrect Use of Measurement Attribute Case #1

Incorrect Use of Measurement Attribute – Case #2

In the following example, OCL constraint OCL-3 is violated and is therefore an incorrect usage of the *Measurement Attribute*. Health IDL *Boolean* does not realize Validity *Measurement* (the *Measurement* that types the Speed Validity *Measurement Attribute*).

- #7: If an IDL *Composition realizes* a *Measurement Attribute*, then the IDL *Composition*'s type is a consistent realization of the *Measurement Attribute*'s type (OCL-3)

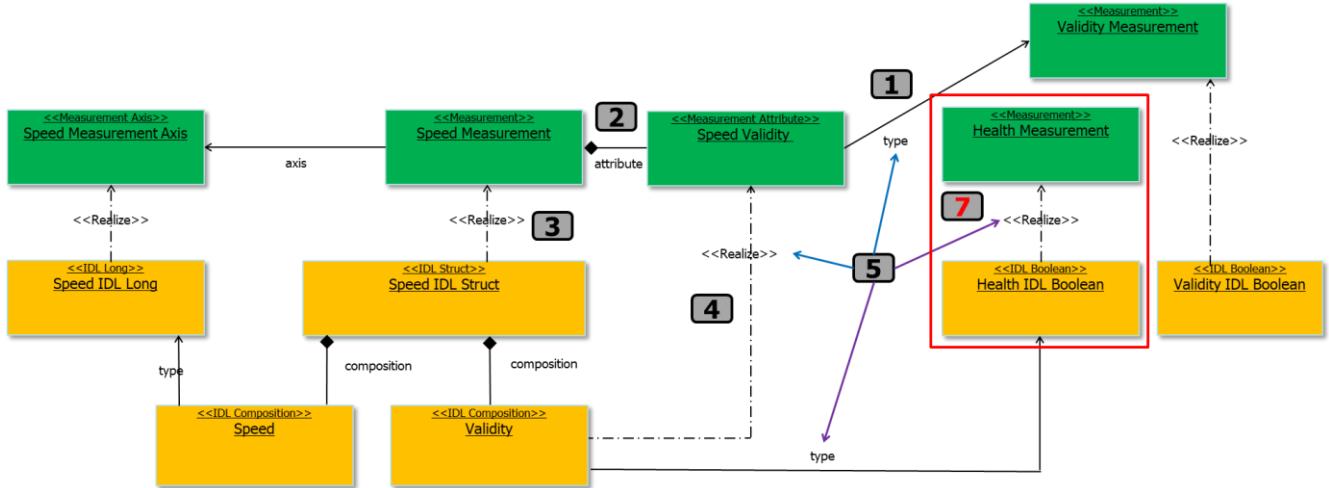


Figure 61: Incorrect Use of Measurement Attribute Case #2

5.3.1.4 Measurement System and Supporting Elements

The *Measurement System*, with its supporting elements, establishes the foundational references to measure the data items. This underlying system supports the logical detail measurements for each data item.

Note that the term “*Measurement System*” does not necessarily imply the use of numbers or that a physical phenomenon is being measured. For example, an *Enumeration* can be used to “measure” a temperature (i.e., HOT, COLD). As another example, a number can be used to “measure” a street.

5.3.1.4.1 What can be an Axis?

The name “axis” is somewhat misleading as many people often equate the term axis with “dimension”. The axis is not a dimension, but rather, simply stated, an axis is a portion of the *Measurement System*. For example, in a two-dimensional positional *Measurement System* there would typically be two axes, x and y. That said, the axes can represent just about anything you desire to compose into a measurement. A four-axes *Measurement System* could be x, y, z, and t. where t is time. That said, we want *Measurement Systems* to be as reusable as possible while still remaining meaningful. A good indicator is that a *MeasurementSystemAxis* realizes *Observables* and therefore is defined by that realization.

5.3.1.4.2 Why is a Measurement System Linked to a Coordinate System, isn't this Redundant?

The simple truth is yes, it is a little redundant since the numbers of axes must match. That said, the measurement metamodel portion of the logical *Measurement System* was designed to maximize reuse. Therefore, *Coordinate Systems* are standalone and define the number of axes, axis relationship description (i.e., orthogonality), plus distance and angular equations. This way, each measurement system can simply point to the *Coordinate System* without having to restate those attributes.

5.3.1.4.3 What is a Good Reference Point?

Reference points are used to tie the *Measurement System* to the “real world”. For example, an Earth Centered Earth Fixed (ECEF) *MeasurementSystem* has (0,0,0) as its origin and specifies

the *Landmark* as the center of the earth. That said, the origin is not sufficiently specified if we do not further tie the ECEF *Measurement System* to the geoid. If the geoid is not specified, then any measurement could be misunderstood. Therefore, the reference points must be specific and describe *one* and *only* one point. Typically, the reference points should be equated to the physical world or to an external standard reference system.

5.3.1.5 *Landmarks, Reference Points, Parts, and Default Value Type Units*

Reference points, as described above, are used to link the *Measurement System* to either the real world, or to other published standards, etc. This is accomplished by defining a *Landmark*; for example, the *InternationalDateLine* is defined in text as “*Describes the position of the InternationalDateLine at the Equator*”. A reference point called *NorthPoleAtPrimeMeridian* can then be defined in the ECEF *Measurement System* at the coordinate (latitude: PI/2, longitude, 0). The *Units* for the coordinate reference point parts are defined by the *DefaultValueTypeUnit* on each *MeasurementSystem* axis as *RealRadians* for both latitude and longitude axes.

5.3.1.5.1 *When is a New Measurement System Required?*

Measurement Systems should be created when an *Observable* is to be refined into a *Measurement* and the “topology” of the *Measurement* is not currently represented by existing *Measurement Systems* (i.e., the axes don’t match up).

Measurement Systems should be created when they describe a *Measurement* that is somehow fundamentally different than existing *Measurement Systems*. Fundamental differences are described as those differences that would allow a single *Measurement* to be described with more than one point in the *Measurement System* or rather, if the point cannot be described unambiguously. More simply, if the number of axes is different, or the reference points don’t adequately describe the *Landmarks* and location of the *Landmark* for your *Measurement*, a new *Measurement System* should be created.

5.3.1.6 *Number of Reference Points*

The minimum number of reference points required in fully describing a *Measurement System* is N where N is the number of axes. This assumes that none of the reference points lie on the same axis. The reason that it is not N+1 is because we already describe the axes relationships of the *Measurement System* through the *Coordinate System* and the angle and distance functions defining the *Measurement System*.

5.3.1.7 *Standard Measurement System*

In the case of data items defined by standards that are accepted as *de facto* in industry, the FACE Data Architecture provides a mechanism at the Logical Layer for the modeler to simply reference that recognized Technical Standard. The Technical Standard defines this mechanism as follows:

“A *StandardMeasurementSystem* is used to represent an open, referenced *Measurement System* without requiring the detailed modeling of the *Measurement System*. The reference should be a formal or industry standard which defines the full comprehension of the underlying *Measurement System*.”

The modeler should be aware that for any data items defined as a standardized measurement, the identified standard must meet the following criteria:

- It is normative by industry or formal authority
- It is well-defined
- It can be referenced
- It can appropriately realize an *Observable*

An example of a *StandardMeasurementSystem* is a JPEG image. The JPEG standard is ISO/IEC 10918⁶ and defines an encoding for photographic images.

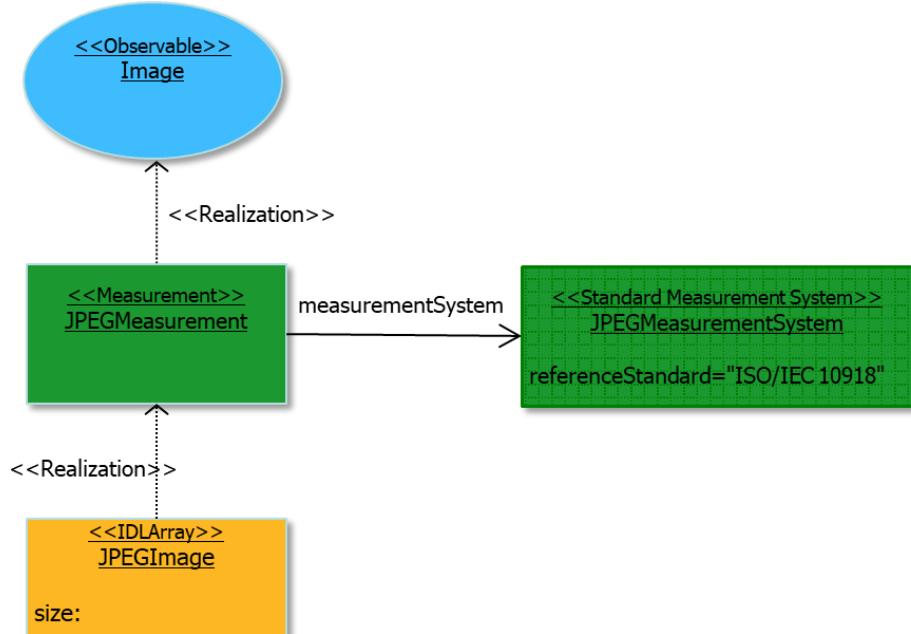


Figure 62: StandardMeasurementSystem Example

The model above shows that the `JPEGMeasurement` realizes the `Image Observable`. Since JPEG is quite complex and is most often treated as a single element and meets the criteria, it makes good sense to define it as a *StandardMeasurementSystem*.

5.3.1.8 Syntax/Naming

In order to maintain consistency and clarity, the guidance put forth touches on best practices of naming conventions for the Logical data elements defined through *Measurements*, *Measurement Systems*, and supporting metamodel elements. Since, some of the elements covered in this section are not subject to CCB management, the best practices listed here are merely recommendations. For those metamodel elements under the CCB management purview, these naming conventions will be enforced for all new elements submitted through the CCB process. The guidance provided in this section will cover syntax specific for each element.

⁶ ISO/IEC 10918: Information Technology – Digital Compression and Coding of Continuous-Tone Still Images.

The *Measurement* and *Measurement Axis* are not CCB-managed elements so naming conventions are recommendations for best practices from a single UoP perspective. The FACE Technical Standard and the SDM impose these recommendations on all *Measurement* and *Measurement Axis* candidates for inclusion in the SDM.

Measurement

This section identifies naming rules for *Measurement*:

- Suffix every name with `_ Meas`
- In general:
 - *Measurement System* aligned:
 - To the degree that the *Measurement* is explicitly aligned with the *Measurement System*, then the recommended `<Measurement System Name (without the suffix)>_<VTU Name>_Meas`
 - *Measurement* specific:
 - `<Measurement Name>_<VTU Name>_Meas`

Measurement Axis

This section identifies naming rules for *Measurement Axis*:

- Suffix every name with `_ MeasAxis`
- In general:
 - *Measurement System* aligned:
 - To the degree that the *Measurement* is explicitly aligned with the *Measurement System*, then the recommended `<Measurement System Axis Name>_<VTU Name>_ MeasAxis`
 - *Measurement* specific:
 - `<Measurement Name>_<VTU Name>_ MeasAxis`

The syntax and naming of *Measurement Systems* and related elements are very specific to help data modelers find applicable *Measurements* and *Measurement Systems*. Also, since a *Measurement System*'s *Units* are flexible and can be overridden by a *Measurement*, do not embed units and/or type in the name of *Measurement Systems* or *Measurement System Axis*. The following syntax guidance should be used for naming *CoordinateSystem*, *Landmark*, *ReferencePoint*, *MeasurementSystem*, and *MeasurementSystemsAxis* elements.

Coordinate System

This section identifies naming rules for *Coordinate System*:

- Use common name for *Coordinate System* (e.g., “Cartesian”)
- Suffix every name with `_CoordSys`

- If there are multiple variants on the *Coordinate System*, then use the following to differentiate:
 - Single-axis system: <Coordinate System Name>_<Axis Name>
 - Multi-axis system: <Coordinate System Name>_<Number of Axes>D, or
 - <Coordinate System Name>_<Common Multidimension Name>, or
 - <Common Multidimension Name>
 - Multi-axis system variants (or for clarity on a multi-axis system): <Coordinate System Name>_<Number of Axes>D_<Axis Names> (e.g., *Cartesian_3D_XYZ* versus *Cartesian_3D_XYT*)
- If a variant is added in a CR, assess the existing *CoordinateSystem* names and adjust if necessary; for example, “Discrete” exists today – if “Discrete_2D” is added, then “Discrete” would change to “Discrete_<name of axis>”

Coordinate System Axis

This section identifies naming rules for *Coordinate System Axis*:

- Suffix every name with _ CoordSysAxis
- In general: <Coordinate System Name>_<Axis Name>_CoordSysAxis (where Coordinate System Name is the name of the *CoordinateSystem* that uses the axis)
 - If the supported *Coordinate System* is a single-axis coordinate system: <Coordinate System Name>_CoordSysAxis
 - If multiple *Coordinate Systems* use the axis: <Coordinate System Category>_<Axis Name> (e.g., *Angular_Azimuth_CoordSysAxis*)
- If an axis of a *CoordinateSystem* is added that uses an existing *CoordinateSystemAxis*, assess the existing *CoordinateSystemAxis* names and adjust if necessary

Measurement System

This section identifies naming rules for *Measurement System*:

- Suffix every name with _ MeasSys
- In general, if there are multiple variants of the *Measurement System*, then use the following to differentiate:
 - Single-axis system: <Measurement System Name>_<Axis Name>
 - Multi-axis system: <Measurement System Name>_<Number of Axes>D, or
 - <Measurement System Name>_<common multidimension name>
 - Multi-axis system variants (or for clarity on a multi-axis system): < Measurement System Name >_<Number of Axes>D_<Axis Names> (e.g., *Cartesian_3D_CoordSys* versus *Cartesian_4D_CoordSys*)
 - Frame of reference is a further variant (e.g., *Course_MagnetNorth*)

- If a variant is added in a CR, assess the existing *CoordinateSystem* names and adjust if necessary; for example, “Discrete” exists today – if “Discrete_2D” is added, then “Discrete” would change to “Discrete_<name of axis>”

Measurement System Axis

This section identifies naming rules for *Measurement System Axis*:

- Suffix every name with _MeasSysAxis
- In general:
 - If the supported *Measurement System* is a single-axis coordinate system:
 $\langle\text{Measurement System Name}\rangle\text{_MeasSysAxis}$
 - If multiple *Measurement Systems* use the axis: $\langle\text{Measurement System Name}\rangle\text{_Axis Name}\text{_MeasSysAxis}$ (where *Measurement System* Name is the name of the *MeasurementSystem* that uses the axis)
- If an axis of a *MeasurementSystem* is added that uses an existing *MeasurementSystemAxis*, assess the existing *MeasurementSystemAxis* names and adjust if necessary

Unit

This section identifies naming rules for *Unit*:

- In general, use the common name for the *Unit* in plural form (e.g., use *Watts*, *Feet*, *Meters* instead of *Watt*, *Foot*, *Meter*)
- If the *Unit* is a rate, use the singular form (e.g., use “*MetersPerSecond*” instead of “*MeterPerSeconds*”)
- Avoid abbreviations and be mindful that a “common name” might be confused with a different unit
- Do not add a suffix

Value Type Unit

This section identifies naming rules for the *ValueTypeUnit*:

- In general: $\langle\text{ValueType Name}\rangle\text{_Unit Name}$
- If the VTU contains a constraint: $\langle\text{ValueType Name}\rangle\text{_Unit Name}\text{_Constraint Name}$

Enumeration Value Type Unit

This section identifies naming rules for the *Enumeration Value Type Unit*:

- In general:
 - Suffix with “_Enum”

Value Type Unit Constraint

This section identifies naming rules for *Value Type Unit Constraint*:

- In general, use a concise description of the *Constraint* (avoiding underscores)
- For range *Constraints* where the best description appears to be the range itself:
`<LowerBound>_to_<UpperBound_<"Inc" or "Exc">` (e.g., `UTC_HourOfDayConstraint`)
- For enumeration *Constraints*: `<Name of VTU (without suffix)>_<Concise Description of Constraint>`

Landmarks

This section identifies naming rules for the *Landmarks*:

- In general, use a concise description of the *Landmark*
- If the *Landmark* is based on the value at some number of units: `<Number of Units in English (not numeral)><Name of Unit>` (use the words “one” or “single” instead of the digit “1”)
- When possible, avoid using the name of a *Measurement* that uses the *Landmark* in the *Landmark* name
- When it is truly appropriate to use the name of the *Measurement*: `<Name of Measurement>_<Name of Landmark>` (e.g., `BodyAngle_Origin`)

Reference Points

- For zero value reference points, use:
`Zero<MeasurementSystemAxisName>ReferencePoint` (e.g., `ZeroMassReferencePoint`)
- For one value reference points use:
`One<UnitName><MeasurementSystemAxisName>ReferencePoint` (e.g.,
`OneKilogramMassReferencePoint`)

5.3.1.9 Constraints

5.3.1.9.1 Overview

At the logical level of the Observation Perspective, data types are modeled using *Measurements*. *Measurements* are supported by other elements such as *MeasurementAxis*, *MeasurementSystem*, *MeasurementSystemAxis*, and *ValueTypeUnit*. There are often cases when we want to constrain the *Measurement*’s set of valid values in order to more accurately describe what is being measured. This is accomplished by placing one or more *Constraints* on any or all of these elements.

The metamodel provides the *MeasurementConstraint* element to optionally apply one or more ordered, text-based, descriptive *Constraints* on the following elements: *Measurement*, *MeasurementAxis*, *MeasurementSystem*, and *MeasurementSystemAxis*. The *Constraint* element is used to optionally apply a single *Constraint* to a *ValueTypeUnit*. Whereas *MeasurementConstraint* is limited to a text string, *Constraint* has several sub-types, each of which has attributes specific to the *ValueType* being constrained.

When considering the application of a *MeasurementConstraint*, it is important to understand that the *Constraint* becomes part of the definition. As such, careful consideration should be used to determine which element is constrained. Incorrect application of *Constraints* can have unintended impacts to the overall usage and flexibility of the constrained elements.

5.3.1.9.2 Where to Place Measurement Constraints

The *MeasurementSystem* and its related elements are defined as part of the SDM for the intended purpose of stability, consistency, and reusability. Any *Constraints* on the *MeasurementSystem* contribute to its defined, foundational meaning, the implication of which is to constrain not only the *MeasurementSystem*, but any *Measurements* that are based upon it, limiting reusability.

The following provide general criteria for *MeasurementSystem Constraints*:

- Consider only *Constraints* that have to be part of the definition of the *MeasurementSystem* or its immediately related elements
- For best chance of reusability, defer the *Constraints*; apply these to the *Measurement*, *MeasurementAxis*, or *ValueTypeUnit* for the *MeasurementAxis*
- If the *Constraint* doesn't vary from one *Measurement* to the next, then the *Constraint* could be a candidate for the *MeasurementSystem* or immediately related elements

5.3.1.9.3 General Criteria for Measurement Constraints

This general set of criteria is intended to help the modeler select the correct element to apply the *Measurement Constraints*:

- For *Measurements* with multiple *MeasurementAxis* elements, a *Constraint* that is applicable to the values on all axes should be applied to the *Measurement* or *MeasurementSystem*
For example, the *Constraint*: “the X and Y axis values must be within the confines of a circle” should be applied to the *Measurement* or *MeasurementSystem* because the *Constraint* pertains to both the X and Y axes.
- For *Measurements* with multiple *MeasurementAxis* elements, if the *Constraint* is applicable to a single *MeasurementAxis*, and each *MeasurementAxis* is independent, then apply the *Constraint* to the *MeasurementAxis*
For example, if only one *MeasurementAxis* must be less than 100 feet, then only one *MeasurementAxis* should have this *Constraint* applied.
- For *Measurements* with multiple *MeasurementAxis* elements, if the *Constraint* is applicable to every *MeasurementAxis*, and each *MeasurementAxis* is independent, then the *Constraint* may be applied to the *Measurement*, or each *MeasurementAxis*
For example, if each *Measurement* must be less than 100 feet, and each axis is independent, then the *MeasurementConstraint* can be applied to the *Measurement*, or on each *MeasurementAxis*.
- For *Measurements* with multiple *MeasurementAxis* elements, if the *Constraint* is applicable to a single *MeasurementAxis*, where the axes are dependent, then apply the *Constraint* to the *Measurement*
For example, the height can be no more than half the length.

MeasurementConstraints help in naming the element they constrain:

- If the *MeasurementConstraint* pertains to a *MeasurementAxis*, then use the *Constraint* in the name of the *MeasurementAxis*
For example, `MA_HeightRealMetersLE10000` to denote a *MeasurementAxis* that constrains height to real values that are less than or equal to 10,000 meters.
- If the *Constraint* pertains to part of a *MeasurementAxis*, then use the *ValueTypeUnit* element's *Constraint* in the name of the *MeasurementAxis* part
For example, `VTU_HourOfDay0to23`.
- If a *Measurement* looks suitable aside from its *MeasurementConstraints*, then create a different *Measurement* with a different set of *MeasurementConstraints*

Other considerations:

- The distinction between absolute and relative *Measurements* is important when considering creating *MeasurementConstraints* or using a constrained *Measurement*
For example, if we constrain a latitude *Measurement* to have values from -90 to 90 degrees of arc, then it would be improper to use this *Measurement* for a difference in latitude, which could range from 0 to 180 degrees of arc.

5.3.1.9.4 Value Type Unit Constraints

The *Constraint* element is optionally attributed to *ValueTypeUnit* to specify the valid range of values for *ReferencePoint*, *ReferencePointPart*, *MeasurementSystemAxis*, and *MeasurementAxis* elements. In general, constrain the *ValueTypeUnit*:

- When the constraint universally applies, such as when constraining values to non-negative real numbers
- When a *MeasurementAxis* has multiple parts
The *ValueTypeUnit* should be used to constrain the parts; e.g., a *MeasurementAxis* that consists of three parts: hour, minute, and second, where the hour *Constraint* is either 0-12 or 0-23
- When using an *EnumerationConstraint*
Through the use of the *EnumerationConstraint* element, the modeler can select a subset of *EnumerationLabels* that apply to different *ValueTypeUnits*.

5.3.1.10 Conversions

The metamodel provides elements to support the definition of conversions between two *Measurements*, *MeasurementSystems*, or *Units*. The goal for these conversion elements is to provide additional specification which can be leveraged for code writing and generation.

The conversion elements provide text-based attributes to capture the conversion specification. They do not provide any formal mechanism; however, it does not preclude an organization from specifying the use of a more formal approach; e.g., a conversion library such as MathML.

5.3.1.10.1 Measurement Conversion

The *MeasurementConversion* element is provided in order to support interoperability between different *Measurement* definitions. This element specifies the mapping between two *Measurements* (*source* and *target*) to describe how one measured quantity is transformed into another.

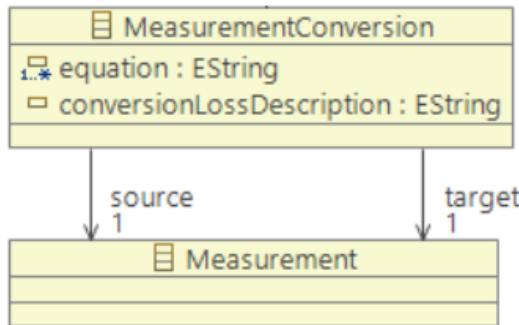


Figure 63: MeasurementConversion Metamodel Elements

The conversion is captured as a set of equations in the *equation* attribute. The specific format of *equation* is undefined. The loss introduced by the conversion equations is captured in the *conversionLossDescription* attribute. The specific format of *conversionLossDescription* is undefined.

The *MeasurementConversion* element is expected to be used mostly during the integration of multiple application data models whose semantics are similar, but differ in their *Measurement* realization. Usage within a single application data model, for purposes other than integration, is expected to be minimal.

5.3.1.10.2 Measurement System Conversion

The *MeasurementSystemConversion* element is provided in order to support interoperability between different *MeasurementSystem* definitions. This element specifies the mapping between two *Measurement Systems* (*source* and *target*) to describe how one measured quantity is transformed into another.

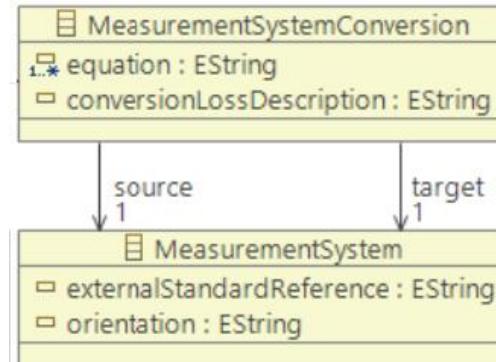


Figure 64: MeasurementSystemConversion Metamodel Elements

Measurement System conversions are captured in the same manner as the *MeasurementConversion* described above. The use of this type of conversion within a single

application data model is expected to be more frequent. The *MeasurementSystem* element provides the underlying context for measuring quantities, defining reference points, units, and potential *Constraints*. The expectation is that similar *Measurement Systems* with minor variations will likely exist in support of a single application data model. For example, a few common *Measurement System* conversions may be:

- The unidirectional conversion from a 3D to a 2D position
- The conversion of Military Grid Reference System (MGRS) position to a position based on the WGS-84 reference frame

The purpose of these conversion elements is to provide additional documentation with respect to the relationships between the identified *source* and *target MeasurementSystems*. The FACE Shared Data Model Governance Plan defines the *MeasurementSystemConversion* element as a *Basis Element*, meaning that additions of *MeasurementSystemConversion* elements to the SDM must be approved for inclusion by the SDM CCB.

5.3.1.10.3 Unit Conversion

Unit conversion is achieved through the *Conversion* element, which describes the conversion between a *source* and *destination ConvertibleElements*. Note that the metamodel currently defines a single *ConvertibleElement* (*Unit*) and a single *Conversion* (*AffineConversion*). The *AffineConversion* defines a function between the affine spaces which preserves the relational reference of the transformed units.

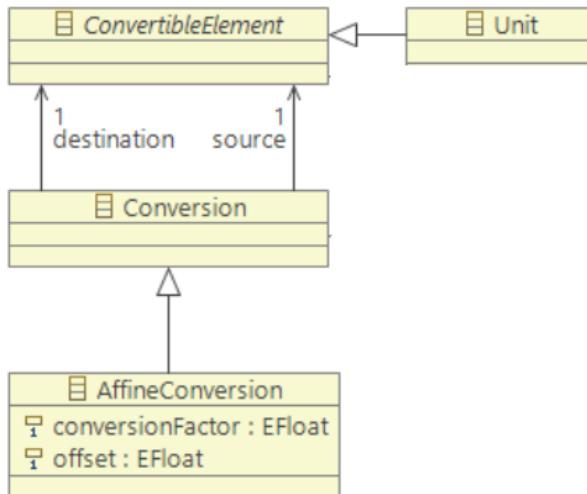


Figure 65: Conversion Metamodel Elements

Note: The *MeasurementSystemAxis* reference to the *ValueTypeUnit* element(s) sets the default value type and unit for the *MeasurementSystem*. When a *Measurement*'s default *ValueTypeUnit* is overridden through the specification of a *ValueTypeUnit* on the *Measurement*'s *MeasurementAxis*, an implicit conversion is assumed between the *MeasurementSystem* and the *Measurement*. This requires that the implicit conversion between the default *ValueTypeUnit* and the override *ValueTypeUnit* be well-defined by a standard; e.g., implicitly converting from real meters to real feet.

The best practice recommendation is to use a *Unit* conversion in addition to the *ValueTypeUnit* override applied to the *MeasurementAxis* in order to avoid the implicit conversion.

5.3.2 Entity-Association Perspective

5.3.2.1 Characteristic Realization

Typically, the characteristics of *Logical Entities* and *Associations* are realized as a 1-to-1 correspondence with the characteristics from the conceptual counterpart. In these cases, the modeler simply needs to go through the effort of identifying the logical *Measurement* aligned with the *Observable* selected at the conceptual layer. Should the frames of reference or units not align there will be some additional work to capture that detail. Refer to white papers covering topics on *Measurements* and *Measurement Systems* for more detail.

The use case where the 1-to-1 correspondence is not true requires some additional effort to identify the full realization mapping between the *Conceptual* and *Logical Entity* characteristics. The example below shows this use case. Note the Conceptual Aircraft has three characteristics: ID, duration, and speed. The modeler can easily infer the *Logical Entity* characteristics and realizations for ID, duration, and speed. However, the name characteristic in the *Logical Entity* does not initiativly map to a *Conceptual Entity* characteristic.

To determine the correct mapping relationship for “name” the modeler needs to look at the logical representation of the “name” characteristic defined by the *NameMeasurement* in the SDM. How is the *NameMeasurement* related back to a conceptual *Observable*? For the *NameMeasurement* that relationship is directed to the *Identifier Observable*. Therefore, both the logical ID and the name characteristics have a relationship mapping back to the conceptual ID characteristic.

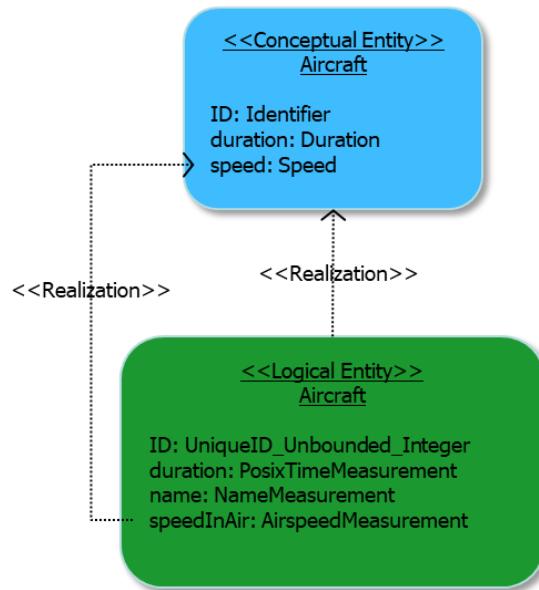


Figure 66: Rolename Change in Realization

Best Practice: Many tools will default the realization attribute as long as there is continuity between characteristic *rolenames* across the layers. It is recommended to maintain the *rolenames* across all layers. Should the *rolename* change the realization must be explicitly modeled.

5.3.2.2 Down-Selection

In the Conceptual Layer there may be additional characteristics captured that are not reflected directly in the information exchanged by the UoP. In this instance it is not unusual to find that some characteristics will not propagate through the lower layers. Therefore, it is not unusual to drop characteristics from *Entities/Associations* at the Logical Layer. This process is known as *Characteristic* down-selection and while it is most commonly used for the *Identifier* characteristic, the technique can be employed for any characteristic of an *Entity/Association*. The interpretation is the preceding layer should be a superset of all the necessary characteristics to define completeness at that layer and may or may not have meaning at lower layers.

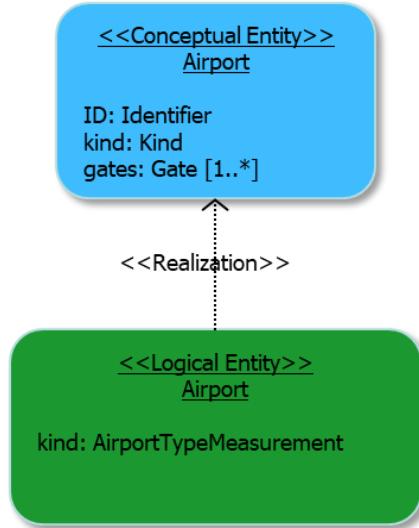


Figure 67: Characteristic Down-Selection

Figure 67 demonstrates the down-selection of two characteristics from the *Conceptual Entity*. In this example, the *LDM* only requires the *Airport* type at the logical level. Therefore, the *Gate* characteristic has been eliminated as well as the common *Identifier* required at the Conceptual Layer.

5.3.3 Application Perspective

5.3.3.1 Logical Queries

Logical Queries are very similar to *Conceptual Queries* except they operate on the *Logical Entity* model. In addition, *Logical Queries* can realize *Conceptual Queries* and can utilize a Where clause to further specify the allowable data set.

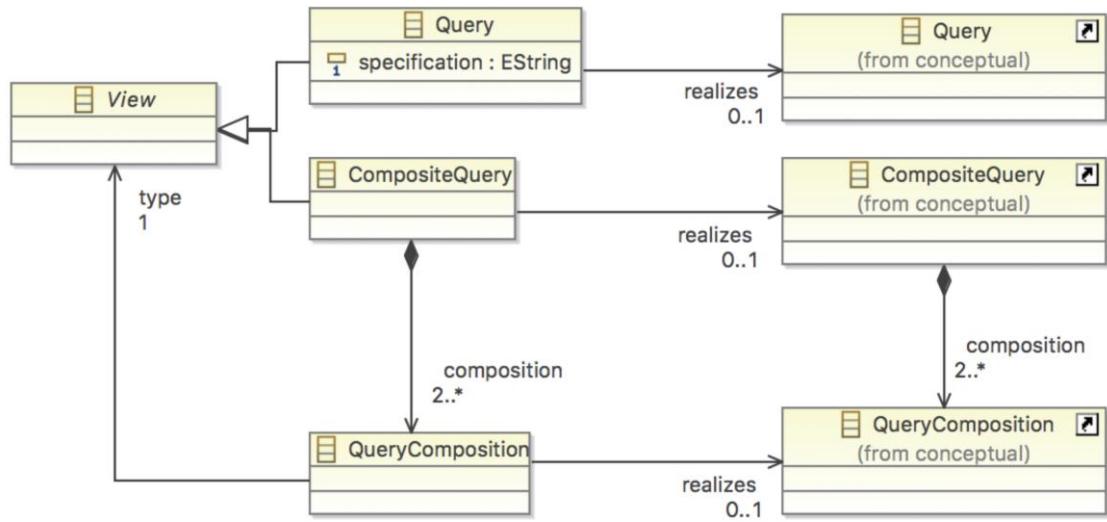


Figure 68: Logical View Metamodel

Figure 68 shows where *Logical Query*, *CompositeQuery*, and *QueryComposition* can realize the *Conceptual Query* elements.

A composite *Query* is represented in the conceptual metamodel as a *CompositeQuery* and is a collection of two or more *Queries*. The “*isUnion*” attribute specifies whether the composed *Queries* are intended to be mutually-exclusive or not.

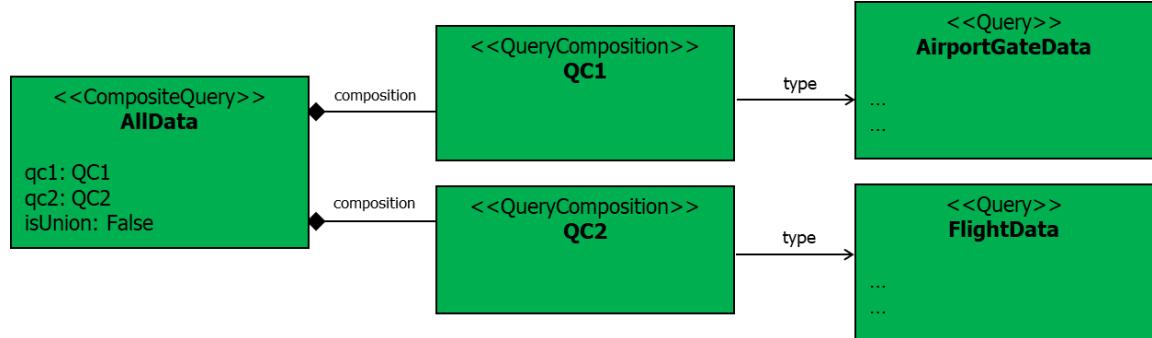


Figure 69: Composite Query Example

5.4 Platform Data Model

This section describes the platform metamodel elements and how they are used to develop a *Platform Data Model (PDM)*. The elements described are:

- Observation Perspective:
 - IDL types
 - Logical element *realization*

- Application Perspective Platform Views:
 - *Query* elements
 - *Template View*
 - Composite View
 - *Template boundQuery* and *effectiveQuery*

5.4.1 Observation Perspective

5.4.1.1 *IDLType*

A platform *IDLType*, in the platform model, is used to realize logical *Measurements*, *MeasurementAxis*, and *ValueTypeUnits*.

Only “leaf” metamodel elements of the *IDLType* (i.e., those that are not further specialized) can be used to realize a *Measurement*, *MeasurementAxis*, or *ValueTypeUnit*. The reader is encouraged to identify these in the FACE Technical Standard §J.2.5 (Meta-Package: face.datamodel.platform). Some of these leaf elements include: *IDLStruct*, *IDLSequence* and *IDLArray*, *Boolean*, *Char*, *Octet*, *Float*, *Double*, *Long*, *Enumeration*, *CharArray*, and *String*. A portion of the related metamodel is shown in Figure 70.

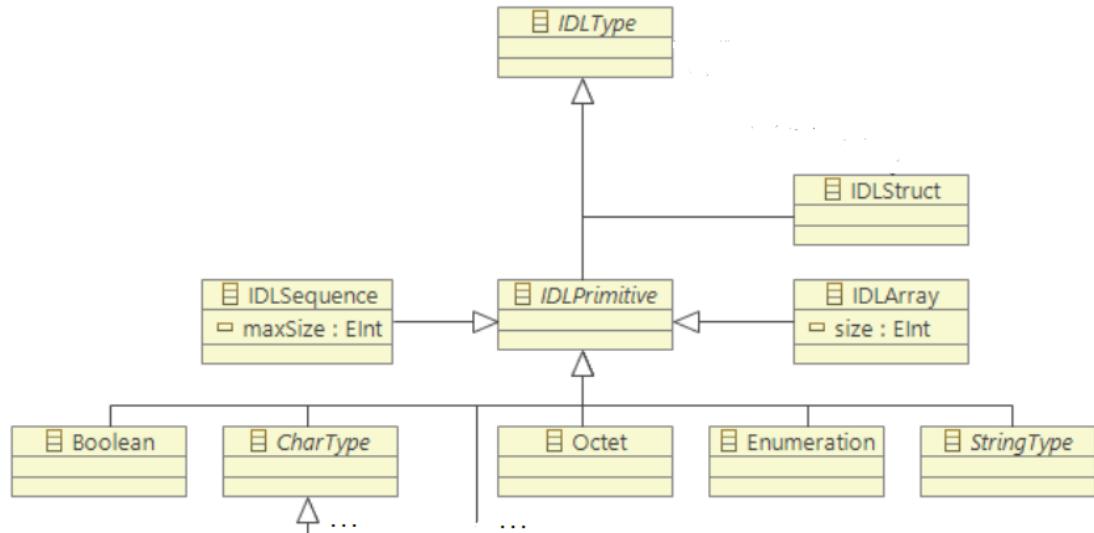


Figure 70: IDLType Metamodel

When selecting which *IDLType* used to represent data, the user should consider the type of data represented, the size, and the range of values, the PDM to IDL bindings, and the IDL to programming language mappings, each of which is specified in the FACE Technical Standard.

5.4.1.2 Realization of Logical Elements to *IDLType*

Table 5, derived from the metamodel and OCL constraints, lists the set of important points regarding realizations of logical elements into *IDLTypes*.

Table 5: Realization from Logical Elements to IDLType

ID	Description
1	<i>IDLType</i> realizes <i>AbstractMeasurement</i> , which is a generalization of <i>Measurement</i> , <i>MeasurementAxis</i> , and <i>ValueTypeUnit</i> .
2	<i>IDLType</i> is a generalization. Only “leaf” types of <i>IDLType</i> can be used for platform realization.
3	The <i>IDLType</i> leaf that is selected determines the size, range of values, and the implementation type in the chosen language.
4	<i>IDLSequence</i> and <i>IDLArray</i> can only realize <i>Measurements</i> whose <i>Measurement System</i> is of type <i>StandardMeasurementSystem</i> .
5	A <i>ValueTypeUnit</i> is realized as an <i>IDLPrimitive</i> .
6	A <i>Measurement</i> that has a single <i>MeasurementAxis</i> with one <i>ValueTypeUnit</i> and no <i>MeasurementAttributes</i> is realized as an <i>IDLPrimitive</i> .
7	A <i>Measurement</i> that has a single <i>MeasurementAxis</i> with multiple <i>ValueTypeUnits</i> and no <i>MeasurementAttributes</i> , is realized as an <i>IDLStruct</i> with one <i>IDLComposition</i> per <i>ValueTypeUnit</i> .
8	A <i>Measurement</i> with multiple <i>MeasurementAxis</i> elements is realized as an <i>IDLStruct</i> with one <i>IDLComposition</i> per <i>MeasurementAxis</i> .
9	A <i>MeasurementAxis</i> that has a single <i>ValueTypeUnit</i> is realized by an <i>IDLPrimitive</i> .
10	A <i>MeasurementAxis</i> that has multiple <i>ValueTypeUnits</i> is realized by an <i>IDLStruct</i> , where each <i>ValueTypeUnit</i> of the <i>MeasurementAxis</i> is realized as a unique <i>IDLComposition</i> of the <i>IDLStruct</i> .
11	A <i>Measurement</i> that has <i>MeasurementAttributes</i> is realized as an <i>IDLStruct</i> with one <i>IDLComposition</i> per <i>MeasurementAttribute</i> .
12	The platform realization of a logical element is consistent with its logical representation in terms of composition hierarchy and type.

5.4.1.2.1 IDLType Realizes AbstractMeasurement

IDLType realizes *AbstractMeasurement*, which is a generalization of *Measurement*, *MeasurementAxis*, and *ValueTypeUnit*.

Figure 71 shows an example of each of the logical *AbstractMeasurement* subtypes realized at the platform level.

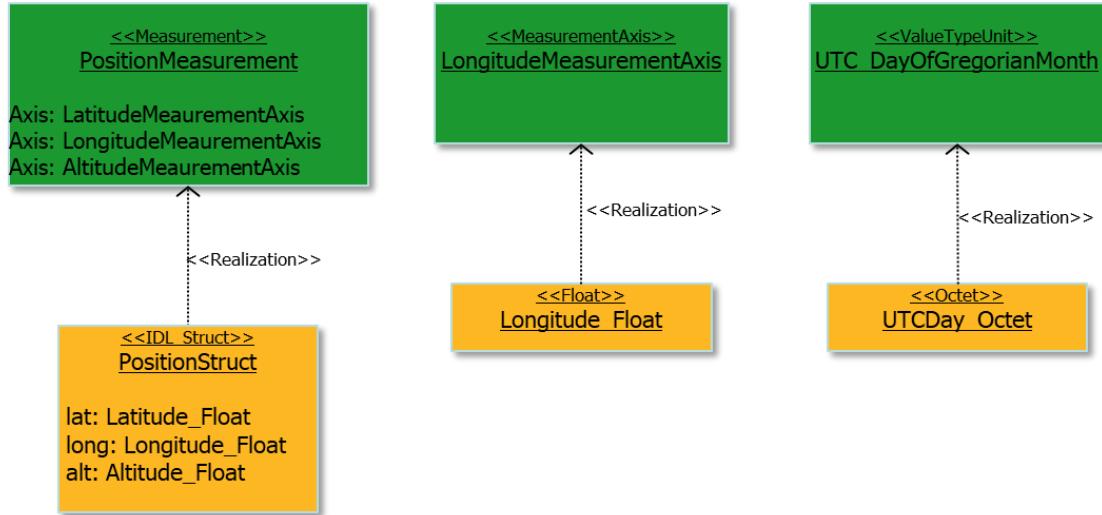


Figure 71: Example of IDLType Realization of AbstractMeasurement

5.4.1.2.2 *IDLType is a Generalization*

IDLType is a generalization. Only “leaf” types of IDLType can be used for platform realization.

Figure 72 shows each of the leaf IDL types. NAME, used in the figure, is a placeholder for the actual name of the leaf IDL types



Figure 72: Leaf IDLTypes

5.4.1.2.3 *The IDLType Leaf Selected*

The *IDLType* leaf that is selected determines the size, range of values, and the implementation type in the chosen language.

For example, Table 12 (IDL Basic Type C Mapping) in the FACE Technical Standard illustrates that an *IDLType* of short has a C Type of *FACE_short*, a size of 2 bytes, a range of values from -2^{15} to $(2^{15} - 1)$ and a default value of 0.

Table 12: IDL Basic Type C Mapping

IDL Basic Type	C Type	Size (bytes)	Range of Values	Default Value
short	FACE_short	2	-2^{15} to $(2^{15} - 1)$	0
long	FACE_long	4	-2^{31} to $(2^{31} - 1)$	0
long long	FACE_long_long	8	-2^{63} to $(2^{63} - 1)$	0

...

Figure 73: Portion of Table 12 from the FACE Technical Standard

5.4.1.2.4 *IDLSequence* and *IDLArray*

IDLSequence and *IDLArray* can only realize *Measurements* whose *MeasurementSystem* is of type *StandardMeasurementSystem*.

For example, in Figure 74, because the *JPEGMeasurement* is based on a *StandardMeasurementSystem*, it can be realized as an *IDLArray* at the platform level, whereas the Description *Measurement* cannot.

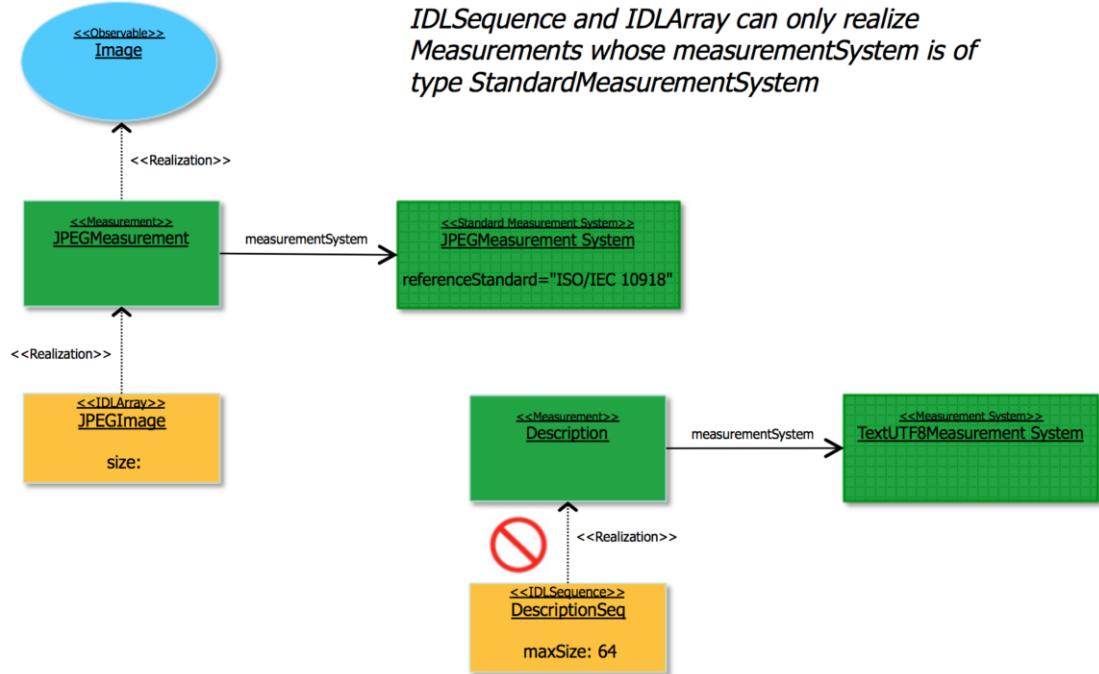


Figure 74: Platform Realization as *IDLArray* and *IDLSequence* from *StandardMeasurementSystem*

5.4.1.2.5 *ValueTypeUnit* Realization

A *ValueTypeUnit* is realized as an *IDLPrimitive*.

Aside from the special case of a *Measurement* with a single *MeasurementAxis*, single *ValueTypeUnit*, and no *MeasurementAttributes*, a *ValueTypeUnit* is always realized as an *IDLPrimitive*. The example below shows the realization of several *ValueTypeUnits* of a hypothetical distance measurement that consists of miles, yards, and feet into the *IDLPrimitives* *UShort*, *UShort*, and *Octet* respectively.

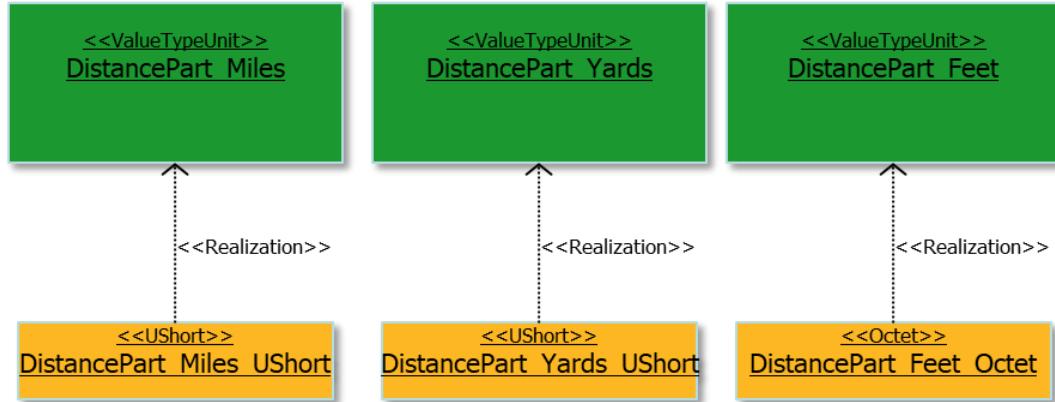


Figure 75: Realization of ValueTypeUnits as IDLPrimitives

5.4.1.2.6 Measurement Special Case 1 Realization

A *Measurement* that has a single *MeasurementAxis* with one *ValueTypeUnit* and no *MeasurementAttributes* is realized as an *IDLPrimitive*.

For example, in Figure 76, *AirspeedMeasurement* has a single-axis *AirspeedMeasurementAxis* with a *ValueTypeUnit* of *RealKnots*, and has no *MeasurementAttributes*.

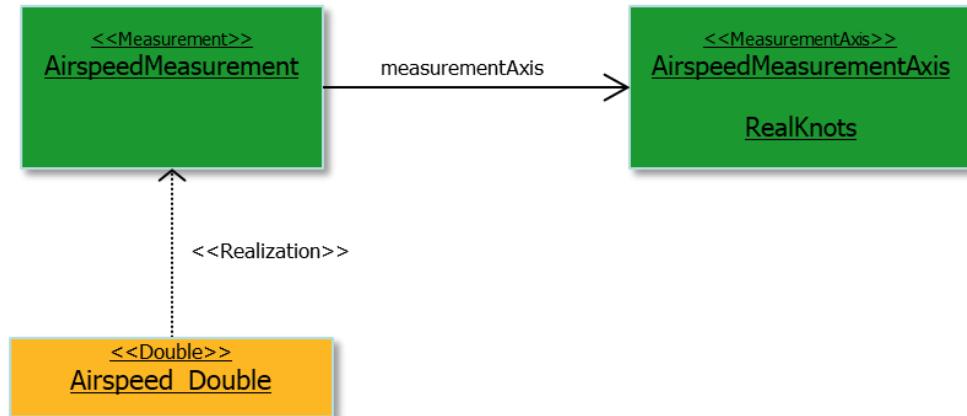


Figure 76: Realization of Measurement, Single Axis and VTU, no MeasurementAttribute

5.4.1.2.7 Measurement Special Case 2 Realization

A *Measurement* that has a single *MeasurementAxis* with multiple *ValueTypeUnits* and no *MeasurementAttributes*, is realized as an *IDLStruct* with one *IDLComposition* per *ValueTypeUnit*.

This realization is shown in Figure 77.

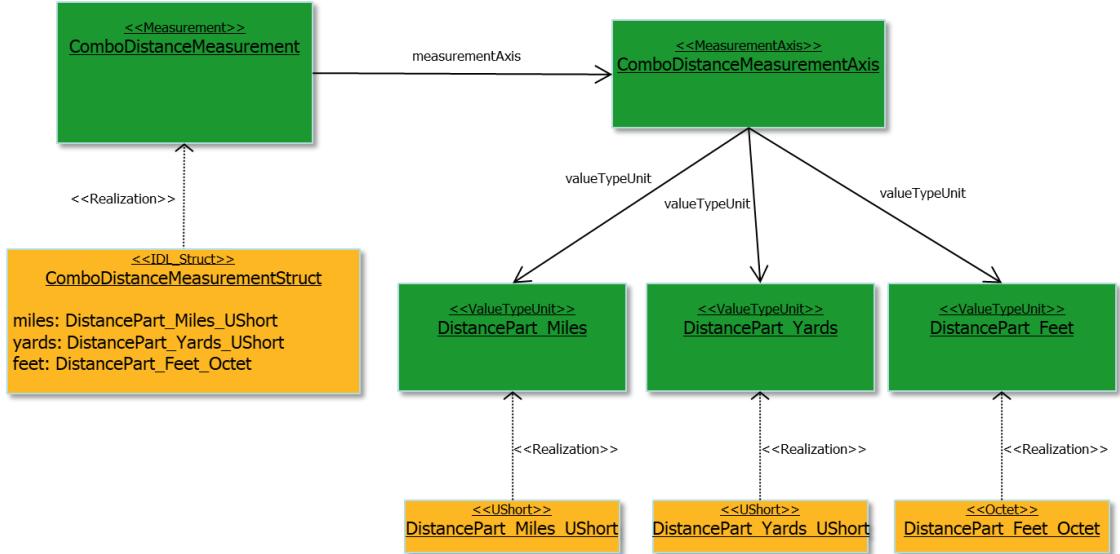


Figure 77: Realization of Measurement, Single Axis, Multiple VTUs, no MeasurementAttributes

5.4.1.2.8 Measurement with Multiple MeasurementAxis Elements

A **Measurement** with multiple **MeasurementAxis** elements is realized as an **IDLStruct** with one **IDLComposition** per **MeasurementAxis**.

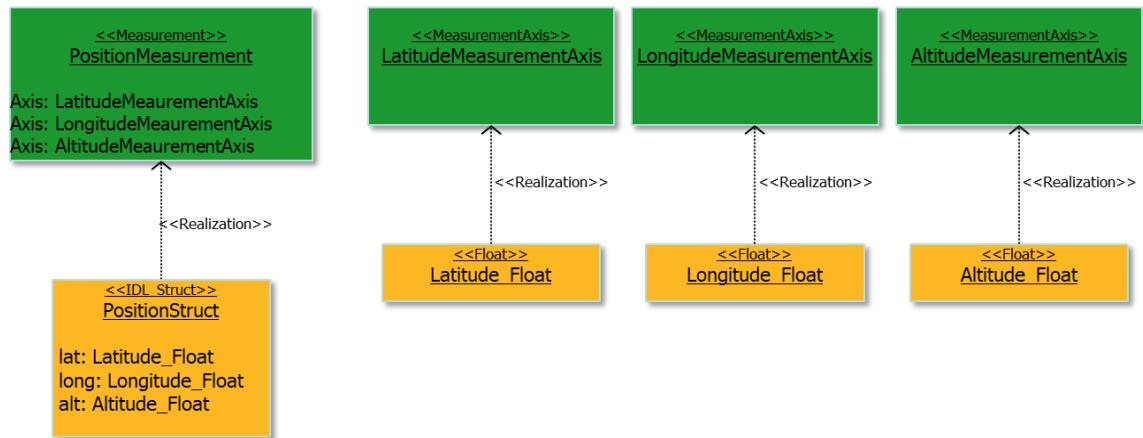


Figure 78: Realization of Measurement with Multiple MeasurementAxis Elements

5.4.1.2.9 MeasurementAxis with Single ValueTypeUnit Realization

A **MeasurementAxis** that has a single **ValueTypeUnit** is realized by an **IDLPrimitive**.

For example, each of the two **MeasurementAxis** elements below has a single **ValueTypeUnit**; **MeasurementAxis** **LongitudeMeasurementAxis** has a single **ValueTypeUnit** (**RealRadians**) as does **MeasurementAxis** **AltitudeMeasurementAxis** (**RealMeters**).

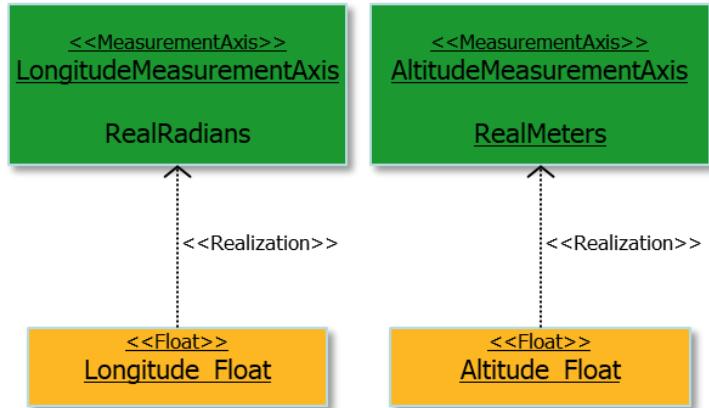


Figure 79: Realization of MeasurementAxis with Single VTU

5.4.1.2.10 Realization of MeasurementAxis with Multiple ValueTypeUnits

A *MeasurementAxis* that has multiple *ValueTypeUnits* is realized by an *IDLStruct*, where each *ValueTypeUnit* of the *MeasurementAxis* is realized as a unique *IDLComposition* of the *IDLStruct*.

The example below is for a model that is distinct from the special case noted in Item 7 in Table 5.

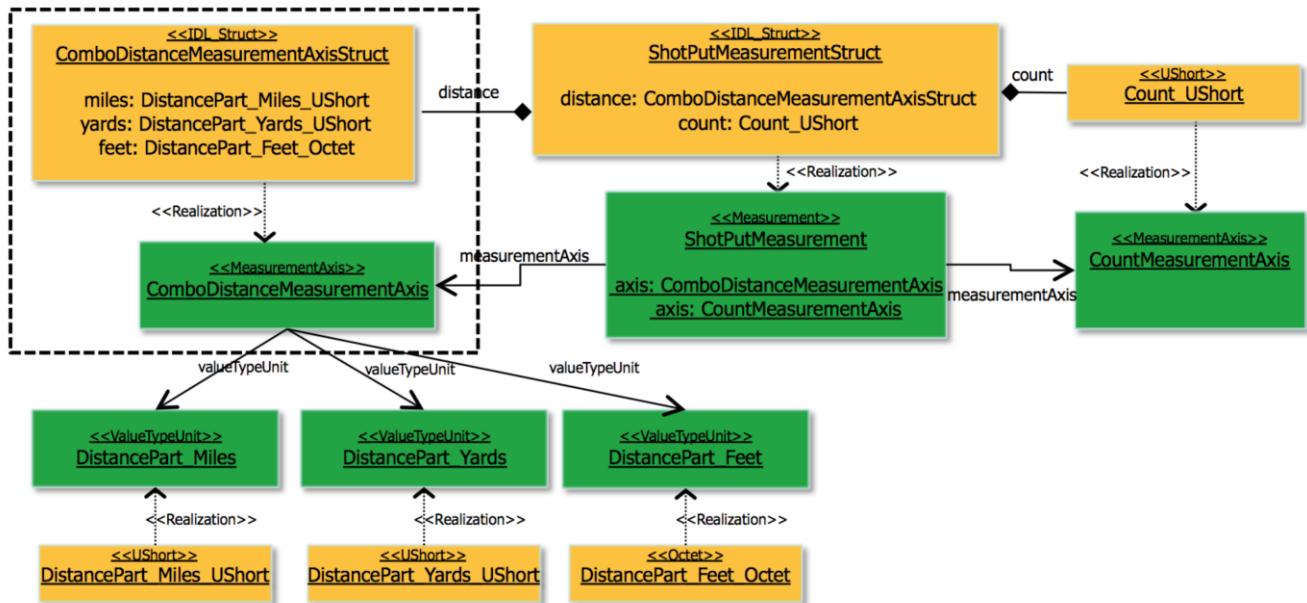


Figure 80: Realization of MeasurementAxis with Multiple VTUs

5.4.1.2.11 Realization of Measurement with MeasurementAttribute

A *Measurement* that has *MeasurementAttributes* is realized as an *IDLStruct* with one *IDLComposition* per *MeasurementAttribute*.

For contrast, Figure 81 shows the *SpeedMeasurement* without *MeasurementAttribute*.

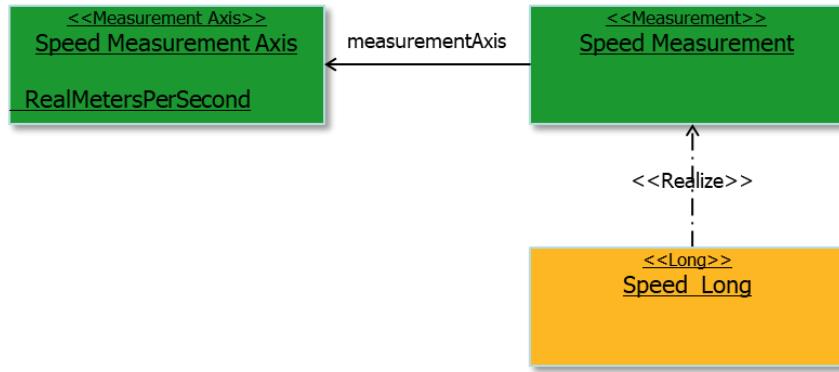


Figure 81: Realization of Measurement without MeasurementAttribute

While Figure 82 shows the changes required in order to support a **SpeedValidity MeasurementAttribute**.

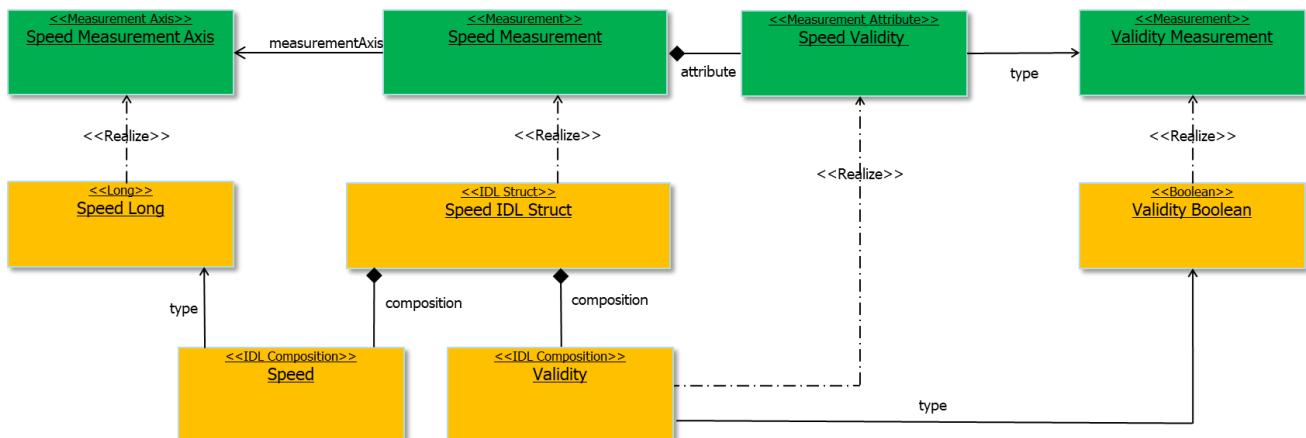


Figure 82: Realization of Measurement with MeasurementAttribute

Section 5.3.1.3 elaborates on **MeasurementAttributes** in greater detail.

5.4.1.2.12 Realization Consistency

The platform realization of a logical element is consistent with its logical representation in terms of composition hierarchy and type.

Because **IDLTypes** are used to realize measurements and related logical elements, there is no concept of down-selection – the **Measurement** and its **realization** are treated as a whole. This means that the number of elements at the logical level must be equal to the number of elements at the platform level, each element must be realized, and that each of the elements must be equal in type across the realization.

An example of consistency in number of elements and complete realization is: for a **Measurement** with three **MeasurementAxis** elements, the **IDLStruct** that **realizes** the **Measurement** must contain three **IDLCompositions** and each of these must realize one **MeasurementAxis**. The models in Figure 83 violate this.

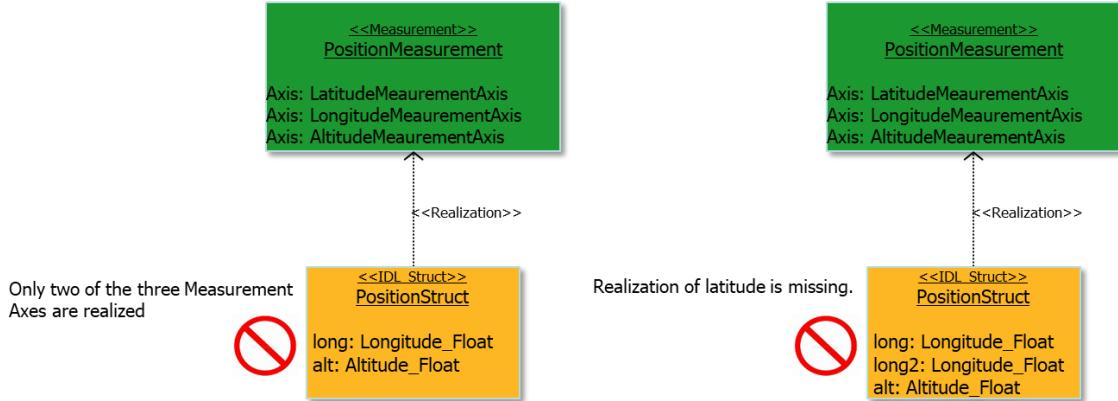


Figure 83: Violation of Realization – Number of Elements and Complete Realization

Consistency in type across realization means, for example, that the selected platform type of an *IDLComposition* of an *IDLStruct* that *realizes* a *Measurement* with three *MeasurementAxis* elements must itself be a realization of one of the *MeasurementAxis* elements.

Using the example above, when selecting a platform type for the “long” *IDLComposition* of the *PositionStruct IDLStruct*, only platform realizations of *LongitudeMeasurementAxis* should be used. A model that violates this is shown in Figure 84.

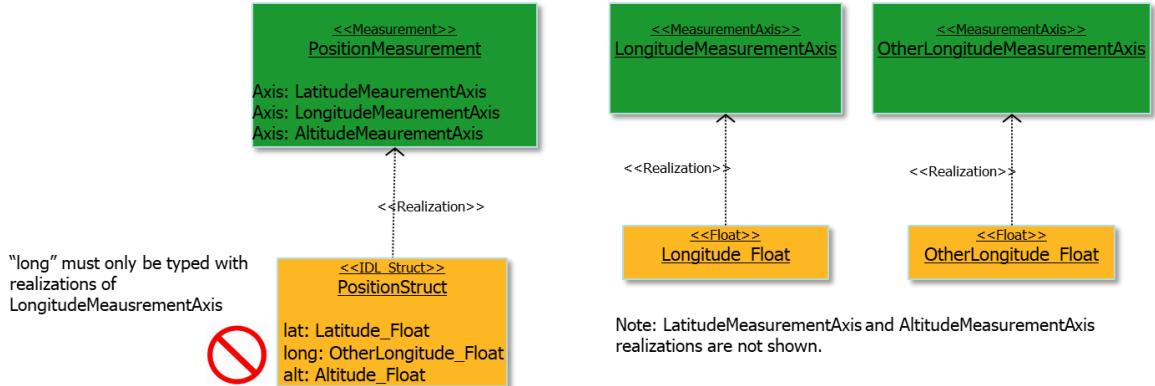


Figure 84: Violation of Realization: Type Consistency across Realization

5.4.2 Application Perspective

5.4.2.1 Platform Views: Queries and Templates

Platform *Views* are defined by *Templates* which format the data defined in a *Platform Query*. The *Platform Query* is very similar to the *Logical Query* except that it operates on the *PDM* elements. *Platform Queries* can realize the *Logical Query* elements much like the logical can realize the conceptual. Platform *Templates* are defined with an IDL-like *Template Language* that was developed to allow for the definition of the platform *View* structure. The *Template-based* definition of platform *Views* differs in this way from conceptual and logical *Views* in that they allow the modeler to define a hierarchy of data structures that can then be used in the UoP Model through UoP *Connections*. *Platform Queries* and *Templates* are further described below.

The platform *View*-relevant metamodel is shown in Figure 85.

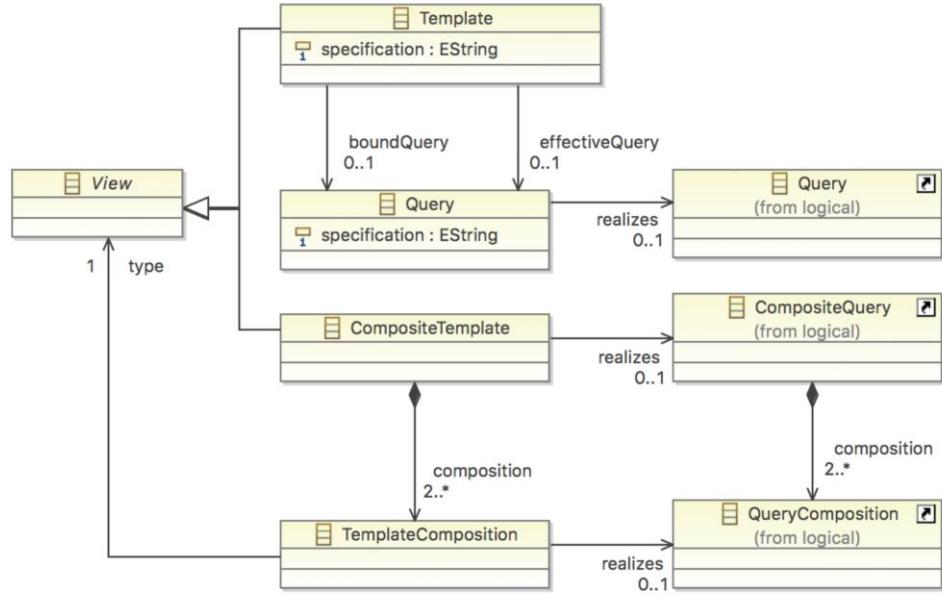


Figure 85: Platform View Metamodel

5.4.2.1.1 Query

In the **PDM**, a *Query* is not a *View*. Instead, the **PDM** uses a *Template* to specify the structure of the data for the *View*. In other words, in the **PDM**, a *Template*, and a *Query* define the *View*, whereas in the **LDM** and **CDM**, only a *Query* defines the *View*.

The analog of *CompositeQuery* is provided in the **PDM**. *CompositeTemplate* allows the union of two or more *Views* through a *TemplateComposition*.

5.4.2.1.2 Template

Templates define the structure of platform *Views*. In this way, the *Template*-based definition of platform *Views* differs from their conceptual and logical counterparts. Templates allow the modeler to define a hierarchy of data structures that specifies the format of the data a UoP sends and receives through *Connections*.

A portion of the ROP **PDM**, described in detail in Chapter 6, is used below to illustrate *Platform Queries* and *Templates*.



Figure 86: Portion of the ROP Platform Data Model

5.4.2.1.3 Platform Query, Template, and Result Example 1

A very simple *Query*, *Template*, and IDL result example is shown below. Although both queries and templates are likely to be captured as text strings, they are shown below using symbology similar to that for other model elements.

Query

```
<<Query>>

select position, extents as size
from Area as aoi
```

In reference to the data model shown in Figure 86, the *Query* shows the projection of two *Characteristics*, *position* and *extents*, from a subset of the model, the *Area Entity*. The “as” keyword creates an alias that can be used subsequently in the *Query* or in a *Template* that is bound to it (only for projected characteristic aliases). The *Characteristic* “extents” of *Entity* *Area* is aliased as *size* and a reference to *Entity* *Area* is aliased as *aoi*.

Note: The names of the *Entities* in the *from_clause* are guaranteed to be unique since they reference model *Entity* names which are already guaranteed to be unique. Projected *Characteristic* names in the *select_clause* must be unique to the *Entities* in the *from_clause*. If the *Characteristic* name exists in more than one *Entity* in the *from_clause* the dot notation must be used to remove the *Characteristic* name conflict: *Entity.name*. For example, the above *Query* could be written as: select *Area.position*, *Area.extents* as *size* from *Area*.

Template

```
<<Template>>
AreaOfInterest

main(aoi) {
    position;
    size;
}
```

The *Template* named “Area” contains a single *Template* method called “main”. The “main” *Template* method references two projected *Characteristics* in the *Query*, *position* and *extents* by its alias *size*.

IDL Result

```
struct AreaOfInterest {
    PositionType position;
    ExtentsType size;
};
```

The resultant IDL for *Template* “AreaOfInterest” is shown above. Note that the type of the *Characteristic* is automatically defined because it is known through the *Platform Entity* model. Note that the name of the *IDLStruct* “AreaOfInterest” comes from the name of the *Template*.

The resultant IDL shown above is an estimate of what would be generated from the `AreaOfInterest Template`. It is not the responsibility of the modeler to hand-write this code.

5.4.2.1.4 Platform Query, Template, and Result Example 2

A portion of the **PDM** from the ADS-B example is shown in Figure 87. The `Airport Entity` composes `id`, `name`, `code`, and one or more `gates`. Note that the `Gate Entity` is composed by `Airport` once, although it is shown using two representations in the figure.

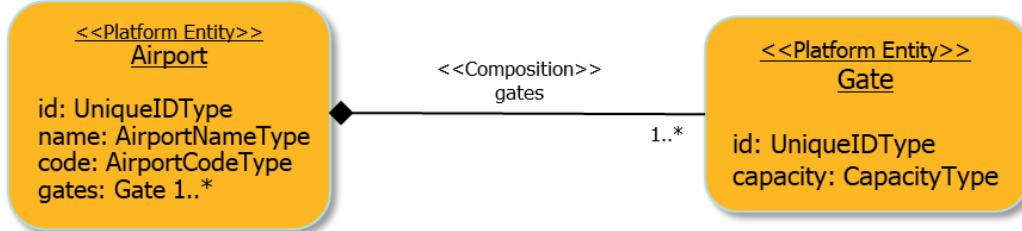


Figure 87: Portion of the ADS-B Platform Data Model

Query

```

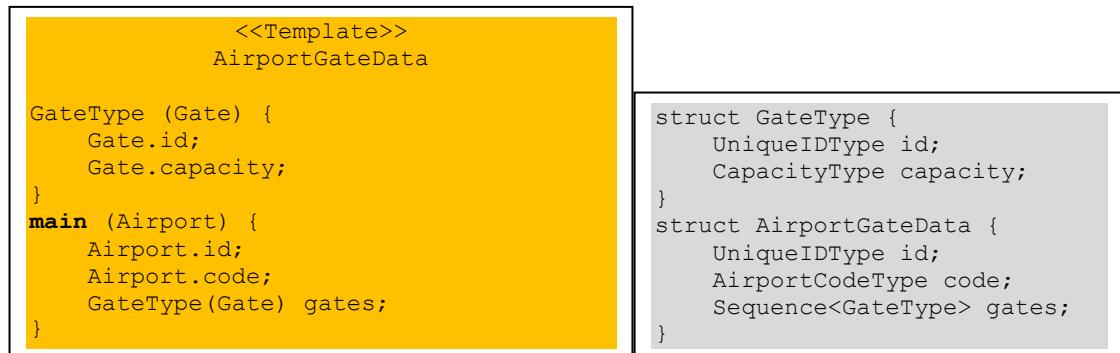
<<Query>>

select Airport.id, Airport.code, Gate.id, Gate.capacity
from Airport
join Gate on Airport.gates
  
```

In the `Query` shown above, the select projects four (4) **Characteristics**, two from the `Airport Entity` (`id` and `code`) and two from the `Gate Entity` (`id` and `capacity`). Each of the projected **Characteristics** is scoped using a reference (`airport` and `gates`) as there can be ambiguity when the names of **Characteristic Compositions of Entities** are the same; e.g., both `Airport` and `Gate` have a **Characteristic Composition** named `id`.

The selection begins at `Entity Airport` (as specified in the “from” clause), and adds `Entity Gate` across the composition with `rolename “gates”`. The result is a subset of the model sufficient to project the desired **Characteristics**.

Template and IDL Result



The *Template* above reflects one way in which the projected *Characteristics* can be packaged along with the matching generated IDL to the right. In this case, the *Template* was written to affect the structure shown on the right: a structure that contains the identifier and code of the airport and a sequence of gates, each with an identifier and capacity.

Note that the multiplicity of the *Characteristic Compositions* in the model, the *Query*, and the reference passed into the *Template* method all determine what the resultant code looks like.

Table 6 illustrates this in three columns. The first shows the portion of the *Template* that is being demonstrated, the second the part of the *Query* that is relevant; the third what the resultant IDL code looks like. A detailed explanation of the *Template Language* and *Template* to IDL mappings is beyond the scope of this example.

Table 6: Example Mapping of Template, Query, and Resultant IDL

Template Part(s)	Associated Query Part(s)	Resulting IDL
<code>main (Airport) { }</code>	<code>“from Airport”</code> Note that reference <code>Airport</code> provides the context for the main Template method's members.	The main Template method is turned into an IDL struct that takes the name of the Template, which in this case is <code>AirportGateData</code> : <code>struct AirportGateData { }</code>
<code>Airport.id;</code>	<code>“select Airport.id”</code>	This Template method member is a projected Characteristic reference to <code>Airport.id</code> . It is turned into a member of the <code>AirportGateData</code> IDL structure that carries the name used in the select statement (<code>id</code>) and the type of the Characteristic in the model (<code>UniqueIDType</code>): <code>UniqueIDType id;</code>
<code>Airport.code;</code>	<code>“select Airport.code”</code>	This Template method member is a projected Characteristic reference to <code>airport.code</code> . It is turned into a member of the <code>AirportGateData</code> IDL structure that carries the name used in the select statement (<code>code</code>) and the type of the Characteristic in the model (<code>AirportCodeType</code>): <code>AirportCodeType code;</code>

Template Part(s)	Associated Query Part(s)	Resulting IDL
GateType(gate) gates;	<p>“join Gate as Gate on Airport.Gates”</p> <p>Note that reference gate provides the context passed to the GateType Template method.</p>	<p>This Template method member is a Template method reference to the GateType Template method that uses the argument gate from the Query as context. It produces code that is a member of the AirportGateData IDL structure that carries the name gates and is of type GateType (the name of the referenced Template method).</p> <p>The multiplicity of the gates member comes from the multiplicity of the reference gate in the context of the reference Airport. In the context of Airport, gate has a multiplicity of 1..*, and therefore the gates member is generated as a sequence of GateType:</p> <pre>Sequence<GateType> gates;</pre>
GateType(gate) { }	<p>“select Gate.id, Gate.capacity”</p> <p>“join Gate on Airport.gates”</p>	<p>The GateType Template method is turned into an IDL structure:</p> <pre>struct GateType { }</pre>
gate.id;	<p>“select gate.id”</p>	<p>This Template method member is a projected Characteristic reference to gate.id. It is turned into a member of the GateType IDL structure that carries the name used in the select statement (id) and the type of the Characteristic in the model (UniqueIDType):</p> <pre>UniqueIDType id;</pre>
gate.capacity;	<p>“select gate.capacity”</p>	<p>This Template method member is a projected Characteristic reference to Gate.capacity. It is turned into a member of the GateType IDL structure that carries the name used in the select statement (capacity) and the type of the Characteristic in the model (CapacityType):</p> <pre>CapacityType capacity;</pre>

5.4.2.1.5 Composite View

A Composite *View* is represented in the platform metamodel as a *CompositeTemplate*, which is a collection of two or more *Templates*. The *isUnion* attribute specifies whether the composed *Templates* are translated to IDL as cases in an IDL union or as members of an IDL structure. Note that in terms of the metamodel, there is a level of indirection through *TemplateComposition* and that the *View* meta-class (at the platform level) specializes *Template* and *CompositeTemplate* to allow structure nesting.

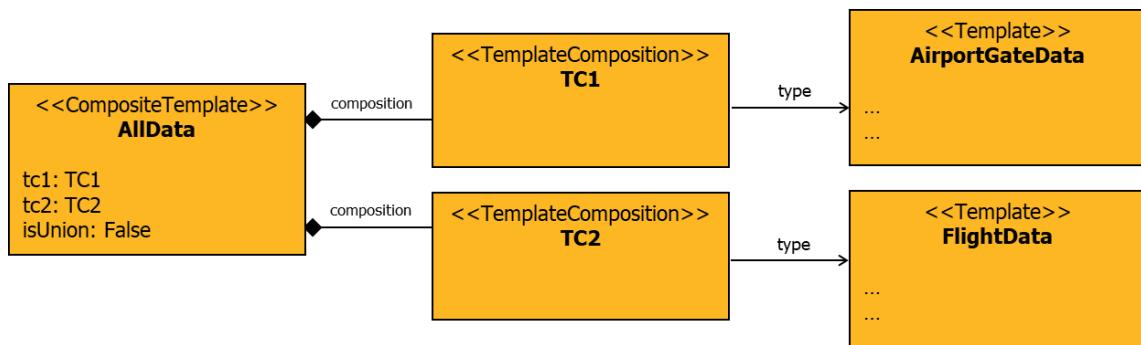


Figure 88: CompositeTemplate Example

5.4.2.1.6 Other Platform View Features

Template: Bound and Effective Query

A *Template* can have an *EffectiveQuery* and/or a *BoundQuery* reference. Each *Template* is a specification that defines a structure for *Characteristics* projected by its *BoundQuery* or its *EffectiveQuery*. As explained above, *Queries* can be defined in the *CDMs* and *LDMs* but must be defined in the *PDMs*. It is only in the *PDM* that they are identified as Effective or Bound; their specific meaning and how they are utilized will be discussed below.

A *BoundQuery* is a *Query* that a *Template* is directly “tied to” or “bound to” in order to produce the desired or intended data needed to develop the platform *Template* data structures.

An *EffectiveQuery* is a *Query* that can produce the desired or intended data needed to develop the platform *Template* data structures. Effective *Queries* note that a *Template* is utilizing other *Templates* and the resulting *Query* may be a complex combination of bound *Queries*.

The *BoundQuery* will always be the *Query* directly associated with the *Template*. The *EffectiveQuery* acts more as a notational device or reference for the modeler and is considered to be optional to the data model. The *BoundQuery* is not optional to the data model.

Template Annotations

Template annotations are added to a *Template* method member to affect how the IDL will be generated. There are currently two *Template* annotations defined:

- `@inline`
- `@optional`

These are described below.

`@inline`

The `@inline` annotation is used to specify that a template method structure is “in lined” into the containing *Template*. The following rules apply to the use of the `@inline` annotation:

- Applies to the *Template* method reference immediately following the annotation
- May not be applied to a projected *Characteristic* reference

- The members of the referenced *Template* method replace the annotated *Template* method member in the enclosing *Template* method’s realized IDL struct
- The multiplicity of the relationship of the referenced *Template* method’s *Entity* type parameter relative to the enclosing *Template* method’s *Entity* type parameter must be 1
- A member name is not required for the annotated *Template* method reference

@optional

The `@optional` annotation is used to specify that an annotated member may not have a value in a message based on the *Template* and is therefore “optional”. The following rules apply to the use of the `@optional` annotation:

- Use the “`@optional`” annotation preceding the *Template* method member
- May not be applied to a wild-card projected *Characteristic*
- May not be applied to an `@inline` annotated *Template* method reference
- The annotated member will render as a sequence of length one in your code

main<x> Equivalent Entity Template

The *Equivalent Entity Template* provides a mechanism to parameterize a *Template* with different *Platform Entity* types. This construct allows for greater reuse by requiring that only the *Template* methods must match. This is in contrast to normal *Template* method parameters that are statically typed and are therefore tied to only one *Entity*. An example of the normal *Template* form is shown in Figure 89.



Figure 89 Normal Template Example

This type of *Template* can be very repetitive on large models that have the same repeating patterns for *Characteristics*. The *Equivalent Entity Template* reduces this duplication through the use of a parameter. Figure 90 is an example of the definition and use of the *Equivalent Entity Template* that optimizes the above example.

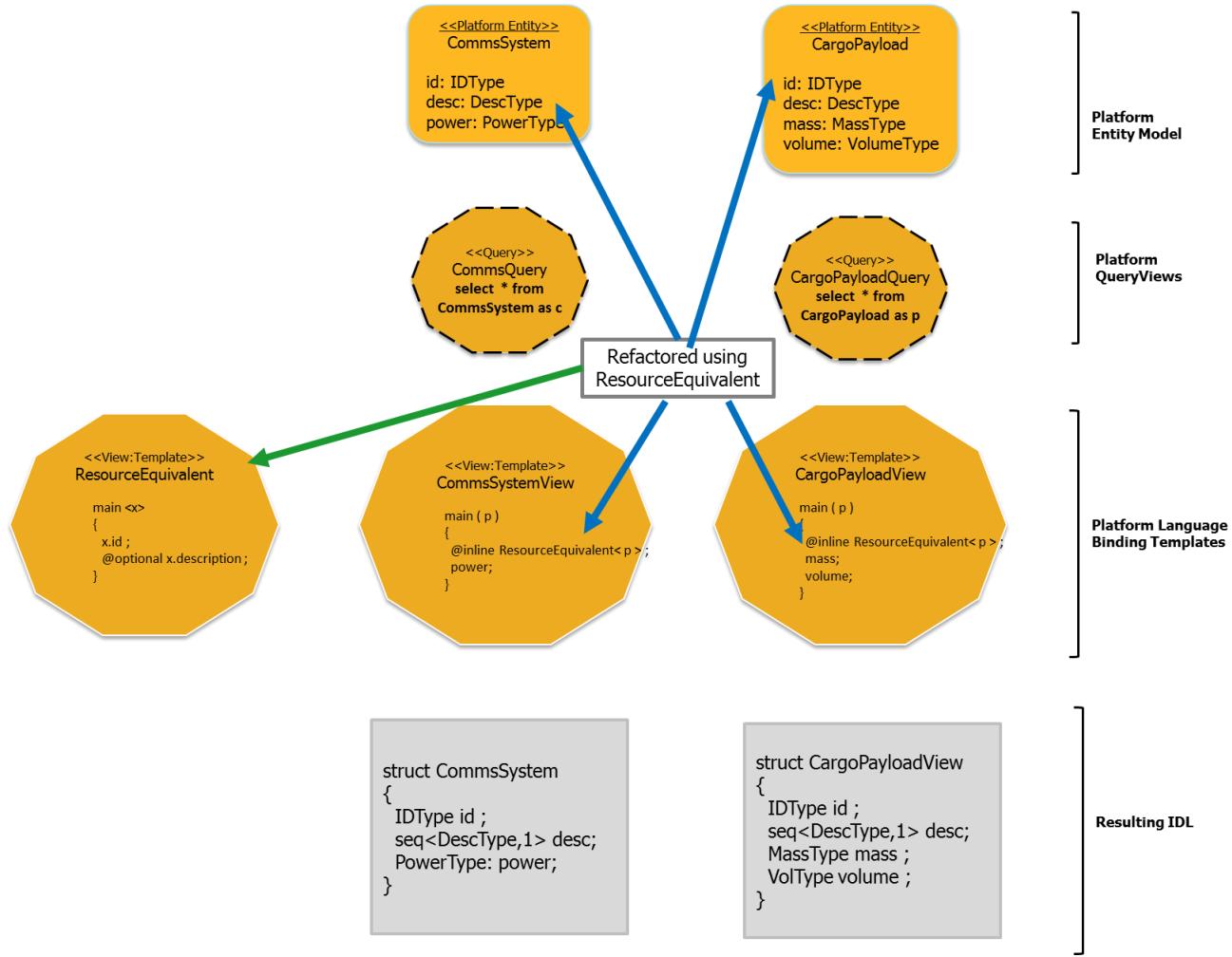


Figure 90: Equivalent Entity Template Example

Figure 90 shows the *Equivalent Entity Template* “main <x>” name **ResourceEquivalent** and is identifiable by use of the angle brackets. To use **ResourceEquivalent** in another *Template* we simply pass in a parameter of “p” to identify the *Entity* type to be used for the IDL generation.

The following are the rules of the use of *Equivalent Entity Template* methods:

- The **parameter** represents an *Entity* whose suitability is not determined by its type, but instead by the presence of specific *Compositions*
- One or more (comma-separated) **parameters** are flanked by **right** and **left angle brackets** (< and >, respectively)
- In the example above, **x** represents *any Entity* that contains *Compositions* named **id** and **description**
- Similar to “duck typing”, which can work the same as polymorphism, but also without inheritance (and all the baggage that comes with it)
- Realized as an *IDLstruct*

- One or more members, each being a reference to a projected *Characteristic* in the *caller's BoundQuery*
- The elements referenced by its members are realized as IDL members of the enclosing *Template* method's realized *IDLstruct*
- Each member must have a unique name in the enclosing *Template*
- Scoping can be applied by using one of the two *Equivalent Entity Template* method types:
 - A “main” *Equivalent Entity Template* method
 - A supporting *Equivalent Entity Template* method
- A language binding *Template* whose “main” *Template* method is an *Equivalent Entity Template* method may *not* have:
 - Other *Template* elements (no unions or *Template* methods of any kind)
 - A “Using” statement
 - A bound or effective query
- A language binding *Template* whose “main” *Template* method is a static *Entity Template* method may have zero or more supporting *Equivalent Entity Template* methods
- Each *Characteristic* reference must be *Entity* qualified: the parameter followed by “.” followed by the role name of a *Characteristic*; e.g., x.id
- *Characteristic* wildcards are not allowed

6 Example Data Models

This chapter walks through the example data models used in this document. The example demonstrates the concept of a Relevant Operating Picture (ROP).

6.1 Relevant Operating Picture Example

The following example is derived from concepts present in the mission systems domain, with the primary focus on what is commonly called the Relevant Operating Picture (ROP). The ROP is defined as the tactical items of interest within a geographic area associated with a specific mission. Tactical items of interest are such things as tanks, trucks, ships, personnel, etc. These represent things that can be tracked by on-board and off-board sensors, and in some cases they can be tracked by both, which can lead to multiple “tracking” relationships that need to be correlated to avoid presenting the crew with an inaccurate view of the tactical situation or ROP.

During execution of a mission, it is important to understand the affiliation of items within the ROP so that the crew has good situational awareness of blue (friendly) and red (threat) forces, as well as those that are neutral or unknown.

The following sections examine pieces of the context described above and present a set of *Entities* and *Associations* that comprise the concepts necessary to understand the ROP.

6.1.1 Modeled Domain Concepts

6.1.1.1 Mission-Relevant Area

The above text states that the ROP is defined as a geographic area relevant to a mission. Parsing that simple statement results in the following *CDM* fragment:



Figure 91: Mission-Relevant Area Conceptual Data Model

All of the *Entities* in this model include an *Identifier* property as required by the OCL constraints in the FACE Technical Standard. While this is required at the conceptual level, the *Identifier* property can be dropped at subsequent levels if it is not required by the application.

The Area *Entity* is further defined by its location (position) and its size (extents), both of which are *Observables* defined in the FACE SDM. For this example, there is no need to further characterize the Mission *Entity*.

Recall that the ROP is defined as “an area relevant to a mission”. The `MissionRelevantArea Association` provides the link between a mission and a geographic area. The multiplicities on the `Association` should be interpreted as follows:

- For any `MissionRelevantArea`, there is always exactly one Area and one Mission; this is indicated by the respective `Participant` multiplicities labeled “1..1” nearest to the Area and Mission `Conceptual Entities` in Figure 91
- Given any Area, it can be a part of zero or more `MissionRelevantAreas`
- Given a Mission, it is always part of exactly one `MissionRelevantArea`

6.1.1.2 Mission Execution

Missions are executed by Forces and Forces are made up of Platforms (aircraft, ground vehicles, stationary ground installations, ships, etc.). Figure 92 illustrates the set of `Entities` and `Associations`. This diagram tells us that each `MissionExecution Association` has one Mission `Participant` and one Platform `Participant`, but a Mission may participate in zero or more `MissionExecutions` while a Platform can only participate in one. Stated another way, a Mission can be executed by multiple Platforms, but a Platform can only execute one Mission (at a time). A similar pattern is shown for the `PlatformForce Association`.

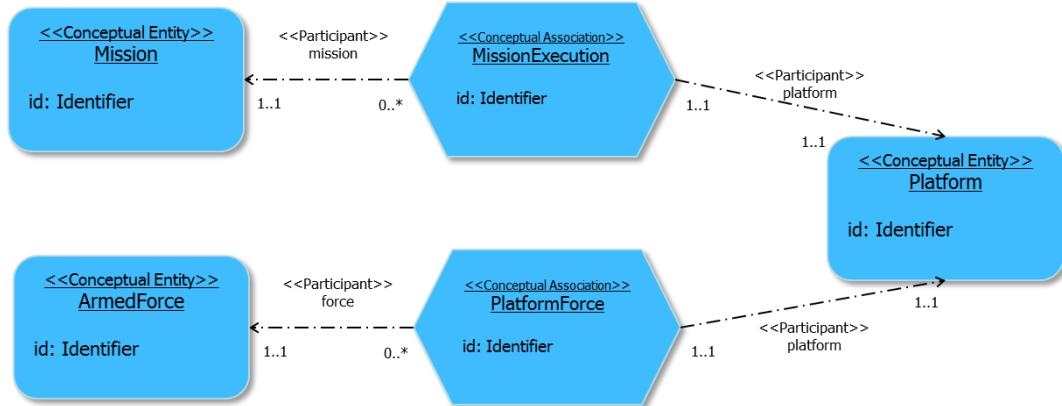


Figure 92: Mission Execution and Platform Force Conceptual Data Model

6.1.1.3 Armed Force Affiliation

When executing a mission, understanding which items in the ROP are part of the friendly and threat forces is critical. The determination of whether an item is friendly or otherwise is frequently determined by the country with which the force is associated and the current state of relations with that country. Figure 93 shows how these relationships could be modeled.

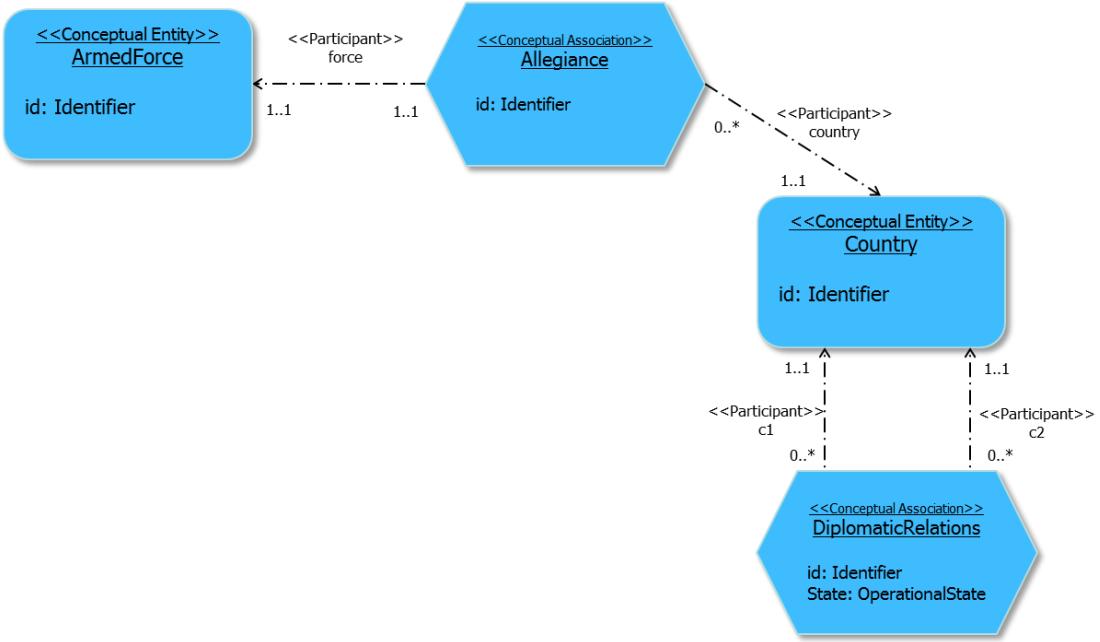


Figure 93: Armed Force Affiliation Conceptual Data Model

A **Country Entity** has been added and is characterized by the **Identifier** property. To accommodate describing the diplomatic relationships between countries, a **DiplomaticRelation Association** has been added to associate one country with another. An **OperationalState Observable** has been added to the **Association** to capture the state of the relationship (e.g., friends, enemies, etc.).

Finally, the **Allegiance Association** establishes a relationship between some **ArmedForce** and a **Country**. As shown in the diagram, an **ArmedForce** is associated with only one **Country** while a **Country** may be associated with more than one Force (e.g., the USA has multiple forces, but each is affiliated with only the USA).

6.1.1.4 Tracking

One of the primary types of content in the ROP is objects that are being tracked by sensors that are installed in platforms executing the mission. Some correlation algorithms rely on knowing where an item has been as a clue to its behavior and possible intent. To accommodate this, the model includes **Entities** and **Associations** to express the history of where an item has been. Figure 94 illustrates the **Entities** and **Associations** that embody the concepts described here.

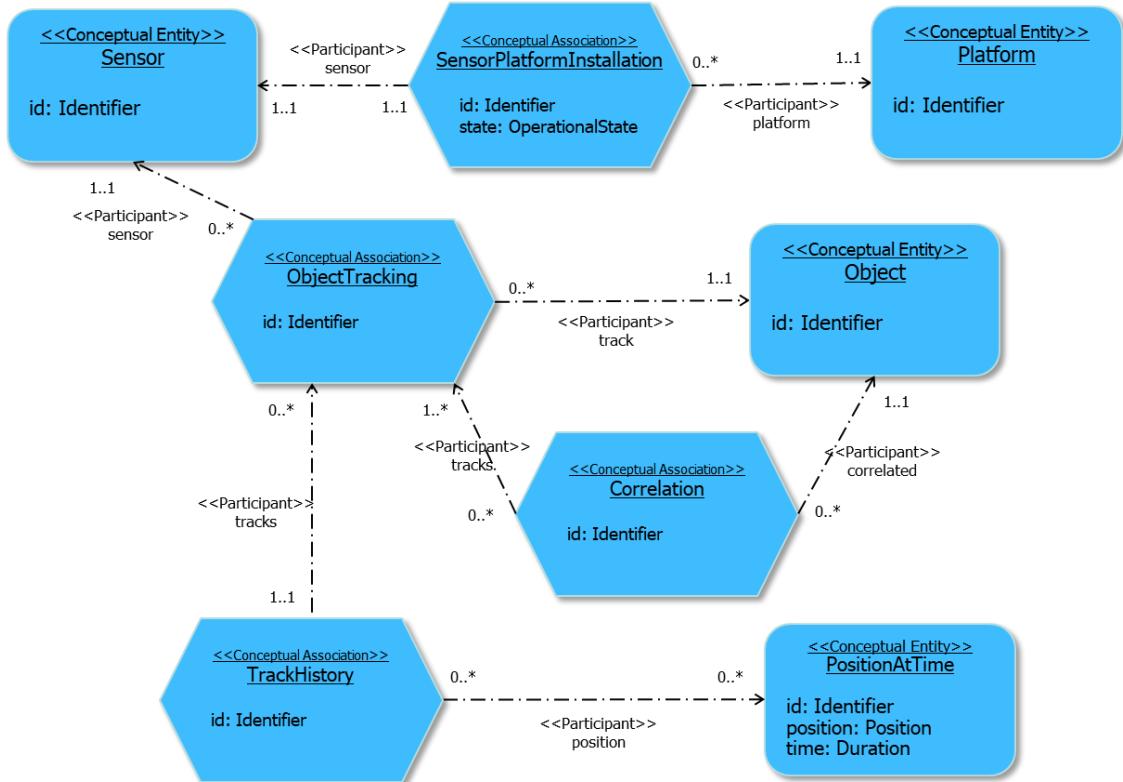


Figure 94: Tracking Conceptual Data Model

6.1.2 Entities and Associations

6.1.2.1 Allegiance

Allegiance is an *Association* which shows the relationship between an ArmedForce and a Country. When used in conjunction with the DiplomaticRelations *Association*, the idea could be expressed that a force may have allegiance to a country which has hostile relations with our country (i.e., a red force), or is an ally of ours (i.e., a blue force).

6.1.2.2 Area

The *Area Entity* represents the idea of a geographic area. It contains *Observable* properties for position (to say where it is), and extents (to say how big it is). This *Entity* captures a very simple reusable idea and therefore can be used in any situation that might require reference to a geographic area.

6.1.2.3 Correlation

Correlation is an *Association* that relates objects that are being tracked. It indicates that there is some perceived correlation between the two items being tracked. This example model shows that this relationship requires one *Object* and one or more *ObjectTrackings*. A unique aspect demonstrated here is the ability to use *Associations* as *Participants* in other *Associations*. This is allowed because *Associations* are themselves specializations of *Entities* and add the idea of *Participants*.

6.1.2.4 *Country*

Country is an *Entity* intended to represent a state actor in the world. This example has been kept simple and does not address the idea of non-state actors.

6.1.2.5 *DiplomaticRelations*

This is an *Association* that captures the idea of the relationship between different countries. This *Association* includes composition of an *OperationalState Observable* intended to capture the state of that relationship (e.g., friendly, hostile, neutral, etc.).

6.1.2.6 *ArmedForce*

The *ArmedForce Entity* represents a *Participant* in a military scenario. Armed Forces represent the “sides” such as friendly forces, threat forces, etc.

6.1.2.7 *Mission*

The *Mission Entity* represents the concept of a mission.

6.1.2.8 *Mission Execution*

The *MissionExecution Association* captures the relationship between a *Platform* and a *Mission*. This relationship has *Participants* of one mission and zero or more platforms.

6.1.2.9 *Mission-Relevant Area*

MissionRelevantArea is the essential *Association* that brings meaning to the relationship between a mission and a geographic area and forms a key component in the idea of an ROP. This relationship allows consideration of the ROP as the set of Objects whose positions are within the *MissionRelevantArea*. Taking this further, we can look through the Force, Allegiance, and *DiplomaticRelations* for those objects to find objects that are red forces or blue forces.

6.1.2.10 *Object*

The *Object Entity* represents some item that may be of interest during a mission. It is intentionally left abstract rather than giving it a more specific label (e.g., track) to allow this *Entity* to be used in a broad range of modeling scenarios. Some readers might have expected that “Track” would be an *Entity* specializing an object. In the ROP example, since the object is shown as participating in an *ObjectTracking* relationship with the role of track, readers of the model gain understanding that the *Object* is a “Track”. “Track” in this example is defined as an object being tracked by a *Sensor*.

6.1.2.11 *ObjectTracking*

ObjectTracking is an *Association* that indicates a tracking relationship between a sensor and some object essentially making that object a track in this context.

6.1.2.12 *Platform*

Platform is a generalization of systems that can host a sensor. *Platform* has been kept general in order to be used in cases where it represents an aircraft, a ship, a ground vehicle, a ground installation, etc.

6.1.2.13 *PlatformForce*

`PlatformForce` is an *Association* between a `Platform` and an `ArmedForce`.

6.1.2.14 *PositionAtTime*

`PositionAtTime` is an *Entity* that represents a position at a specific point in time.

6.1.2.15 *Sensor*

`Sensor` represents some piece of equipment that can be used in sensing. In this scenario, little additional characterization is added.

6.1.2.16 *SensorPlatformInstallation*

`SensorPlatformInstallation` is an *Association* that introduces the concept of a sensor being installed in a platform. As the diagram indicates, this relationship requires one sensor and one platform. Platforms can be part of multiple `SensorPlatformInstallation` relationships (i.e., platforms can have multiple installed sensors), while a sensor can only be installed in a single platform.

6.1.2.17 *TrackHistory*

`TrackHistory` is an *Association* between zero or more `ObjectTrackings` and zero or more `PositionAtTimes`.

7 FACE Technical Standard Use of the Data Architecture

7.1 What Changed from FACE Data Architecture 2.1 to 3.0?

7.1.1 Technical Standard (Requirements Changes)

Table 7: FACE Data Architecture 2.1 to 3.0 Changes

Technical Standard, Edition 2.1 Requirement	Technical Standard, Edition 3.0 Requirement	Rationale for Change	Impact to Backwards-Compatibility Summary
This column identifies the requirement in the previous version of the standard.	This column identifies the requirement in the current version of the standard.	The column identifies the rationale and value of the change.	This column summarizes the impact to backwards-compatibility.
Section 3.6.2	Section 3.9.4.1		
1. Each FACE UoP shall be accompanied by a data model. This data model is the USM.	1. Each UoP using the TS Interface shall be accompanied by a USM.	No change	N/A
2. The USM: a. Shall be an XMI file that conforms to the EMOF 2.0 (OMG) metamodel specified in Appendix G.	2. The USM shall be an XMI file conforming to the EMOF 2.0 metamodel specified in Appendix J.	Change to the metamodel to improve clarity, resolve issues, and implement new features.	Scripting will be provided to minimize the impact. View definitions are changing significantly and existing USMs will likely need to be modified in order to conform to FACE Technical Standard, Edition 3.0.
b. Shall use the “xmi:id” attribute (provided by XMI) with a unique Universally Unique Identifier (UUID) as the ID for all elements.	3. The USM shall use the “xmi:id” attribute with a unique Universally Unique Identifier (UUID) as the ID for all elements.	No change	N/A
c. Shall validate against the OCL 2.3.1 (OMG) constraints specified in the FACE Shared Data Model Governance Plan.	4. The USM shall adhere to the OCL 2.3.1 constraints in Appendix J.	Change to the OCL to match the updated metamodel.	No breaking changes to existing USMs are expected.
d. Shall include definitions of all messages sent to or received from the TSS API.	5. The USM shall include all data elements sent by the UoP.	No change	N/A

Technical Standard, Edition 2.1 Requirement	Technical Standard, Edition 3.0 Requirement	Rationale for Change	Impact to Backwards-Compatibility Summary
e. Shall include all elements identified as messages sent or received by the UoP as well as all elements upon which those messages depend, including PDM, LDM, and CDM Elements and Views.	6. The USM shall include all data elements received by the UoP.	No change	N/A
f. Any governed elements submitted with the USM shall be consistent, as defined by the FACE Shared Data Model Governance Plan, with the elements in the Shared Data Model that have been approved by the CCB.	7. The USM shall be in alignment with the SDM.	No change	N/A
N/A	Section 3.9.4.2		
N/A	1. A DSDM shall be an XMI file conforming to the EMOF 2.0 metamodel specified in Appendix J.	New requirement	Makes explicit the requirements that apply to a DSDM. Existing DSDMs will need to be updated to the new metamodel.
N/A	2. The DSDM shall use the “xmi:id” attribute with a unique Universally Unique Identifier (UUID) as the ID for all elements.	New requirement	Makes explicit the requirements that apply to a DSDM.
N/A	3. The DSDM shall adhere to the OCL 2.3.1 constraints in Appendix J.	New requirement	Makes explicit the requirements that apply to a DSDM. Existing DSDMs will need to be updated to the new OCL constraints.
N/A	4. The DSDM shall be in alignment with the SDM.	New requirement	Makes explicit the requirements that apply to a DSDM.

7.1.2 Improvements and Corrections

The following is a summary of the Data Architecture language changes. Each is described in further detail in the migration section below.

Improvements and Corrections

- *Measurement Precision*
- Multiplicity refinement

- *Association Participant* paths modeled instead of using a grammar (dot notation)
- *Entity* generalization to *Entity* specialization
- Enumerations improvements
- Variable length, bounded variable length, and fixed length strings

Refactored Features

- Data model hierarchy
- *Association Participant* path
- *UnitOfPortability*
- *MessagePort*

Enhancements

- Abstract UoP Model (Conceptual/Logical UoPs)
- Integration Model (data exchange of UoPs)
- *Domain* and *BasisEntities*
- Standard *Measurement System*
- Traceability Model
- *View* definition through *Query*, *Template*, and *CompositeTemplate*
- *Measurement* attributes
- Uniqueness of *Entities*
- Single *Observable*
- Language bindings

Removed Features

- Aliases
- Wide Character and Wide String

7.2 Migrating from FACE Data Architecture 2.1 to 3.0

This section describes a potential migration path to convert between 2.1 and 3.0 data models. Each of the changes is grouped with other similar changes in the following categories:

- Improvements and Corrections
- Refactored Features
- Enhancements

- Removed Features

Note: “No impact” is used to mean that either no change is required, or that the transition from a 2.1-conformant model to a 3.0-conformant model can be done in a purely automated fashion.

It is strongly suggested that automated conversions from 2.1 to 3.0 should be reviewed and verified to be correct as there are many subtleties that can cause a change in meaning that affects the semantic description of the model.

7.2.1 Improvements and Corrections

7.2.1.1 Measurement Precision Improvements

Precision has been moved from an attribute of the *MeasurementAxis* logical element to an attribute of both *Composition* and *IDLComposition* at the platform level. It is applicable when the type of *Composition* or *IDLComposition* is an *IDLPrimitive*. The meta-type of precision has changed from a *string* to a *float*.

Migrating *Precision* values should be performed by utilizing 2.1 *MeasurementAxis Precision* for *Composition* and *IDLComposition Precision* when they are typed as *IDLPrimitives* that realize *Measurements* that reference those *MeasurementAxis* elements.

Conversion can be automated but should be verified.

7.2.1.2 Multiplicity Refinement

The multiplicities for *Participant* or *Composition* can now be refined when the data is realized from one model layer to the next. The *CDM* can contain the broadest multiplicity range, which can then be refined or narrowed at the Logical and/or Platform Layers. Since the Platform Layer is closely aligned with the program implementation and language binding, it makes the most sense to refine at the Platform Layer, leaving the semantic multiplicity consistent at the Conceptual and Logical Layers.

There is minor impact for migration. In addition to the *lowerBound* and *upperBound* attributes of *Characteristic*, the metamodel now includes two attributes for *Participant*, *sourceLowerBound*, and *sourceUpperBound*, which reflect the multiplicity from the perspective of the participating *Entity*. The default for unspecified multiplicities is *1..1* for *lowerBound* and *upperBound*, and *0..** for *sourceLowerBound* and *sourceUpperBound* respectively.

7.2.1.3 Entity Generalization Changed to Entity Specialization

The 2.1 generalization metamodel approach was changed to an *Entity* specialization modeling approach. *Entities* in 3.0 can now specialize a single *Entity* which causes the specialized *Entity* to inherit the *Characteristics* of the more abstract *Entity*. This change removed an ambiguity issue concerning the override *versus* the addition of a *Characteristic*. It also adjusted the notation, and added the ability to reference the specialized relationship in a *View*.

Partial conversion between 2.1 and 3.0 models can be automated; however, manual review of *Entities* that specialize is required because automation cannot guarantee that the model transformation is correct.

7.2.1.4 Enumeration Improvements

The mechanism of enumeration declaration was modified to address naming conflict in programming languages. The source code output will differ between 2.1 and 3.0 resulting in some UoP updates required (e.g., use of qualification preceding the enumeration label).

The PDM enumeration literals were removed to reduce modeling efforts and redundancy. FACE 3.0 code generation uses enumeration labels that are defined at the logical data model level for code generation.

Automated conversion is possible; however, if a USM used different enumeration literals at the platform level than those used at the logical level then manual conversion may be required.

7.2.1.5 Variable Length, Bounded Variable Length, and Fixed Length Strings

All of these strings were reworked in FACE 2.1 Approved Correction (ACR) #134 which modified the FACE 2.1 and 2.1.1 Metamodel. The FACE 3.0 Metamodel closely matches ACR #134 except at the Logical String model whereby 3.0 utilizes a constraint to identify fixed length strings and ACR #134 used a data type.

7.2.2 Refactored Features

7.2.2.1 Data Architecture Hierarchy was Refactored

A higher-level *ArchitectureModel* container was added to support the new Integration Model and Traceability Model.

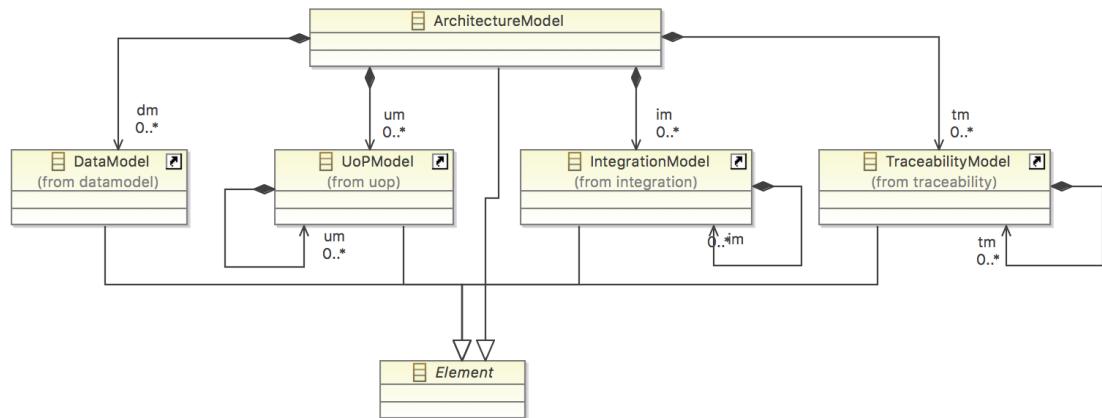


Figure 95: FACE Edition 3.0 Architecture Model Metamodel

The data model hierarchy was refactored to move the Conceptual, Logical, and Platform Data Models under a common “Data Model”. The Data Model, UoP Model, Integration Model, and Traceability Model together form the Architecture Model.

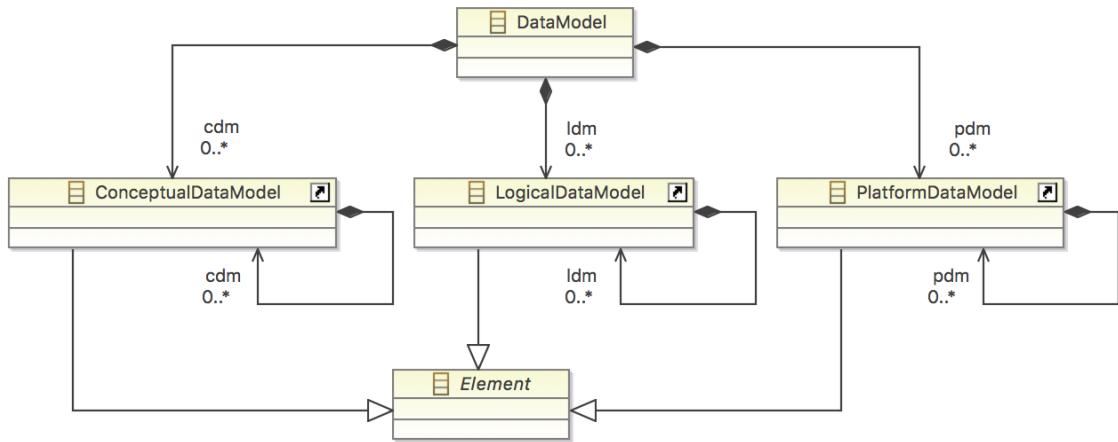


Figure 96: FACE Edition 2.1 Data Model Metamodel

This migration can be automated; refer to your tooling features to see if it is supported.

7.2.2.2 Association Participant Paths

Association paths are now specified using metamodel elements instead of a text-based grammar dot notation. Every *Association* with a specified path will have to be changed.

This migration can be automated; refer to your tooling features to see if it is supported.

7.2.2.3 Unit of Portability

Additional attributes have been added to the *UnitOfPortability* element to capture design assurance metadata and accommodate the refactor of the 2.1 *MessagePort* to 3.0 *Connection* addressed in the following section.

The *UnitOfPortability* should be updated to make use of the new attributes.

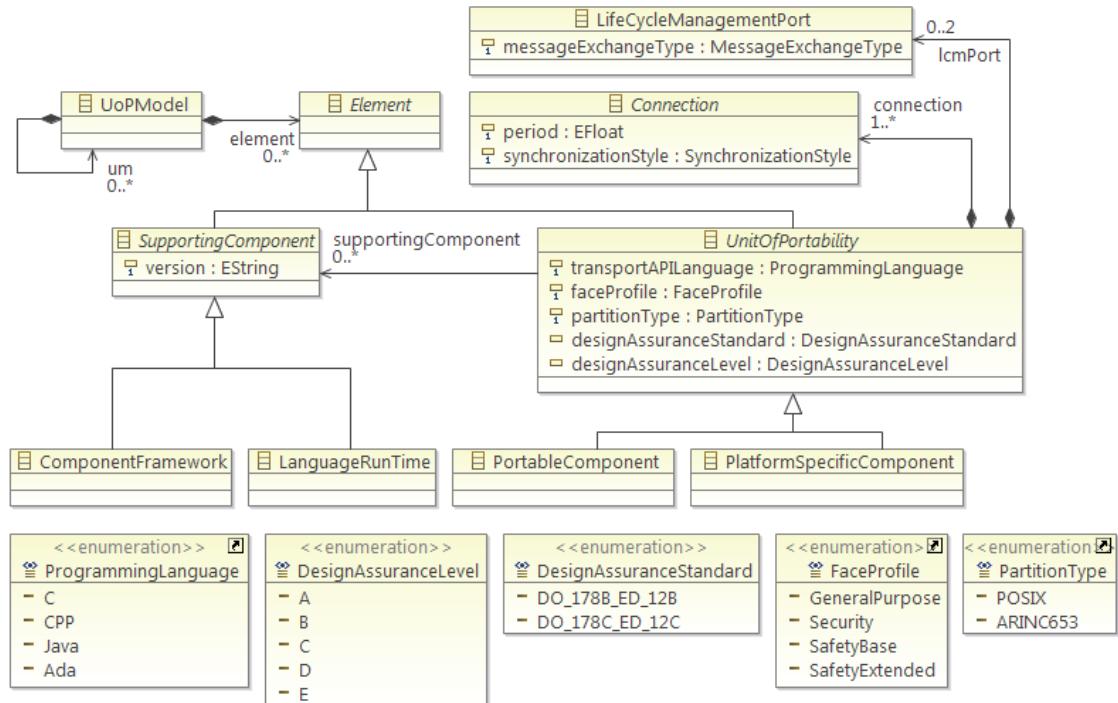


Figure 97: UoP Metamodel

7.2.2.4 UoP Message Ports Renamed to Connections

This migration can be automated; refer to your tooling features to see if it is supported.

The Message Port defined in the 2.1 Technical Standard was re-designed to better align with the TSS terminology for a *Connection*.

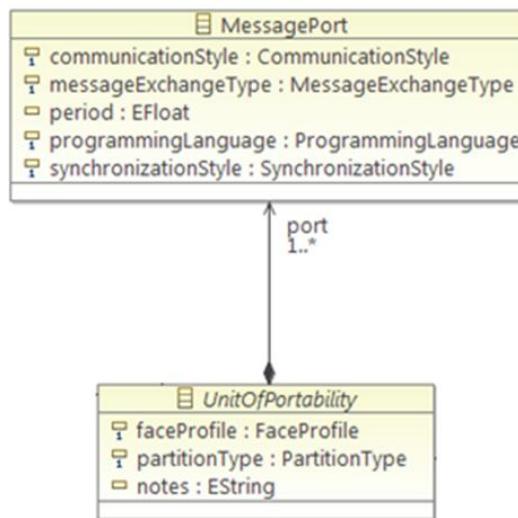


Figure 98: FACE Technical Standard, Edition 2.1, Message Port

Figure 98 shows the 2.1 *MessagePort*, with its respective attributes. In the 3.0 Technical Standard *MessagePort* was deprecated and replaced with the *Connection* element. As a result, the existing attributes to the 2.1 *MessagePort* element were refactored to align with the new *Connection* model, as shown in Figure 99.

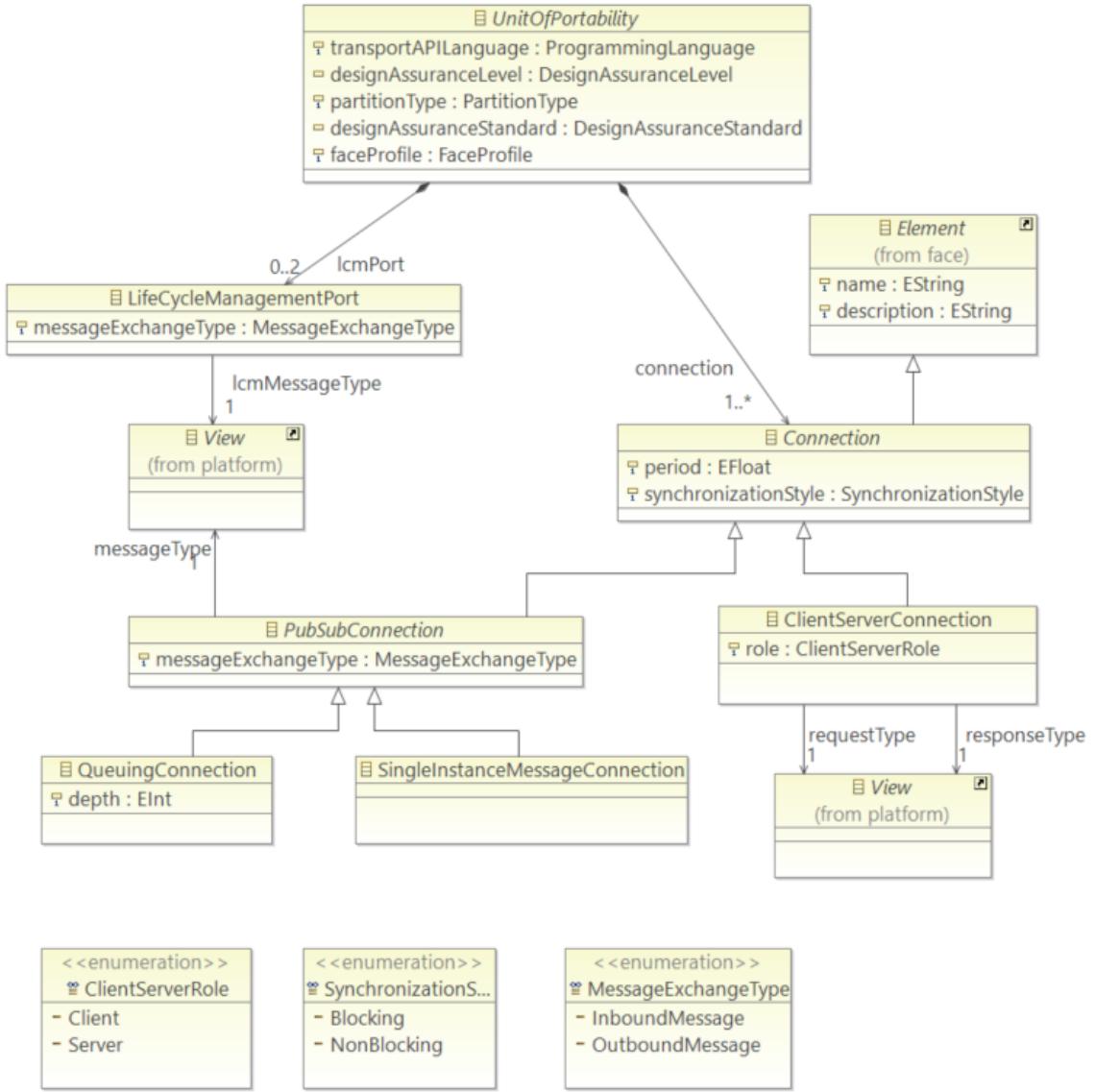


Figure 99: FACE Technical Standard UoP Connection Format

As noted, the *MessagePort* element was replaced by the *Connection* element. *Connection* is further specified through the specialized elements: *PubSubConnection* and *ClientServerConnection*. These two connection types are associated with the platform *View*.

The refactor of the *MessagePort* affected the representation in the following ways:

- The *MessageExchangeType* attribute was moved to the *PubSubConnection*, where it characterizes that connection type as an *InboundMessage* or *OutboundMessage*

- The *programmingLanguage* attribute was moved to the *UnitOfPortability* element and renamed to: *transportAPILanguage*
- The *period* and *synchronizationStyle* attributes were moved to the new *Connection* element without further modification
- The *CommunicationStyle* attribute was refactored into metamodel elements specializing the *PubSubConnection*: the *QueueingConnection* and *SingleInstanceMessageConnection*
- Lastly, the new *ClientServerConnection* element gained an attribute specifying its role as either *Client* or *Server*

7.2.3 Enhancements

7.2.3.1 *Optional Abstract UoP Model (Conceptual/Logical UoPs)*

There is no impact for migration as this is an optional feature.

7.2.3.2 *Optional Integration Model (Data exchange of UoPs)*

There is no impact for migration as this is an optional feature.

7.2.3.3 *Domain and BasisEntities (these are SDM Elements)*

Domain and *BasisEntity* are new optional modeling CCB-managed elements. They are intended to address challenges with *Entity* uniqueness for conceptual models that have *Entities* representing dissimilar concepts but have similar if not the same *Characteristics*. The *Domain* is a container solution to categorize a set of *BasisEntity* elements for a *Domain*. The *BasisEntity* represents a unique *Domain* concept foundational to other *Conceptual Entities* and when referenced by an *Entity* it is used as part of the identity of the *Entity*.

These elements are described in previous sections of this document. As these are optional elements, there would be some refactor effort should these new elements be chosen for use.

7.2.3.4 *Standard Measurement System*

This is a CCB-managed element and, if used, must be submitted to the CCB for approval and incorporation into the SDM.

7.2.3.5 *Traceability Model*

There is no impact for migration as this is an optional feature.

7.2.3.6 *View Definition through Query Language and Template Language, and Unions*

Changes to the *Characteristic* projection mechanism is the most significant migration issue when moving from FACE Technical Standard, Edition 2.1 to the FACE Technical Standard, Edition 3.0.

Automated conversion of FACE Technical Standard, Edition 2.1 *Views* to FACE Technical Standard, Edition 3.0 *Queries* and *Templates* is possible. Whereas the mapping of a single *Characteristic* projection to a *Query* is fairly straightforward, “Join” expressions and *Templates* should be reviewed to ensure consistency of intent.

7.2.3.7 *Measurement Attributes*

There is no impact for migration as this is an optional feature.

7.2.3.8 *Uniqueness of Entities Optional Constraint*

FACE Technical Standard, Edition 2.1 required the conceptual model *Entities* to be unique. FACE Technical Standard, Edition 3.0 makes this constraint optional.

There is no impact for migration as this is an optional feature.

The optional nature of this feature is reflected in the OCL constraints as executed through tooling. The CTS has the ability to enable or disable this check.

7.2.3.9 *Single Observable Uniqueness Optional Constraint*

There is no impact for migration as this is an optional feature.

The optional nature of this feature is reflected in the OCL constraints as executed through tooling. The CTS has the ability to enable or disable this check.

7.2.3.10 *UoP Design Assurance Attributes*

There is no impact for migration as this is an optional feature.

Two new attributes were added to the UoP Model element to capture design assurance properties as related to the DO-178 standard. The two new attributes are as follows:

- *DesignAssuranceLevel* values A through E
- *DesignAssuranceStandard* with values for editions 12B and 12C

7.2.3.11 *Language Bindings*

Language bindings are now mapped to IDL 4.1. Several sections of the FACE Technical Standard describe the mappings from IDL 4.1 to approved languages, among them:

- §3.14: IDL to Programming Language Mappings
- §J.8: Platform Data Model to IDL Bindings
- Appendix K: Supporting Constructs for IDL to Programming Language Mappings

Generated code based on the new mappings will likely be different between FACE Technical Standard, Edition 2.1 and Technical Standard, Edition 3.0, and could require modifications to the platform *View Templates* to produce the desired code.

7.2.4 **Removed Features**

7.2.4.1 *Aliases*

Minimal impact because there are no known code generators, including the FACE CTS that used the alias model elements (e.g., *Alias* and *AliasSet*) as described in the FACE Technical Standard, Edition 2.x.

Note: FACE Technical Standard, Edition 2.x aliases could be used in a conversion from 2.1 to 3.0 as the *Template* identifiers which would in turn be used for code generation. However, the generated code would likely be different if this approach is implemented as there are no known 2.x code generators that actually implemented the standard correctly as it pertains to aliases.

7.2.4.2 *Wide Characters and Wide-Character Strings*

This feature was removed as part of a larger change in the FACE Technical Standard, which removed support for wide characters. There is expected to be little to no impact as wide characters are seldom used in the embedded systems community.

7.3 FACE Data Model Artifacts

The FACE Data Architecture contains several data model artifact types. These are SDM, USM, and DSDM.

Models of these types should conform to the FACE Data Architecture metamodel structure. However, each of these types of model artifacts differ in their purpose and constraints to which they must conform.

7.4 Considerations for Conformance

As stated above, the FACE Conformance Policy, CTS, and Shared Data Model Governance Plan define and validate the rules of a USM or DSDM. There are three parts to validation of a USM and DSDM:

1. The data model is validated against the structural definition as per the metamodel.
2. OCL rules are run against the data model to ensure constraints are met.
3. The model is validated against the rules of the Shared Data Model Governance Plan which validates that only CCB-approved SDM elements are used, unmodified, and that the *Query* and *Template Languages* are correctly specified.

There are two optional constraints that can be chosen when running for conformance:

1. Single *Observable* – this constraint checks that an *Observable* is used only once in each *Entity* definition in the *CDM*.
2. Uniqueness of *Entities* – this constraint checks that each *Entity* is uniquely defined against all other *Entities*; where uniqueness is defined as using a different set of *Characteristics*, specializations, and/or *BasisEntity* references.

During the early development of the data model, care should be taken to use existing SDM elements where possible. If SDM new *Basis Elements* are required for a USM, such as new *Observables* or *MeasurementSystems*, they must be submitted to the FACE SDM CCB for approval. This process can be slow – weeks if not months – so submission should be made as soon as possible. Also, the guidance identified in this document should be followed meticulously in order to maximize likelihood of acceptance as this guidance is used by the CCB to reduce subjectivity in the evaluation of proposed elements for inclusion into the SDM. That said, as data modeling is a complex effort, some subjectivity is inevitable.

8 Additional Resources

- FACE Technical Standard, Edition 3.0 (www.opengroup.org/library/c17c)
- FACE Shared Data Model Governance Plan (www.opengroup.org/face/information)
- NIST Special Publication 330, 2008 Edition – The International System of Units (SI) (<https://www.nist.gov/pml/special-publication-330>)
- SAE AS-4UCS-3: Data Dictionary: Mathematical Structure and Context (<http://standards.sae.org>)
- ISO 1151: Flight Dynamics – Concepts, Quantities, and Symbols
- ISO/IEC 14977:1996: Information Technology – Syntactic Metalanguage – Extended BNF

A Data Model Glossary

This Glossary includes only terms of elements that can be constructed. Terms in *italics* are data model elements and use the metamodel model definition. This Glossary does not duplicate the metamodel definitions; for those you should refer to the FACE Technical Standard. Terms with no italics are conversational and describe the concepts: (e.g., *ConceptualDataModel* versus Conceptual Data Model). Each term includes a description of the ESSENCE of the term and the USE of the term in the metamodel. Terms that are utilized from the FACE AV-2 definitions are marked with (AV-2) next to their name.

Note: The FACE Data Architecture is a new modeling language and therefore does not use other modeling language definitions. Instead, all definitions are contained within the metamodel definition, descriptions, OCL constraints, and the definitions outlined below.

Term	Definition
Architecture Model	The top-level or root container that contains Data Models, UoP Models, Integration Models, and Traceability Models.
Association	Defines the relationship between two or more participants. Each <i>Participant</i> in an <i>Association</i> is described by a typed <i>Entity</i> and its path (see <i>Participant</i> and <i>PathNode</i>). In the FACE Metamodel, the <i>Association</i> specializes an <i>Entity</i> . As such, <i>Associations</i> must follow all of the same rules as an <i>Entity</i> . For example, at the conceptual level, its composition characteristic set must include the <i>Identifier Observable</i> . Each <i>Association</i> must have at least one <i>Characteristic</i> .
Basis Elements	Those foundational <i>Data Model</i> elements that are controlled by the FACE SDM CCB.
Basis Entity	A CCB-managed element that represents a unique domain concept and establishes a foundation from which <i>Conceptual Entities</i> can be referenced. Used to differentiate two or more <i>Entities</i> that are different even though they have the same <i>Characteristics</i> . Also allows for modeling of <i>Entities</i> that don't need to be fully described for a UoP. Note: A <i>BasisEntity</i> cannot contain any <i>Characteristics</i> and is defined only by its description.
Cardinality	The number of elements in a particular set or other grouping. For <i>Characteristic Compositions</i> and <i>Participants</i> it is the minimum or maximum number of elements making up the Multiplicity.

Term	Definition
Characteristic	Either a compositional attribute for an <i>Entity</i> or for an <i>Association</i> , or a <i>Participant Entity</i> which contributes to the defined relationship.
Conceptual Association	An <i>Association</i> within the <i>Conceptual Data Model</i> . (See <i>Association</i> and <i>Conceptual Data Model</i>)
Conceptual Data Model	The semantic definition of <i>Entities</i> and relationships that sufficiently describes “Things” (Things = ideas, concepts, etc.) and the relationships between “Things”. The <i>CDM</i> can also contain <i>Views</i> as well as <i>Entities</i> , <i>Associations</i> , and <i>Observables</i> .
Conceptual Entity	An <i>Entity</i> within the <i>Conceptual Data Model</i> . (See <i>Entity</i> , <i>Association</i> , and <i>Conceptual Data Model</i>)
Coordinate System	Defines the distance and angle equation of the <i>Measurement System</i> . It is reusable and can be referenced by multiple <i>Measurement Systems</i> to define the space. The <i>Coordinate System</i> is comprised of multiple <i>CoordinateSystemAxis</i> . The <i>Coordinate System Axis</i> does not have to be orthogonal and it is not required that the axes be ordered.
Coordinate System Axis	Represents a dimension within a <i>Coordinate System</i> where a dimension is not necessarily geospatial and the axis is not necessarily continuous. The <i>Coordinate System Axis</i> does not have to be orthogonal and it is not required that the axes be ordered.
Data Architecture (AV-2)	A set of related models, specifications, and governance policies with the primary purpose of providing an interoperable means of data exchange.
Data Model (AV-2)	An abstraction that describes real-world elements, their properties, and their relationships in order to establish a common understanding for communication between components.
Data Model Language (AV-2)	A language specified as an EMOF metamodel and OCL constraints used to capture data element syntax and semantics.
Defining Property	A defining property contributes to the uniqueness of an <i>Entity</i> or <i>Association</i> . For example, <i>Characteristics</i> are defining properties of both <i>Entities</i> and <i>Associations</i> .
Domain	A representation of a data space defined by a set of <i>BasisEntity</i> elements relating to an area of knowledge specific to practitioners within the domain.
Domain-Specific Data Model (AV-2)	A data model designed to the FACE Data Architecture requirements. It captures domain-specific semantics.

Term	Definition
Entity	<p>Represents a Thing or Concept defined by its set of <i>Characteristics</i>, specializations, and <i>BasisEntity</i> references.</p> <p>(See <i>Conceptual Entity</i>, <i>Logical Entity</i>, and <i>Platform Entity</i>)</p>
Entity Equivalence	<p>When two or more <i>Entities</i> have the exact same <i>Characteristics</i>, specializations, and <i>BasisEntity</i> references.</p>
Entity Uniqueness	<p>When all <i>Conceptual Entities</i> in a data model meet the uniqueness constraints (different <i>Characteristics</i>, specializations, and <i>BasisEntity</i> references).</p> <p>Note: Participation in an <i>Association</i> is not used for uniqueness determination.</p>
Frame of Reference	<p>Defined through the <i>Coordinate System</i>, <i>Measurement System</i>, and Reference Points.</p>
Generalization	<p>The formulation of general concepts from specific instances by abstracting common properties.</p>
Logical Data Model	<p>Defines <i>Measurement</i>-related information and uses it to refine the <i>Observable Characteristics</i> of <i>Conceptual Entities</i>.</p>
Logical Entity	<p>An <i>Entity</i> within the <i>Logical Data Model</i> and a means to capture a set of <i>Measurement</i>-related choices for the <i>Conceptual Entity</i> it realizes.</p> <p>(See <i>Entity</i>, <i>Association</i>, and <i>Logical Data Model</i>)</p>
Measurement	<p>Describes a datum's data type, unit, and the frame of reference as a realization of an <i>Observable</i>.</p>
Measurement System	<p>Provides a detailed frame of reference for <i>Measurements</i>. In addition, it is a system of measure specified in terms of a <i>Coordinate System</i> and a set of axes, reference points, units, and value types.</p>
Multiplicity	<p>The range of the number of elements possible within a set. Each lower bound and upper bound is referred to as cardinality, whereas the range is the Multiplicity.</p> <p>(See <i>Characteristic Compositions</i> and <i>Association Participants</i>)</p>
Observable	<p>Something that can be perceived but not further characterized, and is typically quantified through <i>Measurements</i> of the physical world. An <i>Observable</i> is independent of any specific data representation, units, or reference frame. For example, "length" may be thought of as an <i>Observable</i> in that it can be measured, but at the conceptual level the nature of the <i>Measurement</i> is deferred to the logical level.</p>
Object Constraint Language	<p>The language used to define the additional rules of the FACE Data Model.</p>
Participant	<p>An <i>Entity</i> (and path) that takes part in an association/relationship.</p>

Term	Definition
Path	<p>A means by which the relational context of a <i>Participant</i> can be narrowed to a specific <i>Characteristic</i>.</p> <p>Note: FACE 3.0 only has <i>Association Participant</i> paths.</p>
Platform Data Model	<p>Defines the language IDL type information and uses it to refine the <i>Measurement Characteristics</i> on the <i>Logical Entities</i>.</p>
Platform Entity	<p>An <i>Entity</i> within the Platform Data Model. A means to capture a set of language-related choices for the <i>Logical Entity</i> it <i>realizes</i>.</p> <p>(See <i>Entity</i>, <i>Association</i>, <i>Realize</i>, and <i>Platform Data Model</i>)</p>
Query	<p>The specification for the portion of the <i>Entity</i> model that “matters” to a <i>View</i>.</p>
Realize (Realization)	<p>The relationship between similar model elements across levels of abstraction.</p>
Refinement	<p>The clarification of model elements from a more abstract characterization to a more concrete characterization over the extent of the model levels: Conceptual, Logical, and Platform.</p>
Semantic Definition	<p>The meaning of the data in the information exchange defined solely by the <i>Conceptual Data Model Entities</i> and <i>Associations</i>.</p> <p>Note: Realization of these conceptual model elements or their use in queries does not change the meaning established by the <i>Entities</i> and <i>Associations</i> at the conceptual level.</p>
Shared Data Model (AV-2)	<p>An instance of a Data Model whose purpose is to define commonly used items and to serve as a basis for all other data models. Alignment with the required elements in the Shared Data Model (SDM) is necessary for conformance of any other Data Model. The Shared Data Model is governed by a CCB.</p>
Shared Data Model Configuration Control Board (CCB) (AV-2)	<p>The entity responsible for managing and approving changes to the Shared Data Model.</p>
Specialization	<p>The “specializes” relationship of an <i>Entity</i> is a mechanism to specify that one <i>Entity</i> (the “specializing <i>Entity</i>”) has all the <i>Characteristics</i> of another.</p> <p>Note: Specialization is not an “is-a” relationship, nor does it imply polymorphism. It is simply a convenient means for construction.</p>
Standard Measurement System	<p>Used to represent an open, referenced <i>Measurement System</i> without requiring the detailed modeling of the <i>Measurement System</i>. The reference should be a formal or industry standard which defines the full comprehension of the underlying <i>Measurement System</i>.</p>
Source Multiplicity	<p>Defines the minimum cardinality and the maximum cardinality for the <i>Association</i> relative to the <i>Participant</i>.</p>

Term	Definition
Source Lower Bound	Defines the minimum cardinality for the multiplicity of the <i>Association</i> relative to the <i>Participant</i> .
Source Upper Bound	Defines the maximum cardinality for the multiplicity of the <i>Association</i> relative to the <i>Participant</i> . Note: A <i>sourceUpperBound</i> multiplicity of –1 represents an unbounded or infinite quantity.
Template	Specifies the structured grouping of <i>Entity Characteristics</i> , which were identified through a <i>Query</i> that can be converted to IDL 4.1 constructs.
Template Language	A language that is used to specify the structured grouping of <i>Entity Characteristics</i> that can be converted to IDL 4.1 constructs. Note: The <i>Template Language</i> was designed to be similar to IDL but reduce the overall workload in generating IDL constructs.

B Data Model Example XMI

This appendix includes the example data model in the XMI format prescribed by the FACE Technical Standard, Edition 3.0. The format is XMI and can be moved to a single file with a “.face” file extension for tutorials and extension. This example, while not a complete example of all FACE Data Model features, provides an example of the core features of the FACE Data Architecture.

B.1 Example FACE 3.0 Conformant Data Model Listing

The document examples of the ROP provided here in the XMI format for reference by the reader/modeler. It is a valid model verified by the FACE CTS and includes the FACE SDM 3.0.

While this document recommends the usage of this model for getting started, building understanding, and experimentation, there are a few key points and recommendations that should be noted before starting:

The ROP:

- Consists of examples from this document
- Is not a complete model
- Has been verified by the FACE 3.0 CTS

Conformance Tool optional settings:

- Optional constraints are not utilized in the XMI:
 - Entity Uniqueness: entities in this model may not have distinct sets of characteristics; see Appendix A and Section 5.2.2.1.3
 - Single *Observable*: there may or may not be multiple instances of an Observable type in a characteristic set of an Entity or Association

Recommendations, to avoid confusion:

- Do not change global unique identifiers (guids) of the model elements
- Do not copy/paste sections of the model to other models
- Do not edit SDM elements
- The best practice recommendation is to not modify at all, but extend by adding additional elements: *Entities*, *Associations*, *Characteristics*, and *Views*

B.1.1 “Relevant Operating Picture” XMI

```
<?xml version="1.0" encoding="UTF-8"?>
<face:ArchitectureModel xmi:version="2.0" xmlns:xmi="http://www.omg.org/XMI"
  xmlns:conceptual="http://www.opengroup.us/face/datamodel/conceptual/3.0"
  xmlns:datamodel="http://www.opengroup.us/face/datamodel/3.0"
  xmlns:face="http://www.opengroup.us/face/3.0"
  xmlns:integration="http://www.opengroup.us/face/integration/3.0"
  xmlns:logical="http://www.opengroup.us/face/datamodel/logical/3.0"
  xmlns:platform="http://www.opengroup.us/face/datamodel/platform/3.0"
  xmlns:traceability="http://www.opengroup.us/face/traceability/3.0"
  xmlns:uop="http://www.opengroup.us/face/uop/3.0" xmi:id="_SkDvQCqWEeelF6AY1Hf4Pg"
  name="SDM_3_0_3" description="FACE Shared Data Model v3.0.3">
  <dm xmi:type="datamodel:DataModel" xmi:id="_U70Q0CqWEeelF6AY1Hf4Pg" name="SDM_3_0_3"
    description="FACE Shared Data Model v3.0.3">
    <cdm xmi:type="datamodel:ConceptualDataModel"
      xmi:id="EAID_3511E63F_1D0B_4e10_A561_57648BBF67D4" name="Conceptual_Model" description="">
      <cdm xmi:type="datamodel:ConceptualDataModel"
        xmi:id="SDM_790A8C2B_091D_4D9B_B708_EAEEA707CB23"
        name="FACE_Shared_Data_Model_Conceptual">
          <cdm xmi:type="datamodel:ConceptualDataModel"
            xmi:id="EAID_B39E9DAD_7B4E_4eff_89C0_FCD963B8235C" name="Observables">
            <element xmi:type="conceptual:Observable"
              xmi:id="EAID_8AE4B471_6AD8_473b_A6B8_5FA79179F21A" name="NonPhysicalAddress"
              description="A scheme applied over a non-physical location/space used to delineate
              different elements or parts (e.g. IPv4, IPv4, telephone number)."/>
            <element xmi:type="conceptual:Observable"
              xmi:id="EAID_953E7031_D240_4b4c_B2E2_A5F7F6B8B28D" name="Metric" description="A function
              that defines a relationship between each pair of elements of a set."/>
            <element xmi:type="conceptual:Observable"
              xmi:id="EAID_CA624FC_15D7_4d5a_9AF8_3515E166CC5E" name="Order" description="Order is an
              observable that describes a measure of the position of an element in a group of
              elements."/>
            <element xmi:type="conceptual:Observable"
              xmi:id="EAID_C40D7048_65D6_4c77_B067_B01C8D3EC5A2" name="Polarization" description="The
              action of restricting the vibrations of a transverse wave, especially light, wholly or
              partially to one direction."/>
            <element xmi:type="conceptual:Observable"
              xmi:id="EAID_87855F1B_1FC_4229_889D_1C402450C739" name="Size" description="Size is an
              observable that describes the magnitude or number of a measurable or countable entity."/>
            <element xmi:type="conceptual:Observable"
              xmi:id="EAID_A8C6A8D3_CE3E_4460_A258_926948CAD4B2" name="Uncertainty" description="Not
              completely confident or sure. Used to describe the degree of uncertainty in a value."/>
            <element xmi:type="conceptual:Observable"
              xmi:id="SDM_87BC163C_EAAA_41BA_BE15_BC1583ED0953" name="Color" description="The human
              perception of frequencies of light, characterized by the spectral density of the
              light."/>
            <element xmi:type="conceptual:Observable"
              xmi:id="SDM_42F16876_807C_4B6B_9B7C_DCC75E73CF03" name="Gain" description="A
              multiplicative increase (or decrease, for values less than one) in the amount or rate of
              something. This observable should only be used as an attribute of an Association."/>
            <element xmi:type="conceptual:Observable"
              xmi:id="SDM_65FA5692_DBE9_40F5_87DC_DB21BC57144" name="Sensitivity" description="The
              ratio of the output change to an input change. This observable should only be used as an
              attribute of an Association."/>
            <element xmi:type="conceptual:Observable"
              xmi:id="SDM_72EB2843_C4C7_41C8_A915_41CE41C2BD2A" name="Probability" description="The
              extent to which something is likely to occur. More precisely, it is the relative
              frequency of an outcome in the hypothetical limit of an infinite number of identical
              experiments."/>
            <element xmi:type="conceptual:Observable"
              xmi:id="SDM_912F5A47_36F3_4C53_924C_687194ECB6A1" name="Efficiency" description="The
              ratio of useful output of a machine or process compared to its input. This observable
              should only be used as an attribute of an Association."/>
            <element xmi:type="conceptual:Observable"
              xmi:id="SDM_52A8DA5A_7756_4DDB_8519_AAC142935D21" name="IndexOfRefraction"
              description="The ratio of the speed of light in vacuum to that in the medium."/>
          <cdm xmi:type="datamodel:ConceptualDataModel"
            xmi:id="SDM_D951054D_1C58_4C16_B348_34F9271A9366" name="AssociationObservables">
```

```

<element xmi:type="conceptual:Observable"
xmi:id="SDM_A131A0E9_6F41_4B27_8A3A_69D3FA0D8890" name="Ratio" description="The
quantitative relation between two amounts showing the number of times one value contains
or is contained within the other. This should only be used within an Association and
should identify the two participating attributes using the path attribute of the
associated entity."/>
</cdm>
<cdm xmi:type="datamodel:ConceptualDataModel"
xmi:id="SDM_E013D43D_4E33_4DAO_9A75_5EF97DCD8FBC" name="ProductObservables">
<element xmi:type="conceptual:Observable"
xmi:id="SDM_27B8B1EB_F1D3_43A4_9884_5C744FD0AB7D" name="Image" description="A
representation of the external form of an object. Measurements should be referenced to
an external standards."/>
<element xmi:type="conceptual:Observable"
xmi:id="SDM_0A0FE6578_583C_4C37_8A97_037062BC3CA4" name="Video" description="The
reproduction, display or broadcast of moving visual images. Measurements should be
referenced to an external standards."/>
<element xmi:type="conceptual:Observable"
xmi:id="SDM_DE46D106_05B4_4A0F_A47C_60C0C9B7C8BE" name="Audio" description="The
reproduction or transmission of sound data. Measurements should be referenced to an
external standards."/>
</cdm>
<cdm xmi:type="datamodel:ConceptualDataModel"
xmi:id="EAID_FD9862C9_B48C_481a_8116_AF98D0A35708" name="AmountOfSubstance">
<element xmi:type="conceptual:Observable"
xmi:id="EAID_280D1606_DD95_455c_B535_04810D45E721" name="AmountOfSubstance"
description="Quantity of elementary entities, such as atoms, molecules, electrons, and
other particles."/>
<element xmi:type="conceptual:Observable"
xmi:id="EAID_0016984E_BB39_4f54_95F7_41C62B101EBF" name="ChemicalConcentration"
description="Amount of substance contained within a defined volume or mass."/>
</cdm>
<cdm xmi:type="datamodel:ConceptualDataModel"
xmi:id="EAID_23E097F2_6E1A_4d74_B068_649072247CC5" name="Angle">
<element xmi:type="conceptual:Observable"
xmi:id="EAID_5977632F_0313_4d51_82A4_E716D94C7D7D" name="Angle" description="Divergence
of two straight lines from a common point or of two planes from a common line. This
should typically be used within an Association indicating the angle between two
associated entities."/>
</cdm>
<cdm xmi:type="datamodel:ConceptualDataModel"
xmi:id="EAID_98D3DCF6_6061_48db_9FC9_9BD741CA665C" name="Area">
<element xmi:type="conceptual:Observable"
xmi:id="EAID_4B94E0C3_63C2_4166_9A21_564E6B39FEE1" name="ScalarArea"
description="Magnitude of a surface space."/>
</cdm>
<cdm xmi:type="datamodel:ConceptualDataModel"
xmi:id="EAID_60F805D3_2250_4e40_81E6_5C474709C019" name="Counting">
<element xmi:type="conceptual:Observable"
xmi:id="EAID_39CB7F84_FBC5_4861_BD11_FAC97574B2A2" name="Count" description="Total number
of a collection of objects."/>
<element xmi:type="conceptual:Observable"
xmi:id="EAID_D6D476D1_7FDC_4375_B79B_785E5E9EBA3D" name="Resolution"
description="Describes the sharpness, fineness, or granularity of separation of the
individual elements of a thing which can be produced or recorded. Examples are the
separation of pixels in an image, or the separation of a chemical mixture into its
component parts."/>
</cdm>
<cdm xmi:type="datamodel:ConceptualDataModel"
xmi:id="EAID_7116FAF1_D771_4dcf_A9CF_112EC57E77D8" name="Density">
<element xmi:type="conceptual:Observable"
xmi:id="EAID_4D9CB92E_1010_4fd8_9520_0184188C4374" name="Density" description="Mass of a
substance per unit volume."/>
<element xmi:type="conceptual:Observable"
xmi:id="EAID_29F6EF02_F3F2_4590_8A84_3F28FE25B16F" name="Humidity" description="Amount of
water vapor in the atmosphere or in a gas."/>
</cdm>
<cdm xmi:type="datamodel:ConceptualDataModel"
xmi:id="EAID_ACB62864_ED0D_4ele_AE3D_58581E71754C" name="DoseEquivalent">

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<element xmi:type="conceptual:Observable"
xmi:id="EAID_29F32E46_EDB2_472d_80CA_7B91F8275889" name="DoseEquivalent"
description="Biological effectiveness of an absorbed dose of ionizing radiation."/>
</cdm>
<cdm xmi:type="datamodel:ConceptualDataModel">
<element xmi:type="conceptual:Observable"
xmi:id="EAID_AAEBD590_8038_4a34_B35C_1AB8A5559744" name="Electricity">
<element xmi:type="conceptual:Observable"
xmi:id="EAID_FFFF9F507_6448_48bd_B548_5B85F4057903" name="ElectricCapacitance"
description="Ability of an item to store an electrical change."/>
<element xmi:type="conceptual:Observable"
xmi:id="EAID_0B869DF6_099A_4526_95F5_4BFC7393718E" name="ElectricCharge"
description="Extent to which an item has more or fewer electrons than protons."/>
<element xmi:type="conceptual:Observable"
xmi:id="EAID_CAE607F9_8F99_4a23_854E_8B8536720799" name="ElectricChargeDensity"
description="Electric charge per unit volume of space, in one, two or three dimensions
which are per unit length, surface area, or volume respectively."/>
<element xmi:type="conceptual:Observable"
xmi:id="EAID_35DDCEBF_B184_4159_B5C4_932587A840B5" name="ElectricCurrent"
description="Movement of electric charge through a medium."/>
<element xmi:type="conceptual:Observable"
xmi:id="EAID_60A46947_91C7_4bc7_A74D_1DE2137E5CC5" name="ElectricCurrentDensity"
description="Amount of net charge that crosses an area perpendicular to the current flow
per time period."/>
<element xmi:type="conceptual:Observable"
xmi:id="EAID_FD27C3E6_3A30_45b8_B836_91CD599BD168" name="ElectricPotential"
description="Difference in electric charge between two points."/>
<element xmi:type="conceptual:Observable"
xmi:id="SDM_DDEDA360_71B5_46BB_A631_4A610C017042" name="ElectricResistance"
description="Extent to which an item reduces electrical current passing through it."/>
</cdm>
<cdm xmi:type="datamodel:ConceptualDataModel">
<element xmi:type="conceptual:Observable"
xmi:id="EAID_29322D03_5221_4476_BCE0_FCD59CEADE7E" name="Energy">
<element xmi:type="conceptual:Observable"
xmi:id="EAID_AFCB75C7_863B_4112_8F1E_2FB4FE1D4D2A" name="AbsorbedDose"
description="Radiation energy absorbed by unit mass of substances."/>
<element xmi:type="conceptual:Observable"
xmi:id="EAID_EEED99B8_359B_41bf_B6B0_2BA8EC5E1B07" name="AbsorbedDoseRate"
description="Rate of radiation energy absorbed by unit mass of substances."/>
<element xmi:type="conceptual:Observable"
xmi:id="EAID_32D02294_1A54_48ee_AA9D_2EA0EDBC4B76" name="Energy" description="Capacity of
a physical system to perform work."/>
</cdm>
<cdm xmi:type="datamodel:ConceptualDataModel">
<element xmi:type="conceptual:Observable"
xmi:id="EAID_53BCC2C7_42F6_46b7_9DD0_7F901BF5AF83" name="State">
<element xmi:type="conceptual:Observable"
xmi:id="EAID_CAAAC3A37_65D4_4c73_8361_7586C2CAC41C" name="ConfigurationState"
description="Captures the particular configuration condition relevant to an entity."/>
<element xmi:type="conceptual:Observable"
xmi:id="EAID_7BF4374F_EC27_40ba_B155_54CEA52345C2" name="HealthState"
description="Condition of an item with respect to some purpose or use."/>
<element xmi:type="conceptual:Observable"
xmi:id="EAID_FCB07A59_EABE_47c1_A408_48FB5942DEA1" name="Mode" description="A way or
manner in which something occurs or is experienced, expressed, or done."/>
<element xmi:type="conceptual:Observable"
xmi:id="EAID_ED7C3BF6_9851_4b9b_BCCC_5D8F81C127B7" name="OperationalState"
description="The relative standing of any process, method or series of acts of a
practical or mechanical nature."/>
<element xmi:type="conceptual:Observable"
xmi:id="EAID_629FBDD0_AEAD_41f0_9C6F_603D7CF9D269" name="ValidityState"
description="Indication of fitness of information with respect to some use or purpose."/>
</cdm>
<cdm xmi:type="datamodel:ConceptualDataModel">
<element xmi:type="conceptual:Observable"
xmi:id="EAID_5D8EBA55_61ED_4e7e_8F29_9F619CA59DC0" name="Force">
<element xmi:type="conceptual:Observable"
xmi:id="EAID_B4FA8AFA_1FC5_4cc3_8E95_1956D00176DC" name="Force" description="Influence on
an object with a mass."/>
<element xmi:type="conceptual:Observable"
xmi:id="EAID_69A1D868_1DE4_4fce_9C0B_7A47AB1FC46B" name="Torque" description="Twisting
force that tends to cause rotation."/>
</cdm>

```

```

<cdm xmi:type="datamodel:ConceptualDataModel"
xmi:id="EAID_9CF8817E_BFC5_4933_BEDB_629449526974" name="Identifier">
    <element xmi:type="conceptual:Observable"
xmi:id="EAID_B14C698C_13F8_434c_9D67_54CF514CA74E" name="Identifier"
description="Distinguishes an item from other items. The uniqueness of this identifier
should be quantified in the realized measurement. Identifiers may best be used in the
context of an association to capture how one associated entity refers to another."/>
</cdm>
<cdm xmi:type="datamodel:ConceptualDataModel"
xmi:id="EAID_BC5499CE_F7FA_4e9c_810F_9E8C3CE5ADC3" name="Illuminance">
    <element xmi:type="conceptual:Observable"
xmi:id="EAID_F07E3618_8CE7_4422_9D21_C8FBB9D77794" name="Illuminance" description="Total
luminous flux incident on a surface per unit area."/>
</cdm>
<cdm xmi:type="datamodel:ConceptualDataModel"
xmi:id="SDM_714CD245_E72C_4646_BA3C_B81380A2C366" name="Irradiance">
    <element xmi:type="conceptual:Observable"
xmi:id="SDM_7C315F29_0FED_4160_97C0_05ABE8C37021" name="Irradiance" description="Radiant
flux (i.e. radiant power) incident on a surface per unit area."/>
</cdm>
<cdm xmi:type="datamodel:ConceptualDataModel"
xmi:id="EAID_944C9593_EADB_41f9_BE22_B7F71BBA5E8E" name="InformationElement"
description="Abstract information that applies to attributes of an entity (e.g., text,
diagrams, labels, etc.)">
    <cdm xmi:type="datamodel:ConceptualDataModel"
xmi:id="EAID_2C638398_A0AC_44a1_9E25_D41B7D44B547" name="Kind">
        <element xmi:type="conceptual:Observable"
xmi:id="EAID_83B70E53_9E0D_4223_8D53_C07C30BD5CB3" name="Kind" description="Describes the
concept of a type descriptor."/>
    </cdm>
    <cdm xmi:type="datamodel:ConceptualDataModel"
xmi:id="EAID_1234D951_C778_464c_84EB_7081F576A92E" name="Description">
        <element xmi:type="conceptual:Observable"
xmi:id="EAID_137FD219_342E_47be_A785_7324D2954BAB" name="Description"
description="Summary level information about an item."/>
    </cdm>
</cdm>
<cdm xmi:type="datamodel:ConceptualDataModel"
xmi:id="EAID_7C07FAB4_CDF5_4a09_9787_55E357205B81" name="Length">
    <element xmi:type="conceptual:Observable"
xmi:id="EAID_80D92BE8_8DF0_4f7c_82A6_CBF5DF17443A" name="Distance" description="Amount of
separation between two points."/>
    <element xmi:type="conceptual:Observable"
xmi:id="EAID_0C0725EB_2FB1_46d2_A11A_716E6D6299E3" name="Extent" description="Dimensions
of the bounding region encompassing the item."/>
</cdm>
<cdm xmi:type="datamodel:ConceptualDataModel"
xmi:id="EAID_1D725B44_BAC9_4733_8D4B_4F072340BC6F" name="LuminousIntensity">
    <element xmi:type="conceptual:Observable"
xmi:id="EAID_8B463517_0982_4cd0_884D_DD91D17AC345" name="LuminousIntensity"
description="Wavelength weighted power emitted by a light source in a particular
direction per unit solid angle."/>
</cdm>
<cdm xmi:type="datamodel:ConceptualDataModel"
xmi:id="EAID_6133412F_3EAA_4a9b_8B54_C2A30F2E4A0C" name="Mass">
    <element xmi:type="conceptual:Observable"
xmi:id="EAID_5DD98B4_F3C5_4131 ACA9_A6CBCDEE8F6B" name="Mass" description="Amount of
matter in a physical body (solid, liquid, gas) which determines the body's resistance to
being accelerated by a force and the strength of its mutual gravitational attraction with
other bodies."/>
</cdm>
<cdm xmi:type="datamodel:ConceptualDataModel"
xmi:id="EAID_259A9F0C_5DB1_4fb3_B9E2_C0EBB9654C1B" name="Orientation">
    <element xmi:type="conceptual:Observable"
xmi:id="EAID_AB3FAE18_6F92_4a74_812F_77AF2DCD6F6F" name="Orientation"
description="Angular position of an object relative to a fixed reference frame that
describes how the object is placed."/>
</cdm>
<cdm xmi:type="datamodel:ConceptualDataModel"
xmi:id="EAID_87B06E46_6F77_4b0f_B10F_811F93CF30BF" name="Position">

```

```

<element xmi:type="conceptual:Observable"
xmi:id="EAID_7CA3D9F9_0614_4f82_A971_D2367427403F" name="Position" description="Location
of an item relative to a fixed reference frame."/>
</cdm>
<cdm xmi:type="datamodel:ConceptualDataModel"
xmi:id="EAID_C73A97BA_5AAF_4a5a_A17D_D3F6C6378F53" name="Power">
<element xmi:type="conceptual:Observable"
xmi:id="EAID_0FE1D4CF_7DB9_46c2_961B_2C3AB44B694F" name="Power" description="Rate at
which work is performed or energy is converted."/>
</cdm>
<cdm xmi:type="datamodel:ConceptualDataModel"
xmi:id="EAID_2AA28623_C4E2_4471_85F6_79A1D13E5768" name="Pressure">
<element xmi:type="conceptual:Observable"
xmi:id="EAID_54D14004_BB23_4f72_95FB_9FF384A743A7" name="Pressure" description="Force per
unit area perpendicular to the surface of an item."/>
</cdm>
<cdm xmi:type="datamodel:ConceptualDataModel"
xmi:id="SDM_4DB77607_F044_43F6_B294_1330A858AF02" name="RadiantIntensity">
<element xmi:type="conceptual:Observable"
xmi:id="SDM_FF6759E2_8460_414E_97C7_7AE465C71AC4" name="RadiantIntensity"
description="Power emitted by a radiation source in a particular direction per unit solid
angle."/>
</cdm>
<cdm xmi:type="datamodel:ConceptualDataModel"
xmi:id="EAID_82448C3A_F8D7_4ffd_A311_F530C41FA5ED" name="Rate">
<element xmi:type="conceptual:Observable"
xmi:id="EAID_A082A853_2D96_4222_8065_D06483A48AE8" name="Acceleration" description="Rate
of change of velocity per unit time."/>
<element xmi:type="conceptual:Observable"
xmi:id="EAID_E0FD8349_12D2_40aa_9131_1FF4BA823E26" name="AngularAcceleration"
description="Rate of change of angular velocity."/>
<element xmi:type="conceptual:Observable"
xmi:id="EAID_21309243_2D0E_4536_8135_69F86BE3D515" name="AngularVelocity"
description="Norm of a vector of angular motion of the target body."/>
<element xmi:type="conceptual:Observable"
xmi:id="EAID_29913A1B_DFBB_4db4_AE2B_93C6CC1EF116" name="CountRate" description="Rate at
which a total amount is accumulated over a time period."/>
<element xmi:type="conceptual:Observable"
xmi:id="EAID_5C94882D_D81D_44fd_9A96_04915D63D7BD" name="DataRate" description="Quantity
of data transferred over a defined time period."/>
<element xmi:type="conceptual:Observable"
xmi:id="EAID_2435A700_DF6F_4e88_98FA_05AD14BA5F5D" name="MassFlowRate" description="Mass
of substance which passes through a given surface per unit time."/>
<element xmi:type="conceptual:Observable"
xmi:id="EAID_6A475A9C_9D31_4f7e_92EF_2D00DE6F7E66" name="OrientationAcceleration"
description="Rate of change in Orientation Velocity."/>
<element xmi:type="conceptual:Observable"
xmi:id="EAID_8A6BA64A_0232_41e4_AA18_CD71B80A66DC" name="OrientationVelocity"
description="Rate of change in Orientation."/>
<element xmi:type="conceptual:Observable"
xmi:id="EAID_CD425350_A680_49d4_974D_4052C9BABB30" name="ScalarAcceleration"
description="Rate of change of speed."/>
<element xmi:type="conceptual:Observable"
xmi:id="EAID_06B460A8_5CEC_4e63_9607_4413DB527E37" name="Speed" description="Rate at
which an object covers a distance."/>
<element xmi:type="conceptual:Observable"
xmi:id="EAID_6576E8D2_2D88_4881_819E_7CA0B661B8A5" name="TemporalFrequency"
description="Number of occurrences of a repeating event per unit time. Events are assumed
to have a uniform period."/>
<element xmi:type="conceptual:Observable"
xmi:id="EAID_331BB7F2_6E37_433e_8027_991D9E82BA67" name="Velocity" description="Rate at
which an object covers a distance in a specified direction."/>
</cdm>
<cdm xmi:type="datamodel:ConceptualDataModel"
xmi:id="EAID_C48D59AA_06DF_480b_A3DE_113C0620BD16" name="Temperature">
<element xmi:type="conceptual:Observable"
xmi:id="EAID_2912B4B3_E784_4796_A911_6CE50C6872FB" name="Temperature"
description="Average kinetic energy of particles in an item (i.e., how hot or cold the
item is.)."/>

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<element xmi:type="conceptual:Observable"
xmi:id="EAID_413788BB_764C_45d6_BBB3_904F396F92A3" name="TemperatureDelta" description="A
change or difference between two temperatures."/>
</cdm>
<cdm xmi:type="datamodel:ConceptualDataModel"
xmi:id="EAID_2F81B2B6_4024_4e4d_BDC2_34DBD1B84CE4" name="Time">
<element xmi:type="conceptual:Observable"
xmi:id="EAID_6F2C6003_64FF_42a1_B4D1_00E34745B793" name="CalendarTime"
description="Position in time, a realization of which could be a specific date and time
on a calendar. This is not to be used for time durations, which would be the difference
between two time observables."/>
<element xmi:type="conceptual:Observable"
xmi:id="EAID_4E729952_4D4F_46f9_B372_04489372E9D4" name="Duration" description="Quantity
of time, such as would be obtained from the difference between two specific date/times on
a calendar (i.e., the difference between two CalendarTime observables)."/>
</cdm>
<cdm xmi:type="datamodel:ConceptualDataModel"
xmi:id="EAID_4C132758_4862_40cf_8CC9_3F02FF5C88BD" name="Viscosity">
<element xmi:type="conceptual:Observable"
xmi:id="EAID_C58154E2_40C4_466f_AAF2_CF0751E434A6" name="DynamicViscosity"
description="Property of a fluid that expresses its resistance to shearing flows. Also
called Shear Viscosity."/>
<element xmi:type="conceptual:Observable"
xmi:id="EAID_9894902C_4D24_43b6_9EA0_3FC535B15003" name="KinematicViscosity"
description="Property of a fluid that is the ratio of its resistance to shearing flows
(i.e., its dynamic viscosity) to its density."/>
</cdm>
<cdm xmi:type="datamodel:ConceptualDataModel"
xmi:id="EAID_619822DB_095A_4c7c_8B95_078BF3ACB963" name="Volume">
<element xmi:type="conceptual:Observable"
xmi:id="EAID_363355FA_D46C_4c74_BF38_B9466951F1A0" name="ScalarVolume"
description="Magnitude of a three dimensional space."/>
</cdm>
</cdm>
<cdm xmi:type="datamodel:ConceptualDataModel"
xmi:id="EAID_7BB5A78A_9DE4_4e69_9CAF_951261CEBDDF" name="FoundationEntities">
<element xmi:type="conceptual:Entity"
xmi:id="EAID_D7479E38_3FB8_4339_A7EB_786F9FF201EF" name="Encryption" description="A type
of procedure, method, or mechanism of encryption.">
<composition xmi:type="conceptual:Composition"
xmi:id="EAID_E9D593B9_9C8C_48c4_9352_D18C812D4CBC" rolename="elementID"
type="EAID_B14C698C_13F8_434c_9D67_54CF514CA74E"/>
<composition xmi:type="conceptual:Composition"
xmi:id="EAID_2AD652A2_0D95_4742_91ED_E963D29978A1" rolename="mode"
type="EAID_FCB07A59_EABE_47c1_A408_48FB5942DEA1"/>
</element>
<element xmi:type="conceptual:Entity"
xmi:id="EAID_8407F549_64BD_451a_AC2B_B41C4560C365" name="Path" description="A set of
ordered adjacent points in a topological metric space">
<composition xmi:type="conceptual:Composition"
xmi:id="EAID_28FED059_72A5_45ba_958B_F8C979F2F26B" rolename="elementID"
type="EAID_B14C698C_13F8_434c_9D67_54CF514CA74E"/>
<composition xmi:type="conceptual:Composition"
xmi:id="EAID_7BADBE10_041C_4clf_8CBF_B566DAB07576" rolename="metric"
type="EAID_953E7031_D240_4b4c_B2E2_A5F7F6B8B28D"/>
<composition xmi:type="conceptual:Composition"
xmi:id="EAID_CBE5E234_880B_4530_A240_D858B40211C0" rolename="points" lowerBound="2"
upperBound="-1" type="EAID_4FC53F43_0509_4622_96EE_7ABCEDB53E80"/>
</element>
<element xmi:type="conceptual:Entity"
xmi:id="EAID_4FC53F43_0509_4622_96EE_7ABCEDB53E80" name="Point" description="A position
with zero dimension in a space">
<composition xmi:type="conceptual:Composition"
xmi:id="EAID_FFCCF86E2_DB0A_40aa_85B4_BE3A8A5BA82B" rolename="elementID"
type="EAID_B14C698C_13F8_434c_9D67_54CF514CA74E"/>
<composition xmi:type="conceptual:Composition"
xmi:id="EAID_65BEC94_9E9B_433c_B747_8310D64D09CE" rolename="position"
type="EAID_7CA3D9F9_0614_4f82_A971_D2367427403F"/>
</element>
</cdm>
</cdm>

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    </cdm>
    <cdm xmi:type="datamodel:ConceptualDataModel" name="RIG_ConceptualDataModelPackage">
        <cdm xmi:type="datamodel:ConceptualDataModel" name="RIG_DogOwnership_CDM_Package"
description="Package containing the dog ownership example.">
            <element xmi:type="conceptual:Entity" name="Dog" description=" " >
                <composition xmi:type="conceptual:Composition" rolename="name" description=" "
type="EAID_B14C698C_13F8_434c_9D67_54CF514CA74E"/>
                <composition xmi:type="conceptual:Composition" rolename="size"
type="EAID_87855F1B_1FC8_4229_889D_1C402450C739"/>
                <composition xmi:type="conceptual:Composition" rolename="age"
type="EAID_4E729952_4D4F_46f9_B372_04489372E9D4"/>
            </element>
            <element xmi:type="conceptual:Entity" name="Person">
                <composition xmi:type="conceptual:Composition" rolename="SSN"
type="EAID_B14C698C_13F8_434c_9D67_54CF514CA74E"/>
                <composition xmi:type="conceptual:Composition" rolename="age"
type="EAID_4E729952_4D4F_46f9_B372_04489372E9D4"/>
            </element>
            <element xmi:type="conceptual:Association" name="DogOwnership" description=" " >
                <composition xmi:type="conceptual:Composition" rolename="licenseNum"
description=" " type="EAID_B14C698C_13F8_434c_9D67_54CF514CA74E"/>
                <composition xmi:type="conceptual:Composition" rolename="registration"
description=" " type="//@cdm.0/@cdm.0/@element.3"/>
                <participant xmi:type="conceptual:Participant" rolename="dog" description=" "
type="//@cdm.0/@cdm.1/@cdm.0/@element.0" sourceUpperBound="1"/>
                <participant xmi:type="conceptual:Participant" rolename="owner" description=" "
type="//@cdm.0/@cdm.1/@cdm.0/@element.1"/>
            </element>
            <element xmi:type="conceptual:Entity" name="Registration">
                <composition xmi:type="conceptual:Composition" rolename="registrationID"
type="EAID_B14C698C_13F8_434c_9D67_54CF514CA74E"/>
            </element>
            <element xmi:type="conceptual:Query" name="RIG_DogOwnership_CDM_Query1"
specification="select name from Dog"/>
            <element xmi:type="conceptual:Query" name="RIG_DogOwnership_CDM_Query2"
specification="select Person.*, Dog.* from Person join DogOwnership on DogOwnership.owner
= Person join Dog on DogOwnership.dog = Dog"/>
            <element xmi:type="conceptual:Query" name="RIG_DogOwnership_CDM_Query3"
specification="SELECT Person.*, Dog.name, Dog.age, DogOwnership.* FROM Person JOIN
DogOwnership on DogOwnership.owner = Person JOIN Dog on DogOwnership.dog = Dog"/>
        </cdm>
        <cdm xmi:type="datamodel:ConceptualDataModel"
name="RIG_AircraftAirportArrival_CDM_Package">
            <element xmi:type="conceptual:Entity" name="Aircraft">
                <composition xmi:type="conceptual:Composition" rolename="aircraftID"
type="EAID_B14C698C_13F8_434c_9D67_54CF514CA74E"/>
                <composition xmi:type="conceptual:Composition" rolename="duration"
type="EAID_4E729952_4D4F_46f9_B372_04489372E9D4"/>
                <composition xmi:type="conceptual:Composition" rolename="speed"
type="EAID_06B460A8_5CEC_4e63_9607_4413DB527E37"/>
            </element>
            <element xmi:type="conceptual:Entity" name="Airport">
                <composition xmi:type="conceptual:Composition" rolename="airportID"
type="EAID_B14C698C_13F8_434c_9D67_54CF514CA74E"/>
                <composition xmi:type="conceptual:Composition" rolename="airportKind"
type="EAID_83B70E53_9E0D_4223_8D53_C07C30BD5CB3"/>
                <composition xmi:type="conceptual:Composition" rolename="gates" upperBound="-1"
type="//@cdm.0/@cdm.1/@cdm.1/@element.3"/>
            </element>
            <element xmi:type="conceptual:Association" name="Arrival">
                <composition xmi:type="conceptual:Composition" rolename="ID"
type="EAID_B14C698C_13F8_434c_9D67_54CF514CA74E"/>
                <composition xmi:type="conceptual:Composition" rolename="calendarTime"
type="EAID_6F2C6003_64FF_42a1_B4D1_00E34745B793"/>
                <composition xmi:type="conceptual:Composition" rolename="arrivalKind"
type="EAID_83B70E53_9E0D_4223_8D53_C07C30BD5CB3"/>
                <participant xmi:type="conceptual:Participant" rolename="arrivedAt"
type="//@cdm.0/@cdm.1/@cdm.1/@element.1"/>
                <participant xmi:type="conceptual:Participant" rolename="reporting"
type="//@cdm.0/@cdm.1/@cdm.1/@element.0"/>
            </element>

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        <element xmi:type="conceptual:Entity" name="Gate">
            <composition xmi:type="conceptual:Composition" rolename="gateID"
type="EAID_B14C698C_13F8_434c_9D67_54CF514CA74E"/>
                <composition xmi:type="conceptual:Composition" rolename="area"
type="EAID_4B94E0C3_63C2_4166_9A21_564E6B39FEE1"/>
                    <composition xmi:type="conceptual:Composition" rolename="capacity"
type="EAID_83B70E53_9E0D_4223_8D53_C07C30BD5CB3"/>
                </element>
                <element xmi:type="conceptual:Entity" name="RotaryWing"
specializes="//@dm.0/@cdm.1/@cdm.1/@element.0">
                    <composition xmi:type="conceptual:Composition" rolename="distance"
type="EAID_80D92BE8_8DF0_4f7c_82A6_CBF5DF17443A"/>
                </element>
                <element xmi:type="conceptual:Entity" name="FixedWing"
specializes="//@dm.0/@cdm.1/@cdm.1/@element.0">
                    <composition xmi:type="conceptual:Composition" rolename="kind"
type="EAID_83B70E53_9E0D_4223_8D53_C07C30BD5CB3"/>
                </element>
            </cdm>
            <cdm xmi:type="datamodel:ConceptualDataModel"
name="RIG_ModeledDomainConcepts_CDM_Package" description="Model elements from RIG section
4.1.1.">
                <element xmi:type="conceptual:Entity" name="Area" description="The Area entity
represents the idea of a geographic area. It contains observable properties for position
(to say where it is), and extents (to say how big it is). This entity captures a very
simple reusable idea and therefore can be used in any situation that might requires
reference to a geographic area.">
                    <composition xmi:type="conceptual:Composition" rolename="ID"
type="EAID_B14C698C_13F8_434c_9D67_54CF514CA74E"/>
                    <composition xmi:type="conceptual:Composition" rolename="position"
type="EAID_7CA3D9F9_0614_4f82_A971_D2367427403F"/>
                    <composition xmi:type="conceptual:Composition" rolename="extents"
type="EAID_0C0725EB_2FB1_46d2_A11A_716E6D6299E3"/>
                </element>
                <element xmi:type="conceptual:Entity" name="Mission" description="The Mission
entity represents the concept of a mission.">
                    <composition xmi:type="conceptual:Composition" rolename="ID"
type="EAID_B14C698C_13F8_434c_9D67_54CF514CA74E"/>
                </element>
                <element xmi:type="conceptual:Association" name="MissionRelevantArea"
description="MissionRelevantArea is the essential association that brings meaning to the
relationship between a mission and a geographic area and forms a key component in the
idea of a "Relevant Operating Picture". This relationship allows one to think about the
Relevant Operating Picture as the set of Objects whose positions are within the
MissionRelevantArea. One could go further and look through the Force, Allegiance, and
DiplomaticRelations for those objects to find objects that are red forces or blue
forces.">
                    <composition xmi:type="conceptual:Composition" rolename="ID"
type="EAID_B14C698C_13F8_434c_9D67_54CF514CA74E"/>
                    <participant xmi:type="conceptual:Participant" rolename="area"
type="//@dm.0/@cdm.1/@cdm.2/@element.0"/>
                    <participant xmi:type="conceptual:Participant" rolename="mission"
type="//@dm.0/@cdm.1/@cdm.2/@element.1" sourceLowerBound="1" sourceUpperBound="1"/>
                </element>
                <element xmi:type="conceptual:Entity" name="Platform" description="Platform is a
generalization of systems that can host a sensor. Platform has been kept general in order
to be used in cases where it represents an aircraft, a ship, a ground vehicle, a ground
installation, etc.">
                    <composition xmi:type="conceptual:Composition" rolename="ID"
type="EAID_B14C698C_13F8_434c_9D67_54CF514CA74E"/>
                </element>
                <element xmi:type="conceptual:Entity" name="ArmedForce" description="The Force
entity represents a participant in a military scenario. Forces represent the "sides" such
as friendly forces, threat forces, etc.">
                    <composition xmi:type="conceptual:Composition" rolename="ID"
type="EAID_B14C698C_13F8_434c_9D67_54CF514CA74E"/>
                </element>
                <element xmi:type="conceptual:Association" name="MissionExecution"
description="The MissionExecution association captures the relationship between a
Platform and a Mission. This relationship has participants of one mission and zero or
more platforms.">

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        <composition xmi:type="conceptual:Composition" rolename="ID"
type="EAID_B14C698C_13F8_434c_9D67_54CF514CA74E">
            <participant xmi:type="conceptual:Participant" rolename="mission"
type="//@dm.0/@cdm.1/@cdm.2/@element.1"/>
                <participant xmi:type="conceptual:Participant" rolename="platform"
type="//@dm.0/@cdm.1/@cdm.2/@element.3" sourceLowerBound="1" sourceUpperBound="1"/>
                    </element>
                <element xmi:type="conceptual:Association" name="PlatformForce"
description="PlatformForce is an association between a Platform and a Force.">
                    <composition xmi:type="conceptual:Composition" rolename="ID"
type="EAID_B14C698C_13F8_434c_9D67_54CF514CA74E"/>
                        <participant xmi:type="conceptual:Participant" rolename="platform"
type="//@dm.0/@cdm.1/@cdm.2/@element.3" sourceLowerBound="1" sourceUpperBound="1"/>
                            <participant xmi:type="conceptual:Participant" rolename="force"
type="//@dm.0/@cdm.1/@cdm.2/@element.4"/>
                                </element>
                            <element xmi:type="conceptual:Entity" name="Country" description="Country is an
entity intended to represent a state actor in the world. This example has been kept
simple and does not address the idea of non-state actors.">
                                <composition xmi:type="conceptual:Composition" rolename="ID"
type="EAID_B14C698C_13F8_434c_9D67_54CF514CA74E"/>
                            </element>
                            <element xmi:type="conceptual:Association" name="Allegiance"
description="Allegiance is an association which shows the relationship between a Force
and a Country. When used in conjunction with the DiplomaticRelations association, one
could express the idea that a force may have allegiance to a country which has hostile
relations with our country (i.e., a red force), or is an ally of ours (i.e., a blue
force).">
                                <composition xmi:type="conceptual:Composition" rolename="ID"
type="EAID_B14C698C_13F8_434c_9D67_54CF514CA74E"/>
                                    <participant xmi:type="conceptual:Participant" rolename="force"
type="//@dm.0/@cdm.1/@cdm.2/@element.4" sourceLowerBound="1" sourceUpperBound="1"/>
                                        <participant xmi:type="conceptual:Participant" rolename="country"
type="//@dm.0/@cdm.1/@cdm.2/@element.7"/>
                                            </element>
                                            <element xmi:type="conceptual:Association" name="DiplomaticRelations"
description="This is an association that captures the idea of the relationship between
different countries. This association includes composition of an OperationalState
observable intended to capture the state of that relationship (e.g., Friendly, Hostile,
Neutral, etc.).">
                                                <composition xmi:type="conceptual:Composition" rolename="ID"
type="EAID_B14C698C_13F8_434c_9D67_54CF514CA74E"/>
                                                    <composition xmi:type="conceptual:Composition" rolename="state"
type="EAID_ED7C3BF6_9851_4b9b_BCCC_5D8F81C127B7"/>
                                                        <participant xmi:type="conceptual:Participant" rolename="c1"
type="//@dm.0/@cdm.1/@cdm.2/@element.7"/>
                                                            <participant xmi:type="conceptual:Participant" rolename="c2"
type="//@dm.0/@cdm.1/@cdm.2/@element.7"/>
                                                                </element>
                                                                <element xmi:type="conceptual:Entity" name="Sensor" description="Sensor
represents some piece of equipment that can be used in sensing. In this scenario, little
additional characterization is added.">
                                                                    <composition xmi:type="conceptual:Composition" rolename="ID"
type="EAID_B14C698C_13F8_434c_9D67_54CF514CA74E"/>
                                                                </element>
                                                                <element xmi:type="conceptual:Entity" name="Object" description="The Object
entity represents some item that may be of interest during a mission. It is intentionally
left abstract rather than giving it a more specific label (e.g., track) to allow this
entity to be used in a broad range of modeling scenarios. In the ROP example, since the
object is shown as participating in an ObjectTracking relationship with the role of
track, readers of the model gain understanding that the Object is a "Track".">
                                                                    <composition xmi:type="conceptual:Composition" rolename="ID"
type="EAID_B14C698C_13F8_434c_9D67_54CF514CA74E"/>
                                                                </element>
                                                                <element xmi:type="conceptual:Entity" name="PositionAtTime"
description="PositionAtTime is an entity that represents a position at a specific point
in time.">
                                                                    <composition xmi:type="conceptual:Composition" rolename="ID"
type="EAID_B14C698C_13F8_434c_9D67_54CF514CA74E"/>
                                                                <composition xmi:type="conceptual:Composition" rolename="position"
type="EAID_7CA3D9F9_0614_4f82_A971_D2367427403F"/>

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        <composition xmi:type="conceptual:Composition" rolename="time"
type="EAID_4E729952_4D4F_46f9_B372_04489372E9D4"/>
    </element>
    <element xmi:type="conceptual:Association" name="ObjectTracking"
description="ObjectTracking is an association that indicates a tracking relationship
between a sensor and some object essentially making that object a track in this
context.">
        <composition xmi:type="conceptual:Composition" rolename="ID"
type="EAID_B14C698C_13F8_434c_9D67_54CF514CA74E"/>
            <participant xmi:type="conceptual:Participant" rolename="sensor"
type="//@dm.0/@cdm.1/@cdm.2/@element.10"/>
            <participant xmi:type="conceptual:Participant" rolename="track"
type="//@dm.0/@cdm.1/@cdm.2/@element.11"/>
        </element>
        <element xmi:type="conceptual:Association" name="SensorPlatformInstallation"
description="SensorPlatformInstallation is an association that introduces the concept of
a sensor being installed in a platform. As the diagram indicates, this relationship
requires one sensor and one platform. Platforms can be part of multiple
SensorPlatformInstallation relationships (i.e., platforms can have multiple installed
sensors), while a sensor can only be installed in a single platform.">
            <composition xmi:type="conceptual:Composition" rolename="ID"
type="EAID_B14C698C_13F8_434c_9D67_54CF514CA74E"/>
                <participant xmi:type="conceptual:Participant" rolename="sensor"
type="//@dm.0/@cdm.1/@cdm.2/@element.10" sourceLowerBound="1" sourceUpperBound="1"/>
                <participant xmi:type="conceptual:Participant" rolename="platform"
type="//@dm.0/@cdm.1/@cdm.2/@element.3"/>
            </element>
            <element xmi:type="conceptual:Association" name="Correlation"
description="Correlation is an association that relates objects that are being tracked.
It indicates that there is some perceived correlation between the two items being
tracked. This example model shows that this relationship requires one Object and one or
more ObjectTrackings. A unique aspect demonstrated here is the ability to use
associations as participants in other associations. This is allowed because Associations
are themselves specializations of Entities and add the idea of participants.">
                <composition xmi:type="conceptual:Composition" rolename="ID"
type="EAID_B14C698C_13F8_434c_9D67_54CF514CA74E"/>
                    <participant xmi:type="conceptual:Participant" rolename="correlated"
type="//@dm.0/@cdm.1/@cdm.2/@element.11"/>
                    <participant xmi:type="conceptual:Participant" rolename="tracks"
type="//@dm.0/@cdm.1/@cdm.2/@element.13"/>
                </element>
                <element xmi:type="conceptual:Association" name="TrackHistory"
description="TrackHistory is an association between zero or more ObjectTrackings and zero
or more PositionAtTimes.">
                    <composition xmi:type="conceptual:Composition" rolename="ID"
type="EAID_B14C698C_13F8_434c_9D67_54CF514CA74E"/>
                        <participant xmi:type="conceptual:Participant" rolename="position"
lowerBound="0" upperBound="-1" type="//@dm.0/@cdm.1/@cdm.2/@element.12"/>
                        <participant xmi:type="conceptual:Participant" rolename="tracks"
type="//@dm.0/@cdm.1/@cdm.2/@element.13"/>
                    </element>
                </cdm>
                <cdm xmi:type="datamodel:ConceptualDataModel" name="RIG_Rotor_CDM_Package"
description="Model for FAQ question 5.">
                    <element xmi:type="conceptual:Entity" name="Rotor">
                        <composition xmi:type="conceptual:Composition" rolename="ID"
type="EAID_B14C698C_13F8_434c_9D67_54CF514CA74E"/>
                    </element>
                    <element xmi:type="conceptual:Entity" name="Rotorcraft">
                        <composition xmi:type="conceptual:Composition" rolename="ID"
type="EAID_B14C698C_13F8_434c_9D67_54CF514CA74E"/>
                            <composition xmi:type="conceptual:Composition" rolename="rotorSet"
upperBound="4" type="//@dm.0/@cdm.1/@cdm.3/@element.0"/>
                            <composition xmi:type="conceptual:Composition" rolename="area"
type="EAID_4B94E0C3_63C2_4166_9A21_564E6B39FEE1"/>
                            <composition xmi:type="conceptual:Composition" rolename="extent"
type="EAID_0C0725EB_2FB1_46d2_A11A_716E6D6299E3"/>
                    </element>
                    <element xmi:type="conceptual:Association" name="InstalledRotorSet">
                        <composition xmi:type="conceptual:Composition" rolename="ID"
type="EAID_B14C698C_13F8_434c_9D67_54CF514CA74E"/>

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        <composition xmi:type="conceptual:Composition" rolename="count"
type="EAID_39CB7F84_FBC5_4861_BD11_FAC97574B2A2"/>
        <participant xmi:type="conceptual:Participant" rolename="rotor" upperBound="4"
type="//@dm.0/@cdm.1/@cdm.3@element.0" sourceLowerBound="1" sourceUpperBound="1"/>
        <participant xmi:type="conceptual:Participant" rolename="rotorcraft"
type="//@dm.0/@cdm.1/@cdm.3@element.1" sourceLowerBound="1" sourceUpperBound="1"/>
        </element>
    </cdm>
</cdm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_9BA39F14_4927_484a_B00F_7D1C8B0CC103" name="FACE_Shared_Data_Model_Logical">
    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_1D413311_4852_40a3_8919_33A7AD77146E" name="CoordinateSystems">
        <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_5F7EE196_6B19_4727_BBA7_C39452D13B3C" name="Cartesian">
            <element xmi:type="logical:CoordinateSystem"
xmi:id="EAID_9031FA4E_6689_4891_B4D8_6A87899FD6F7" name="Cartesian_Y_CoordSys"
description="One dimensional Cartesian Y coordinate system."
axis="EAID_185CD9A8_B677_41ab_907D_C7F232756DCE" axisRelationshipDescription="only one
axis" angleEquation="n/a" distanceEquation="d = x2-x1"/>
            <element xmi:type="logical:CoordinateSystem"
xmi:id="EAID_552BE1D7_4AE9_43a8_81DC_0CEE6F135F61" name="Cartesian_Z_CoordSys"
description="One dimensional Cartesian Z coordinate system."
axis="EAID_C74601C9_0E7A_483b_AD4C_28D64BE141E3" axisRelationshipDescription="There is
only one axis" angleEquation="n/a" distanceEquation="d = x2-x1"/>
            <element xmi:type="logical:CoordinateSystem"
xmi:id="EAID_D73E1979_E607_48ce_A01F_2EAD5226614D" name="Cartesian_X_CoordSys"
description="One dimensional Cartesian coordinate system."
axis="EAID_3EFC05DA_4D3A_4e3d_8AEC_C9FEC8D85087" axisRelationshipDescription="There is
only one axis." angleEquation="n/a" distanceEquation="d = x2-x1"/>
            <element xmi:type="logical:CoordinateSystem"
xmi:id="EAID_91380EB8_66EF_4d12_AC1D_84FF7F719080" name="Cartesian_2D_CoordSys"
description="Two dimensional Cartesian coordinate system."
axis="EAID_185CD9A8_B677_41ab_907D_C7F232756DCE" axisRelationshipDescription="Axes are
orthogonal to each other." angleEquation="theta = inverse cos ((a dot b)/(|a|*|b|)),
where a and b are vectors." distanceEquation="d=sqrt((x2-x1)^2+(y2-y1)^2)"/>
            <element xmi:type="logical:CoordinateSystem"
xmi:id="EAID_E16B78B2_B2BA_43e5_837E_018DC1FD621C" name="Cartesian_3D_CoordSys"
description="Three dimensional Cartesian coordinate system."
axis="EAID_3EFC05DA_4D3A_4e3d_8AEC_C9FEC8D85087 EAID_185CD9A8_B677_41ab_907D_C7F232756DCE
EAID_C74601C9_0E7A_483b_AD4C_28D64BE141E3" axisRelationshipDescription="Axes are
orthogonal to each other." angleEquation="theta = inverse cos ((a dot b)/(|a|*|b|)),
where a and b are vectors." distanceEquation="d = sqrt((x2-x1)^2 + (y2-y1)^2 + (z2-
z1)^2)"/>
            <element xmi:type="logical:CoordinateSystem"
xmi:id="EAID_B55C9EAD_191D_4857_B016_3DA66484CD06" name="Cartesian_4D_CoordSys"
description="4 dimensional Cartesian coordinate system."
axis="EAID_B9400988_0D42_4158_B085_F2301B7EC419 EAID_3EFC05DA_4D3A_4e3d_8AEC_C9FEC8D85087
EAID_185CD9A8_B677_41ab_907D_C7F232756DCE EAID_C74601C9_0E7A_483b_AD4C_28D64BE141E3"
axisRelationshipDescription="Axes are orthogonal to each other." angleEquation="theta =
inverse cos ((a dot b)/(|a|*|b|)), where a and b are vectors." distanceEquation="d =
sqrt((x2-x1)^2 + (y2-y1)^2 + (z2-z1)^2)"/>
            <element xmi:type="logical:CoordinateSystemAxis"
xmi:id="EAID_B9400988_0D42_4158_B085_F2301B7EC419" name="Cartesian_T_CoordSysAxis"
description="T (time) axis of Cartesian coordinate system"/>
            <element xmi:type="logical:CoordinateSystemAxis"
xmi:id="EAID_3EFC05DA_4D3A_4e3d_8AEC_C9FEC8D85087" name="Cartesian_X_CoordSysAxis"
description="X Axis of Cartesian coordinate system."/>
            <element xmi:type="logical:CoordinateSystemAxis"
xmi:id="EAID_185CD9A8_B677_41ab_907D_C7F232756DCE" name="Cartesian_Y_CoordSysAxis"
description="Y Axis of Cartesian coordinate system"/>
            <element xmi:type="logical:CoordinateSystemAxis"
xmi:id="EAID_C74601C9_0E7A_483b_AD4C_28D64BE141E3" name="Cartesian_Z_CoordSysAxis"
description="Z Axis of Cartesian coordinate system"/>
        </ldm>
        <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_BEEC6FB_B557_47ae_81D9_09F9D7744F57" name="FixedAxisRotations">
            <element xmi:type="logical:CoordinateSystem"
xmi:id="EAID_7490A578_E527_45f2_9F84_437BD4E50D25" name="Rotation_Fixed_Psi_CoordSys"
description="The independent Psi vector of a three axis rotational Coordinate System"

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axis="EAID_6F0C456F_1968_46d9_BAEF_2229D40F786F" axisRelationshipDescription="Right-
handed orthogonal" angleEquation="Alpha = Psi" distanceEquation="NA"/>
<element xmi:type="logical:CoordinateSystem"
xmi:id="EAID_B440AC4B_2F9D_42ff_96F2_5179733187F8" name="Rotation_Fixed_Theta_CoordSys"
description="The independent Theta vector of a three axis rotational Coordinate System"
axis="EAID_3B8A3C01_021F_433a_AEFE_9DC9298A4DA5" axisRelationshipDescription="Right-
handed orthogonal" angleEquation="Alpha = Theta" distanceEquation="NA"/>
<element xmi:type="logical:CoordinateSystem"
xmi:id="EAID_69977E30_FDD9_4fe9_808B_19F526B3A196" name="Rotation_Fixed_Phi_CoordSys"
description="The independent Phi vector of a three axis rotational Coordinate System"
axis="EAID_0DDF191A_235E_4bf5_A2EE_53C3973AE3F0" axisRelationshipDescription="Right-
handed orthogonal" angleEquation="Alpha = Phi" distanceEquation="NA"/>
<element xmi:type="logical:CoordinateSystem"
xmi:id="EAID_2FC5B2EB_0BC0_46f5_8629_06ED863A901D" name="Rotation_Fixed_CoordSys"
description="One fixed axis rotational Coordinate System"
axis="EAID_6F0C456F_1968_46d9_BAEF_2229D40F786F" axisRelationshipDescription="Right-
handed orthogonal" angleEquation="Alpha = Psi" distanceEquation="NA"/>
<element xmi:type="logical:CoordinateSystem"
xmi:id="EAID_B05EB8BF_DD0C_47d8_9C21_842C4B4BFBC9" name="Rotation_Fixed_2D_CoordSys"
description="Two fixed axis rotational Coordinate System"
axis="EAID_6F0C456F_1968_46d9_BAEF_2229D40F786F
EAID_3B8A3C01_021F_433a_AEFE_9DC9298A4DA5" axisRelationshipDescription="Right-handed
orthogonal" angleEquation="Alpha = Psi; Beta = Theta" distanceEquation="NA"/>
<element xmi:type="logical:CoordinateSystem"
xmi:id="EAID_B07E29DC_621C_4130_ACDC_17B4424EB688" name="Rotation_Fixed_3D_CoordSys"
description="Three fixed axis rotational Coordinate System"
axis="EAID_0DDF191A_235E_4bf5_A2EE_53C3973AE3F0 EAID_6F0C456F_1968_46d9_BAEF_2229D40F786F
EAID_3B8A3C01_021F_433a_AEFE_9DC9298A4DA5" axisRelationshipDescription="Right-handed
orthogonal" angleEquation="Alpha = Psi; Beta = Theta; Gamma = Phi"
distanceEquation="NA"/>
<element xmi:type="logical:CoordinateSystemAxis"
xmi:id="EAID_0DDF191A_235E_4bf5_A2EE_53C3973AE3F0" name="Rotation_Fixed_Phi_CoordSysAxis"
description="The Phi vector Q,E measuring rotation about the Fixed Coordinate System x
axis"/>
<element xmi:type="logical:CoordinateSystemAxis"
xmi:id="EAID_6F0C456F_1968_46d9_BAEF_2229D40F786F" name="Rotation_Fixed_Psi_CoordSysAxis"
description="The Psi vector Q,E measuring rotation about the Fixed Coordinate System z
axis."/>
<element xmi:type="logical:CoordinateSystemAxis"
xmi:id="EAID_3B8A3C01_021F_433a_AEFE_9DC9298A4DA5"
name="Rotation_Fixed_Theta_CoordSysAxis" description="The Theta vector Q,E measuring
rotation about the Fixed Coordinate System y axis"/>
</ldm>
<lsm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_2B1A0762_108D_4847_847B_A2D4E9AD34E2" name="Rotational">
<lsm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_2F574B24_9B1C_465d_97F9_F6E55D23243B" name="Tait_BryanRotations">
<element xmi:type="logical:CoordinateSystem"
xmi:id="EAID_C2593E69_B148_46a4_9C24_09E0E87EEB08" name="Rotation_Psi_CoordSys"
description="The independent Psi vector of a three axis rotational Coordinate System"
axis="EAID_E788C011_C6AB_4a7a_99EF_3F872C23AF74" axisRelationshipDescription="Right-
handed orthogonal" angleEquation="Alpha = Psi" distanceEquation="NA"/>
<element xmi:type="logical:CoordinateSystem"
xmi:id="EAID_ACBA8135_5E56_4151_9CF0_493DA097012A" name="Rotation_Theta_CoordSys"
description="The independent Theta vector of a three axis rotational Coordinate System"
axis="EAID_0A7B1219_906D_4aa0_A81F_9D397C9F60E0" axisRelationshipDescription="Right-
handed orthogonal" angleEquation="Alpha = Theta" distanceEquation="NA"/>
<element xmi:type="logical:CoordinateSystem"
xmi:id="EAID_6C57DC8D_F08C_468b_AA55_C5A9D42C6206" name="Rotation_Phi_CoordSys"
description="The independent Phi vector of a three axis rotational Coordinate System"
axis="EAID_683B5E99_B521_4b62_B781_93BADAEAF8DA" axisRelationshipDescription="Right-
handed orthogonal" angleEquation="Alpha = Phi" distanceEquation="NA"/>
<element xmi:type="logical:CoordinateSystem"
xmi:id="EAID_39EAB02D_1E49_4b97_AAB0_2DFEB064700A" name="Rotation_1D_CoordSys"
description="One axis rotational Coordinate System"
axis="EAID_E788C011_C6AB_4a7a_99EF_3F872C23AF74" axisRelationshipDescription="Right-
handed orthogonal" angleEquation="Alpha = Psi" distanceEquation="NA"/>
<element xmi:type="logical:CoordinateSystem"
xmi:id="EAID_57C904FB_B40B_41fa_9769_D7ADEACF06D6" name="Rotation_2D_CoordSys"
description="Two axis rotational Coordinate System"
axis="EAID_E788C011_C6AB_4a7a_99EF_3F872C23AF74"

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EAID_0A7B1219_906D_4aa0_A81F_9D397C9F60E0" axisRelationshipDescription="Right-handed
orthogonal" angleEquation="Alpha = R(rotation Matrix) X v(initial vector)"
distanceEquation="NA"/>
    <element xmi:type="logical:CoordinateSystem"
xmi:id="EAID_A32C05F7_2731_4820_938D_5D7CE852CE37" name="Rotation_3D_CoordSys"
description="Three axis rotational Coordinate System"
axis="EAID_683B5E99_B521_4b62_B781_93BADAEE8DA EAID_E788C011_C6AB_4a7a_99EF_3F872C23AF74
EAID_0A7B1219_906D_4aa0_A81F_9D397C9F60E0" axisRelationshipDescription="Right-handed
orthogonal" angleEquation="Alpha = R(rotation Matrix) X v(initial vector)"
distanceEquation="NA"/>
    <element xmi:type="logical:CoordinateSystemAxis"
xmi:id="EAID_683B5E99_B521_4b62_B781_93BADAEE8DA" name="Rotation_Phi_CoordSysAxis"
description="The Phi vector Q,E measuring rotation about the rotated local X (x')"
axis."/>
    <element xmi:type="logical:CoordinateSystemAxis"
xmi:id="EAID_E788C011_C6AB_4a7a_99EF_3F872C23AF74" name="Rotation_Psi_CoordSysAxis"
description="The Psi vector Q,E measuring rotation about the Fixed Coordinate System z
axis."/>
    <element xmi:type="logical:CoordinateSystemAxis"
xmi:id="EAID_0A7B1219_906D_4aa0_A81F_9D397C9F60E0" name="Rotation_Theta_CoordSysAxis"
description="The Theta vector Q,E measuring rotation about the rotated local Y (N Q,E y'
axis."/>
    </ldm>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_C6D9C82F_78FB_4266_9615_7A637566A37F" name="Scalar">
    <element xmi:type="logical:CoordinateSystem"
xmi:id="EAID_6DABCD14_6669_485d_A1E7_B192E1AF0275" name="Scalar_CoordSys" description="A
scale for one dimensional scalar measurements"
axis="EAID_28244BCE_7916_4b0e_AD94_BACAF6B3567F" axisRelationshipDescription="n/a"
angleEquation="n/a" distanceEquation="|v2-v1|"/>
    <element xmi:type="logical:CoordinateSystemAxis"
xmi:id="EAID_28244BCE_7916_4b0e_AD94_BACAF6B3567F" name="Scalar_CoordSysAxis"
description="A scale for one dimensional scalar measurements"/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_1EA992A2_64A8_405a_9F50_9C328D38069D" name="Angular">
    <element xmi:type="logical:CoordinateSystem"
xmi:id="EAID_C3727901_373B_4ae7_B288_168F4AADAA042" name="Polar_CoordSys"
description="Polar Coordinate System" axis="_vZiY1gg5EeSFspy8Kj3F4Q
_vZiY1Qg5EeSFspy8Kj3F4Q" axisRelationshipDescription="S2 Right Handed Orthogonal"
angleEquation="Alpha = Theta2 - Theta1" distanceEquation="d = sqrt[(r1^2 + r2^2)-
(2*r1*r2*cos(Theta2-Theta1))]">
        <element xmi:type="logical:CoordinateSystem"
xmi:id="EAID_B6CBB90E_3A43_44ca_B1B9_78FED0DA3C7D" name="Spherical_Phi_CoordSys"
description="The independent Phi axis of the 3 dimensional (3D) Spherically symmetric
coordinate system." axis="_vZiY1Ag5EeSFspy8Kj3F4Q" axisRelationshipDescription="S3 Right
Handed Orthogonal (R, Azimuth, Inclination)," angleEquation="Alpha = sqrt[(Theta1^2 +
Theta2^2) - 2(Theta1*Theta2) * cos(Phi1-Phi2)]" distanceEquation="Multiple distance
metrics are possible depending upon the topology"/>
        <element xmi:type="logical:CoordinateSystem"
xmi:id="EAID_55E0A12F_4A1A_421e_ABA8_FC11DB1A3095" name="Spherical_R_CoordSys"
description="The independent R axis of the 3 dimensional (3D) Spherically symmetric
coordinate system." axis="_vZiY1Qg5EeSFspy8Kj3F4Q" axisRelationshipDescription="S3 Right
Handed Orthogonal (R, Azimuth, Inclination)," angleEquation="Alpha = sqrt[(Theta1^2 +
Theta2^2) - 2(Theta1*Theta2) * cos(Phi1-Phi2)]" distanceEquation="Multiple distance
metrics are possible depending upon the topology"/>
        <element xmi:type="logical:CoordinateSystem"
xmi:id="EAID_2EF70F5A_7A56_468e_AC75_6663CE3CB2F4" name="Spherical_Theta_CoordSys"
description="The independent Theta axis of the 3 dimensional (3D) Spherically symmetric
coordinate system." axis="_vZiY1gg5EeSFspy8Kj3F4Q" axisRelationshipDescription="S3 Right
Handed Orthogonal (R, Azimuth, Inclination)," angleEquation="Alpha = sqrt[(Theta1^2 +
Theta2^2) - 2(Theta1*Theta2) * cos(Phi1-Phi2)]" distanceEquation="Multiple distance
metrics are possible depending upon the topology"/>
        <element xmi:type="logical:CoordinateSystem"
xmi:id="EAID_B6E3492E_47BE_44a5_B53B_BC44765EBCCD" name="Spherical_Surface_CoordSys"
description="A spherically symmetric coordinate system for a surface"
axis="_vZiY1Ag5EeSFspy8Kj3F4Q _vZiY1gg5EeSFspy8Kj3F4Q" axisRelationshipDescription="S3
Right Handed Orthogonal (R, Azimuth, Inclination)," angleEquation="Alpha = sqrt[(Theta1^2 +
Theta2^2) - 2(Theta1*Theta2) * cos(Phi1-Phi2)]" distanceEquation="Multiple distance
metrics are possible depending upon the topology"/>

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<element xmi:type="logical:CoordinateSystem" xmi:id="_vZiY1wg5EeSFspy8Kj3F4Q"
name="Spherical_CoordSys" description="A 3 dimensional (3D) Spherically symmetric
coordinate system." axis="_vZiY1Ag5EeSFspy8Kj3F4Q _vZiY1gg5EeSFspy8Kj3F4Q
_vZiY1Qg5EeSFspy8Kj3F4Q" axisRelationshipDescription="S3 Right Handed Orthogonal (R,
Azimuth, Inclination)," angleEquation="Alpha = sqrt[(Theta1^2 + Theta2^2) -
2(Theta1*Theta2) * cos(Phi1-Phi2)]" distanceEquation="Multiple distance metrics are
possible depending upon the topology"/>
<element xmi:type="logical:CoordinateSystemAxis"
xmi:id="_vZiY1Ag5EeSFspy8Kj3F4Q" name="Angular_Inclination_CoordSysAxis" description="The
inclination (or polar) Axis is the set of angles between the zenith direction and the
line segment OP."/>
<element xmi:type="logical:CoordinateSystemAxis"
xmi:id="_vZiY1gg5EeSFspy8Kj3F4Q" name="Angular_Azimuth_CoordSysAxis" description="The
azimuth (or azimuthal) Axis is the set of signed angles measured from the azimuth
reference direction to the orthogonal projection of any line segment OP on the reference
plane."/>
<element xmi:type="logical:CoordinateSystemAxis"
xmi:id="_vZiY1Qg5EeSFspy8Kj3F4Q" name="Angular_Radial_CoordSysAxis" description="The
radius or radial Axis is the set of Euclidian Distance vectors from the origin O to any
point P"/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_E26AFB94_7E63_47b5_A95F_373A0B2B8F3B" name="Discrete">
<element xmi:type="logical:CoordinateSystem"
xmi:id="EAID_9073ABED_00F3_4bf1f_8045_9AE46DBC3456" name="Discrete_CoordSys"
description="Coordinate system used to model sets of discrete states (e.g. Q,E
enumerations)." axis="EAID_DBE6EC88_CB55_4a45_8937_D79C72C5D688"
axisRelationshipDescription="n/a" angleEquation="n/a" distanceEquation="n/a"/>
<element xmi:type="logical:CoordinateSystemAxis"
xmi:id="EAID_DBE6EC88_CB55_4a45_8937_D79C72C5D688" name="Discrete_CoordSysAxis"
description="The axis used to represent a set of discrete states (e.g. Q,E a set of
enumerations)" />
</ldm>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_6E6385F7_641B_446e_BC94_0298C7D73125" name="LogicalValueTypes"
description="The types available to represent the values of Measures">
<element xmi:type="logical:Boolean"
xmi:id="EAID_16DE4A98_8206_47b3_A77D_39227129E528" name="Boolean" description="A type
that can represent only two values, often meaning True or False"/>
<element xmi:type="logical:Character"
xmi:id="EAID_CE8514D2_720F_447f_AA6A_B22659E23666" name="Character" description="A type
representing a single character in some written language"/>
<element xmi:type="logical:Integer"
xmi:id="EAID_372D8BFC_47B1_4385_AD77_6703541E7FAC" name="Integer" description="A whole
number in the range -infinity to +infinity"/>
<element xmi:type="logical:Natural"
xmi:id="EAID_7DE12CF5_1B85_482b_9830_783D356833E9" name="Natural" description="A whole
number ranging from +1 to +infinity; also called "counting numbers""/>
<element xmi:type="logical:NonNegativeReal"
xmi:id="EAID_1EA04603_631A_403e_82FD_D6E5825D1F31" name="NonNegativeReal" description="A
real number ranging from 0 to +infinity"/>
<element xmi:type="logical:Real"
xmi:id="EAID_7CB1E0A3_7D27_45fa_BF9E_22EB15886D68" name="Real" description="A type to
represent any numeric quantity along a continuous line. Real numbers include all rational
and irrational numbers"/>
<element xmi:type="logical:String"
xmi:id="EAID_B93CB919_D464_4577_82EB_0298B395EDB4" name="String" description="A type used
to represent an ordered set of characters in some written language"/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_7F48F8D3_EBBB_43d4_A3FC_28E4C02FD6D7" name="Units">
<element xmi:type="logical:Unit"
xmi:id="EAID_AFB0E821_EDAO_43fa_9BFE_6989D7A150D2" name="CountsPerSecond"
description="Number of events that occur per second"/>
<element xmi:type="logical:Unit"
xmi:id="SDM_56BFF0BA_0CF4_4COB_A403_946C1CF4125C" name="CountsPerMinute"
description="Number of events that occur per minute."/>
<element xmi:type="logical:Unit"
xmi:id="EAID_B3BD94A4_1DCA_49c1_96AB_21E7933947F1" name="KilogramsPerSecond"
description="Rate of change in mass that occur per second"/>

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<element xmi:type="logical:Unit"
xmi:id="SDM_CEF61DF2_E307_43EE_BFE8_EFC76A753125" name="PoundsPerHour" description="Rate
of change in mass that occurs per hour."/>
    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_343D18EE_EB21_4691_988F_57A0F932238C" name="DataRateUnits">
        <element xmi:type="logical:Unit"
xmi:id="EAID_4BD00953_158E_4ebe_B5C2_5D7F99C4C843" name="BitsPerSecond" description="Bits
per second"/>
    </ldm>
    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_E119CB56_8C90_4344_9234_48BC281646E1" name="ElectricChargedDensity">
        <element xmi:type="logical:Unit"
xmi:id="EAID_DED3DC3D_2228_4180_9A4F_CF994B64B6CF" name="CoulombsPerMeter"
description="Coulombs per meter"/>
        <element xmi:type="logical:Unit"
xmi:id="EAID_90D9E4E8_7A91_4dd4_A96E_DF01C3157644" name="CoulombsPerMeterCubed"
description="Coulombs per meter cubed."/>
    <element xmi:type="logical:Unit"
xmi:id="EAID_C784CF8E_F7F8_4370_865A_33FDF5B0CF44" name="CoulombsPerMeterSquared"
description="Coulombs per meter squared"/>
    </ldm>
    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_1155820A_4F2D_4c2a_AE88_C07FB1D7DCEE" name="ElectricCurrentDensity">
        <element xmi:type="logical:Unit"
xmi:id="EAID_1B59A0CB_A750_4fde_B861_3C0FBACB9E7B" name="AmpPerSquareMeter"
description="Unit of measure for representing one amp of electric current flowing through
a material with a cross-sequential area of one square meter."/>
    </ldm>
    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_34A3104E_B9CC_4d0c_B1ED_7A8A9A725886" name="Percentage">
        <element xmi:type="logical:Unit"
xmi:id="EAID_68A9F947_C54C_4c06_84C6_29E302284981" name="Percentage" description="Unit of
measure represented as a number or ratio expressed as a fraction of 100."/>
        <element xmi:type="logical:Unit"
xmi:id="SDM_98DA9F90_0D2C_4FC8_BA7C_42180EF94675" name="PercentPerSecond"
description="Unit of measure for the rate of change of percent per unit second."/>
    </ldm>
    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_141C89BD_8FBF_4ba9_8C07_06EA541A4D65" name="AbsorbedDose">
        <element xmi:type="logical:Unit"
xmi:id="EAID_06F05060_CF06_4f65_A9AF_75CA9D6D4343" name="Grays" description="Unit of
measure for the absorption of on joule of radiation energy by one kilogram or matter."/>
    </ldm>
    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_A48F5144_B237_48e3_95DE_91E8428E64AC" name="AbsorbedDoseRate">
        <element xmi:type="logical:Unit"
xmi:id="EAID_F8CE6A2C_0E47_4f2f_88E0_5F255664DCDA" name="GraysPerSecond"
description="Unit of measure for the rate of the absorption of on joule of radiation
energy by one kilogram or matter over a one second of time."/>
    </ldm>
    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_F0484DCD_1396_4317_A8A3_067DDB8A1CC3" name="Acceleration">
        <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_06176F99_5497_4016_AB99_E148D5C196E8" name="AngularAcceleration">
            <element xmi:type="logical:Unit"
xmi:id="EAID_8864E77B_D4D8_4491_8145_285B1F8959A2" name="DegreesPerSecondPerSecond"
description="Unit of measure for the rate of change of an angular speed in which the base
angular measure unit is degrees."/>
            <element xmi:type="logical:Unit"
xmi:id="EAID_F2444AAF_68C5_4355_8AB0_5BFC0A73975F" name="RadiansPerSecondPerSecond"
description="Unit of measure for the rate of change of an angular velocity in which the
base angular measure unit is radian."/>
        </ldm>
        <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_341B2966_715A_4534_BA74_851528FAF3AE" name="LinearAcceleration">
            <element xmi:type="logical:Unit"
xmi:id="EAID_FE537E8B_388B_421c_8112_91CC5D87E3A1" name="g" description="The nominal
gravitational acceleration of an object in a vacuum near the surface of the Earth. It is
defined by standard as 9.80665 m/s2, which is exactly 35.30394 km/(h·s) (about 32.174
ft/s2, or 21.937 mph/s)."/>

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<element xmi:type="logical:Unit"
xmi:id="EAID_FCADE251_5B0A_4336_9E35_DE698096B06F" name="FeetPerSecondPerSecond"
description="Unit of measure for the rate of change of velocity in which the base
distance measure traveled is feet."/>
    <element xmi:type="logical:Unit"
xmi:id="EAID_9B5484D4_F922_407d_9E61_17E56532FDD8" name="KnotsPerSecond"
description="Unit of measure for the rate of change of velocity in which the base
velocity measure is knots."/>
    <element xmi:type="logical:Unit"
xmi:id="EAID_59A485AE_23F2_4b2d_87E7_18ECB59553EE" name="MetersPerSecondPerSecond"
description="Unit of measure for the rate of change of velocity in which the base
distance measure traveled is meters."/>
</ldm>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_07C807C7_A137_4da8_A9B6_E4317F682AC7" name="AmountOfConcentration">
    <element xmi:type="logical:Unit"
xmi:id="EAID_0B528C0C_B50B_4152_89FE_09BA977E13FE" name="MolesPerCubicMeter"
description="Unit of measure for the number of atoms of a substance per unit volume."/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_92823862_B9DB_4795_8B2E_8C0F397E54C3" name="AmountOfSubstance">
    <element xmi:type="logical:Unit"
xmi:id="EAID_81285D76_2D91_4edd_B41D_009A1301FB63" name="Moles" description="Unit of
measure to express amounts of a chemical substance, defined as the amount of any
substance that contains as many elementary entities as there are atoms in 12 grams of
pure carbon-12."/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_8E0AE736_DA76_4d8e_904C_1A89CB353790" name="Angle">
    <element xmi:type="logical:Unit"
xmi:id="EAID_6BE551B4_AC4C_467d_8264_95EB34EF81FE" name="DegreesOfArc" description="Unit
of measure for a plane angle representing 1/360 of a full rotation. Not an SI unit."/>
    <element xmi:type="logical:Unit"
xmi:id="EAID_B852B3B4_206E_400b_B352_D86D2DC60748" name="Gradians" description="Unit of
measure for a plane angle representing 1/400 of a full rotation. Not an SI unit."/>
    <element xmi:type="logical:Unit"
xmi:id="EAID_8BCEBA5A_6555_4984_B381_F8F96DA34437" name="MinutesOfArc" description="Unit
of measure for angular measurement equal to 1/60 of one degree, because one degree is
1/360 of a circle, one minute of arc is 1/21,600 of a circle."/>
    <element xmi:type="logical:Unit"
xmi:id="EAID_DDC5A152_31FF_4e32_815A_3A1EE216C85A" name="Radians" description="Unit of
measure for angular measurement equal to the length of a corresponding arc of a unit
circle, one radian is just under 57.3 degrees. It is a SI derived unit."/>
    <element xmi:type="logical:Unit"
xmi:id="EAID_D4279E45_927A_442f_AC92_E62BA52F5D2C" name="SecondsOfArc" description="Unit
of measure for angular measurement equal to 1/60 of one minute because one degree is
1/360 of a circle, one minute of arc is 1/21,600 of a circle and one second of arc is
1/1296000."/>
    <element xmi:type="logical:Unit"
xmi:id="EAID_7D11C92B_E44B_451f_BBE2_88A81B7C9D6F" name="Turns" description="Unit of
measure for angular measurement equal to 360 degrees or 2 pi radians. 1 revolution."/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_868CF58F_8777_4443_9E23_8D155F08799B" name="Area">
    <element xmi:type="logical:Unit"
xmi:id="EAID_579A46B3_B398_4030_9A44_1D66192DE8DE" name="Acres" description="Unit of
measure for land area in US and Britain, defined as 1/640 of a square mile."/>
    <element xmi:type="logical:Unit"
xmi:id="EAID_5D6C29C2_C26C_4503_AE5B_AF304582BFAF" name="Barns" description="Unit of
measure for area in nuclear physics expressing the cross sectional are of nuclei and
nuclear reactions. Is approximately the cross sectional area of a uranium's nucleus."/>
    <element xmi:type="logical:Unit"
xmi:id="EAID_90E8AA70_4288_4042_B946_342AAE7B015D" name="Hectares" description="Unit of
measure in the meter system for land area defined as 10,000 square meters."/>
    <element xmi:type="logical:Unit"
xmi:id="EAID_A4DFC00C_AF69_43aa_865D_A4574343F7A1" name="SquareFeet" description="Unit of
measure for area equal to a square measuring one foot on each side, not an SI unit."/>
    <element xmi:type="logical:Unit"
xmi:id="EAID_85A3E015_825D_426b_A14C_6FE8FADD7F5B" name="SquareKilometers"

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description="Unit of measure is a decimal multiple of the surface area measure square
meters, and is a derived SI unit."/>
<element xmi:type="logical:Unit"
xmi:id="EAID_C4A8FCC1_585A_4d82_B7BF_606489503F25" name="SquareMeters" description="Unit
of measure for surface area equal to a square measuring one meter on each side, and is a
derived SI unit."/>
<element xmi:type="logical:Unit"
xmi:id="EAID_8C7E4423_1F5E_47c9_A4FE_AC528FC574E8" name="SquareMiles" description="Unit
of measure for area equal to the area of a square of on statute mile, not an SI unit."/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_1D757B7B_AA6B_475c_BC94_5ED6388E1449" name="CatalyticActivity">
<element xmi:type="logical:Unit"
xmi:id="EAID_67C6498E_77C1_46dd_8018_6577637A7D29" name="Katals" description="Unit of
measure for quantifying the catalytic activity of enzymes and other catalysts, is SI unit
of catalytic activity."/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_3531245C_4691_4b68_8CE9_55B9BABF3E4A" name="CatalyticActivityConcentration">
<element xmi:type="logical:Unit"
xmi:id="EAID_DFCFB2F0_47C7_4242_8272_E2F55BE621CB" name="KatalsPerCubicMeter"
description="Unit of measure for quantifying catalytic activity per unit or volume."/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="SDM_5F57D0EA_AC4C_4C5B_B222_C840B6D8DF2B" name="Covariance">
<element xmi:type="logical:Unit"
xmi:id="SDM_8415168A_2411_46A0_A978_93B03A6F8D8F" name="MeterRadians" description="Unit
of measure to support position-orientation covariances."/>
<element xmi:type="logical:Unit"
xmi:id="SDM_BCF7F806C_3BB7_4138_A289_2EE305A2496E" name="MetersSquaredPerSecondSquared"
description="Unit of measure to support velocity-velocity covariances."/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_7CE279C0_C759_484e_A956_5A39A5BBB743" name="Density">
<element xmi:type="logical:Unit"
xmi:id="EAID_8E188C8D_CA5B_49d9_B4B7_1E01E451F88D" name="CoulombsPerCubicMeter"
description="Unit of measure for representing one coulomb of electric charge per one
cubic meter of volume."/>
<element xmi:type="logical:Unit"
xmi:id="EAID_E991E9BF_F0B8_4b0f_80B6_9BCA1639DC0C" name="CoulombsPerSquareMeter"
description="Unit of measure for representing one coulomb of electric charge per one
square meter of surface."/>
<element xmi:type="logical:Unit"
xmi:id="EAID_16B1EB25_69FB_469a_B7CD_6D74B1A9AA42" name="Density" description="Unit of
measure represented as mass per unit volume. The SI unit of kilogram per cubic meter
(kg/m3) and the cgs unit of gram per cubic centimeter (g/cm3) are probably the most
commonly used units for density. 1,000 kg/m3 equals 1 g/cm3."/>
<element xmi:type="logical:Unit"
xmi:id="EAID_24DF0495_0101_413a_8B3E_5132DFC4095F" name="JoulesPerCubicMeter"
description="Unit of measure for representing useful energy in joules released from on
cubic meter of fuel volume during complete combustion."/>
<element xmi:type="logical:Unit"
xmi:id="EAID_BE2795B1_06AD_4261_B7E8_8A4F4D94FC84" name="KilogramsPerSquareMeter"
description="Unit of measure for representing surface density in mass per unit area."/>
<element xmi:type="logical:Unit"
xmi:id="EAID_3B4B6FB_6B1F_4b41_8EAA_24C1CA377436" name="WattsPerSquareMeter"
description="Unit of measure for representing the rate one watt of heat energy to flow
through one square meter of area normal to the direction of heat flux. Derived SI
Unit."/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_2666FD95_0B38_4c4a_8681_F3A9B32C257E" name="DerivedUnits">
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_31A71A77_D00A_4a7c_8BC2_24DEA8414740" name="Ratios">
<element xmi:type="logical:Unit"
xmi:id="EAID_EB709A75_CD50_4887_8E40_086CE821CBA" name="AmpPerMeter" description="Unit
of measure for representing a magnetic field strength. Derived SI unit"/>
<element xmi:type="logical:Unit"
xmi:id="EAID_D51FFEB5_1DE1_416b_8794_3EBECB2C3ABC" name="Bels" description="Unit of
measure for representing the comparison of the power levels in electrical communication
or sound."/>

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<element xmi:type="logical:Unit"
xmi:id="EAID_311835BB_B20D_434d_8CBD_F5E857464151" name="CubicMetersPerKilogram"
description="Unit of measure for representing specific volume of a substance as the ratio
of the substance's volume per mass, the reciprocal of density."/>
    <element xmi:type="logical:Unit"
xmi:id="EAID_00C18C06_4B39_4c90_97AC_8F3E5B3A70BF" name="Decibels" description="Unit of
measure for representing the intensity of sound."/>
        <element xmi:type="logical:Unit"
xmi:id="SDM_8417AD2B_7703_47F2_A180_04B970F3EAA1" name="DecibelHertz" description="Unit
of measure for representing carrier-to-noise density ratio."/>
            <element xmi:type="logical:Unit"
xmi:id="SDM_19A55A3C_3D1A_4BCD_B752_76969702B21B" name="DecibelWatt" description="The
decibel watt or dBW is a unit for the measurement of the strength of a signal expressed
in decibels relative to one watt."/>
                <element xmi:type="logical:Unit"
xmi:id="EAID_825A32F7_E47C_467e_8BF1_6A7D8010ABE6" name="JoulesPerKelvin"
description="Unit of measure for representing heat capacity or entropy. Derived SI
unit."/>
                    <element xmi:type="logical:Unit"
xmi:id="EAID_5D20F6EE_0253_4544_87B4_058BA94B36AD" name="JoulesPerKilogram"
description="Unit of measure for representing specific energy per unit mass. Derived SI
Unit."/>
                        <element xmi:type="logical:Unit"
xmi:id="EAID_784D140F_A7CF_48d8_8732_26AD73355194" name="JoulesPerKilogramKelvin"
description="Unit of measure for representing specific heat capacity, which is the heat
capacity per unit mass of a material. Derived SI Unit"/>
                            <element xmi:type="logical:Unit"
xmi:id="EAID_E998A459_D274_4ecc_A138_88BE059E72A3" name="KilogramsPerCubicMeter"
description="Unit of measure for material density. Derived SI Unit"/>
                                <element xmi:type="logical:Unit"
xmi:id="EAID_40659D46_18A7_4bdf_A4E2_B6DB4B5FE62B" name="LitersPerHour" description="Unit
of measure for volume flow rate."/>
                                    <element xmi:type="logical:Unit"
xmi:id="EAID_02B18938_8AD8_4ec0_A8C2_B7DFFCC1CE8E" name="MillimetersPerHour"
description="Unit of measure for representing the number of millimeters traveled in one
hour used in speed and velocity metrics."/>
                                        <element xmi:type="logical:Unit"
xmi:id="EAID_6FE784C0_3B93_4de4_B23A_0A5E83DCDFBA" name="Nepers" description="Unit of
measure for representing the ratio of two current, voltages, or analogous quantities. Not
an SI unit."/>
                                            <element xmi:type="logical:Unit"
xmi:id="EAID_393B5A6F_990A_4186_92E8_F6BA2012123D" name="NewtonsPerMeter"
description="Unit of measure for representing surface tension in force per unit length.
SI Derived unit"/>
                                                <element xmi:type="logical:Unit"
xmi:id="EAID_E4A57064_F91E_4cea_8915_E2586756CC3E" name="RevolutionsPerMinute"
description="Unit of measure for representing the frequency of rotation."/>
                                                    <element xmi:type="logical:Unit"
xmi:id="EAID_9948928A_E5D5_4399_81B8_D1B7A8D0D017" name="WattsPerSteradian"
description="Unit of measure for representing the radiant intensity of an object."/>
                                                        </ldm>
                                                    </ldm>
                                                <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_BC922F67_DA3D_4cf0_8EB2_27B5FCFE7E09" name="DryVolume">
                                                    <element xmi:type="logical:Unit"
xmi:id="EAID_4E83620B_DF8D_4a73_BCD8_CFCE5F8CE838" name="Bushels" description="Unit of
measure for representing the capacity used for dry goods."/>
                                                        <element xmi:type="logical:Unit"
xmi:id="EAID_3C7531E9_39D0_4c97_92DF_6EE768E48340" name="DryBarrels" description="Unit of
measure for representing the volume for dry materials."/>
                                                            <element xmi:type="logical:Unit"
xmi:id="EAID_03EC1A39_CC6B_425c_A594_99607CEC301D" name="Gallons" description="Unit of
measure for representing the capacity of liquid measures."/>
                                                                <element xmi:type="logical:Unit"
xmi:id="EAID_66072D3A_A38C_4f03_B011_ACBCB092388E" name="Pecks" description="Unit of
measure for representing the capacity used for dry goods, equal to 1/4 of a bushel."/>
                                                                    <element xmi:type="logical:Unit"
xmi:id="EAID_0B14534E_61DC_4b30_BA8A_1B4CAEE4707B" name="Pints" description="Unit of
measure for representing the capacity of liquid or dry goods, equal to 1/2 of a quart."/>
                                                                <element xmi:type="logical:Unit"
xmi:id="EAID_3716B9AA_FCB9_48c8_B7C4_6A14551BE748" name="Quarts" description="Unit of

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measure for representing the capacity of liquid or dry goods, equal to 1/4 of a
gallon."/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_48235C2B_6A88_44d9_8D89_C6B2AB511F64" name="ElectricCharge">
<element xmi:type="logical:Unit"
xmi:id="EAID_611BFBF3_9651_4770_BEED_69B1E5BA509A" name="AmpHour" description="Unit of
measure for representing the electric charge noting the amount of electricity transferred
by a current of one amp in one hour."/>
<element xmi:type="logical:Unit"
xmi:id="EAID_F0BEB8DA_1C6E_43a8_A030_C04F74B8E417" name="Coulombs" description="Unit of
measure for representing the electric charge, equal to the quantity of electricity
conveyed in one second by a current of one amp."/>
<element xmi:type="logical:Unit"
xmi:id="EAID_8837C190_8C86_48d4_88A1_AB1DA8E83D36" name="MilliAmpHours" description="Unit
of measure for representing the electric charge which is 1000th of an amp hour."/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_17544AD5_99C8_431e_9230_A18EB54B2344" name="ElectricCurrent">
<element xmi:type="logical:Unit"
xmi:id="EAID_1BC72413_1442_4d9a_BBC6_5D13EA4B334F" name="Amp" description="Unit of
measure for representing the rate at which electric current flows."/>
<element xmi:type="logical:Unit"
xmi:id="EAID_C5C03122_CF73_47ec_8478_2807E78D3CB0" name="MilliAmp" description="Unit of
measure for representing small electric currents, 1000th of an amp."/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_D765AAFC_D4C8_42a2_9ACB_45F8FDB3C6C9" name="ElectricFieldStrength">
<element xmi:type="logical:Unit"
xmi:id="EAID_F891B933_289F_4ef0_9131_3FF6843D84F4" name="VoltsPerMeter" description="Unit
of measure for representing electric field strength. An SI Unit."/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_2F1A2D15_E3D5_481a_B6B2_21EFA023BBB2" name="ElectricalCapacitance">
<element xmi:type="logical:Unit"
xmi:id="EAID_2DEC664F_516A_499d_A29B_661CC1D8C7B2" name="Farads" description="Unit of
measure for representing the capacitance of a capacitor across which one coulomb of
charge causes a potential difference of one volt. An SI unit."/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_F21DDA2E_6B43_4465_AC12_4EE82DAD6D9F" name="ElectricalConductance">
<element xmi:type="logical:Unit"
xmi:id="EAID_35FE1B11_2FBC_48c9_BC83_5FBACCC37648" name="Siemens" description="Unit of
measure for representing electrical conductance equal to 1 reciprocal ohm. An SI unit."/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_DD382B0_A1C7_4ad2_B829_1460CDE07A8B" name="ElectricalResistance">
<element xmi:type="logical:Unit"
xmi:id="EAID_5ED25A27_0996_4f32_92CE_6FCC0BAB86A9" name="KiloOhms" description="Unit of
measure for representing electrical resistance equal to 1000 ohms."/>
<element xmi:type="logical:Unit"
xmi:id="EAID_51EC828B_E415_4906_8F6E_022EEF6545A7" name="MegaOhms" description="Unit of
measure for representing electrical resistance equal to 1,000,000 ohms."/>
<element xmi:type="logical:Unit"
xmi:id="EAID_86DA43C5_3454_4f35_9359_E73F1FA7A235" name="Ohms" description="Unit of
measure for representing electrical resistance of a circuit in which an electromotive
force of one volt maintains a current of one amp. An SI unit."/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_6CDBE16D_652A_4e06_AB94_87B0AB825592" name="Energy">
<element xmi:type="logical:Unit"
xmi:id="EAID_6BEAC65A_17AD_49d0_A7D3_0A49C14B7489" name="Joules" description="Unit of
measure for representing the work done by a force of one newton when its point of
application moved one meter in the direction of action of the force. An SI Unit."/>
<element xmi:type="logical:Unit"
xmi:id="EAID_ABE41825_9C94_44f1_8193_DA019AF6540E" name="KilowattHours" description="Unit
of measure for representing electrical energy equivalent to a power consumption of 1,000
watts for 1 hour."/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_C4EEB582_915F_457c_90BA_1CDB5A7D47B6" name="Entropy"/>
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        <lsm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_2D1B5992_D34F_475c_AC12_E41665A3D76D" name="EquivalentDose">
        <element xmi:type="logical:Unit">
xmi:id="EAID_FEF61F65_30EA_4429_BF95_EC1A4A8AC7E7" name="Sieverts" description="Unit of
measure for representing dose equivalent, equal to an effective dose of a joule of energy
per kilogram of recipient mass. An SI Unit."/>
    </lsm>
    <lsm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_97441F90_FD0E_471e_A91C_E6A630DD00CA" name="Exposure">
        <element xmi:type="logical:Unit">
xmi:id="EAID_6440D768_FDAB_40bb_8BAC_9FA4C7C72394" name="CoulombsPerKilogram"
description="Unit of measure for representing radiation exposure in which electrical
charges (ion pairs) in a kilogram of air. A derived SI unit."/>
    </lsm>
    <lsm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_EADEC90A_9D10_4328_9A03_84D925C7EDE4" name="FluidVolume">
        <element xmi:type="logical:Unit">
xmi:id="EAID_4DD8AE21_0EB0_492f_8BBF_048D399C924F" name="CupsUS" description="Unit of
measure for representing the customary cup for cooking ingredients and is defined as 1/2
of a US Pint."/>
        <element xmi:type="logical:Unit">
xmi:id="EAID_F1B57A45_867B_4808_936F_6C4F1F50EF10" name="FluidDramsUS" description="Unit
of measure for representing the volume or capacity in the apothecary system, equal to 1/8
of a fluid ounce."/>
        <element xmi:type="logical:Unit">
xmi:id="EAID_0976132A_E70B_4d8f_B219_B8E01258897D" name="FluidOuncesUS" description="Unit
of measure for representing the volume or capacity in the US Customary System used liquid
measure."/>
        <element xmi:type="logical:Unit">
xmi:id="EAID_13E19836_0B3F_4546_8FB5_5C2F7170F7F6" name="GallonsUS" description="Unit of
measure for representing the liquid volume or capacity in the US Customary System equal
to 4 quarts."/>
        <element xmi:type="logical:Unit">
xmi:id="EAID_E48F9A6C_D5FF_4ee5_AD73_429FF52D50D7" name="GillsUS" description="Unit of
measure for representing the liquid volume, defined as 1/2 a cup in the US Customary
System."/>
        <element xmi:type="logical:Unit">
xmi:id="EAID_A5C59AE1_1DF6_4cf7_8D52_99A1D52461BA" name="LiquidBarrels" description="Unit
of liquid measure for representing 42 gallons or 5.6145833 cubic feet."/>
        <element xmi:type="logical:Unit">
xmi:id="EAID_253BAAF2_22DF_4e68_B114_3947BF549D8C" name="Liters" description="Unit of
measure for representing the volume of on kilogram of pure water at 4 Degrees Celsius and
standard atmospheric pressure."/>
        <element xmi:type="logical:Unit">
xmi:id="EAID_DA6FF1E2_BE3B_4d32_B429_82D068FE4855" name="Minims" description="Unit of
measure for representing the smallest unit of liquid measure 1/60 of a fluid dram, or
roughly equivalent to one drop."/>
        <element xmi:type="logical:Unit">
xmi:id="EAID_11AAA861_4C74_4f26_BA69_9D7BA3EAC5FD" name="OilBarrels" description="Unit of
measure for representing an oil barrels holding 42 US gallons."/>
        <element xmi:type="logical:Unit">
xmi:id="EAID_896D563A_1CED_48f3_AD92_234DF3ADEE9F" name="PintsUS" description="Unit of
measure for representing volume or capacity in US Customary System, used in liquid
measure and equal to 1/8 gallons."/>
        <element xmi:type="logical:Unit">
xmi:id="EAID_9448BB79_C145_432f_90B7_2535DAB51CED" name="QuartsUS" description="Unit of
measure for representing volume or capacity in US Customary System, used in liquid
measure and equal to 1/4 of a US gallon."/>
        <element xmi:type="logical:Unit">
xmi:id="EAID_0BC25F42_D33B_4780_82D8_7508088534AE" name="Tablespoons" description="Unit
of measure for representing 1/2 a fluid ounce or 3 teaspoons typically used as a measure
for cooking."/>
        <element xmi:type="logical:Unit">
xmi:id="EAID_B5226835_2703_4f5b_9837_13DE5347B9C6" name="Teaspoons" description="Unit of
measure for representing a small spoon used in cooking equivalent 1/6 fluid ounce."/>
    </lsm>
    <lsm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_4D16D625_6245_4ddc_A597_C7A4FE9AA71B" name="Force">
        <element xmi:type="logical:Unit">
xmi:id="EAID_F4C79394_2908_4acb_9317_6E30C94B489D" name="Dy whole" description="Unit of

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measure for representing a unit of force specified in the Centimeter Gram Second system
of units."/>
<element xmi:type="logical:Unit"
xmi:id="EAID_3F9CBF28_F842_4896_ABEC_B4498760BD80" name="Newtons" description="Unit of
measure for representing the force that would give a mass of one kilogram an acceleration
of one meter per second per second and is equivalent to 100,000 dynes. An SI unit."/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_A521DBEC_C8C6_4ab0_A723_98FF5C6418B9" name="Frequency">
<element xmi:type="logical:Unit"
xmi:id="EAID_F7DB7C83_5B79_4a4b_AEEE_FF7AAB4861E5" name="GigaHertz" description="Unit of
measure for representing frequency used to measure the clock rate of modern digital
logic, equal to one billion hertz."/>
<element xmi:type="logical:Unit"
xmi:id="EAID_161469CC_7BFE_4206_BF8E_17E105C1A679" name="Hertz" description="Unit of
measure for representing frequency, equal to one cycle per second. An SI unit."/>
<element xmi:type="logical:Unit"
xmi:id="EAID_2DC04833_07D0_462c_B494_1AAF26BAC3F8" name="KiloHertz" description="Unit of
measure for representing frequency equivalent to 1,000 cycles per second or 1,000
hertz."/>
<element xmi:type="logical:Unit"
xmi:id="EAID_B757844F_7DD2_4be1_B0B0_9AAC190AA821" name="MegaHertz" description="Unit of
measure for representing one million hertz, as measure of frequency of radio
transmissions or transmission speeds of electronic devices."/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_6A88C4F4_1721_4f53_BB31_F3254300B00D" name="HeatCapacity"/>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_FBA40BF_3DE0_4d3f_93DF_689E6D11CE27" name="Illuminance">
<element xmi:type="logical:Unit"
xmi:id="EAID_65D4712B_C8F8_4e24_98E0_32A8040A0F94" name="Lux" description="Unit of
measure for representing illumination equal to the direct illumination on a surface that
is equal to one lumen per square meter. An SI unit."/>
<element xmi:type="logical:Unit"
xmi:id="EAID_01CFBEEB_B898_4df8_995C_036BDB6C4188" name="Phot" description="Unit of
measure for representing illuminance equal to one lumen per square centimeter in the
Centimeter Gram Second system."/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_A3PBB11C_EC48_4816_9676_9C1B6593411C" name="Inductance">
<element xmi:type="logical:Unit"
xmi:id="EAID_56F719FC_B33B_44e1_9D77_5D3C3D692182" name="Henrys" description="Unit of
measure for representing inductance equal to an electromotive force of one volt in a
closed circuit with a uniform rate of change of current of one amp per second. An SI
unit."/>
<element xmi:type="logical:Unit"
xmi:id="EAID_37066C1_9515_4b75_B009_12F418FEA4B0" name="MicroHenrys" description="Unit
of measure for representing inductance equal to 1 millionth of a henry."/>
<element xmi:type="logical:Unit"
xmi:id="EAID_3B3B347_3754_436c_9C41_A0E33CD813ED" name="MilliHenrys" description="Unit
of measure for representing inductance equal to 1 thousandth of a henry."/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_64408E5C_0BF5_48cd_A9C8_196D035D628E" name="Length">
<element xmi:type="logical:Unit"
xmi:id="EAID_A763DED3_CE36_462f_9C64_C385D35A8F03" name="Angstroms" description="Unit of
measure for representing length equal to one hundred-millionth of a centimeter mainly to
express wavelengths and interatomic distances."/>
<element xmi:type="logical:Unit"
xmi:id="EAID_BB032E2F_0B77_4617_BEB8_CBF2872478B8" name="AstronomicalUnits"
description="Unit of measure for representing the mean distance between the Earth and the
Sun, equal to 149.6 million kilometers."/>
<element xmi:type="logical:Unit"
xmi:id="EAID_55B68600_CD69_459e_825D_A0EF0067E79A" name="Cables" description="Unit of
measure for representing length as a nautical unit of measure equal to one tenth of a
nautical mile or 100 fathoms."/>
<element xmi:type="logical:Unit"
xmi:id="EAID_F6A1CE92_DD0B_4f03_8AEC_CE88E62A1C0D" name="Centimeters" description="Unit
of measure for representing length equal to one hundredth of a meter."/>

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<element xmi:type="logical:Unit"
xmi:id="EAID_19B91A7E_DD89_458f_BA4F_63B55DCDD16A" name="Chains" description="Unit of
measure for representing a geodetic measure used for land survey, equal to 66 feet."/>
<element xmi:type="logical:Unit"
xmi:id="EAID_90F83E4E_186E_43ce_9C8C_9E618E60F133" name="DataMiles" description="Unit of
measure for representing radar related subjects and in JTIDS, is equal to 6000 feet or
0.987 nautical miles."/>
<element xmi:type="logical:Unit"
xmi:id="EAID_A41BDA35_F482_48e1_8588_B676BF4C8011" name="Fathoms" description="Unit of
measure for representing depth of water equal to 6 feet."/>
<element xmi:type="logical:Unit"
xmi:id="EAID_4B11E95B_FBAD_48c8_A03C_B7E641F18AFE" name="Feet" description="Unit of
measure for representing length as multiple units of the international foot, equal to 12
inches."/>
<element xmi:type="logical:Unit"
xmi:id="EAID_114E6AF4_7196_454e_AF95_281046536321" name="Inches" description="Unit of
measure for representing length in the imperial and US customary systems of
measurement."/>
<element xmi:type="logical:Unit"
xmi:id="EAID_9782EE69_B788_462b_8852_563747B1F80F" name="Kilometers" description="Unit of
measure for representing length equal to 1000 meters."/>
<element xmi:type="logical:Unit"
xmi:id="EAID_0DA0C3BF_9EF2_44c7_99A8_F9D8677BA783" name="Links" description="Unit of
measure for representing length equal to 7.92 survey inches formerly used in land
surveying."/>
<element xmi:type="logical:Unit"
xmi:id="EAID_0A9F29A7_3ABC_4790_9E6D_CEB6C7DBE5E" name="Meters" description="Unit of
measure for representing length equal to the distance traveled in a vacuum by light in
1/299, 782, 458 second or to about 39.37 inches. An SI Unit."/>
<element xmi:type="logical:Unit"
xmi:id="EAID_3A901F73_BD0D_4479_AAF0_58AB0A05E545" name="MetricMiles" description="Unit
of measure for representing length in international athletics of 1500 meters."/>
<element xmi:type="logical:Unit"
xmi:id="EAID_380536E1_27EB_4939_AA22_68976D95172B" name="Millimeters" description="Unit
of measure for representing length equal to one thousandth of a meter."/>
<element xmi:type="logical:Unit"
xmi:id="EAID_705F2A05_3E50_4ecd_AC15_ED90D7540C76" name="NauticalMiles" description="Unit
of measure for representing length at sea or air travel equal to 1.15 miles"/>
<element xmi:type="logical:Unit"
xmi:id="EAID_27B71847_5DA3_49e8_9ECD_0965941CC914" name="ReciprocalMeters"
description="Unit of measure for representing a measure of the shape of a curved surface
equal to the reciprocal of the radius of curvature of a surface in meters."/>
<element xmi:type="logical:Unit"
xmi:id="EAID_337EB82F_0B9D_44ec_963D_16B87BDBE65E" name="Rods" description="Unit of
measure for representing length equal to 5 1/5 yards or 16 1/2 feet used in land
surveying."/>
<element xmi:type="logical:Unit"
xmi:id="EAID_721BF4F7_FF61_4e7e_93A4_4708E22C0C4F" name="StatuteMiles" description="Unit
of measure for representing length on land in English speaking countries equal to 5,280
feet."/>
<element xmi:type="logical:Unit"
xmi:id="EAID_25E89165_B7E4_4b86_A7F5_CB20E507EE6F" name="Yards" description="Unit of
measure for representing length in the US Customary and British Imperial Systems equal to
3 feet."/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_C13D2921_9AB4_407a_B3ED_BB3F5CB60DFA" name="Luminance">
<element xmi:type="logical:Unit"
xmi:id="EAID_95E8CD97_D12C_43b4_AC04_AEFE6A88D852" name="CandelaPerSquareMeter"
description="Unit of measure for representing light emitted per unit area, commonly used
to specify the brightness of a display device. An SI unit."/>
<element xmi:type="logical:Unit"
xmi:id="EAID_C1D5EE04_3949_4231_877F_74D1CE7E8C39" name="Stilbs" description="Unit of
measure for representing luminance in the Centimeter Gram Seconds system for objects that
are not self-luminous, equal to one candela per square centimeter."/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_C4AE669F_20BA_483f_A73F_0C3FFDE10B93" name="LuminousFlux">
<element xmi:type="logical:Unit"
xmi:id="EAID_4B042F46_5BE0_4555_BE22_C079264ECE1E" name="Lumens" description="Unit of
measure for representing luminous flux, equal to the amount of light emitted per second

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in a unit solid angle of on steradian from a uniform source of one candela. An SI
unit."/>
    </ldm>
    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_C8A344B6_9D5F_4024_9583_19169181C457" name="LuminousIntensity">
        <element xmi:type="logical:Unit"
xmi:id="EAID_846F619C_9BC7_40b2_AAA5_3CD2222F84CF" name="Candelas" description="Unit of
measure for representing luminous intensity emitted by a light source in a particular
direction, weighted by the luminosity function. An SI Unit."/>
    </ldm>
    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_A91A24BA_052C_4046_B78B_73C36C479497" name="MagneticField">
        <element xmi:type="logical:Unit"
xmi:id="EAID_4D37723D_ACC0_44e7_B1C7_6EB897E4F748" name="Oersteds" description="Unit of
measure for representing magnetic field strength in the Centimeter Gram Second system."/>
        <element xmi:type="logical:Unit"
xmi:id="EAID_4733852F_C574_42b8_B6CD_6A665A869BCF" name="Teslas" description="Unit of
measure for representing magnetic flux density equal to a flux of one weber in an area of
one square meter. An SI unit."/>
    </ldm>
    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_B6DFB41D_2B7F_44a2_AA9A_EF10F98EC4DA" name="MagneticFlux">
        <element xmi:type="logical:Unit"
xmi:id="EAID_1D856CCC_D134_490e_A26B_A55DE73BD59C" name="Maxwells" description="Unit of
measure for representing magnetic flux equal to the flux through one square centimeter
normal to a field of one gauss, in the Centimeter Gram Second system."/>
        <element xmi:type="logical:Unit"
xmi:id="EAID_FC322DA3_AB79_4c7d_8736_EC76A47812A8" name="Webers" description="Unit of
measure for representing magnetic flux equal to the flux that produces in a circuit of
one turn an electromotive force of one volt, when the flux is uniformly reduced to zero
within one second. An SI unit."/>
    </ldm>
    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_162DEF21_C862_442e_B0C3_3A2149F72396" name="MagneticFluxDensity">
        <element xmi:type="logical:Unit"
xmi:id="EAID_7FBDC60_82FF_4291_993B_0247FE33C000" name="Gauss" description="Unit of
measure for representing magnetic flux density equal one Maxwell per square centimeter,
in the Centimeter Gram Second system."/>
    </ldm>
    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_8145F73A_1151_4a74_A2CB_F0A732321088" name="Mass">
        <element xmi:type="logical:Unit"
xmi:id="EAID_353F519A_9F65_47ce_A46C_FFA8E2555DEA" name="Dalton_UnifiedAtomicMassUnits"
description="Unit of measure for representing mass on an atomic or molecular scale
defined as one twelfth of the rest mass of an unbound atom of carbon-12 in its nuclear
and electronic ground state."/>
        <element xmi:type="logical:Unit"
xmi:id="EAID_D7D0A1EB_DF28_4ed9_B090_C877DCDEEDF0" name="ElectronMass" description="Unit
of measure for representing electron rest mass is an atomic fundamental physical constant
is defined as the mass of a stationary electron."/>
        <element xmi:type="logical:Unit"
xmi:id="EAID_E389C2FD_BCCD_4263_AF43_474D39577BFE" name="Grams" description="Unit of
measure for representing a metric unit of mass equal to one thousandth of a kilogram."/>
        <element xmi:type="logical:Unit"
xmi:id="EAID_A21827D1_48AF_4e25_A534_D2CDAE199D76" name="KiloGrams" description="Unit of
measure for representing the mass equal to the International Prototype of the
Kilogram."/>
        <element xmi:type="logical:Unit"
xmi:id="EAID_5B6C4513_5B50_45de_904F_CC6838B799B7" name="Milligrams" description="Unit of
measure for representing a metric unit of mass equal to one thousandth of a gram."/>
        <element xmi:type="logical:Unit"
xmi:id="EAID_2B22C06E_920A_4f7d_A448_80257FE3E92C" name="Tonnes" description="Unit of
measure for representing a metric unit of mass equal to 1,000 kilograms or 2, 240 pounds.
A non-SI unit."/>
    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_AF92DCDD_8F89_4f00_9B77_3E15B22C9A2C" name="Avoirdupois">
        <element xmi:type="logical:Unit"
xmi:id="EAID_6313EB2C_C1DF_4bb8_909E_706066DAC8C7" name="AvoirdupoisGrains"
description="Unit of measure for representing a unit of 1/7000 of a pound from the
avoirdupois system based on the 16 ounce pound or 7,000 grains."/>

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        <element xmi:type="logical:Unit"
xmi:id="EAID_E2830A10_28D1_42e5_869C_C877BA89B178" name="Drams" description="Unit of
measure for representing a unit of mass of 1/256 of a pound or 1/16 of an ounce."/>
        <element xmi:type="logical:Unit"
xmi:id="EAID_EBE1D89F_3A41_4039_965B_9C14FD995D1D" name="Hundredweights"
description="Unit of measure for representing a unit of mass equal to 100 pounds defined
and used in the US Customary System."/>
        <element xmi:type="logical:Unit"
xmi:id="EAID_05A0CF20_2537_4082_9DA0_CEC3B171F99D" name="LongHundredweights"
description="Unit of measure for representing a unit of mass equal to 112 pounds defined
and used in the Imperial System."/>
        <element xmi:type="logical:Unit"
xmi:id="EAID_40CDD4FC_7078_48ee_B9D8_D6DD15EB6D57" name="LongTons" description="Unit of
measure for representing a unit of weight equal to 2240 pounds used in the Imperial
System."/>
        <element xmi:type="logical:Unit"
xmi:id="EAID_E0C37101_E706_4367_B997_F415C16EBB5A" name="Ounces" description="Unit of
measure for representing an avoirdupois unit of weight equal to 1/16 of an avoirdupois
pound or 437.5 grains."/>
        <element xmi:type="logical:Unit"
xmi:id="EAID_2B44DABD_6782_433a_8B99_8AB710AFAC31" name="Pounds" description="Unit of
measure for representing an avoirdupois unit of weight equal to 7000 grains."/>
        <element xmi:type="logical:Unit"
xmi:id="EAID_A6E38DAD_887B_4b79_8292_CD090E037FB9" name="Tons" description="Unit of
measure for representing a unit of weight equal to 2000 pounds used in the US Customary
System."/>
    </ldm>
    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_E452AD3E_E6EF_48a3_9000_A486BFD74208" name="Troy">
        <element xmi:type="logical:Unit"
xmi:id="EAID_29152C26_65FA_4226_93D5_214F28E63E10" name="TroyGrains" description="Unit of
measure for representing a unit of weight used for precious metals and gemstones equal to
1/60 dram or equal to the avoirdupois grain."/>
        <element xmi:type="logical:Unit"
xmi:id="EAID_DCB6C9FA_27ED_4dc0_99C3_5BBAF1C6C58B" name="TroyOunces" description="Unit of
measure for representing a unit of weight used for precious metals and gemstones equal to
480 grains."/>
        <element xmi:type="logical:Unit"
xmi:id="EAID_74D51E3B_0B05_4b5b_B9E4_0F2848DD100C" name="TroyPounds" description="Unit of
measure for representing a unit of weight used for precious metals and gemstones equal to
5,760 grains."/>
    </ldm>
    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_523ABA87_04E0_4de7_B3FA_D0A3D1468D89" name="MassConcentration"/>
    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_A52F3819_F68E_49a2_AE92_3000B8873476" name="MolarEnergy">
        <element xmi:type="logical:Unit"
xmi:id="EAID_5E1C4348_C669_4229_A707_90C0BE07D7B1" name="JoulesPerMole" description="Unit
of measure for representing the measure of the energy per amount of material. An SI
derived unit."/>
    </ldm>
    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_AF1BEB28_2C68_4f7a_A654_1A436CFDE512" name="MolarEntropy">
        <element xmi:type="logical:Unit"
xmi:id="EAID_F578A32F_EBCB_4a34_A6DB_0BFD0E4EEDCE" name="JoulesPerMoleKelvin"
description="Unit of measure for representing molar heat capacity defining the amount of
heat needed to increase the temperature of one mole of a substance by one degree."/>
    </ldm>
    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_C0095EC_762D_4025_97A8_93F26514E05A" name="MomentOfForce">
        <element xmi:type="logical:Unit"
xmi:id="EAID_C0B1C69D_4742_4acf_82CD_DB92D5878FAA" name="NewtonMeters" description="Unit
of measure for representing torque resulting from a force of one newton applied
perpendicularly to a moment arm which is one meter long. An SI unit."/>
    </ldm>
    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_B5F13586_8376_4642_8FF5_D7F05C886A5B" name="Power">
        <element xmi:type="logical:Unit"
xmi:id="EAID_ACAA2155_27C3_4a8d_9F84_17451EC9DE42" name="Watts" description="Unit of
measure for representing the power in an electric circuit in which the potential

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difference is one volt and the current one amp., equal to one joule per second and is an SI unit."/>

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<element xmi:type="logical:Unit"
xmi:id="SDM_C0C083BC_8B9E_4A59_B0FD_B16B72870BB2" name="MetricHorsepower"
description="One metric horsepower as the power to raise a mass of 75 kilograms against the Earth's gravitational force over a distance of one metre in one second: 75 kg · 9.80665 m/s² · 1 m / 1 s = 75 kgf·m/s = 1 PS. This is equivalent to 735.49875 W."/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_20724726_250C_4ff4_B6D2_8A7FA5801793" name="Permeability">
<element xmi:type="logical:Unit"
xmi:id="EAID_88F0F618_A2DD_4536_921F_6D2E6CA1CD0D" name="HenrysPerMeter"
description="Unit of measure for representing the permeability of a material surrounded by a single turn of a flat sheet conductor including an area of one square meter and length one meter which gives an inductance of one henry. A Derived SI Unit."/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_53C9FC83_79BD_4e7e_A5D0_420F11424DC8" name="Permittivity">
<element xmi:type="logical:Unit"
xmi:id="EAID_7A1862E4_E85E_46d5_8A59_F50EFBBE9131" name="FaradsPerMeter"
description="Unit of measure for representing the resistance encountered when forming an electric field in a medium. An SI derived unit."/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_4B7EA033_0489_40cf_B20F_DBAA28D250A53" name="Pressure">
<element xmi:type="logical:Unit"
xmi:id="EAID_C28AD0FA_5435_4be9_BC05_F718E801C001" name="Bars" description="Unit of measure for representing pressure equal to a million dynes per square centimeter used in meteorology to report atmospheric pressure."/>
<element xmi:type="logical:Unit"
xmi:id="EAID_B12A36E4_D202_4eca_913A_41313B5C69F0" name="FlightLevel" description="Unit of measure for representing a surface of constant atmosphere pressure which is related to a specific pressure datum, 1013.2hPa, and is separated from other such surfaces by specific pressure intervals."/>
<element xmi:type="logical:Unit"
xmi:id="EAID_0A0C5318_D176_4967_8B4E_E436A3715FF3" name="InchesOfMercury"
description="Unit of measure for representing the pressure exerted by a column of mercury one inch high under standard conditions of temperature and gravity."/>
<element xmi:type="logical:Unit"
xmi:id="EAID_C437C35F_4DFB_4200_8133_5DA158EB6085" name="MillimetersOfMercury"
description="Unit of measure for representing the pressure exerted by a column of mercury one millimeter high under standard conditions of temperature and gravity."/>
<element xmi:type="logical:Unit"
xmi:id="EAID_9CDA2125_1689_411c_AC85_04287E8FC3CE" name="Pascals" description="Unit of measure for representing pressure of one newton per square meter. An SI Unit."/>
<element xmi:type="logical:Unit"
xmi:id="EAID_411C9D3A_3AC2_4123_BDAE_7F5C771611E6" name="PoundsPerSquareInch"
description="Unit of measure for representing pressure based on the avoirdupois units resulting form a force of one pound-force applied to an area of one square inch. A non-SI Unit."/>
<element xmi:type="logical:Unit"
xmi:id="EAID_E55C3C11_FA94_4421_9280_F20C673B8919" name="Torr" description="Unit of measure for representing pressure with the ratio of 760 to 1 standard atmosphere, roughly equal to the fluid pressure exerted by a millimeter of mercury used in high-vacuum physics and engineering. A non-SI Unit."/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_99CD3AB8_443B_403a_B846_2D5EB490CD77" name="Radiance">
<element xmi:type="logical:Unit"
xmi:id="EAID_449612D3_50F4_4eb2_8187_91A1482ACE83" name="WattsPerSquareMeterSteradian"
description="Unit of measure for representing radiance and is defined as the power per unit solid angle. An SI unit."/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_C2C0FF0B_B5C6_4057_B8C1_61992C1C5CA0" name="RadiantIntensity">
<element xmi:type="logical:Unit"
xmi:id="EAID_3A685039_DB3F_4044_AAEC_945F46598CC5" name="WattPerSteradian"
description="Unit of measure for representing radiant intensity characterized as the emission of radiation by an antenna. An SI Unit."/>
</ldm>
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<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_57EC71DE_6A7E_4cab_A347_3077716EF57E" name="Radioactivity">
<element xmi:type="logical:Unit">
<xmi:id="EAID_CAF4F95D_F642_423c_83A6_6219ED07002D" name="Becquerels" description="Unit of measure for representing radioactivity, defined as the activity of a quantity of radioactive material in which one nucleus decays per second. An SI derived unit."/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_BE375988_26A7_4ac0_98F8_C8F0339DF492" name="SolidAngle">
<element xmi:type="logical:Unit">
<xmi:id="EAID_02B1EB9C_7717_42b5_A24B_5BB6C5E413B4" name="SquareDegrees" description="Unit of measure for representing the measure of a solid angle used to measure parts of a sphere. A non-SI unit."/>
<element xmi:type="logical:Unit">
<xmi:id="EAID_51821B33_5943_4d6c_9667_151F4D916559" name="Steradians" description="Unit of measure for representing squared radian is the measure of a solid angle used to measure parts of a sphere. An SI unit."/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_56EEC7F8_8058_43af_83D2_11480E771BBE" name="Speed">
<element xmi:type="logical:Unit">
<xmi:id="EAID_7D8284DB_98CF_48c0_B99D_81FB7F9FDE83" name="FeetPerMinute" description="Speed unit of feet per minute."/>
<element xmi:type="logical:Unit">
<xmi:id="EAID_005D48C3_E6E2_4f9f_9041_1E13D27392F4" name="FeetPerSecond" description="Speed unit of feet per second."/>
<element xmi:type="logical:Unit">
<xmi:id="EAID_D0BB71A9_1DA4_4b42_B20F_1DA918A74312" name="DegreesPerSecond" description="Unit of measure for representing rotational speed, defined by the change in orientation of an object, in degrees every second. An SI Unit."/>
<element xmi:type="logical:Unit">
<xmi:id="EAID_E3D2CD7F_05FE_4878_ACD3_C4E23734ED1F" name="KilometersPerHour" description="Unit of measure for representing a measure of speed expressed as the number of kilometers travelled in one hour."/>
<element xmi:type="logical:Unit">
<xmi:id="EAID_C791EA45_64E6_469f_A762_B7E86B5359A0" name="Knots" description="Unit of measure for representing a measure of speed equal to one nautical mile per hour."/>
<element xmi:type="logical:Unit">
<xmi:id="EAID_F0BA2B63_62FD_42c1_8A47_9706562E9E84" name="Mach" description="Unit of measure for representing the speed of sound, the distance travelled per unit of time by a sound wave propagating through an elastic medium. "/>
<element xmi:type="logical:Unit">
<xmi:id="EAID_D656A860_B181_4712_B6C0_3CC4761A682D" name="MetersPerSecond" description="Unit of measure for representing speed and velocity. An SI derived unit."/>
<element xmi:type="logical:Unit">
<xmi:id="EAID_774E705B_1B1D_406a_8403_42360910A569" name="MilesPerHour" description="Unit of measure for representing speed expressing the number of statute miles covered in one hour used in the Imperial and US Customary systems."/>
<element xmi:type="logical:Unit">
<xmi:id="EAID_C21F5F62_131A_4807_894F_A58BF924B164" name="RadiansPerSecond" description="Unit of measure for representing rotational speed, defined by the change in orientation of an object, in radians every second. An SI Unit."/>
<element xmi:type="logical:Unit">
<xmi:id="EAID_5C4E1875_B52B_4a98_8FOE_A235796974BB" name="SpeedOfLight" description="Unit of measure for representing the speed of light in a vacuum, is a universal physical constant whose value is 299,792,458 meters per second."/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_84B65442_5510_48d5_9976_18707D937C5A" name="Temperature">
<element xmi:type="logical:Unit">
<xmi:id="EAID_723C724A_263B_48fe_B9EA_6D471D78BECA" name="DegreesCelsius" description="Unit of measure for representing temperature where water freezes at 0 degrees and boils at 100 degrees."/>
<element xmi:type="logical:Unit">
<xmi:id="EAID_A1A79A69_F65A_4734_8957_894EFEDA1F5A" name="DegreesFahrenheit" description="Unit of measure for representing temperature where water freezes at 32 degrees and boils at 212 degrees (at standard atmospheric pressure)."/>
<element xmi:type="logical:Unit">
<xmi:id="EAID_C06308E5_8978_48e2_963B_596CFB8C04A4" name="DegreesKelvin" description="Unit of measure for representing temperature at which all thermal motion ceases in the classical description of thermodynamics. An SI unit."/>
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        </ldm>
        <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_93A2E7E2_61C3_48d8_98E7_CE20EF168722" name="ThermalConductivity">
            <element xmi:type="logical:Unit">
xmi:id="EAID_DE210BBE_A970_49f8_888D_776EC8E42FB3" name="WattsPerMeterKelvin"
description="Unit of measure for representing thermal conductance where a material of one joule of energy per one second moves through the distance of one meter due to a temperature difference of one kelvin. An SI derived unit."/>
            </ldm>
            <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_2342696B_A50C_4a50_93E9_0C18B97AC18A" name="Time">
            <element xmi:type="logical:Unit">
xmi:id="EAID_55641AED_3F8A_497b_BF82_630E05CFCEE4" name="Days" description="Unit of time duration equal to 24 hours; approximately one rotation of the Earth"/>
            <element xmi:type="logical:Unit">
xmi:id="EAID_ACBBEC7_C23C_48d8_8355_ED0A3A3A3324" name="Hours" description="Unit of time duration equal to 60 minutes"/>
            <element xmi:type="logical:Unit">
xmi:id="EAID_DD9D1386_CC2E_4f76_BD72_A2E1BAF61CAC" name="Microseconds" description="Unit of time duration equal to one millionth of a second"/>
            <element xmi:type="logical:Unit">
xmi:id="EAID_CDB24D2F_2CBF_4617_BD58_7A64770B4AF7" name="Milliseconds" description="Unit of time duration equal to one thousandth of a second"/>
            <element xmi:type="logical:Unit">
xmi:id="EAID_D16C8EB8_AEA3_4dc4_B32D_2EA864931180" name="Minutes" description="Unit of time duration equal to 60 seconds"/>
            <element xmi:type="logical:Unit">
xmi:id="EAID_8E83CE63_89C9_4911_98A0_F7D3A60EF0EB" name="Nanoseconds" description="Unit of time duration equal to one billionth of a second"/>
            <element xmi:type="logical:Unit">
xmi:id="EAID_17A1BB83_047A_4b42_A183_1237BC07B435" name="Seconds" description="SI base unit of time. One second is defined to be the duration of 9192631770 periods of the radiation corresponding to the transition between the two hyperfine levels of the ground state of the cesium 133 atom"/>
        </ldm>
        <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_A65AABFB_BDEB_49f4_938A_0C6D0A2FAB3C" name="Viscosity">
            <element xmi:type="logical:Unit">
xmi:id="EAID_80D9C661_993E_4fd3_833C_855ABF3F1359" name="Centipoise" description="Units for dynamic (shear) viscosity, equivalent to milliPascal-seconds"/>
            <element xmi:type="logical:Unit">
xmi:id="EAID_F25C01B7_B6ED_481e_B13B_5EFA4E8A0315" name="Centistokes" description="Units for kinematic viscosity, 1 centistokes (cSt) = 0.01 St= 0.000001 m^2/sec"/>
            <element xmi:type="logical:Unit">
xmi:id="EAID_1C753236_2F55_4424_9CA3_47AD45CC4934" name="PascalSeconds" description="SI units for dynamic (shear) viscosity"/>
            <element xmi:type="logical:Unit">
xmi:id="EAID_E1018FCF_16B7_4a50_8D59_EA9270C4288C" name="Poise" description="Units for dynamic (shear) viscosity. 1 Poise = 100 cP = 0.1 Pascal-seconds"/>
            <element xmi:type="logical:Unit">
xmi:id="EAID_610F07F0_80C3_4243_81DD_70AD7BF78660" name="SayboltUniversalSeconds"
description="Obsolete units for kinematic viscosity. Conversion to the preferred units of centistokes (cSt) is defined in ASTM D 2161"/>
            <element xmi:type="logical:Unit">
xmi:id="EAID_9B5D0AEF_2419_442d_B413_AD98445E7BC7" name="SquareMetersPerSecond"
description="SI units for kinematic viscosity"/>
            <element xmi:type="logical:Unit">
xmi:id="EAID_B146CC58_0C97_4511_A034_B1E3D4414251" name="Stokes" description=" Units for kinematic viscosity, 1 stokes (St) = 0.0001 m^2/sec"/>
        </ldm>
        <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_9BAF9C2C_5BB2_4e98_994F_5BB8307528B8" name="Voltage">
            <element xmi:type="logical:Unit">
xmi:id="EAID_D1F6B8CB_00D0_447a_B871_02D5EA97DFED" name="ElectronVolts" description="Unit of measure representing the amount of kinetic energy gained by a single unbound electron when it accelerates through an electric potential difference of one volt. A non-SI unit."/>
            <element xmi:type="logical:Unit">
xmi:id="EAID_7DAFAFA2_9CA0_4db4_ADB9_A483D5B16E8D" name="Volts" description="Unit of measure representing the difference in electric potential between two points of a

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conducting wire when an electric current of one amp dissipates one watt of power between those points. An SI derived unit."/>

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        </ldm>
        <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_F4FE45A0_0E6E_41d9_B525_A30FB6A008BC" name="Volume">
            <element xmi:type="logical:Unit"
xmi:id="EAID_6C2D0767_7566_4967_B174_C1F38C5F3DC5" name="CubicCentimeters"
description="Unit of measure representing volume of a cube measuring 1 cm x 1 cm x 1 cm.
A SI derived unit."/>
            <element xmi:type="logical:Unit"
xmi:id="EAID_E959EB0F_095E_4e90_88F4_32E5490BB442" name="CubicFeet" description="Unit of
measure representing volume of a cube measuring the same multiple of a foot unit in
length on all sides."/>
            <element xmi:type="logical:Unit"
xmi:id="EAID_8EED50A7_7179_44ab_B373_930D69E2476B" name="CubicInches" description="Unit
of measure representing volume of a cube measuring 1 in x 1 in x 1 in."/>
            <element xmi:type="logical:Unit"
xmi:id="EAID_B6983E55_B326_4925_B8B0_0EF9E75250DD" name="CubicMeters" description="Unit
of measure representing volume of a cube measuring 1 m x 1 m x 1 m. A SI derived unit."/>
            <element xmi:type="logical:Unit"
xmi:id="EAID_8BA0E5B0_CB13_490a_9363_6A3C2C2B16B8" name="CubicMillimeters"
description="Unit of measure representing volume of a cube measuring 1 mm x 1 mm x 1 mm.
A SI derived unit."/>
            <element xmi:type="logical:Unit"
xmi:id="EAID_3DP7E5B0_A605_4e2b_BB15_B8EC36059B8B" name="CubicYards" description="Unit of
measure representing volume of a cube measuring 1 yds x 1 yds x 1 yds."/>
        </ldm>
        <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_1A440A82_31D5_4a0d_B09E_D7771FF6A41C" name="Work">
            <element xmi:type="logical:Unit"
xmi:id="EAID_C1B2CBC7_C0DB_4a69_80B2_087D899DC14A" name="Ergs" description="Unit of
measure representing work or energy equal to the work done by a force of one dyne when
its point of application moves through a distance of one centimeter in the direction of
the force, used in the Centimeter Gram Seconds system."/>
        </ldm>
        <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_43329893_F8AF_41cd_8872_35C8FFBFEECA" name="UnitlessDimensionless">
            <element xmi:type="logical:Unit"
xmi:id="EAID_1268C4EA_1948_4472_B251_CDD0342B9BC1" name="Percent" description="A number
or rate that is expressed as a certain number of parts of something divided into 100
parts."/>
            <element xmi:type="logical:Unit"
xmi:id="EAID_DA342318_2A86_40ad_9B8F_93BD6F02D542" name="Ratio" description="A unit used
to specify the ratio of one value to another having the same units"/>
            <element xmi:type="logical:Unit"
xmi:id="EAID_0C482F2C_A548_4cf1_B9AD_5086FD62C41B" name="Unitless" description="A
placeholder to specify for values that have no engineering units or where
units are not meaningful, but a Unit specification is required"/>
        </ldm>
        <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_FD83CB19_A234_48f5_9EA5_0140BB39AB79" name="ValueTypeUnits">
            <element xmi:type="logical:ValueTypeUnit"
xmi:id="EAID_1356F678_1656_494d_9587_5615F7840EFA" name="AbstractDiscreteSetUnitless"
description="Abstract set of states for the AbstractDiscreteSetMeasurementSystem, which
must be overridden in the MeasurementAxis for a real; Measurement."
unit="EAID_0C482F2C_A548_4cf1_B9AD_5086FD62C41B"
valueType="EAID_87E593E9_A387_4059_89D3_2186644F837E"/>
            <element xmi:type="logical:ValueTypeUnit"
xmi:id="EAID_48B35E80_41DF_45be_890D_92A511EE778E" name="RealCentimeters"
description="Centimeters represented as a Real"
unit="EAID_F6A1CE92_DD0B_4f03_8AEC_CE88E62A1C0D"
valueType="EAID_7CB1E0A3_7D27_45fa_BF9E_22EB15886D68"/>
            <element xmi:type="logical:ValueTypeUnit"
xmi:id="EAID_122E280A_4470_443b_A90F_2A32793938A2" name="RealMach" description="Mach
represented as Real" unit="EAID_F0BA2B63_62FD_42c1_8A47_9706562E9E84"
valueType="EAID_7CB1E0A3_7D27_45fa_BF9E_22EB15886D68"/>
            <element xmi:type="logical:ValueTypeUnit"
xmi:id="EAID_87ABB560_138F_4984_908E_3D7C00EFFCC5" name="IntegerCount"
description="Number of occurrences as an integer"
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unit="EAID_0C482F2C_A548_4cf1_B9AD_5086FD62C41B"
valueType="EAID_372D8BFC_47B1_4385_AD77_6703541E7FAC"/>
<element xmi:type="logical:ValueTypeUnit"
xmi:id="EAID_A71F1148_7ED6_47bb_8D23_40879881A511" name="IntegerHours"
description="Integer hours" unit="EAID_ACBBECC7_C23C_48d8_8355_ED0A3A3A3324"
valueType="EAID_372D8BFC_47B1_4385_AD77_6703541E7FAC"/>
<element xmi:type="logical:ValueTypeUnit"
xmi:id="EAID_53D339BB_B8AB_4c87_8FCE_EF87F0CB7BEF" name="IntegerMicroseconds"
description="Integer microseconds" unit="EAID_DD9D1386_CC2E_4f76_BD72_A2E1BAF61CAC"
valueType="EAID_372D8BFC_47B1_4385_AD77_6703541E7FAC"/>
<element xmi:type="logical:ValueTypeUnit"
xmi:id="EAID_C9419C4D_A541_4810_82FB_FC6266B893DD" name="IntegerMilliseconds"
description="Integer milliseconds" unit="EAID_CDB24D2F_2CBF_4617_BD58_7A64770B4AF7"
valueType="EAID_372D8BFC_47B1_4385_AD77_6703541E7FAC"/>
<element xmi:type="logical:ValueTypeUnit"
xmi:id="EAID_4F8968A0_E38F_4434_B511_EE50E0BD0A5A" name="IntegerMinutes"
description="Integer minutes" unit="EAID_D16C8EB8_AEA3_4dc4_B32D_2EA864931180"
valueType="EAID_372D8BFC_47B1_4385_AD77_6703541E7FAC"/>
<element xmi:type="logical:ValueTypeUnit"
xmi:id="EAID_8FAB4588_E952_4394_AA69_083EAF893AF4" name="IntegerNanoseconds"
description="Integer nanoseconds" unit="EAID_8E83CE63_89C9_4911_98A0_F7D3A60EF0EB"
valueType="EAID_372D8BFC_47B1_4385_AD77_6703541E7FAC"/>
<element xmi:type="logical:ValueTypeUnit"
xmi:id="EAID_D4E6F91B_E17A_42b5_9D3F_A5A852B8519E" name="IntegerSeconds"
description="Integer seconds" unit="EAID_17A1BB83_047A_4b42_A183_1237BC07B435"
valueType="EAID_372D8BFC_47B1_4385_AD77_6703541E7FAC"/>
<element xmi:type="logical:ValueTypeUnit"
xmi:id="EAID_22D33FCC_F623_427d_B954_D2AFD978990E" name="NaturalBitsPerSecond"
description="Data rate as real number in bits per second"
unit="EAID_4BD00953_158E_4ebe_B5C2_5D7F99C4C843"
valueType="EAID_7DE12CF5_1B85_482b_9830_783D356833E9"/>
<element xmi:type="logical:ValueTypeUnit"
xmi:id="EAID_6E69624B_5262_42bc_B6F2_6972D125FC06" name="NaturalEventsPerSecond"
description="Count rate as real number in counts per second"
unit="EAID_AFB0E821_EDAO_43fa_9BFE_6989D7A150D2"
valueType="EAID_7DE12CF5_1B85_482b_9830_783D356833E9"/>
<element xmi:type="logical:ValueTypeUnit"
xmi:id="EAID_888A1206_11E0_434b_A43D_1CC0091F92BB" name="NaturalPixelCount"
description="Pixel count as a natural numerical representation."
unit="EAID_0C482F2C_A548_4cf1_B9AD_5086FD62C41B"
valueType="EAID_7DE12CF5_1B85_482b_9830_783D356833E9"/>
<element xmi:type="logical:ValueTypeUnit"
xmi:id="EAID_AC8A2C1D_F694_403a_A8A3_79014B281D10" name="NonNegativeGraysPerSecond"
description="Non-negative Grays per second"
unit="EAID_F8CE6A2C_0E47_4f2f_88E0_5F255664DCDA"
valueType="EAID_1EA04603_631A_403e_82FD_D6E5825D1F31"/>
<element xmi:type="logical:ValueTypeUnit"
xmi:id="EAID_2AD72CD8_0C70_4620_A675_683A13073D43" name="NonNegativeRealCandelas"
description="power emitted by a light source in a particular direction"
unit="EAID_846F619C_9BC7_40b2_AAA5_3CD222F84CF"
valueType="EAID_1EA04603_631A_403e_82FD_D6E5825D1F31"/>
<element xmi:type="logical:ValueTypeUnit"
xmi:id="EAID_F77FC9A7_BB84_4e52_96C5_088210366367" name="NonNegativeRealCubicMeters"
description="Non-negative Real cubic meters"
unit="EAID_B6983E55_B326_4925_B8B0_0EF9E75250DD"
valueType="EAID_1EA04603_631A_403e_82FD_D6E5825D1F31"/>
<element xmi:type="logical:ValueTypeUnit"
xmi:id="EAID_E6457D6B_6D62_4e74_8BDB_21EC7A0254E2" name="NonNegativeRealGrays"
description="Non-negative Grays." unit="EAID_06F05060_CF06_4f65_A9AF_75CA9D6D4343"
valueType="EAID_1EA04603_631A_403e_82FD_D6E5825D1F31"/>
<element xmi:type="logical:ValueTypeUnit"
xmi:id="EAID_D7BCB56E_6A7C_49a8_BC34_45FCEB45A6C3" name="NonNegativeRealLux"
description="Newton Meters as a real numerical representation"
unit="EAID_65D4712B_C8F8_4e24_98E0_32A8040A0F94"
valueType="EAID_1EA04603_631A_403e_82FD_D6E5825D1F31"/>
<element xmi:type="logical:ValueTypeUnit"
xmi:id="EAID_08FEE312_2D6C_498d_B43C_0A241BED52B2" name="NonNegativeRealMeter"
description="Meter as a non-negative real numerical representation."
unit="EAID_0A9F29A7_3ABC_4790_9E6D_CEBD6C7DBE5E"
valueType="EAID_1EA04603_631A_403e_82FD_D6E5825D1F31"/>

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<element xmi:type="logical:ValueTypeUnit"
xmi:id="EAID_21572174_353B_4fb9_92AB_66D35B6D1D45" name="NonNegativeRealMetersPerSecond"
description="Meters per second as a non-negative real numerical representation."
unit="EAID_D656A860_B181_4712_B6C0_3CC4761A682D"
valueType="EAID_1EA04603_631A_403e_82FD_D6E5825D1F31"/>
    <element xmi:type="logical:ValueTypeUnit"
xmi:id="EAID_46C7930A_5384_4f0e_BF83_DF1D0ABF6026" name="NonNegativeRealSieverts"
description="Sieverts as a non-negative real representation."
unit="EAID_FEF61F65_30EA_4429_BF95_EC1A4A8AC7E7"
valueType="EAID_1EA04603_631A_403e_82FD_D6E5825D1F31"/>
    <element xmi:type="logical:ValueTypeUnit"
xmi:id="EAID_08C169D6_365F_4573_BB2D_87F29AFF3BF0" name="RealAmp" description="Electric
current described in the real numerical value of Amp."
unit="EAID_1BC72413_1442_4d9a_BBC6_5D13EA4B334F"
valueType="EAID_7CB1E0A3_7D27_45fa_BF9E_22EB15886D68"/>
    <element xmi:type="logical:ValueTypeUnit"
xmi:id="EAID_B1320CCC_42D6_40f1_ADFE_41BD8B26E069" name="RealAmpHour"
description="Electric charge described in real numerical value of Amp per hour."
unit="EAID_611BFBF3_9651_4770_BEED_69B1E5BA509A"
valueType="EAID_7CB1E0A3_7D27_45fa_BF9E_22EB15886D68"/>
    <element xmi:type="logical:ValueTypeUnit"
xmi:id="EAID_D0606B2C_8462_4b2d_969A_CA3E6A32276C" name="RealAmpPerSquareMeters"
description="Electric Current Density described in the real numerical value of Amp per
square meter." unit="EAID_1B59A0CB_A750_4fde_B861_3C0FBACB9E7B"
valueType="EAID_7CB1E0A3_7D27_45fa_BF9E_22EB15886D68"/>
    <element xmi:type="logical:ValueTypeUnit"
xmi:id="EAID_5570B556_17D4_41a8_B786_840B7A4CAAE3" name="RealCelsius" description="Value
in Degrees Celsius" unit="EAID_723C724A_263B_48fe_B9EA_6D471D78BECA"
valueType="EAID_7CB1E0A3_7D27_45fa_BF9E_22EB15886D68"/>
    <element xmi:type="logical:ValueTypeUnit"
xmi:id="EAID_38E03039_78D2_40f5_AB1B_9AF607B50C0E1" name="RealCoulomb"
description="Electric charge described in the real numerical value of Coulomb"
unit="EAID_F0BEB8DA_1C6E_43a8_A030_C04F74B8E417"
valueType="EAID_7CB1E0A3_7D27_45fa_BF9E_22EB15886D68"/>
    <element xmi:type="logical:ValueTypeUnit"
xmi:id="EAID_FC0CC9EF_5264_46f8_97E5_BD9B4B98D732" name="RealCoulombsPerMeter"
description="Charge Density described in real numerical value in Coulombs per Meter"
unit="EAID_DED3DC3D_2228_4180_9A4F_CF994B64B6CF"
valueType="EAID_7CB1E0A3_7D27_45fa_BF9E_22EB15886D68"/>
    <element xmi:type="logical:ValueTypeUnit"
xmi:id="EAID_C5AE86FF_FB90_4d95_A739_4025CA644CDF" name="RealDegrees"
description="Degrees as a real numerical representation."
unit="EAID_6BE551B4_AC4C_467d_8264_95EB34EF81FE"
valueType="EAID_7CB1E0A3_7D27_45fa_BF9E_22EB15886D68"/>
    <element xmi:type="logical:ValueTypeUnit"
xmi:id="EAID_B153F0A8_254B_414d_B9B4_F51B02D32419" name="RealDegreesPerSecond"
description="Orientation velocity in degrees per second as a real numerical
representation." unit="EAID_D0BB71A9_1DA4_4b42_B20F_1DA918A74312"
valueType="EAID_7CB1E0A3_7D27_45fa_BF9E_22EB15886D68"/>
    <element xmi:type="logical:ValueTypeUnit"
xmi:id="EAID_06E92ADA_7777_4544_965E_B598909369E6" name="RealDegreesPerSecondPerSecond"
description="Orientation acceleration in degrees per second squared as a real numerical
representation." unit="EAID_8864E77B_D4D8_4491_8145_285B1F8959A2"
valueType="EAID_7CB1E0A3_7D27_45fa_BF9E_22EB15886D68"/>
    <element xmi:type="logical:ValueTypeUnit"
xmi:id="EAID_E3839F0F_515A_4496_AE49_EA85C5A5F0AC" name="RealFahrenheit"
description="Value in Degrees Fahrenheit"
unit="EAID_A1A79A69_F65A_4734_8957_894EFEDA1F5A"
valueType="EAID_7CB1E0A3_7D27_45fa_BF9E_22EB15886D68"/>
    <element xmi:type="logical:ValueTypeUnit"
xmi:id="EAID_88944113_E0D8_475b_90B9_A0BF53FE5027" name="RealFarad" description="Electric
capacitance described in real numerical value Farad."
unit="EAID_2DEC664F_516A_499d_A29B_661CC1D8C7B2"
valueType="EAID_7CB1E0A3_7D27_45fa_BF9E_22EB15886D68"/>
    <element xmi:type="logical:ValueTypeUnit"
xmi:id="EAID_AFB6D10F_59C7_4f0b_882F_858971C1E91D" name="RealHertz" description="Temporal
frequency as real number in Hertz" unit="EAID_161469CC_7BFE_4206_BF8E_17E105C1A679"
valueType="EAID_7CB1E0A3_7D27_45fa_BF9E_22EB15886D68"/>
    <element xmi:type="logical:ValueTypeUnit"
xmi:id="EAID_CBAB96B0_9F89_4e60_A472_F652D5F52946" name="RealJoules" description="Joules

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as a real numerical representation" unit="EAID_6BEAC65A_17AD_49d0_A7D3_0A49C14B7489"
valueType="EAID_7CB1E0A3_7D27_45fa_BF9E_22EB15886D68"/>
    <element xmi:type="logical:ValueTypeUnit"/>
xmi:id="EAID_8AEE5DA4_5925_412c_9D23_D625B93B0665" name="RealKelvin" description="Value
in Degrees Kelvin" unit="EAID_C06308E5_8978_48e2_963B_596CFB8C04A4"
valueType="EAID_7CB1E0A3_7D27_45fa_BF9E_22EB15886D68"/>
    <element xmi:type="logical:ValueTypeUnit"/>
xmi:id="EAID_B4409B5D_DA7B_4d42_9A81_C62B97A89B11" name="RealKilogram" description="Mass
described in the real numerical value of Kilograms."
unit="EAID_A21827D1_48AF_4e25_A534_D2CDAE199D76"
valueType="EAID_7CB1E0A3_7D27_45fa_BF9E_22EB15886D68"/>
    <element xmi:type="logical:ValueTypeUnit"/>
xmi:id="EAID_1194AAE8_DD2D_44c0_BD43_58C01BD29FFF" name="RealKilogramsPerCubicMeter"
description="Real kilograms per cubic meter."
unit="EAID_BE2795B1_06AD_4261_B7E8_8A4F4D94FC84"
valueType="EAID_1EA04603_631A_403e_82FD_D6E5825D1F31"/>
    <element xmi:type="logical:ValueTypeUnit"/>
xmi:id="EAID_9A891B27_936C_4ffb_A999_2D737950B1E6" name="RealKilogramsPerSecond"
description="Mass rate as real number in kilograms per second"
unit="EAID_B3BD94A4_1DCA_49c1_96AB_21E7933947F1"
valueType="EAID_7CB1E0A3_7D27_45fa_BF9E_22EB15886D68"/>
    <element xmi:type="logical:ValueTypeUnit"/>
xmi:id="EAID_F6853D08_6D00_4844_AB9C_60686E09323F" name="RealKnots" description="Knots as
a real number" unit="EAID_C791EA45_64E6_469f_A762_B7E86B5359A0"
valueType="EAID_7CB1E0A3_7D27_45fa_BF9E_22EB15886D68"/>
    <element xmi:type="logical:ValueTypeUnit"/>
xmi:id="EAID_CA989C3B_DF5E_4455_9105_18A186D41CD7" name="RealKnotsPerSecond"
description="Acceleration in knots per second as a real number"
unit="EAID_9B5484D4_F922_407d_9E61_17E56532FDD8"
valueType="EAID_7CB1E0A3_7D27_45fa_BF9E_22EB15886D68"/>
    <element xmi:type="logical:ValueTypeUnit" xmi:id="vZiY3wg5EeSFspy8Kj3F4Q"
name="RealMeters" description="Meters representation as a Real"
unit="EAID_0A9F29A7_3ABC_4790_9E6D_CEBD6C7DBE5E"
valueType="EAID_7CB1E0A3_7D27_45fa_BF9E_22EB15886D68"/>
    <element xmi:type="logical:ValueTypeUnit"/>
xmi:id="EAID_A3B35DAE_F099_4f94_814A_3CCBD68FD08E" name="RealMetersPerSecond"
description="Velocity In Meters Per Second As Real"
unit="EAID_D656A860_B181_4712_B6C0_3CC4761A682D"
valueType="EAID_7CB1E0A3_7D27_45fa_BF9E_22EB15886D68"/>
    <element xmi:type="logical:ValueTypeUnit"/>
xmi:id="EAID_BC96F5E1_6F63_462c_84A3_61CFB36D8011" name="RealMetersPerSecondPerSecond"
description="Meters Per Second Per Second As Real"
unit="EAID_59A485AE_23F2_4b2d_87E7_18ECB59553EE"
valueType="EAID_7CB1E0A3_7D27_45fa_BF9E_22EB15886D68"/>
    <element xmi:type="logical:ValueTypeUnit"/>
xmi:id="EAID_B50F1085_EE30_4408_9028_ECD2D1151D8A" name="RealMoles" description="Amount
of Substance described in the real numerical value of Moles."
unit="EAID_81285D76_2D91_4edd_B41D_009A1301FB63"
valueType="EAID_1EA04603_631A_403e_82FD_D6E5825D1F31"/>
    <element xmi:type="logical:ValueTypeUnit"/>
xmi:id="EAID_76E379BA_96C9_4f5d_A0F4_BCF5D4D5B9D3" name="RealMolesPerCubicMeter"
description="Moles per cubic meter in a real numerical representation."
unit="EAID_0B528C0C_B50B_4152_89FE_09BA977E13FE"
valueType="EAID_7CB1E0A3_7D27_45fa_BF9E_22EB15886D68"/>
    <element xmi:type="logical:ValueTypeUnit"/>
xmi:id="EAID_2E982ED3_8795_413c_9E7D_AF1362B8E313" name="RealNewtonMeters"
description="Real newton meters" unit="EAID_0A9F29A7_3ABC_4790_9E6D_CEBD6C7DBE5E"
valueType="EAID_7CB1E0A3_7D27_45fa_BF9E_22EB15886D68"/>
    <element xmi:type="logical:ValueTypeUnit"/>
xmi:id="EAID_D40F5AB0_A485_4b81_AA5B_E668E0ACB798" name="RealNewtons" description="Value
type used to describe a value of Newtons as a real."
unit="EAID_3F9CBF28_F842_4896_ABEC_B4498760BD80"
valueType="EAID_7CB1E0A3_7D27_45fa_BF9E_22EB15886D68"/>
    <element xmi:type="logical:ValueTypeUnit"/>
xmi:id="EAID_19E866E6_D186_469f_8670_97CDF785C2D9" name="RealPascal" description="Pascal
as a real numerical representation." unit="EAID_9CDA2125_1689_411c_AC85_04287E8FC3CE"
valueType="EAID_7CB1E0A3_7D27_45fa_BF9E_22EB15886D68"/>
    <element xmi:type="logical:ValueTypeUnit"/>
xmi:id="EAID_B31A800C_880E_4285_8914_12871094C4EE" name="RealPascalSeconds"
description="Real numeric value for dynamic viscosity in SI units of Pascal-seconds"

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unit="EAID_1C753236_2F55_4424_9CA3_47AD45CC4934"
valueType="EAID_7CB1E0A3_7D27_45fa_BF9E_22EB15886D68"/>
<element xmi:type="logical:ValueTypeUnit"
xmi:id="EAID_32D64A1E_4E12_41f2_802F_E09F36EC367A" name="RealPercentage"
description="Percentage represented as a real value."
unit="EAID_68A9F947_C54C_4c06_84C6_29E302284981"
valueType="EAID_1EA04603_631A_403e_82FD_D6E5825D1F31"/>
<element xmi:type="logical:ValueTypeUnit"
xmi:id="EAID_222F7273_01B5_4e83_B616_DFEC1E04ABED" name="RealRadiansPerSecond"
description="Orientation velocity in radians per second as a real numerical
representation." unit="EAID_C21F5F62_131A_4807_894F_A58BF924B164"
valueType="EAID_7CB1E0A3_7D27_45fa_BF9E_22EB15886D68"/>
<element xmi:type="logical:ValueTypeUnit"
xmi:id="EAID_FE60D41B_86AF_4f9e_B507_96A5730B1E52" name="RealRadians" description="Radian
rotations as a real numerical representation."
unit="EAID_DDC5A152_31FF_4e32_815A_3A1EE216C85A"
valueType="EAID_7CB1E0A3_7D27_45fa_BF9E_22EB15886D68"/>
<element xmi:type="logical:ValueTypeUnit"
xmi:id="EAID_8AB5E4C7_4D23_411d_B40D_01DD8CDD2525" name="RealRadiansPerSecondPerSecond"
description="Real radians per second per second."
unit="EAID_F2444AAF_68C5_4355_8AB0_5BFC0A73975F"
valueType="EAID_7CB1E0A3_7D27_45fa_BF9E_22EB15886D68"/>
<element xmi:type="logical:ValueTypeUnit"
xmi:id="EAID_D2F368C7_B356_4229_B15D_89F2E1A76DC7" name="RealRadiansPerSecondSquared"
description="Orientation acceleration in radians per second squared as a real numerical
representation." unit="EAID_F2444AAF_68C5_4355_8AB0_5BFC0A73975F"
valueType="EAID_7CB1E0A3_7D27_45fa_BF9E_22EB15886D68"/>
<element xmi:type="logical:ValueTypeUnit"
xmi:id="EAID_7C107E2B_CDC3_4f2f_86AD_DBEC40A0C0E3"
name="RealRadiansPerSecondValueUnit" description="Value type unit for real radians
per second." unit="EAID_C21F5F62_131A_4807_894F_A58BF924B164"
valueType="EAID_7CB1E0A3_7D27_45fa_BF9E_22EB15886D68"/>
<element xmi:type="logical:ValueTypeUnit"
xmi:id="EAID_A558BC68_B8EF_43d8_8889_65E126114613" name="RealSeconds"
description="Seconds as Real" unit="EAID_17A1BB83_047A_4b42_A183_1237BC07B435"
valueType="EAID_7CB1E0A3_7D27_45fa_BF9E_22EB15886D68"/>
<element xmi:type="logical:ValueTypeUnit"
xmi:id="EAID_D936F85E_17F7_417a_9240_849DECFA5F6" name="RealSquareMeters"
unit="EAID_C4A8FCC1_585A_4d82_B7BF_606489503F25"
valueType="EAID_1EA04603_631A_403e_82FD_D6E5825D1F31"/>
<element xmi:type="logical:ValueTypeUnit"
xmi:id="EAID_C5E6300B_BD72_485e_83C1_63975AF70D50" name="RealSquareMetersPerSecond"
description="Real numeric value for kinematic viscosity in SI units of m^2/sec"
unit="EAID_9B5D0AEF_2419_442d_B413_AD98445E7BC7"
valueType="EAID_7CB1E0A3_7D27_45fa_BF9E_22EB15886D68"/>
<element xmi:type="logical:ValueTypeUnit"
xmi:id="SDM_E23833E7_EC26_48D2_AA3E_519AF74C9200" name="RealUnitless" description="Real
numeric value for values with no units." unit="EAID_0C482F2C_A548_4cf1_B9AD_5086FD62C41B"
valueType="EAID_7CB1E0A3_7D27_45fa_BF9E_22EB15886D68"/>
<element xmi:type="logical:ValueTypeUnit"
xmi:id="EAID_BB71A3BE_09B3_4824_95EF_19A4464F51B8" name="RealVolt" description="Electric
Potential described in the real numerical value of Volts"
unit="EAID_7DAFAFA2_9CA0_4db4_ADB9_A483D5B16E8D"
valueType="EAID_7CB1E0A3_7D27_45fa_BF9E_22EB15886D68"/>
<element xmi:type="logical:ValueTypeUnit"
xmi:id="EAID_5F476114_19FC_45df_B348_DE6F26145C2D" name="RealWatts" description="Watts as
a non-negative real numerical representation."
unit="EAID_ACAA2155_27C3_4a8d_9F84_17451EC9DE42"
valueType="EAID_7CB1E0A3_7D27_45fa_BF9E_22EB15886D68"/>
<element xmi:type="logical:ValueTypeUnit"
xmi:id="EAID_78C708C0_6629_4464_B0DD_8D88EF3B63EC" name="StringISO8601Basic"
description="Text String formatted per ISO 8601's basic format"
unit="EAID_0C482F2C_A548_4cf1_B9AD_5086FD62C41B"
valueType="EAID_B93CB919_D464_4577_82EB_0298B395EDB4"/>
<element xmi:type="logical:ValueTypeUnit"
xmi:id="EAID_ED9E8C67_EADC_4e8b_AE9D_FDE127E74F8A" name="StringISO8601Extended"
description="Text String formatted per ISO 8601's extended format"
unit="EAID_0C482F2C_A548_4cf1_B9AD_5086FD62C41B"
valueType="EAID_B93CB919_D464_4577_82EB_0298B395EDB4"/>
<element xmi:type="logical:ValueTypeUnit"
xmi:id="EAID_D0C34A2D_4DF4_435b_BD0D_39375F4DC173" name="StringUnitless" description="The

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StringUnitless ValueType is typically used for text based measurement systems."
unit="EAID_0C482F2C_A548_4cf1_B9AD_5086FD62C41B"
valueType="EAID_B93CB919_D464_4577_82EB_0298B395EDB4"/>
    <element xmi:type="logical:ValueTypeUnit"
xmi:id="EAID_770A3B26_286B_4669_9D59_28EEEDDFA38D" name="UTC_DayOfGregorianMonth"
description="Day of the Gregorian Month and Year of the measurement"
unit="EAID_0C482F2C_A548_4cf1_B9AD_5086FD62C41B"
valueType="EAID_372D8BFC_47B1_4385_AD77_6703541E7FAC">
        <constraint xmi:type="logical:IntegerRangeConstraint"
xmi:id="EAID_E5263524_9EF8_4bea_BF77_DB5811A1CA39" name="UTC_DayOfMonthConstraint"
description="UTC (and Gregorian) Day of Month is represented by values from 1 for the
first day of the month to the number of days in the month, which depends on the month and
year, but never exceeds 31" lowerBound="1" upperBound="31"/>
    </element>
    <element xmi:type="logical:ValueTypeUnit"
xmi:id="EAID_4363AD8C_A1ED_447c_8074_A9C2C1BFAD59" name="UTC_GregorianYear"
description="Gregorian calendar year of the measurement"
unit="EAID_0C482F2C_A548_4cf1_B9AD_5086FD62C41B"
valueType="EAID_372D8BFC_47B1_4385_AD77_6703541E7FAC">
        <element xmi:type="logical:ValueTypeUnit"
xmi:id="EAID_7CE0FD03_E2B8_4a2b_BEF3_AC063A10AF19" name="UTC_HourOfGregorianDay"
description="Hour of the Gregorian Day, Month, Year of the measurement. Each UTC day
contains exactly 24 hours." unit="EAID_0C482F2C_A548_4cf1_B9AD_5086FD62C41B"
valueType="EAID_372D8BFC_47B1_4385_AD77_6703541E7FAC">
            <constraint xmi:type="logical:IntegerRangeConstraint"
xmi:id="EAID_C2BB6D22_F3FC_4b14_8CCB_6543C0CD22D5" name="UTC_HourOfDayConstraint"
description="UTC Hour of Day starts at 0 and ends at 23. All days are 24 hours long."
upperBound="23"/>
        </element>
        <element xmi:type="logical:ValueTypeUnit"
xmi:id="EAID_F525FE9D_FC27_4971_AB94_AAB65C8FD169" name="UTC_LocalTimeHourOffset"
description="The number of hours that the local time is before or after the prime
meridian (Zulu time). This offset represents the difference from Zulu due to time zone
and daylight savings time." unit="EAID_0C482F2C_A548_4cf1_B9AD_5086FD62C41B"
valueType="EAID_372D8BFC_47B1_4385_AD77_6703541E7FAC">
            <constraint xmi:type="logical:IntegerRangeConstraint"
xmi:id="EAID_EBF61D38_B48D_4398_BF79_EA01FD593B76"
name="UTC_LocalTimeHourOffsetConstraint" description="UTC time offset can range from UTC-
12:00 to UTC+14:00 in 15 minute increments. This element is just the hour component of
the offset." lowerBound="-12" upperBound="14"/>
        </element>
        <element xmi:type="logical:ValueTypeUnit"
xmi:id="EAID_DA807F63_757D_47ee_9A1A_4C45CFA6E054" name="UTC_LocalTimeMinuteOffset"
description="The minute component of the hour:minute offset that the local time is before
or after the prime meridian (Zulu time). Values can range from -45 to +45 in 15 min
increments." unit="EAID_0C482F2C_A548_4cf1_B9AD_5086FD62C41B"
valueType="EAID_372D8BFC_47B1_4385_AD77_6703541E7FAC">
            <constraint xmi:type="logical:IntegerRangeConstraint"
xmi:id="EAID_C4A9341E_CD92_4f67_B09D_364B1B811CD4"
name="UTC_LocalTimeMinuteOffsetConstraint" description="UTC time offset can range from
UTC-12:00 to UTC+14:00 in 15 minute increments. This element is just the minute component
of the offset." lowerBound="-45" upperBound="45"/>
        </element>
        <element xmi:type="logical:ValueTypeUnit"
xmi:id="EAID_6BBAF578_C863_44a7_A3E6_EDCF0E358B65" name="UTC_MinuteOfHour"
description="Minute of the hour of the Gregorian Day, Month, Year of the measurement.
Each UTC hour contains exactly 60 minutes."
unit="EAID_0C482F2C_A548_4cf1_B9AD_5086FD62C41B"
valueType="EAID_372D8BFC_47B1_4385_AD77_6703541E7FAC">
            <constraint xmi:type="logical:IntegerRangeConstraint"
xmi:id="EAID_0F803579_FBA4_47ea_948A_0E98A06E0885" name="UTC_MinuteOfHourConstraint"
description="UTC Minute of hour starts at 0 and ends at 59. There are always 60 minutes
per hour, though sometimes the last minute may be 1 sec longer or shorter than the other
minutes" upperBound="59"/>
        </element>
        <element xmi:type="logical:ValueTypeUnit"
xmi:id="EAID_E2FA4AF7_5100_4797_A1BD_B5E448ED93EE" name="UTC_MonthOfGregorianYear"
description="Month of the Gregorian Year of the measurement"
unit="EAID_0C482F2C_A548_4cf1_B9AD_5086FD62C41B"
valueType="EAID_372D8BFC_47B1_4385_AD77_6703541E7FAC">

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<constraint xmi:type="logical:IntegerRangeConstraint"
xmi:id="EAID_18669915_5A53_4caa_9D0A_354EE23975D8" name="UTC_MonthOfYearConstraint"
description="UTC (and Gregorian calendar) uses values of 1 through 12 to represent the 12
months January through December, respectively" lowerBound="1" upperBound="12"/>
    </element>
    <element xmi:type="logical:ValueTypeUnit"
xmi:id="EAID_C6177F0A_A31C_496d_8F54_D3C02C9FA020" name="UTC_SecondOfMinute"
description="Second of the hour and minute of the Gregorian Day, Month, Year of the
measurement. UTC minutes usually have 60 seconds, but the last minute of the last day of
a month can have 59 or 61 seconds." unit="EAID_17A1BB83_047A_4b42_A183_1237BC07B435"
valueType="EAID_372D8BFC_47B1_4385_AD77_6703541E7FAC">
        <constraint xmi:type="logical:IntegerRangeConstraint"
xmi:id="EAID_921B1D6C_6254_44e5_8454_D836DF6B4046" name="UTC_SecondOfMinuteConstraint"
description="UTC second of day starts at 0 and ranges to the number of seconds in a
minute minus 1. UTC minutes usually have 60 seconds, but the last minute of the last day
of a month can have 59 or 61 seconds." upperBound="60"/>
    </element>
    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_5E4B31C0_2934_4b1b_A705_FD7B78AB7323" name="VTUConstraints">
        <element xmi:type="logical:ValueTypeUnit"
xmi:id="EAID_4F1038CC_792E_45bb_98D7_C8EF9D196BA6" name="RealDegreesNeg180To180Inclusive"
description="Real degrees from -180 through 180 (-180 <= N <= 180)"
unit="EAID_6BE551B4_AC4C_467d_8264_95EB34EF81FE"
valueType="EAID_7CB1E0A3_7D27_45fa_BF9E_22EB15886D68">
            <constraint xmi:type="logical:RealRangeConstraint"
xmi:id="EAID_F240C471_8544_4a95_96B2_BF32D2546AAD" name="Minus_180_to_180_Inc_Constraint"
description="-180 <= N <= 180" lowerBound="-180.0" upperBound="180.0"/>
        </element>
        <element xmi:type="logical:ValueTypeUnit"
xmi:id="EAID_49C4825B_9D02_47e6_B56D_C6DD3C26FAB7" name="RealDegreesNeg90to90Inclusive"
description="Real degrees from -90 through 90 (-90 <= N <= 90)"
unit="EAID_6BE551B4_AC4C_467d_8264_95EB34EF81FE"
valueType="EAID_7CB1E0A3_7D27_45fa_BF9E_22EB15886D68">
            <constraint xmi:type="logical:RealRangeConstraint"
xmi:id="EAID_3AC90D51_5B0C_4582_919F_7B881B35A6FE" name="Minus_90_to_90_Inc_Constraint"
description="-90 <= N <= 90" lowerBound="-90.0" upperBound="90.0"/>
        </element>
        <element xmi:type="logical:ValueTypeUnit"
xmi:id="EAID_31A246CA_C815_43d1_B837_0E8B6EA17AB0"
name="RealRadiansNegHalfPItoHalfPIInclusive" description="Real radians from -PI/2 through
PI/2 (-90 <= N <= 90)" unit="EAID_DDC5A152_31FF_4e32_815A_3A1EE216C85A"
valueType="EAID_7CB1E0A3_7D27_45fa_BF9E_22EB15886D68">
            <constraint xmi:type="logical:RealRangeConstraint"
xmi:id="EAID_DB67AB4F_AB73_43e4_AE09_A085D588A10D"
name="Minus_HalfPI_to_HalfPI_Inclusive_Constraint" description="-90 <= N <= 90"
lowerBound="-1.5707964" upperBound="1.5707964"/>
        </element>
        <element xmi:type="logical:ValueTypeUnit"
xmi:id="EAID_BB939174_23D5_4298_8575_7F5A0CD0FFE3" name="RealDegreesZeroThru360Inclusive"
description="Real degrees from 0 through 360 (0 <= N <= 360)"
unit="EAID_6BE551B4_AC4C_467d_8264_95EB34EF81FE"
valueType="EAID_7CB1E0A3_7D27_45fa_BF9E_22EB15886D68">
            <constraint xmi:type="logical:RealRangeConstraint"
xmi:id="EAID_D5877566_53A2_402a_AC4B_E0B65F72DDDE" name="Zero_to_360_Inc_Constraint"
description="0 <= N <= 360" upperBound="360.0"/>
        </element>
        <element xmi:type="logical:ValueTypeUnit"
xmi:id="EAID_AADC4D73_088F_4aad_BEE1_9117FD97AE1E" name="RealRadiansNegPIThruPIInclusive"
description="Real radians from -Pi through Pi (-Pi <= N <= Pi)"
unit="EAID_DDC5A152_31FF_4e32_815A_3A1EE216C85A"
valueType="EAID_7CB1E0A3_7D27_45fa_BF9E_22EB15886D68">
            <constraint xmi:type="logical:RealRangeConstraint"
xmi:id="EAID_F681128B_4B28_4219_A478_01AFA1370B62" name="Minus_Pi_To_Pi_Inc_Constraint"
description="-Pi <= N <= Pi" lowerBound="-3.1415927" upperBound="3.1415927"/>
        </element>
        <element xmi:type="logical:ValueTypeUnit"
xmi:id="EAID_D4022E84_FA1B_4733_9756_2E8993224B63" name="RealRadiansZeroThru2PIExclusive"
description="Real radians from 0 to 2Pi (0 <= N <= 2Pi)"
unit="EAID_DDC5A152_31FF_4e32_815A_3A1EE216C85A"
valueType="EAID_7CB1E0A3_7D27_45fa_BF9E_22EB15886D68">

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        <constraint xmi:type="logical:RealRangeConstraint"
xmi:id="EAID_7EB04BE7_75EC_40d6_9B0B_F1B1D06FA827" name="Zero_to_2Pi_Excl_Constraint"
description="0 < N <= 2Pi" upperBound="6.2831855" upperBoundInclusive="false"/>
    </element>
    <element xmi:type="logical:ValueTypeUnit"
xmi:id="EAID_DC0ADCC0_A94D_49ca_8B19_E92ECF744CBD" name="RealRadiansZeroThru2PIInclusive"
description="Real radians from 0 through 2Pi (0 < N <= 2Pi)"
unit="EAID_DDC5A152_31FF_4e32_815A_3A1EE216C85A"
valueType="EAID_7CB1E0A3_7D27_45fa_BF9E_22EB15886D68">
        <constraint xmi:type="logical:RealRangeConstraint"
xmi:id="EAID_2A206229_E2D6_4cc1_A8B9_F9AD084DB4E9" name="Zero_to_2Pi_Inc_Constraint"
description="0 < N <= 2Pi" upperBound="6.2831855"/>
    </element>
</ldm>
</ldm>
<lsm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_5AB3187A_C693_4d3d_9218_2CED00F96DC8" name="LandMarks">
    <element xmi:type="logical:Landmark"
xmi:id="EAID_EB968219_ABA4_4258_B28D_3EB10CC30198" name="VehicleHeading" description="The
positive direction of the longitudinal axis of the vehicle."/>
    <element xmi:type="logical:Landmark"
xmi:id="EAID_2F0D69A5_4129_4c17_9019_E5E7887CF69B"
name="DynamicViscosityOfWaterAt100DegreesC" description="Dynamic viscosity of liquid
water at100 degrees Celsius"/>
    <element xmi:type="logical:Landmark"
xmi:id="EAID_ED7BF052_B664_43ca_863C_98065DF8ABDC" name="VehicleCourse" description="The
positive direction of the longitudinal velocity of the vehicle."/>
    <element xmi:type="logical:Landmark"
xmi:id="EAID_4A5A23A8_A843_4a9e_AD4A_123D5C05C2E1"
name="DynamicViscosityOfWaterAt20DegreesC" description="Dynamic viscosity of liquid water
at 20 degrees Celsius"/>
    <element xmi:type="logical:Landmark"
xmi:id="EAID_BB1C688B_89B0_4870_91D0_859F5FF6528B"
name="KinematicViscosityOfGlycerineAt20point3DegreesC" description="Kinematic viscosity of
glycerin at 20.3 degrees Celsius"/>
    <element xmi:type="logical:Landmark"
xmi:id="EAID_1EC36204_738B_488c_91FF_A5D749D60501"
name="KinematicViscosityOfWaterAt20DegreesC" description="Kinematic viscosity of liquid
water at 20 degrees Celsius"/>
    <element xmi:type="logical:Landmark"
xmi:id="EAID_BE0A312C_18B3_4bab_AB14_66F783441FB7" name="OneBitPerSecondDataRateLandmark"
description="One bit per second data movement"/>
    <element xmi:type="logical:Landmark"
xmi:id="EAID_23090211_4137_49e3_BE03_478F7B076C5A" name="OneCountLandmark"
description="One occurrence of a countable event"/>
    <element xmi:type="logical:Landmark"
xmi:id="EAID_175292B7_54B4_4291_8319_AAC132B024F7" name="OneCountPerSecondLandmark"
description="One occurrence of a countable event per second"/>
    <element xmi:type="logical:Landmark"
xmi:id="EAID_173741CF_C731_4508_AFC9_DB1919375D9C" name="OneHertzLandmark"
description="One occurrence of a repeatable event per second"/>
    <element xmi:type="logical:Landmark"
xmi:id="EAID_4432BF37_F8E1_4711_810A_C0F63807C62A" name="OneKilogramPerSecondLandmark"
description="One kilogram per second rate of flow in mass"/>
    <element xmi:type="logical:Landmark"
xmi:id="EAID_96044A9F_18B8_4b8f_B293_2E6A8EE88CED" name="ZeroCountLandmark"
description="No occurrences of a countable event"/>
    <element xmi:type="logical:Landmark"
xmi:id="EAID_19BA6F6F_BB75_4d4e_BB33_192B0F9C4222" name="ZeroCountRateLandmark"
description="No occurrences of a countable event per second"/>
    <element xmi:type="logical:Landmark"
xmi:id="EAID_21588F8E_3D75_4d1b_8D50_3C1D7B234FA8" name="ZeroDataRateLandmark"
description="No data movement"/>
    <element xmi:type="logical:Landmark"
xmi:id="EAID_4221DC2B_A11C_4974_B680_59E35E5F3D34" name="ZeroFrequencyLandmark"
description="No occurrences of a repeatable event"/>
    <element xmi:type="logical:Landmark"
xmi:id="EAID_8C6E7A81_45EB_4bbc_AADC_A8626F0B16D4" name="ZeroKilogramPerSecondLandmark"
description="No change in mass per second"/>
<lsm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_1FE799FB_2BC9_4b1d_9D9A_FC3231510FF7" name="Inertial_Landmarks">
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<element xmi:type="logical:Landmark"
xmi:id="EAID_2085FA87_8EBD_4106_9E00_58BB469AAE58" name="BodyReferenceOrigin"
description="An arbitrary point on the body where the values along the X, Y, and Z axes
are 0."/>
<element xmi:type="logical:Landmark"
xmi:id="EAID_E49CAB52_7C08_4eb1_BDD4_EC09FF21617E" name="BodyX_Landmark" description="A
position in the body reference plane (XZ plane) and on the body reference axis. This
point sets the reference axis."/>
<element xmi:type="logical:Landmark"
xmi:id="EAID_89DC18C3_B7D5_44a8_867B_861E120A4261" name="BodyY_Landmark" description="A
position tangent to the body reference plane (XZ plane) at the origin that sets the Y
axis."/>
<element xmi:type="logical:Landmark"
xmi:id="EAID_0B59FCBD_32A1_4a9a_B428_3506CEB2BF8B" name="BodyZ_Landmark" description="A
position in the body reference plane (XZ plane) perpendicular to the body reference axis
at the origin. This point sets the Z axis."/>
<element xmi:type="logical:Landmark"
xmi:id="EAID_26CB2B76_DD86_4dba_8A03_201027CAA562" name="ENU_UpNormal" description="The
up Normal to the Tangent North/East plane at the position of the NED origin"/>
<element xmi:type="logical:Landmark"
xmi:id="EAID_1BA0FB36_0DA4_4164_96DF_351A53CAF6B" name="NEDDownNormal" description="The
down Normal to the Tangent North/East plane at the position of the NED origin"/>
<element xmi:type="logical:Landmark"
xmi:id="EAID_937ABD7C_68C2_47e5_BB64_B914F6B00A5A" name="VehicleCenterOfGravity"
description="The center of mass or gravity of a vehicle"/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_03631913_CE44_4aa5_88D3_63FF2683AF4E" name="EarthFrameLandmarks">
<element xmi:type="logical:Landmark"
xmi:id="EAID_CCAECCA6_A8E7_4b19_8372_3B124CCC9CB2" name="EarthGeoid" description="The
earth geoid that represents the surface of equal gravitational potential. This is
represented by the Mean Sea Level."/>
<element xmi:type="logical:Landmark"
xmi:id="EAID_FDA77403_098B_48e3_836D_B7C4A19EECA4" name="EarthSurface" description="The
earth geoid that represents the surface of equal gravitational potential. This is
represented by the Mean Sea Level."/>
<element xmi:type="logical:Landmark"
xmi:id="EAID_617A190E_2F4D_45ec_8E3A_52B62B536854" name="LocalEastParallel"
description="The East Parallel at the position of the NED origin."/>
<element xmi:type="logical:Landmark"
xmi:id="EAID_4E14BCE8_702C_4af8_881F_D04BAFC6B6DC" name="Location" description="The
geographical location of a position or reference datum."/>
<element xmi:type="logical:Landmark"
xmi:id="EAID_97F860D8_5B30_4a8e_AFCF_720EF01E8527" name="MagneticNorth"
description="Position of the Magnetic North Pole."/>
<element xmi:type="logical:Landmark"
xmi:id="EAID_C61CD9D1_AD77_486c_BDCA_6F51188A81C4" name="WGS84Ellipsoid" description="The
WGS84 Ellipsoid calculated to approximate the earth geoid."/>
<element xmi:type="logical:Landmark" xmi:id="_qfQeQAE1EeSj3_IywtjKpA"
name="EarthCenter" description="The center of the Mass of the Earth"/>
<element xmi:type="logical:Landmark"
xmi:id="EAID_9EB09F9B_3761_4d81_B802_BEB61ABA6D4" name="NorthPoleAtPrimeMeridian"
description="Describes the position of the North Pole at the Prime Meridian."/>
<element xmi:type="logical:Landmark" xmi:id="_jDNG8AE2EeSj3_IywtjKpA"
name="PrimeMeridianEquatorSurface" description="Describes the point of Intersection of
the prime meridian, the equator, and the surface of the earth."/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_EB97C09D_FA9A_4981_BCE4_DE80C8BAC012" name="AbsorbedDoseLandmarks">
<element xmi:type="logical:Landmark"
xmi:id="EAID_F1759756_0DA4_49d7_B58C_1B2DD187B77E" name="OneGrayAbsorbedDoseLandmark"
description="Unit absorbed dose."/>
<element xmi:type="logical:Landmark"
xmi:id="EAID_E7A24B06_5DDB_4231_8E10_D0B9CC02B13C" name="ZeroAbsorbedDoseLandmark"
description="Zero absorbed dose."/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_E26E705B_7C17_499a_BEC6_BEB070D87319" name="AbsorbedDoseRateLandmarks">
<element xmi:type="logical:Landmark"
xmi:id="EAID_47DED456_6C3D_44c7_9586_CAFE4585DB0E"

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name="OneGrayPerSecondAbsorbedDoseRateLandmark" description="Unit absorbed dose rate
landmark."/>
<element xmi:type="logical:Landmark"
xmi:id="EAID_FD255658_0DE4_4a8c_8C24_E8A7983EA13D" name="ZeroAbsorbedDoseRateLandmark"
description="Zero absorbed dose rate."/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_20C84A34_373E_4d18_9840_27DB599A1FBE" name="AccelerationLandmarks">
<element xmi:type="logical:Landmark"
xmi:id="EAID_09ABA2E4_B0C7_44a8_BE55_4EA8AAA0A739"
name="OneMeterPerSecondPerSecondAccelerationInXAxisLandmark" description="Acceleration
landmark of one m/sec^2 in X axis"/>
<element xmi:type="logical:Landmark"
xmi:id="EAID_323305A0_518D_4ce4_8088_588354B84E57"
name="OneMeterPerSecondPerSecondAccelerationInYAxisLandmark" description="Acceleration
landmark of one m/sec^2 in Y axis"/>
<element xmi:type="logical:Landmark"
xmi:id="EAID_B317A567_5F73_4116_B993_B97BBEF86098"
name="OneMeterPerSecondPerSecondAccelerationInZAxisLandmark" description="Acceleration
landmark of one m/sec^2 in Z axis"/>
<element xmi:type="logical:Landmark"
xmi:id="EAID_D136372D_418A_4f80_B84C_9244DE95A17A" name="ZeroAccelerationLandmark"
description="Landmark for zero acceleration in all directions"/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_2EEC258C_54F0_4838_BF13_E922001DFEC9" name="AmountOfConcentrationLandmarks">
<element xmi:type="logical:Landmark"
xmi:id="EAID_E6D16447_F932_4bae_85F5_749590338288"
name="OneMolePerCubicMeterConcentrationLandmark" description="Represents an amount of 1
Mole per cubic meter concentration of a substance"/>
<element xmi:type="logical:Landmark"
xmi:id="EAID_BA35625A_C590_411f_83AA_23C717E26A46" name="ZeroConcentrationLandmark"
description="Represents a chemical concentration of zero (i.e., no amount of
substance)"/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_1A43B456_A5AC_4744_8F9F_E72B5B739C01" name="AmountOfSubstanceLandmarks"
description="Collection of landmark elements applicable to Amount Of Substance
measurements.">
<element xmi:type="logical:Landmark"
xmi:id="EAID_E586CBA3_83E6_448e_86FC_785FB8EA3435"
name="OneMoleAmountOfSubstanceLandmark" description="The mole represents an amount of
substance in the unit of Avogadro's constant (6.022x10^23) of atoms or molecules."/>
<element xmi:type="logical:Landmark"
xmi:id="EAID_396D9821_327B_4ed3_ABD0_A4ABACE8B529" name="ZeroAmountOfSubstanceLandmark"
description="The natural units of substances are molecules, which are groups of atoms
bonded together, this represents no molecules for a referenced substance."/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_B715C26A_2294_4470_BD10_E657D1177AAC" name="AngularAccelerationLandmarks">
<element xmi:type="logical:Landmark"
xmi:id="EAID_D2BEEB6_6083_41a1_A2D1_218FFEB94D37"
name="PiRadiansPerSecondPerSecondAngularAccelerationLandmark" description="Landmark for
Pi radians per second per second."/>
<element xmi:type="logical:Landmark"
xmi:id="EAID_00FDA1C5_DB08_435d_B0B5_3EB09EB42534" name="ZeroAngularAccelerationLandmark"
description="Landmark for zero angular acceleration."/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_BC319A47_C930_4249_8D89_61D5085B1756" name="AngularVelocityLandmarks">
<element xmi:type="logical:Landmark"
xmi:id="EAID_C33668AC_6B16_4868_B8DF_EFCDF6DF0F440"
name="PiRadiansPerSecondAngularVelocityLandmark" description="Landmark indicating an
angular rate of Pi radians per second."/>
<element xmi:type="logical:Landmark"
xmi:id="EAID_3D64786C_A7B2_496d_818E_3D426333E4B7" name="ZeroAngularVelocityLandmark"
description="Angular velocity landmark representing a zero angular velocity (i.e., no
rotation)"/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_68896E49_8D19_4c6c_BD0D_56F4799C0BDB" name="AreaLandmarks">
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<element xmi:type="logical:Landmark"
xmi:id="EAID_E9E460F3_91B4_4bc3_887F_68AC7C7D5133" name="UnitAreaLandmark"
description="Landmark representing an area of 1 square meter"/>
<element xmi:type="logical:Landmark"
xmi:id="EAID_C47A25DB_FE40_4b10_A43F_B646B6B2FDE2" name="ZeroAreaLandmark"
description="Landmark representing zero area"/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_B08FDE57_5C49_41e7_9D11_EF49F447F2BC" name="BodyAngleLandmark">
<element xmi:type="logical:Landmark"
xmi:id="EAID_7B2AA6B0_4E32_428e_B420_674937EB807B" name="BodyAngleAttitudeEquilibrium"
description="The point at which the local vehicle body frame has no rotation in any of
the three axes that originate at the vehicle center of gravity (longitudinal, lateral,
and vertical)."/>
<element xmi:type="logical:Landmark"
xmi:id="EAID_EB421BF8_9BA2_4b2c_9F12_89947506FFAC" name="BodyAnglePiOver2RadianLeftRoll"
description="The orientation of the local vehicle body frame with respect to the vertical
axis (or lateral axis) after a -Pi/2 radian rotation along the longitudinal axis (a roll
to left)"/>
<element xmi:type="logical:Landmark"
xmi:id="EAID_46C2DBA8_097E_4920_BA96_7CC8F27215AC" name="BodyAnglePiOver4RadianPitchUp"
description="The orientation of the local vehicle body frame with respect to the
longitudinal (or vertical axis) after a Pi/4 radian rotation along the lateral axis (a
pitch up)"/>
<element xmi:type="logical:Landmark"
xmi:id="EAID_7BA5AA9E_8487_4169_8591_E8A62103DE76" name="BodyAnglePiOver6RadianYawLeft"
description="The orientation of the local vehicle body frame with respect to the
longitudinal axis (or lateral axis) after a -Pi/6 radian rotation along the vertical axis
(a yaw left)"/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_9B4979E6_2648_41b3_B77B_09B193C47BCB" name="BodyFrameAttitudeLandmark">
<element xmi:type="logical:Landmark"
xmi:id="EAID_39753BD3_1FF4_47ca_A367_845117E99553" name="BodyAttitudeOriginLandmark"
description="The point at which the body attitude is aligned to the local level frame and
has no rotation in any of the three axes that originate at the vehicle center of gravity
(longitudinal, lateral, and vertical)."/>
<element xmi:type="logical:Landmark"
xmi:id="EAID_913ABE8D_D741_4b8e_AA57_E015677CB52D"
name="BodyAttitudePiOver2RadianLeftRoll" description="The orientation of the body with
respect to the vertical axis (or lateral axis) after a Pi/2 radian rotation along the
longitudinal axis (a roll to left)"/>
<element xmi:type="logical:Landmark"
xmi:id="EAID_3E7D915F_92BA_4d27_BC1A_52D9915CAF0F"
name="BodyAttitudePiOver4RadianUpPitch" description="The orientation of the body with
respect to the longitudinal (or vertical axis) after a Pi/4 radian rotation along the
lateral axis (a pitch up)"/>
<element xmi:type="logical:Landmark"
xmi:id="EAID_F8CBB773_7EC3_4cf3_A6BF_322F5E0611A2"
name="BodyAttitudePiOver6RadianLeftYaw" description="The orientation of the body with
respect to the longitudinal axis (or lateral axis) after a -Pi/6 radian rotation along
the vertical axis (a yaw left)"/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="SDM_2022C397_14EE_470C_8A47_0CCE057DCAE0" name="CovarianceLandmarks">
<element xmi:type="logical:Landmark"
xmi:id="SDM_06467E5A_8024_4295_960C_9EBFC0833ED3" name="ZeroValueLandmark"
description="Zero value, unitless"/>
<element xmi:type="logical:Landmark"
xmi:id="SDM_03DAC63E_46E2_4EB8_98C4_E17820ADC892" name="PositiveOneValueLandmark"
description="Positive one value, unitless"/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_46AE3D14_1673_4d58_B36F_2EF1CB493C2B" name="DensityLandmarks">
<element xmi:type="logical:Landmark"
xmi:id="EAID_9F7700F1_01DE_4525_A353_EFB98340E64A" name="WaterDensityLandmark"
description="Density of water at 4 degrees C and 1 Atmosphere pressure"/>
<element xmi:type="logical:Landmark"
xmi:id="EAID_ED886DCA_4126_41d7_88CF_DEB43A2462C8" name="ZeroDensityLandmark"
description="Zero value of density (i.e., no mass in a volume)"/>
</ldm>

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        <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_4FCEC184_A34E_4892_A205_A30FEEA2C46B" name="DoseEquivalentLandmarks">
            <element xmi:type="logical:Landmark"
xmi:id="EAID_FDC373B4_972D_4e28_BF96_F2C36D7ADDD3"
name="OneSievertDoseEquivalentLandmark" description="One Sievert dose equivalent."/>
            <element xmi:type="logical:Landmark"
xmi:id="EAID_DA54FC44_ED7D_48f6_AB58_4EB88B717F97" name="ZeroDoseEquivalentLandmark"
description="Zero dose equivalent"/>
        </ldm>
        <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_605F71F8_52B9_4cc7_A510_6961CE9E770B" name="ElectricityLandmarks"
description="Collection of landmark elements applicable to Electric Current
measurements.">
            <element xmi:type="logical:Landmark"
xmi:id="EAID_1F30EE79_9169_465b_865B_96D6C06844B4" name="OneAmpLandmark" description="A
current of 1 amp means that there is 1 coulomb of charge passing through a cross section
of a wire every 1 second."/>
            <element xmi:type="logical:Landmark"
xmi:id="EAID_D906AAE7_5FE3_46a0_8164_81A17CE49BDB"
name="OneAmpPerSquareMeterCurrentDensityXDirectionLandmark" description="One amp per
square meter of electric current density of the X vector direction. "/>
            <element xmi:type="logical:Landmark"
xmi:id="EAID_97227095_5555_43bc_A29F_18C21EF95AD1"
name="OneAmpPerSquareMeterCurrentDensityYDirectionLandmark" description="One amp per
square meter of electric current density of the Y vector direction. "/>
            <element xmi:type="logical:Landmark"
xmi:id="EAID_3812651D_A79A_4181_8D48_8E7D2B39160E"
name="OneAmpPerSquareMeterCurrentDensityZDirectionLandmark" description="One amp per
square meter of electric current density of the Z vector direction. "/>
            <element xmi:type="logical:Landmark"
xmi:id="EAID_7C6FB1B9_F9F9_4b44_94F3_E6883ACC835F" name="OneCoulombLandmark"
description="Its SI definition is the charge transported by a constant current of one amp
in one second."/>
            <element xmi:type="logical:Landmark"
xmi:id="EAID_932FC611_74B3_4b33_BA1B_0C017A64F0E0" name="OneCoulombPerMeterCubedLandmark"
description="A unit of electric current density measured at one unit of coulombs per
meter cubed as applied to volume."/>
            <element xmi:type="logical:Landmark"
xmi:id="EAID_E266B00D_B505_41f8_8219_9AF152973344" name="OneCoulombPerMeterLandmark"
description="A unit of electric current density measured at one unit of coulombs per
meter."/>
            <element xmi:type="logical:Landmark"
xmi:id="EAID_F581EEC1_D7B0_4a12_A380_CFDE0FE31101"
name="OneCoulombPerMeterSquaredLandmark" description="A unit of electric current density
measured at one unit of coulombs per meter squared as applied to a surface area."/>
            <element xmi:type="logical:Landmark"
xmi:id="EAID_79DB8969_ED34_45fa_B559_C6C84BCA72C0" name="OneFaradLandmark" description="A
unit of stored electrical charge measured at One Farad."/>
            <element xmi:type="logical:Landmark"
xmi:id="EAID_36E07197_7892_4ac1_A1DE_03F74C4423F3" name="OneVoltLandmark" description="A
unit of electric potential measured at one unit of volt."/>
            <element xmi:type="logical:Landmark"
xmi:id="EAID_425AD038_620E_4728_AAEA_06C1B85F4160" name="ZeroCapacitanceLandmark"
description="No electrical charge stored by a body."/>
            <element xmi:type="logical:Landmark"
xmi:id="EAID_3099F886_D076_4f49_98A5_452E887259DA"
name="ZeroElectricChargeDensityLandmark" description="No measurable electric charge
density."/>
            <element xmi:type="logical:Landmark"
xmi:id="EAID_C4DAF340_8D6D_494b_A77D_B012BDCC2CB0" name="ZeroElectricChargeLandmark"
description="No charge is flowing through a circuit."/>
            <element xmi:type="logical:Landmark"
xmi:id="EAID_4EFDC88_21D2_413e_A8E7_C237BAAD6EF8"
name="ZeroElectricCurrentDensityLandmark" description="No measurable electric current
density."/>
            <element xmi:type="logical:Landmark"
xmi:id="EAID_02BD4EDE_A62E_44d3_806E_5F0959476547" name="ZeroElectricPotentialLandmark"
description="No measurable electric potential. No voltage."/>
        </ldm>
        <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_72F6375A_57C3_466b_8DF6_36D507D3D64E" name="EnergyLandmarks">

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<element xmi:type="logical:Landmark"
xmi:id="EAID_FC5FCA4E_4789_465a_A59A_5ABF75EC9B83" name="OneJouleEnergyLandmark"
description="A force of 1 newton through distance of meter."/>
    <element xmi:type="logical:Landmark"
xmi:id="EAID_52901778_4D76_4bb1_8A71_C9462DF5B4E8" name="ZeroEnergyLandmark"
description="Zero energy."/>
    </ldm>
    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_E462EE61_6AE0_4b94_97D9_84A47BC33704" name="ForceLandmarks">
        <element xmi:type="logical:Landmark"
xmi:id="EAID_75F976AD_CA44_4adb_8D48_8BA2B25A1DCD" name="Kilopond" description="Force
landmark equal to the magnitude of the force exerted by one kilogram of mass in a 9.80665
m/s^2 gravitational field."/>
        <element xmi:type="logical:Landmark"
xmi:id="EAID_7EB3F434_82EC_4375_A434_5085A142F9BA" name="ZeroForceLandmark"
description="Landmark indicating a force of zero (no applied force)" />
    </ldm>
    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_9B83362B_5297_4186_8F22_C36667F71F25" name="HumidityLandmarks">
        <element xmi:type="logical:Landmark"
xmi:id="EAID_E9D530D6_1823_4e71_BB7D_1271C64B263C"
name="SaturatedRelativeHumidityLandmark" description="Represents 100% relative
humidity."/>
        <element xmi:type="logical:Landmark"
xmi:id="EAID_4AA2689D_30FC_46a2_9429_1B3741351F35" name="ZeroRelativeHumidity"
description="Represents zero relative humidity." />
    </ldm>
    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_1234FB8E_0203_4acb_8BE1_DC5EF4BA80CA" name="IlluminanceLandmarks">
        <element xmi:type="logical:Landmark"
xmi:id="EAID_72916D9B_2F88_4238_BEFC_6BE360FECB2D" name="OneLuxIlluminanceLandmark"
description="1 lux (= lumen per square meter)" />
        <element xmi:type="logical:Landmark"
xmi:id="EAID_4ED560B6_21E8_4034_AC6A_3E13CA23DB34" name="ZeroIlluminanceLandmark"
description="zero illuminance landmark" />
    </ldm>
    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_33F3D7F7_F29C_4dab_BDBB_1975059426D4" name="LengthLandmarks">
        <element xmi:type="logical:Landmark"
xmi:id="EAID_80F96761_0360_479d_98D0_300A625D8793" name="OneMeterDistanceLandmark"
description="One meter." />
        <element xmi:type="logical:Landmark"
xmi:id="EAID_BE2755D6_D723_4955_A378_04212C88ACF3" name="ONeMeterWidthExtentLandmark"
description="One Meter width landmark for extent" />
        <element xmi:type="logical:Landmark"
xmi:id="EAID_DD4089D3_E5F9_459f_AF68_2E7D03864E85" name="ZeroDistanceLandmark"
description="Zero distance." />
    </ldm>
    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_F3688BCF_0AE5_4ca9_BB0C_11EC5E0BD15C" name="LuminousIntensityLandmarks">
        <element xmi:type="logical:Landmark"
xmi:id="EAID_E55AD9BB_D33A_4a81_8ED1_1B0833BA91BF" name="Darkness"
description="Represents no visible light." />
        <element xmi:type="logical:Landmark"
xmi:id="EAID_899B5AFF_D42E_4649_8089_0D7F02146AB6" name="SingleCandela"
description="power emitted by a light source in a particular direction" />
    </ldm>
    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_379D18D5_787E_4a60_ACF7_2E1334620243" name="MassLandmarks"
description="Collection of landmark elements applicable to Mass measurements.">
        <element xmi:type="logical:Landmark"
xmi:id="EAID_F5EE0165_F768_43ea_8E46_19F80DA779FF" name="OneKilogramLandmark"
description="The one kilogram mass for a body as measured when the body is a rest
relative to an observer, an inherent property of the body." />
        <element xmi:type="logical:Landmark"
xmi:id="EAID_894D6C59_4EAA_470a_B61A_D5561C678545" name="ZeroMassLandmark"
description="No recorded object mass." />
    </ldm>
    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_880C3557_FFFE_4dfc_AE15_C94E41EB8931" name="OneMoleLandmark"
description="The amount of substance of a system which contains exactly 6.02214076 × 10^23 elementary entities." />

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name="OrientationAccelerationLandmarks" description="Logical package to capture
orientation acceleration landmarks elements.">
    <element xmi:type="logical:Landmark"
xmi:id="EAID_ABE2EA4A_7F83_4b9e_817F_592893C43816">
name="AxialForcePiOver4RadianUpPitchAxis" description="Net force in the positive x-
direction (Lateral Axis/PitchAxis) to create an angle Pi/4 radians in the up direction"/>
    <element xmi:type="logical:Landmark"
xmi:id="EAID_8F4761A5_A3AE_468f_B499_319860B64B8D">
name="NormalForcePiOver6RadianLeftYawAxis" description="Net force in positive z-direction
(Vertical Axis/Yaw Axis) to create a Pi/6 radians angle in the negative direction"/>
    <element xmi:type="logical:Landmark"
xmi:id="EAID_0F69C644_7864_4e70_9C0C_97365921347E">
name="SideForcePiOver2RadianRightRollAxis" description="Net force in positive y-direction
(Longitudinal Axis/Roll Axis) to create a Pi/2 radians angle in the positive
direction."/>
    <element xmi:type="logical:Landmark"
xmi:id="EAID_FEB346B7_0463_40ca_BDEF_CC2F44B8CF5A" name="ZeroRotationalAcceleration"
description="No rotation about any axis due to external forces on an object."/>
    </ldm>
    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_0DDD5E4F_E9D5_48bb_A2B7_1FC0A54377FC" name="OrientationVelocityLandmarks">
        <element xmi:type="logical:Landmark"
xmi:id="EAID_874C6C78_DAD9_4ef9_8CBE_6213F4FA5252" name="NeutralChangeRate"
description="Rate of change in orientation is non-existent."/>
        <element xmi:type="logical:Landmark"
xmi:id="EAID_6A77CF2F_C9B8_47e5_BF5B_6B243F14AAB6" name="PiOver2RadianRightRollRate"
description="Velocity Rate required to change the roll angle of orientation pi/2 radians
right."/>
        <element xmi:type="logical:Landmark"
xmi:id="EAID_37236D77_26DF_45fd_B528_88F78467EE4C" name="PiOver4RadianUpPitchRate"
description="Velocity Rate required to change the pitch angle of orientation Pi/4 radians
up."/>
        <element xmi:type="logical:Landmark"
xmi:id="EAID_EF97A4DA_ED5B_4704_B17D_2A4FA62603C6" name="PiOver6RadianLeftYawRate"
description="Velocity Rate required to change the roll angle of orientation Pi/6 radians
left."/>
    </ldm>
    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_8A972E2D_AD23_4489_BC11_B5F08ABD3612" name="PowerLandmarks">
        <element xmi:type="logical:Landmark"
xmi:id="EAID_6B2B9037_EBBE_44ea_B0D3_1A9DA3542A18" name="OneWattPowerLandmark"
description="Landmark for 1 Watt of power"/>
        <element xmi:type="logical:Landmark"
xmi:id="EAID_8D7C54F8_850B_443a_8875_DDA859EDDF8E" name="ZeroPowerLandmark"
description="Zero Watts of Power Landmark"/>
    </ldm>
    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_0311A086_04D9_4342_BDF1_7EB23855EB7E" name="PressureLandmarks">
        <element xmi:type="logical:Landmark"
xmi:id="EAID_CF1128BC_C286_4666_BAD7_F91AD3BA58FC" name="OnePascalLandmark"
description="Force of 1 N per square meter"/>
        <element xmi:type="logical:Landmark"
xmi:id="EAID_5E2A754E_190C_41fb_92DA_1C9627E027DA" name="ZeroPressureLandmark"
description="Zero pressure"/>
    </ldm>
    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_3307EE35_37F1_4f0a_AB2C_3934FFD68366" name="ResolutionLandmarks">
        <element xmi:type="logical:Landmark"
xmi:id="EAID_58DED9B5_477F_4054_AA12_9877FDC7782B" name="OriginLandmark"
description="Screen resolution origin expressed as (0,0)"/>
        <element xmi:type="logical:Landmark"
xmi:id="EAID_57C5E3B5_6C67_4d1b_89B9_6EFD08E28F1B" name="UnitPixelLandmark"
description="A one unit pixel defined landmark."/>
    </ldm>
    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_6B2ECCBA_9FFA_488f_92C4_D4772E754371" name="ScalarAccelerationLandmarks">
        <element xmi:type="logical:Landmark"
xmi:id="EAID_816CEBC9_F8B9_4002_8383_997BAA6C63DB"
name="OneMeterPerSecondPerSecondScalarAccelerationLandmark" description="Acceleration
landmark of one m/sec^2 in X axis"/>

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<element xmi:type="logical:Landmark"
xmi:id="EAID_79DDE6C7_4797_4dfd_975D_116B337B8E63" name="ZeroScalarAccelerationLandmark"
description="Zero velocity, an object's motion is constant, neither speeding up or
slowing down"/>
    </ldm>
    <ldm xmi:type="datamodel:LogicalDataModel">
        <element xmi:type="logical:Landmark"
xmi:id="EAID_E69B26E5_875C_4325_AF95_BD44D4C2B6DD" name="SpeedLandmarks">
            <element xmi:type="logical:Landmark"
xmi:id="EAID_E463202C_BB78_4ea0_ACCE_34527B0C18C5" name="OneMeterPerSecondLandmark"
description="One meter per second"/>
                <element xmi:type="logical:Landmark"
xmi:id="EAID_7D5FCB19_24EB_4641_BA39_BD21319038CD" name="ZeroSpeedLandmark"
description="Zero speed."/>
                    </ldm>
                    <ldm xmi:type="datamodel:LogicalDataModel">
                        <element xmi:type="logical:Landmark"
xmi:id="EAID_84DB3782_2285_445d_8349_10B5D5BB5708" name="TemperatureLandmarks">
                            <element xmi:type="logical:Landmark"
xmi:id="EAID_99B14262_EA23_4511_A3F0_3546D028849D" name="AbsoluteZero" description="The
lower limit of the thermodynamic temperature scale, a fictitious state at which the
enthalpy and entropy of a cooled ideal gas reaches its minimum value (-459.67 deg F, -273.15 deg C, 0 deg K)"/>
                            <element xmi:type="logical:Landmark"
xmi:id="EAID_CED1C8C6_F278_4501_A043_E59507D5CF90" name="BoilingPointOfWater"
description="Boiling point of water at 1 atmosphere pressure (212 deg F, 671.67 deg R,
100 deg C, 373.15 deg K)"/>
                            <element xmi:type="logical:Landmark"
xmi:id="EAID_F1FC1D80_0D3E_402b_B1BE_6271F0BC9DED" name="FreezingPointOfWater"
description="Freezing point of water at 1 atmosphere pressure (32 deg F, 491.67 deg R, 0
deg C, 273.15 deg K)"/>
                    </ldm>
                    <ldm xmi:type="datamodel:LogicalDataModel">
                        <element xmi:type="logical:Landmark"
xmi:id="EAID_C92F89A2_E3B1_49b7_8456_685F37F21356" name="TimeLandmarks">
                            <element xmi:type="logical:Landmark"
xmi:id="EAID_712C56C3_07E9_4693_B56E_4DD0BD9C13A3" name="GregorianCalendarOrigin"
description="Beginning of year 0 (1/1/0 0:00:00) per Pope Gregory's bull in 1582, to
reform the Julian calendar to set the date for Easter to the time the First Council of
Nicaea had agreed to in 325."/>
                            <element xmi:type="logical:Landmark"
xmi:id="EAID_26121EAF_96C4_4e3b_90B5_568E427782FE" name="OneSecondDurationLandmark"
description="One second duration landmark."/>
                            <element xmi:type="logical:Landmark"
xmi:id="EAID_526E5000_ED7A_408d_86CD_65EEED91050F" name="SpecificGregorianDayStart"
description="The moment that a specified day of a specified month of a specified year
starts. e.g. 0:00:0 of Feb 12, 2000."/>
                            <element xmi:type="logical:Landmark"
xmi:id="EAID_D15D3A25_475C_4597_A3C8_D1BCE85BA908" name="SpecificGregorianMonthStart"
description="The moment that a specified month of a specified year starts. e.g. 0:00:0 of
Feb 1, 2000."/>
                            <element xmi:type="logical:Landmark"
xmi:id="EAID_0114BCB1_A3F4_44b0_B710_D128C24A8C58" name="SpecificGregorianYearStart"
description="The moment that a specified year starts (0:00:00 on Jan 1 of specified
year)"/>
                            <element xmi:type="logical:Landmark"
xmi:id="EAID_DE454468_5239_4a39_81AC_B71B1EEAC2CA" name="SpecificTimeOfDay"
description="The time duration between the specified time and the start of the specified
Gregorian day"/>
                            <element xmi:type="logical:Landmark"
xmi:id="EAID_E3DB5E79_28F5_4546_AF37_5C5C59EAA687" name="UnixEpochStart"
description="Start of Unix Epoch (Jan 1, 1970 0:00:00)"/>
                            <element xmi:type="logical:Landmark"
xmi:id="EAID_07D5AF61_422D_4fff_8E3F_EBADE19C9743" name="UTC_DayStart" description="The
moment that a specified UTC day of a specified month of a specified year starts. e.g.
0:00:00 Zulu"/>
                            <element xmi:type="logical:Landmark"
xmi:id="EAID_0F3F8CEA_7F8A_4d9d_B338_692BCEA4F9EB" name="UTC_Noon" description="12 hours
after the start of a specified UTC day of a specified month of a specified year. e.g.
12:00:00 Zulu"/>
                            <element xmi:type="logical:Landmark"
xmi:id="EAID_3149A12E_1AB1_4ffd_9D14_1466FA5DCDE0" name="ZeroDurationLandmark"
description="A zero second duration meaning no time has elapsed."/>
                    </ldm>

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        <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_6CA6C2B7_0436_414a_B387_95B15A033D83" name="TorqueLandmarks">
            <element xmi:type="logical:Landmark"
xmi:id="EAID_12C94E15_7436_4c2e_891F_279398A2CD96" name="OneNewtonMeterLandmark"
description="Unit value of torque representing 1 newton of force applied to a moment arm
of 1 meter."/>
            <element xmi:type="logical:Landmark"
xmi:id="EAID_0A16B1C3_3293_4b6d_AE0B_CD5DB0606EC2" name="ZeroTorqueLandmark"
description="No measurable torque."/>
        </ldm>
        <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_FF1AFED9_85B0_4398_8DAO_715BEAEDAE1" name="VelocityLandmarks">
            <element xmi:type="logical:Landmark"
xmi:id="EAID_924F91D1_E7B0_41f0_9E35_9A5EABAD0DDC" name="NoMotionVelocityLandmark"
description="Landmark for zero velocity in all directions"/>
            <element xmi:type="logical:Landmark"
xmi:id="EAID_C4B225CB_048A_4847_8BB7_5FE18049CAA5" name="UnitVelocityInXAxisLandmark"
description="Velocity landmark of one m/sec in X axis"/>
            <element xmi:type="logical:Landmark"
xmi:id="EAID_BA313E72_BA10_4b3f_B184_7B146075F771" name="UnitVelocityInYAxisLandmark"
description="Velocity landmark of one m/sec in Y axis"/>
            <element xmi:type="logical:Landmark"
xmi:id="EAID_0456CB67_FDB8_48db_B9AF_0690B41F3AA1" name="UnitVelocityInZAxisLandmark"
description="Velocity landmark of one m/sec in Z axis"/>
        </ldm>
        <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_621304AA_28B7_423c_8816_643563B97A7F" name="VolumeLandmarks">
            <element xmi:type="logical:Landmark"
xmi:id="EAID_1550FA6E_1F8C_4b47_9DC2_F36336B730F0" name="OneCubicMeterLandmark"
description="Landmark for a value of one cubic meter of volume."/>
            <element xmi:type="logical:Landmark"
xmi:id="EAID_2205BF3D_7A57_4440_A3B4_1D1EE359EFDF" name="ZeroVolumeLandmark"
description="Landmark for zero volume"/>
        </ldm>
        <ldm xmi:type="datamodel:LogicalDataModel"
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description="Measurement system for integer-based addressing policies and standards."
measurementSystemAxis="EAID_E955A716_98F4_4b0a_AD6E_58FC647EECBA"
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measurementSystemAxis="EAID_E955A716_98F4_4b0a_AD6E_58FC647EECBA"
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description="Measurement System for IPv6 addresses."
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externalStandardReference="IETF RFC 4193" orientation="N/A"/>
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description="Measurement System for Uniform Resource Identifier (URI) measurements."
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coordinateSystem="EAID_9073ABED_00F3_4b1f_8045_9AE46DBC3456"
externalStandardReference="RFC 3986" orientation="N/A"/>
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description="Measurement System Axis for integer addresses."/>

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used to specify position in terms of a local inertial point. ">
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name="LocalEastNorthUpMeasurementSystem">
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description="A geo measurement system. The three axes are centered at a geographical
position Q,E and oriented relative to features on the earth Q,E the North Pole (local
meridian) Q,E the east (local parallel) Q,E and tangent to the NE plane. The East Axis
MS" measurementSystemAxis="EAID_007860D2_AD02_4720_A9CC_C000E090AFF1"
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description="A geo measurement system. The three axes are centered at a geographical
position Q,E and oriented relative to features on the earth Q,E the North Pole (local
meridian) Q,E the east (local parallel) Q,E and tangent to the NE plane. The Up Axis MS"
measurementSystemAxis="EAID_822D8EDD_9474_4451_98B6_32E70F59B4FF"
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geographical position Q,E and oriented relative to features on the earth Q,E the North
Pole (local meridian) Q,E the east (local parallel) Q,E and tangent to the NE plane."
measurementSystemAxis="EAID_007860D2_AD02_4720_A9CC_C000E090AFF1
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coordinateSystem="EAID_E16B78B2_B2BA_43e5_837E_018DC1FD621C"
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for Geographic Centered, East, North, Up (ENU) Inertial Reference Frames."
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description="The Y_North coordinate value of the North Pole Datum for Geographic Centered, East, North, Up (ENU) Inertial Reference Frames."
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description="The East axis of an ENU Measurement System."
axis="EAID_3EFC05DA_4D3A_4e3d_8AEC_C9FEC8D85087"
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description="The North axis of an ENU Measurement System."
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description="The Up axis of an ENU Measurement System."
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name="Position_VehicleNED_Down_MeasSys" description="A geo measurement system attached to a vehicle. The three axes are centered at the vehicle CoG Q,E and oriented relative to features on the earth Q,E the North Pole (local meridian) Q,E the east (local parallel) Q,E and tangent to the NE plane. Down Axis MS."
measurementSystemAxis="_XyWdesXpEeS20aHYOO_RKQ"
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East, Down (NED) Inertial Reference Frames. "
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name="Position_VehicleNED_East_MeasSys" description="A geo measurement system attached to
a vehicle. The three axes are centered at the vehicle CoG Q,E and oriented relative to
features on the earth Q,E the North Pole (local meridian) Q,E the east (local parallel)
Q,E and tangent to the NE plane. EastAxis MS."
measurementSystemAxis="_XyWdfMXpEeS20aHYOO_RKQ"
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description="The Y_East axis coordinate value of the Origin for Vehicle Centered, North,
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geographical measurement system attached to a vehicle. The three axes are centered at the
vehicle CoG Q,E and oriented relative to features on the earth Q,E the North Pole (local
meridian) Q,E the east (local parallel) Q,E and tangent to the NE plane."
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_XyWdesXpEeS20aHYOO_RKQ" coordinateSystem="EAID_E16B78B2_B2BA_43e5_837E_018DC1FD621C"
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description="The coordinate values of the Origin for Vehicle Centered, North, East, Down
(NED) Inertial Reference Frames." landmark="EAID_937ABD7C_68C2_47e5_BB64_B914F6B00A5A">
    <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_F4D65F38_F236_4da0_B3A2_C157C016785F" axis="_XyWde8XpEeS20aHYOO_RKQ"
value="0" valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
    <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_8534AD9C_5230_4618_A241_585E5B00D0B1" axis="_XyWdfMXpEeS20aHYOO_RKQ"
value="0" valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
    <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_C0ACCEAC_57E2_492e_8FBD_8F4C60F35FE1" axis="_XyWdesXpEeS20aHYOO_RKQ"
value="0" valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
    </referencePoint>
    <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_FA89D92B_89BC_4d50_81C9_54E81E83E3F5" name="VehicleNED_NorthDatum"
description="The coordinate values of the Geographic North Pole for Vehicle Centered,
North, East, Down (NED) Inertial Reference Frames."
landmark="EAID_9EB09F9B_3761_4d81_B802_BEB61ABA6D4">

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        <referencePointPart xmi:type="logical:ReferencePointPart"
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value="Measured Value" valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
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xmi:id="EAID_64709ED8_BBA0_43df_9358_C59E3E628924" axis="_XyWdfMXpEeS20aHYOO_RKQ"
value="0" valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
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value="0" valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
    </referencePoint>
    <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_37C14BA0_E866_41af_8B6C_242770CC9A71" name="VehicleNED_EastDatum"
description="The coordinate values of the local East Parallel for Vehicle Centered,
North, East, Down (NED) Inertial Reference Frames."
landmark="EAID_617A190E_2F4D_45ec_8E3A_52B62B536854">
        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_AA2B7A09_6EA4_44e1_8D97_9E830ABC7295" axis="_XyWde8XpEeS20aHYOO_RKQ"
value="0" valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_4A9B10C7_21D3_4c54_9B18_C203D3D4CC6C" axis="_XyWdfMXpEeS20aHYOO_RKQ"
value="Measured Value" valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_6179D933_75CD_465a_858B_C2FC6523EFF8" axis="_XyWdesXpEeS20aHYOO_RKQ"
value="0" valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
    </referencePoint>
    <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_0652E3BD_14E2_4fd9_B3F7_87E9FCA4A8F3" name="VehicleNED_DownDatum"
description="The coordinate values of the local Down Normal to the North/East tangent
plane for Vehicle Centered, North, East, Down (NED) Inertial Reference Frames."
landmark="EAID_1BA0FB36_0DA4_4164_96DF_351A53CAF6B">
        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_DC4C7E55_9DCE_4796_8B0E_6C8A0ACE2BDE" axis="_XyWde8XpEeS20aHYOO_RKQ"
value="0" valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_B266B498_3A99_4d51_8D55_D4BD2BC7B698" axis="_XyWdfMXpEeS20aHYOO_RKQ"
value="0" valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_B631082A_BE80_4b1a_80A1_5F965543B126" axis="_XyWdesXpEeS20aHYOO_RKQ"
value="Measured Value" valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
    </referencePoint>
</element>
<element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_EA2D7214_102B_47e6_96E1_AD39FEF7AA78"
name="Position_VehicleNED_North_Meassys" description="A geo measurement system attached
to a vehicle. The three axes are centered at the vehicle CoG Q,E and oriented relative to
features on the earth Q,E the North Pole (local meridian) Q,E the east (local parallel)
Q,E and tangent to the NE plane. North Axis MS."
measurementSystemAxis="_XyWde8XpEeS20aHYOO_RKQ"
coordinateSystem="EAID_D73E1979_E607_48ce_A01F_2EAD5226614D"
externalStandardReference="ISO 1151/1, 1.1.4" orientation="Orthogonal, Right Handed">
    <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_36EF0F7A_CFEA_48e8_B5A8_E2B094834831" name="VehicleNED-OriginNorthAxis"
description="The X_North axis coordinate value of the Origin for Vehicle Centered, North,
East, Down (NED) Inertial Reference Frames. "
landmark="EAID_937ABD7C_68C2_47e5_BB64_B914F6B00A5A">
        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_7932C7A6_658D_431f_B7E1_1157B20296DD" axis="_XyWde8XpEeS20aHYOO_RKQ"
value="0" valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
    </referencePoint>
    <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_168EF502_A56F_4e93_8FOB_E85BE6A4726D" name="VehicleNED_NorthDatumNorthAxis"
description="The X_North Axis coordinate value of the Geographic North Pole for Vehicle
Centered, North, East, Down (NED) Inertial Reference Frames."
landmark="EAID_9EB09F9B_3761_4d81_B802_BEB61ABA64">
        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_E1891A0C_6277_4910_8AA7_A4BBA2E249C0" axis="_XyWde8XpEeS20aHYOO_RKQ"
value="Measured Value" valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
    </referencePoint>
</element>
<element xmi:type="logical:MeasurementSystemAxis"
xmi:id="XyWde8XpEeS20aHYOO_RKQ" name="Position_North_X_MeasSysAxis" description="The

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North axis of an NED Measurement System."
axis="EAID_3EFC05DA_4D3A_4e3d_8AEC_C9FEC8D85087"
defaultValueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
    <element xmi:type="logical:MeasurementSystemAxis"
xmi:id="XyWdfMXpEeS20aHYOO_RKQ" name="Position_East_Y_MeasSysAxis" description="The East
axis of an NED Measurement System." axis="EAID_185CD9A8_B677_41ab_907D_C7F232756DCE"
defaultValueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
    <element xmi:type="logical:MeasurementSystemAxis"
xmi:id="XyWdesXpEeS20aHYOO_RKQ" name="Position_Down_Z_MeasSysAxis" description="The Down
axis of an NED Measurement System." axis="EAID_C74601C9_0E7A_483b_AD4C_28D64BE141E3"
defaultValueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
</ldm>
    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="SDM_67861813_3C4A_436D_9425_B2454EC7443C"
name="VehicleNorthEastPositionMeasurementSystem">
        <element xmi:type="logical:MeasurementSystem"
xmi:id="SDM_39CD01B9_4C85_47F7_943F_25C14DB4BFE1"
name="VehicleNEPositionMeasurementSystem" description="A geographical measurement system
attached to a vehicle. The two axes are centered at the vehicle CoG, and oriented
relative to features on the earth, the North Pole (local meridian), the east (local
parallel), and tangent to the NE plane." measurementSystemAxis="_XyWde8XpEeS20aHYOO_RKQ
_XyWdfMXpEeS20aHYOO_RKQ" coordinateSystem="EAID_91380EB8_66EF_4d12_AC1D_84FF7F719080"
externalStandardReference="ISO 1151/1, 1.1.4" orientation="Orthogonal, Right Handed">
            <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="SDM_2E4F58EA_E4E0_4AF2_84C3_3E8BF7FAF29A" name="VehicleNED_OriginNEAxis"
description="The coordinate values of the Origin for Vehicle Centered,North,East,Down
(NED) Inertial Reference Frames." landmark="EAID_937ABD7C_68C2_47e5_BB64_B914F6B00A5A">
                <referencePointPart xmi:type="logical:ReferencePointPart"
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value="0" valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
                <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="SDM_90BAFE98_989B_4462_B368_71C359E3681D" axis="_XyWde8XpEeS20aHYOO_RKQ"
value="0" valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
            </referencePoint>
            <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="SDM_3999EFF6_90A9_4514_9275_FB8771160FCE" name="VehicleNED_NorthDatumNEAxis"
description="The coordinate values of the Geographic North Pole for Vehicle
Centered,North,East,Down (NED) Inertial Reference Frames."
landmark="EAID_9EB09F9B_3761_4d81_B802_BEB61ABA6D4">
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xmi:id="SDM_E21A33CF_DB5C_4FD7_A022_109310C1C565" axis="_XyWde8XpEeS20aHYOO_RKQ"
value="Measured Value" valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
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xmi:id="SDM_2EC1DDAD_F389_4DDE_86F0_1BB133540676" axis="_XyWdfMXpEeS20aHYOO_RKQ"
value="0" valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
            </referencePoint>
            <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="SDM_A9CC5AEC_3C13_4B91_B05F_F3E4F3244A7B" name="VehicleNED_EastDatumNEAxis"
description="The coordinate values of the local East Parallel for Vehicle
Centered,North,East,Down (NED) Inertial Reference Frames."
landmark="EAID_617A190E_2F4D_45ec_8E3A_52B62B536854">
                <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="SDM_5A278DF0_65BF_464A_8FA9_69D15E224B08" axis="_XyWde8XpEeS20aHYOO_RKQ"
value="0" valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
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xmi:id="SDM_5A24F965_97E5_43DC_B0C2_D594EA0A5BFD" axis="_XyWdfMXpEeS20aHYOO_RKQ"
value="Measured Value" valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
            </referencePoint>
        </element>
    </ldm>
    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_2DB1AAD2_3837_4903_96CD_F4D80E1639FD"
name="GeneralPercentMeasurementSystems">
        <element xmi:type="logical:Landmark"
xmi:id="EAID_3AA29924_8FEE_46ab_898A_1871CBF25D30" name="ZeroPercentLandmark"
description="The zero point for a general percent scale."/>
        <element xmi:type="logical:Landmark"
xmi:id="EAID_C304D56E_CF5B_4079_8DF9_F4190C8F654D" name="HundredPercentLandmark"
description="The landmark for 100% nominal capability for the general percent scale."/>

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description="A scalar for unitless percent measurements. The 100% reference point is a
configuration parameter of the intended measurement."
measurementSystemAxis="EAID_81EE33FE_5828_4ee9_ABC0_F982F861E37"
coordinateSystem="EAID_6DABCD14_6669_485d_A1E7_B192E1AF0275"
externalStandardReference="N/A" orientation="Scalar">
    <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_86CB7423_FFF8_4385_A5DF_3AA3DCC5A9E7" name="ZeroPointReferencePoint"
description="The zero point for a general percentage scale."
landmark="EAID_3AA29924_8FEE_46ab_898A_1871CBF25D30">
        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_FBF4C1F_0D71_4b96_9AFD_F868B15A0E6B"
axis="EAID_81EE33FE_5828_4ee9_ABC0_F982F861E37" value="0"
valueTypeUnit="EAID_32D64A1E_4E12_41f2_802F_E09F36EC367A"/>
    </referencePoint>
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xmi:id="EAID_6CE70DDE_20C3_4b53_8E7C_26095E85A1B9" name="HundredPercentReferencePoint"
description="The 100% nominal capability for the general percent scale."
landmark="EAID_C304D56E_CF5B_4079_8DF9_F4190C8F654D">
        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_ACD6EE98_E18B_4a86_8719_28BB3FE9BC36"
axis="EAID_81EE33FE_5828_4ee9_ABC0_F982F861E37" value="100"
valueTypeUnit="EAID_32D64A1E_4E12_41f2_802F_E09F36EC367A"/>
    </referencePoint>
</element>
<element xmi:type="logical:MeasurementSystemAxis"
xmi:id="EAID_81EE33FE_5828_4ee9_ABC0_F982F861E37" name="General_Percent_MeasSysAxis"
description="A scale for unitless percent measurements. The 100% reference point is a
configuration parameter of the intended measurement."
axis="EAID_28244BCE_7916_4b0e_AD94_BACAF6B3567F"
defaultValueTypeUnit="EAID_32D64A1E_4E12_41f2_802F_E09F36EC367A"/>
    </ldm>
    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_1A54ECC2_CD29_4aac_98B0_A28EA8F10A18"
name="VehicleReferencedMeasurementSystems">
        <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_C5CD44F3_18DB_457f_A240_F9105DA7A25C"
name="ComponentReferenceMeasurementSystems">
            <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_1949A011_0E18_41f1_B354_6D73B2985A47"
name="ComponentReferenceMeasurementSystem">
                <element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_1CBEEDD4_75A4_4c0f_Ad88_6FEEF5FE207E" name="Component_Reference_MeasSys"
description="A MS vehicle fixed Q,E arbitrary origin Q,E x-axis facing forward Q,E z-axis
facing down Q,E y-axis completing the MS. This MS is used to locate points or components
within the body or component frame of reference."
measurementSystemAxis="EAID_F1776DE9_22E2_414e_A70F_7E346D7C9551
EAID_6DA5DEB1_0C07_48ed_B088_3B14702AD3DD EAID_FC3052EB_7B28_4e03_8A7E_78D2D121B9E4"
coordinateSystem="EAID_E16B78B2_B2BA_43e5_837E_018DC1FD621C"
externalStandardReference="ISO 1151, 6.1.9" orientation="Right-handed Orthogonal">
                    <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_13FD27C7_7978_486b_9F7B_380F137DDDC"
name="ComponentReferencePlaneAxisDatum" description="The coordinate values of the Zaxis
Datum for a body referenced measurement system. The Y datum and the X Datum establish the
reference plane." landmark="EAID_89DC18C3_B7D5_44a8_867B_861E120A4261">
                        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_98B41C0D_DB88_4c36_9E96_D75771A03D68"
axis="EAID_F1776DE9_22E2_414e_A70F_7E346D7C9551" value="0"
valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
                        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_FA7BE885_31A2_4cd5_A28B_9A22E8EE8111"
axis="EAID_6DA5DEB1_0C07_48ed_B088_3B14702AD3DD" value="0"
valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
                        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_B627C254_32F1_4b46_8653_7BBF555B60D8"
axis="EAID_FC3052EB_7B28_4e03_8A7E_78D2D121B9E4" value="Reference Value"
valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
                    </referencePoint>
                    <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_C32B3D95_7B2C_4da6_839A_5320F8D429C0" name="ComponentYAxisDatum">

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description="The coordinate values of the Yaxis Datum for a body referenced measurement
system." landmark="EAID_89DC18C3_B7D5_44a8_867B_861E120A4261">
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axis="EAID_F1776DE9_22E2_414e_A70F_7E346D7C9551" value="0"
valueTypeUnit="_vZiY3wg5EeSFSpy8Kj3F4Q"/>
    <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_04AC9A2D_C558_4f7f_AF6F_8DEEA8512F21"
axis="EAID_6DA5DEB1_0C07_48ed_B088_3B14702AD3DD" value="Reference Value"
valueTypeUnit="_vZiY3wg5EeSFSpy8Kj3F4Q"/>
    <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_4974BBAC_61E8_49e7_A067_4553AF3B361D"
axis="EAID_FC3052EB_7B28_4e03_8A7E_78D2D121B9E4" value="0"
valueTypeUnit="_vZiY3wg5EeSFSpy8Kj3F4Q"/>
    </referencePoint>
<referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_657C9A7F_41D6_4dc1_9471_2531E6A1AB74" name="ComponentOrigin"
description="The coordinate values of the Origin for a body referenced measurement
system." landmark="EAID_2085FA87_8EBD_4106_9E00_58BB469AAE58">
    <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_66567410_B937_4a28_AF4E_4B18DEB6E2D8"
axis="EAID_F1776DE9_22E2_414e_A70F_7E346D7C9551" value="0"
valueTypeUnit="_vZiY3wg5EeSFSpy8Kj3F4Q"/>
    <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_36098AC7_5702_4cf1_94EC_8AB1E46B1558"
axis="EAID_6DA5DEB1_0C07_48ed_B088_3B14702AD3DD" value="0"
valueTypeUnit="_vZiY3wg5EeSFSpy8Kj3F4Q"/>
    <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_4F451E1F_0030_4e36_9BEA_B9E7E7E01D1C"
axis="EAID_FC3052EB_7B28_4e03_8A7E_78D2D121B9E4" value="0"
valueTypeUnit="_vZiY3wg5EeSFSpy8Kj3F4Q"/>
    </referencePoint>
<referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_611444FD_1EC5_4ec2_BC7C_F995AB7C119A" name="ComponentReferenceAxisDatum"
description="The coordinate values of the X axis Datum for a body referenced measurement
system." landmark="EAID_E49CAB52_7C08_4eb1_BDD4_EC09FF21617E">
    <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_6A046072_61D8_4ac1_A301_434C30FEA3B8"
axis="EAID_F1776DE9_22E2_414e_A70F_7E346D7C9551" value="Reference Value"
valueTypeUnit="_vZiY3wg5EeSFSpy8Kj3F4Q"/>
    <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_B8042E0B_4FA7_4a54_8DFC_CB8262660C38"
axis="EAID_6DA5DEB1_0C07_48ed_B088_3B14702AD3DD" value="0"
valueTypeUnit="_vZiY3wg5EeSFSpy8Kj3F4Q"/>
    <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_11D48611_88B3_4cd9_A417_8418FC3B7946"
axis="EAID_FC3052EB_7B28_4e03_8A7E_78D2D121B9E4" value="0"
valueTypeUnit="_vZiY3wg5EeSFSpy8Kj3F4Q"/>
    </referencePoint>
</element>
</ldm>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_D4EE6811_902B_4286_9CB4_C37AE060936D"
name="VehicleReferenceMeasurementSystems">
    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_82B59856_1128_4d8b_98DA_5EDC08CC1196"
name="VehicleCoGReferenceMeasurementSystem">
        <element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_D620C106_5F28_4004_AC5D_E5AD2FEB6B33" name="Vehicle_CoG_Reference_MeasSys"
description="A MS vehicle fixed Q,E origin at the CoG Q,E x-axis coincident with the
vehicle reference axis Q,E z-axis in the vehicle reference plane Q,E y-axis normal to the
vehicle RP. This MS is used to locate points or components within the vehicle frame of
reference." measurementSystemAxis="EAID_F1776DE9_22E2_414e_A70F_7E346D7C9551
EAID_6DA5DEB1_0C07_48ed_B088_3B14702AD3DD EAID_FC3052EB_7B28_4e03_8A7E_78D2D121B9E4"
coordinateSystem="EAID_E16B78B2_B2BA_43e5_837E_018DC1FD621C"
externalStandardReference="ISO 1151, 6.1.4" orientation="Right-handed Orthogonal">
            <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_A7B55DCF_0CDC_4422_A58E_A72AF6F01C87" name="BodyReferencePlaneAxisDatum"
description="The coordinate values of the Zaxis Datum for a body referenced measurement

```

system. The Y datum and the X Datum establish the reference plane."

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    landmark="EAID_89DC18C3_B7D5_44a8_867B_861E120A4261">
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            axis="EAID_FC3052EB_7B28_4e03_8A7E_78D2D121B9E4" value="Reference Value"
            valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
        </referencePoint>
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            coordinate values of the Yaxis Datum for a body referenced measurement system."
            landmark="EAID_89DC18C3_B7D5_44a8_867B_861E120A4261">
            <referencePointPart xmi:type="logical:ReferencePointPart"
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                axis="EAID_F1776DE9_22E2_414e_A70F_7E346D7C9551" value="0"
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                axis="EAID_6DA5DEB1_0C07_48ed_B088_3B14702AD3DD" value="Reference Value"
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                axis="EAID_FC3052EB_7B28_4e03_8A7E_78D2D121B9E4" value="0"
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            <referencePoint xmi:type="logical:ReferencePoint"
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                <referencePointPart xmi:type="logical:ReferencePointPart"
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                    axis="EAID_F1776DE9_22E2_414e_A70F_7E346D7C9551" value="0"
                    valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
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                    axis="EAID_6DA5DEB1_0C07_48ed_B088_3B14702AD3DD" value="0"
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                    xmi:id="EAID_E15CD012_6C5A_4120_A73C_584D23881F9F" name="BodyReferenceAxisDatum"
                    description="The coordinate values of the X axis Datum for a body referenced measurement
                    system." landmark="EAID_E49CAB52_7C08_4eb1_BDD4_EC09FF21617E">
                    <referencePointPart xmi:type="logical:ReferencePointPart"
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                        axis="EAID_F1776DE9_22E2_414e_A70F_7E346D7C9551" value="Reference Value"
                        valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
                    <referencePointPart xmi:type="logical:ReferencePointPart"
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                        axis="EAID_6DA5DEB1_0C07_48ed_B088_3B14702AD3DD" value="0"
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                        axis="EAID_FC3052EB_7B28_4e03_8A7E_78D2D121B9E4" value="0"
                        valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
                    </referencePoint>
                </element>
                <element xmi:type="logical:MeasurementSystem"
                    xmi:id="EAID_D11F77F6_DD7B_4e42_A1FE_038CFCFFADC4" name="Vehicle_Reference_X_MeasSys"
                    description="A MS vehicle fixed Q,E arbitrary origin Q,E x-axis coincident with the
                    vehicle reference axis. This MS is used to locate points or components within the vehicle

```

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frame of reference." measurementSystemAxis="EAID_F1776DE9_22E2_414e_A70F_7E346D7C9551"
coordinateSystem="EAID_D73E1979_E607_48ce_A01F_2EAD5226614D"
externalStandardReference="ISO 1151, 6.1.4" orientation="Right-handed Orthogonal">
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        description="The coordinate values of the X axis Datum for a body referenced measurement
        system." landmark="EAID_E49CAB52_7C08_4eb1_BDD4_EC09FF21617E">
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                axis="EAID_F1776DE9_22E2_414e_A70F_7E346D7C9551" value="Reference Value"
                valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
            </referencePoint>
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                xmi:id="EAID_89184C11_23E1_41e6_A7D7_8FFDACA7885B" name="BodyXCoGOrigin" description="The
                coordinate values of the Origin for a body referenced measurement system."
                landmark="EAID_937ABD7C_68C2_47e5_BB64_B914F6B00A5A">
                    <referencePointPart xmi:type="logical:ReferencePointPart">
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                        axis="EAID_F1776DE9_22E2_414e_A70F_7E346D7C9551" value="0"
                        valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
                    </referencePoint>
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                <element xmi:type="logical:MeasurementSystemAxis">
                    xmi:id="EAID_F1776DE9_22E2_414e_A70F_7E346D7C9551" name="Body_X_MeasSysAxis"
                    description="The X axis of a body fixed reference plane (e.g. Q,E ISO 1151 Q,E 6.1.1).
                    May be used in any body fixed measurement system."
                    axis="EAID_3EFC05DA_4D3A_4e3d_8AEC_C9FEC8D85087"
                    defaultValueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
                    <element xmi:type="logical:MeasurementSystemAxis">
                        xmi:id="EAID_6DA5DEB1_0C07_48ed_B088_3B14702AD3DD" name="Body_Y_MeasSysAxis"
                        description="The Y Axis of a body fixed measurement system. May be used in any body fixed
                        measurement system" axis="EAID_185CD9A8_B677_41ab_907D_C7F232756DCE"
                        defaultValueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
                    <element xmi:type="logical:MeasurementSystemAxis">
                        xmi:id="EAID_FC3052EB_7B28_4e03_8A7E_78D2D121B9E4" name="Body_Z_MeasSysAxis"
                        description="The X axis of a body fixed reference plane (e.g. Q,E ISO 1151 Q,E 6.1.1).
                        May be used in any body fixed measurement system."
                        axis="EAID_C74601C9_0E7A_483b_AD4C_28D64BE141E3"
                        defaultValueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
                    </ldm>
                <ldm xmi:type="datamodel:LogicalDataModel">
                    xmi:id="EAID_F86D9BA1_29F8_4916_B45A_5C8204928A2B"
                    name="VehicleReferenceMeasurementSystem">
                        <element xmi:type="logical:MeasurementSystem">
                            xmi:id="EAID_28B76EFB_1D16_4ecd_B846_238A9253FE41" name="Vehicle_Reference_MeasSys"
                            description="A MS vehicle fixed Q,E arbitrary origin Q,E x-axis coincident with the
                            vehicle reference axis Q,E z-axis in the vehicle reference plane Q,E y-axis normal to the
                            vehicle RP. This MS is used to locate points or components within the vehicle frame of
                            reference." measurementSystemAxis="EAID_F1776DE9_22E2_414e_A70F_7E346D7C9551
                            EAID_FC3052EB_7B28_4e03_8A7E_78D2D121B9E4 EAID_6DA5DEB1_0C07_48ed_B088_3B14702AD3DD"
                            coordinateSystem="EAID_E16B78B2_B2BA_43e5_837E_018DC1FD621C"
                            externalStandardReference="ISO 1151, 6.1.4" orientation="Right-handed Orthogonal">
                                <referencePoint xmi:type="logical:ReferencePoint">
                                    xmi:id="EAID_CDDAE664_3693_4b85_963A_062B6B19BAE5" name="BodyReferencePlaneAxisDatum"
                                    description="The coordinate values of the Zaxis Datum for a body referenced measurement
                                    system. The Y datum and the X Datum establish the reference plane."
                                    landmark="EAID_0B59FCBD_32A1_4a9a_B428_3506CEB2BF8B">
                                        <referencePointPart xmi:type="logical:ReferencePointPart">
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                                            axis="EAID_F1776DE9_22E2_414e_A70F_7E346D7C9551" value="0"
                                            valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
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                                            xmi:id="EAID_8F8EF46D_3CA6_413c_9935_AA93DB60BA1D"
                                            axis="EAID_6DA5DEB1_0C07_48ed_B088_3B14702AD3DD" value="0"
                                            valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
                                        <referencePointPart xmi:type="logical:ReferencePointPart">
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                                            axis="EAID_FC3052EB_7B28_4e03_8A7E_78D2D121B9E4" value="Reference Value"
                                            valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
                                        </referencePoint>
                                    </element>
                                </ldm>
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    </element>

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coordinate values of the Yaxis Datum for a body referenced measurement system."
landmark="EAID_89DC18C3_B7D5_44a8_867B_861E120A4261">
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xmi:id="EAID_05687BE6_3F22_4dfc_92AB_703D83B12BAB"
axis="EAID_F1776DE9_22E2_414e_A70F_7E346D7C9551" value="0"
valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
    <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_1A77DD62_3639_439d_BCF3_F95166488DB8"
axis="EAID_6DA5DEB1_0C07_48ed_B088_3B14702AD3DD" value="Reference Value"
valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
    <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_F7B60DF3_39EC_4031_A7CC_E7CDBBA841F4"
axis="EAID_FC3052EB_7B28_4e03_8A7E_78D2D121B9E4" value="0"
valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
</referencePoint>
<referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_48A2FED6_8536_4fb8_BD50_948DE5451DA2" name="BodyOrigin" description="The
coordinate values of the Origin for a body referenced measurement system."
landmark="EAID_2085FA87_8EBD_4106_9E00_58BB469AAE58">
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xmi:id="EAID_8B30BC36_4E8C_470e_A264_8B44BC00053F"
axis="EAID_F1776DE9_22E2_414e_A70F_7E346D7C9551" value="0"
valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
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axis="EAID_6DA5DEB1_0C07_48ed_B088_3B14702AD3DD" value="0"
valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
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axis="EAID_FC3052EB_7B28_4e03_8A7E_78D2D121B9E4" value="0"
valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
</referencePoint>
<referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_9C90A477_166D_4758_B31E_B43F274EC110" name="BodyReferenceAxisDatum"
description="The coordinate values of the X axis Datum for a body referenced measurement
system." landmark="EAID_E49CAB52_7C08_4eb1_BDD4_EC09FF21617E">
    <referencePointPart xmi:type="logical:ReferencePointPart"
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axis="EAID_F1776DE9_22E2_414e_A70F_7E346D7C9551" value="Reference Value"
valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
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valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
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axis="EAID_FC3052EB_7B28_4e03_8A7E_78D2D121B9E4" value="0"
valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
</referencePoint>
</element>
</ldm>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_48A8A209_6711_4a00_BED7_33DEE66B75FA"
name="AmountOfConcentrationMeasurementSystem">
    <element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_4EEF0F23_1874_450c_BB7D_52DDBE50A712" name="AmountOfConcentration_MeasSys"
description="System for measuring the amount of concentration."
measurementSystemAxis="EAID_46FC50D2_7494_46f3_8494_DDA55E45A2F"
coordinateSystem="EAID_D73E1979_E607_48ce_A01F_2EAD5226614D"
externalStandardReference="N/A" orientation="Values increase as concentration increases">
        <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_10C3231C_6547_464f_A0F2_D6750CB4E51B"
name="OneMolePerCubicMeterConcentrationReferencePoint" description="Represents a unit
amount of chemical concentration (i.e., 1 mole/cubic meter."
landmark="EAID_E6D16447_F932_4bae_85F5_749590338288">
            <referencePointPart xmi:type="logical:ReferencePointPart"
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axis="EAID_46FC50D2_7494_46f3_8494_DDAA55E45A2F" value="1.0"
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    <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_E5210479_294C_4137_A1CB_8F34A558D305" name="ZeroConcentrationReferencePoint"
description="Origin point for chemical concentration"
landmark="EAID_BA35625A_C590_411f_83AA_23C717E26A46">
    <referencePointPart xmi:type="logical:ReferencePointPart"
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axis="EAID_46FC50D2_7494_46f3_8494_DDAA55E45A2F" value="0"
valueTypeUnit="EAID_76E379BA_96C9_4f5d_A0F4_BCF5D4D5B9D3"/>
    </referencePoint>
</element>
<element xmi:type="logical:MeasurementSystemAxis"
xmi:id="EAID_46FC50D2_7494_46f3_8494_DDAA55E45A2F"
name="AmountOfConcentration_MeasSysAxis" description="Axis for the Amount of
Concentration Measurement System" axis="EAID_3EFC05DA_4D3A_4e3d_8AEC_C9FEC8D85087"
defaultValueTypeUnit="EAID_76E379BA_96C9_4f5d_A0F4_BCF5D4D5B9D3"/>
    </ldm>
    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_50A2650B_114C_4eed_A1E4_9BA9193E23CC" name="BodyAngleMeasurementSystem">
        <element xmi:type="logical:MeasurementSystemAxis"
xmi:id="EAID_DB86FF39_07BB_4a57_9836_7B3B54986C22" name="Azimuth_MeasSysAxis"
description="The rotation about the Z-Down axis of a Local Vehicle reference frame.
Measured from a reference ray between the origin and the Local Vehicle z axis reference
point and a ray between the origin and an observed point." axis="vZiYlgg5EeSFspy8Kj3F4Q"
defaultValueTypeUnit="EAID_FE60D41B_86AF_4f9e_B507_96A5730B1E52"/>
        <element xmi:type="logical:MeasurementSystemAxis"
xmi:id="EAID_FD4DFBE6_DDC2_452e_8DCC_063B42A14BF6" name="Elevation_MeasSysAxis"
description="The rotation about the y'-Down axis of a Local Vehicle reference frame.
Measured from a reference ray between the origin and the Local Vehicle y' axis reference
point and a ray between the origin and an observed point." axis="vZiY1Ag5EeSFspy8Kj3F4Q"
defaultValueTypeUnit="EAID_FE60D41B_86AF_4f9e_B507_96A5730B1E52"/>
        <element xmi:type="logical:MeasurementSystemAxis"
xmi:id="EAID_B4BBE81D_D304_4b09_8641_27E2398843F8" name="Radial_Distance_MeasSysAxis"
description="The from the origin of a Local Vehicle reference frame. Measured on a ray
between the origin and an observed point." axis="vZiY1Qg5EeSFspy8Kj3F4Q"
defaultValueTypeUnit="vZiY3wg5EeSFspy8Kj3F4Q"/>
        <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_8FA17A63_D874_48f5_8222_4E0898AD8F00"
name="PositionCenteredAzElMeasurementsystem">
            <element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_868B018F_5CCB_4697_BF14_FC29199C78A2" name="Position_Centered_AzEl_MeasSys"
description="MS for the azimuth Q,E elevation Q,E and radial distance from a geo-
referenced point to an object. Zero elevation is local tangent plane Q,E zero azimuth is
true north. Positive values are up Q,E and clockwise when viewing the xy plane from the
top of the position." measurementSystemAxis="EAID_DB86FF39_07BB_4a57_9836_7B3B54986C22
EAID_B4BBE81D_D304_4b09_8641_27E2398843F8 EAID_FD4DFBE6_DDC2_452e_8DCC_063B42A14BF6"
coordinateSystem="vZiY1wg5EeSFspy8Kj3F4Q" externalStandardReference="ISO 1151"
orientation="Right-handed orthogonal">
                <referencePoint xmi:type="logical:ReferencePoint"
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description="The coordinate values of the Origin for Geographic Centered, East, North, Up
(ENU) Spherical Inertial Reference Frame."
landmark="EAID_4E14BCE8_702C_4af8_881F_D04BAFC6B6DC">
                    <referencePointPart xmi:type="logical:ReferencePointPart"
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axis="EAID_DB86FF39_07BB_4a57_9836_7B3B54986C22" value="0"
valueTypeUnit="EAID_FE60D41B_86AF_4f9e_B507_96A5730B1E52"/>
                    <referencePointPart xmi:type="logical:ReferencePointPart"
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axis="EAID_FD4DFBE6_DDC2_452e_8DCC_063B42A14BF6" value="0"
valueTypeUnit="EAID_FE60D41B_86AF_4f9e_B507_96A5730B1E52"/>
                    <referencePointPart xmi:type="logical:ReferencePointPart"
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axis="EAID_B4BBE81D_D304_4b09_8641_27E2398843F8" value="0"
valueTypeUnit="vZiY3wg5EeSFspy8Kj3F4Q"/>
                </referencePoint>
                <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_55777EB4_D211_428b_A879_595C8C05526F" name="NorthDatum" description="The
coordinate values of the North datum for Geographic Centered, East, North, Up (ENU)

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Spherical Inertial Reference Frame."
landmark="EAID_9EB09F9B_3761_4d81_B802_BEB61ABA6D64">
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Spherical Inertial Reference Frame."
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description="Measurement System for the azimuth displacement from a geo-referenced point
to an object. Zero azimuth is true north. Positive values are clockwise when viewing the
xy plane from the top of the position."
measurementSystemAxis="EAID_DB86FF39_07BB_4a57_9836_7B3B54986C22"
coordinateSystem="EAID_2EF70F5A_7A56_468e_AC75_6663CE3CB2F4"
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valueTypeUnit="EAID_FE60D41B_86AF_4f9e_B507_96A5730B1E52"/>
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valueTypeUnit="EAID_FE60D41B_86AF_4f9e_B507_96A5730B1E52"/>
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description="Measurement System for the elevation displacement from a geo-referenced
point to an object. Zero elevation is local tangent plane. Positive values are up Q,E
when viewing the xy plane from the top of the position."
measurementSystemAxis="EAID_FD4DFBE6_DDC2_452e_8DCC_063B42A14BF6"
coordinateSystem="EAID_B6CB90E_3A43_44ca_B1B9_78FED0DA3C7D"
externalStandardReference="ISO 1151" orientation="Right-handed orthogonal">
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description="The coordinate values of the Origin for Geographic Centered, East, North, Up
(ENU) Spherical Inertial Reference Frame."
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valueTypeUnit="EAID_FE60D41B_86AF_4f9e_B507_96A5730B1E52"/>
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description="The coordinate values of the East datum for Geographic Centered, East,
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name="Position_Centered_RadialDistance_MeasSys" description="Measurement System for the
radial distance from a geo-referenced point to an object. All radial distances are
positive." measurementSystemAxis="EAID_B4BBE81D_D304_4b09_8641_27E2398843F8"
coordinateSystem="EAID_55E0A12F_4A1A_421e_ABA8_FC11DB1A3095"
externalStandardReference="ISO 1151" orientation="Right-handed orthogonal">
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description="The coordinate values of the Origin for Geographic Centered, East, North, Up
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landmark="EAID_4E14BCE8_702C_4af8_881F_D04BAFC6B6DC">

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description="The coordinate values of the East datum for Geographic Centered, East,
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description="Measurement System for the azimuth and depression from the reference point
of a Vehicle to an object. Positive values are down Q,E and clockwise when viewing the xy
plane from the top of the body."
measurementSystemAxis="EAID_DB86FF39_07BB_4a57_9836_7B3B54986C22
EAID_FD4DFBE6_DDC2_452e_8DCC_063B42A14BF6"
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name="Vehicle_Centered_AzDepRadial_MeasSys" description="Measurement System for the azimuth Q,E depression Q,E and radial distance from the reference point of a Vehicle to an object." measurementSystemAxis="EAID_DB86FF39_07BB_4a57_9836_7B3B54986C22

EAID_FD4DFBE6_DDC2_452e_8DCC_063B42A14BF6 EAID_B4BBE81D_D304_4b09_8641_27E2398843F8"

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name="VehicleCenteredAzimuthElevationDistanceMeasurementSystem">
    <element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_CB8BEEF2_8BEC_464f_AD7E_F37E47D642B2"
name="Vehicle_Centered_AzElDist_Meassys" description="Measurement System for the azimuth
Q,E elevation Q,E and radial distance from the reference point of a Vehicle to an object.
Positive values are up Q,E and clockwise when viewing the xy plane from the top of the
body." measurementSystemAxis="EAID_DB86FF39_07BB_4a57_9836_7B3B54986C22
EAID_FD4DFBE6_DDC2_452e_8DCC_063B42A14BF6 EAID_B4B8E81D_D304_4b09_8641_27E2398843F8"
coordinateSystem="_vZiY1wg5EeSFspy8Kj3F4Q" externalStandardReference="ISO 1151"
orientation="Right-handed orthogonal">
        <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_0C047899_9645_4850_B6A3_4DE90C6641AF" name="VehicleYDatum" description="The
coordinate values of the Y Datum for a body referenced measurement system."
landmark="EAID_89DC18C3_B7D5_44a8_867B_861E120A4261">
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_A6247C02_A004_4211_AE07_F557AF848AED"
axis="EAID_DB86FF39_07BB_4a57_9836_7B3B54986C22" value="pi/2"
valueTypeUnit="EAID_FE60D41B_86AF_4f9e_B507_96A5730B1E52"/>
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_C8CCB60E_E5CB_4999_AEDC_C35F81DA13F1"
axis="EAID_FD4DFBE6_DDC2_452e_8DCC_063B42A14BF6" value="0"
valueTypeUnit="EAID_FE60D41B_86AF_4f9e_B507_96A5730B1E52"/>
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_21DF842E_DF7E_4c9f_BB64_172994E13D12"
axis="EAID_B4B8E81D_D304_4b09_8641_27E2398843F8" value="Reference Value"
valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
        </referencePoint>
        <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_F44FB4F4_3FF0_419c_8258_3A5EA3EBED34" name="VehicleXDatum" description="The
coordinate values of the X Datum for a body referenced measurement system."
landmark="EAID_E49CAB52_7C08_4eb1_BDD4_EC09FF21617E">
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_2F8D99D9_82E8_4013_A9F1_51D48B8259C6"
axis="EAID_DB86FF39_07BB_4a57_9836_7B3B54986C22" value="0"
valueTypeUnit="EAID_FE60D41B_86AF_4f9e_B507_96A5730B1E52"/>
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_F3473DC0_2318_4bb2_A9C4_EC35B3137DE3"
axis="EAID_FD4DFBE6_DDC2_452e_8DCC_063B42A14BF6" value="0"
valueTypeUnit="EAID_FE60D41B_86AF_4f9e_B507_96A5730B1E52"/>
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_39228F5F_7399_4bd0_A581_10581C387673"
axis="EAID_B4B8E81D_D304_4b09_8641_27E2398843F8" value="Referenc Value"
valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
    </referencePoint>

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        <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_F312E5A4_5673_40e1_B0EA_259F36FE5B5E" name="VehicleOriginDatum"
description="The coordinate values of the Origin for a body referenced measurement
system." landmark="EAID_2085FA87_8EBD_4106_9E00_58BB469AAE58">
        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_9443A34D_9076_4879_8645_8AD867425BF7"
axis="EAID_DB86FF39_07BB_4a57_9836_7B3B54986C22" value="0"
valueTypeUnit="EAID_FE60D41B_86AF_4f9e_B507_96A5730B1E52"/>
        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_F1BFC2AF_2C94_4f23_BF74_172BF5210683"
axis="EAID_FD4DFBE6_DDC2_452e_8DCC_063B42A14BF6" value="0"
valueTypeUnit="EAID_FE60D41B_86AF_4f9e_B507_96A5730B1E52"/>
        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_7688C1BA_EBBE_41c0_BBF0_EDE6FDEF741D"
axis="EAID_B4BBE81D_D304_4b09_8641_27E2398843F8" value="0"
valueTypeUnit="_vZiY3wg5EeSFSpy8Kj3F4Q"/>
    </referencePoint>
    <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_41301846_4612_4b25_A180_BEDB03B741AD" name="VehicleZDatum" description="The
coordinate values of the Z Datum for a body referenced measurement system."
landmark="EAID_0B59FCBD_32A1_4a9a_B428_3506CEB2BF8B">
        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_9E45F58F_7311_432f_8E18_037910B1ABBA"
axis="EAID_DB86FF39_07BB_4a57_9836_7B3B54986C22" value="0"
valueTypeUnit="EAID_FE60D41B_86AF_4f9e_B507_96A5730B1E52"/>
        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_E4750AE6_3377_46eb_A72B_0AE235FE712F"
axis="EAID_FD4DFBE6_DDC2_452e_8DCC_063B42A14BF6" value="-pi/2"
valueTypeUnit="EAID_FE60D41B_86AF_4f9e_B507_96A5730B1E52"/>
        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_8CE0EC90_AA19_4fd9_9AE9_C79B84945D22"
axis="EAID_B4BBE81D_D304_4b09_8641_27E2398843F8" value="Reference Value"
valueTypeUnit="_vZiY3wg5EeSFSpy8Kj3F4Q"/>
    </referencePoint>
</element>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_A153722E_B37E_4bc2_A8B1_25246C5D7104"
name="VehicleCenteredAzimuthElevationMeasurementSystem">
    <element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_462D0E66_ACD7_4285_99CB_4F4BAE99792E" name="Vehicle_Centered_AzEl_MeasSys"
description="Measurement System for the azimuth and elevation from the reference point of
a Vehicle to an object. Positive values are up Q,E and clockwise when viewing the xy
plane from the top of the body."
measurementSystemAxis="EAID_DB86FF39_07BB_4a57_9836_7B3B54986C22
EAID_FD4DFBE6_DDC2_452e_8DCC_063B42A14BF6"
coordinateSystem="EAID_B6E3492E_47BE_44a5_B53B_BC44765EBCCD"
externalStandardReference="ISO 1151" orientation="Right-handed orthogonal">
        <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_C912E257_0776_435f_9517_DDC5A8D844EF" name="VehicleYDatum" description="The
coordinate values of the Y Datum for a body referenced measurement system."
landmark="EAID_89DC18C3_B7D5_44a8_867B_861E120A4261">
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_94D2A8D5_9A60_4a98_829F_8E9A0ABC28A1"
axis="EAID_DB86FF39_07BB_4a57_9836_7B3B54986C22" value="pi/2"
valueTypeUnit="EAID_FE60D41B_86AF_4f9e_B507_96A5730B1E52"/>
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_7215C4C1_3AE5_4e16_9148_F64856D033FD"
axis="EAID_FD4DFBE6_DDC2_452e_8DCC_063B42A14BF6" value="0"
valueTypeUnit="EAID_FE60D41B_86AF_4f9e_B507_96A5730B1E52"/>
        </referencePoint>
        <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_126BE7A0_58CF_46ea_BDCD_CA3F3A9BAD4C" name="VehicleOriginDatum"
description="The coordinate values of the Origin for a body referenced measurement
system." landmark="EAID_2085FA87_8EBD_4106_9E00_58BB469AAE58">
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_0E40BF16_C02C_4acf_BDAF_AA777F45C93C"
axis="EAID_DB86FF39_07BB_4a57_9836_7B3B54986C22" value="0"
valueTypeUnit="EAID_FE60D41B_86AF_4f9e_B507_96A5730B1E52"/>
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_A5A90D7B_C349_4893_85E3_B6735BE52CF5"

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axis="EAID_FD4DFBEE6_DDC2_452e_8DCC_063B42A14BF6" value="0"
valueTypeUnit="EAID_FE60D41B_86AF_4f9e_B507_96A5730B1E52"/>
    </referencePoint>
    <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_15E484E6_857A_4fd3_AAA1_6AC9F32AA0D6" name="VehicleZDatum" description="The
coordinate values of the Z Datum for a body referenced measurement system."
landmark="EAID_0B59FCBD_32A1_4a9a_B428_3506CEB2BF8B">
    <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_EE2C8011_49DB_4e48_B765_61F0DB7C425"
axis="EAID_DB86FF39_07BB_4a57_9836_7B3B54986C22" value="0"
valueTypeUnit="EAID_FE60D41B_86AF_4f9e_B507_96A5730B1E52"/>
    <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_38B1998C_7198_494b_9F2D_FE4A3EE1E91C"
axis="EAID_FD4DFBEE6_DDC2_452e_8DCC_063B42A14BF6" value="-pi/2"
valueTypeUnit="EAID_FE60D41B_86AF_4f9e_B507_96A5730B1E52"/>
    </referencePoint>
</element>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_A83BA5CF_7E2C_41e4_A3B6_4CEC38DE93BF"
name="VehicleCenteredAzimuthMeasurementSystem">
    <element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_4077EA6C_C215_4c65_AA39_DF813710E8BC" name="Vehicle_Centered_Az_MeasSys"
description="Single axis Measurement System for the azimuth displacement from the
reference point of a Vehicle to an object."
measurementSystemAxis="EAID_DB86FF39_07BB_4a57_9836_7B3B54986C22"
coordinateSystem="EAID_2EF70F5A_7A56_468e_AC75_6663CE3CB2F4" orientation="right-handed
orthogonal">
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xmi:id="EAID_37A90A30_1FD1_462c_91BA_CA05EE607CCE" name="VehicleOriginDatum"
description="The coordinate values of the Origin for a body referenced measurement
system." landmark="EAID_2085FA87_8EBD_4106_9E00_58BB469AAE58">
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_642A9CA3_6B29_4f32_8F2B_87DC7A903D2C"
axis="EAID_DB86FF39_07BB_4a57_9836_7B3B54986C22" value="0"
valueTypeUnit="EAID_FE60D41B_86AF_4f9e_B507_96A5730B1E52"/>
            </referencePoint>
            <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_D3FFDD7A_A930_4043_B514_9DDA9D2D9569" name="VehicleXDatum" description="The
coordinate values of the X Datum for a body referenced measurement system."
landmark="EAID_E49CAB52_7C08_4eb1_BDD4_EC09FF21617E">
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_5AE51A70_5DC0_40b7_BD22_914FEA28059C"
axis="EAID_DB86FF39_07BB_4a57_9836_7B3B54986C22" value="0"
valueTypeUnit="EAID_FE60D41B_86AF_4f9e_B507_96A5730B1E52"/>
            </referencePoint>
            <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_696CDAC0_FD87_49b5_8233_3FE57F1BAF2A" name="VehicleYDatum" description="The
coordinate values of the Y Datum for a body referenced measurement system."
landmark="EAID_89DC18C3_B7D5_44a8_867B_861E120A4261">
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_D3E6E373_4EF6_4ced_A194_3A0135D13916"
axis="EAID_DB86FF39_07BB_4a57_9836_7B3B54986C22" value="pi/2"
valueTypeUnit="EAID_FE60D41B_86AF_4f9e_B507_96A5730B1E52"/>
            </referencePoint>
        </element>
    </ldm>
    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_AEC9E13D_F2FE_48ec_8454_67ABD38C433D"
name="VehicleCenteredDepressionMeasurementSystem">
        <element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_94FFFCBF_884F_4aa9_9A7A_F3A88AFF000C" name="Vehicle_Centered_Dep_MeasSys"
description="Single axis Measurement System for the depression displacement from the
reference point of a Vehicle to an object."
measurementSystemAxis="EAID_FD4DFBEE6_DDC2_452e_8DCC_063B42A14BF6"
coordinateSystem="EAID_B6CBB90E_3A43_44ca_B1B9_78FED0DA3C7D" orientation="right-handed
orthogonal">
            <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_35726913_300A_4629_B321_09B322C44167" name="VehicleOriginDatum"
description="The coordinate values of the Origin for a body referenced measurement
system." landmark="EAID_2085FA87_8EBD_4106_9E00_58BB469AAE58">

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        <referencePointPart xmi:type="logical:ReferencePointPart"
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axis="EAID_FD4DFBE6_DDC2_452e_8DCC_063B42A14BF6" value="0"
valueTypeUnit="EAID_FE60D41B_86AF_4f9e_B507_96A5730B1E52"/>
    </referencePoint>
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xmi:id="EAID_7E9847F0_A24F_4174_BE9B_53AC177ED697" name="VehicleXDatum" description="The
coordinate values of the X Datum for a body referenced measurement system."
landmark="EAID_E49CAB52_7C08_4eb1_BDD4_EC09FF21617E">
    <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_5AFDF5F3_EF91_483e_BFDF_F566AA608ACF"
axis="EAID_FD4DFBE6_DDC2_452e_8DCC_063B42A14BF6" value="0"
valueTypeUnit="EAID_FE60D41B_86AF_4f9e_B507_96A5730B1E52"/>
    </referencePoint>
    <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_108283FB_0C3A_4f11_A7E4_EF5587C055D8" name="VehicleZDatum" description="The
coordinate values of the Z Datum for a body referenced measurement system."
landmark="EAID_0B59FCBD_32A1_4a9a_B428_3506CEB2BF8B">
    <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_A37FA088_7690_4680_9A43_3BDFD7CBC252"
axis="EAID_FD4DFBE6_DDC2_452e_8DCC_063B42A14BF6" value="pi/2"
valueTypeUnit="EAID_FE60D41B_86AF_4f9e_B507_96A5730B1E52"/>
    </referencePoint>
</element>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_36E3E3FA_A7E1_4fc4_BA04_316C5150712B"
name="VehicleCenteredElevationMeasurementSystem">
    <element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_BB969A49_C5B6_4a39_AA7C_EED017AE6BBD" name="Vehicle_Centered_El_MeassSys"
description="Single axis Measurement System for the elevation displacement from the
reference point of a Vehicle to an object."
measurementSystemAxis="EAID_FD4DFBE6_DDC2_452e_8DCC_063B42A14BF6"
coordinateSystem="EAID_B6CBB90E_3A43_44ca_B1B9_78FED0DA3C7D" orientation="right-handed
orthogonal">
        <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_54D7F782_8F07_47d4_BFA5_095703FB06CF" name="VehicleOriginDatum"
description="The coordinate values of the Origin for a body referenced measurement
system." landmark="EAID_2085FA87_8EBD_4106_9E00_58BB469AAE58">
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_7A340110_ABCB_40a2_85F0_4064B16B545F"
axis="EAID_FD4DFBE6_DDC2_452e_8DCC_063B42A14BF6" value="0"
valueTypeUnit="EAID_FE60D41B_86AF_4f9e_B507_96A5730B1E52"/>
            </referencePoint>
            <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_7A92A7A9_5585_4d51_A0CC_3777E8235B93" name="VehicleXDatum" description="The
coordinate values of the X Datum for a body referenced measurement system."
landmark="EAID_E49CAB52_7C08_4eb1_BDD4_EC09FF21617E">
                <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_D5E758D3_6E05_4007_AA49_695BA425CF48"
axis="EAID_FD4DFBE6_DDC2_452e_8DCC_063B42A14BF6" value="0"
valueTypeUnit="EAID_FE60D41B_86AF_4f9e_B507_96A5730B1E52"/>
                </referencePoint>
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xmi:id="EAID_463CAD4A_E73C_436d_B56D_983A1D9AD3F5" name="VehicleZDatum" description="The
coordinate values of the Z Datum for a body referenced measurement system positive up."
landmark="EAID_0B59FCBD_32A1_4a9a_B428_3506CEB2BF8B">
                    <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_30EA8A8C_F7B5_438b_9962_B29B68D69B00"
axis="EAID_FD4DFBE6_DDC2_452e_8DCC_063B42A14BF6" value="-pi/2"
valueTypeUnit="EAID_FE60D41B_86AF_4f9e_B507_96A5730B1E52"/>
                    </referencePoint>
                </element>
            </ldm>
            <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_E7EDAADE_9585_421a_B599_8B1FE5009C62"
name="VehicleCenteredRadialMeasurementSystem">
                <element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_651C1B44_EC57_4d09_B244_B7C13C317E07" name="Vehicle_Centered_Radial_MeasSys"
description="Single axis Measurement System for the radial displacement from the
reference point of a Vehicle to an object. All values are positive"

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measurementSystemAxis="EAID_B4BBE81D_D304_4b09_8641_27E2398843F8"
coordinateSystem="EAID_55E0A12F_4A1A_421e_ABA8_FC11DB1A3095" orientation="right-handed
orthogonal">
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xmi:id="EAID_77889BDE_A710_467a_8E34_D439A01005E9" name="VehicleOriginDatum"
description="The coordinate values of the Origin for a body referenced measurement
system." landmark="EAID_2085FA87_8EBD_4106_9E00_58BB469AAE58">
        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_EB64CF81_9B64_48cf_B030_C5A9A8E37D4A"
axis="EAID_B4BBE81D_D304_4b09_8641_27E2398843F8" value="0"
valueTypeUnit="_vZiY3wg5EeSFsp8Kj3F4Q"/>
        </referencePoint>
        <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_BE351A23_3208_4963_9C8E_5C5414EC75EE" name="VehicleXDatum" description="The
coordinate values of the X Datum for a body referenced measurement system."
landmark="EAID_E49CAB52_7C08_4eb1_BDD4_EC09FF21617E">
        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_07467AC2_7149_4910_80BF_94DB4C923185"
axis="EAID_B4BBE81D_D304_4b09_8641_27E2398843F8" value="Reference Value"
valueTypeUnit="_vZiY3wg5EeSFsp8Kj3F4Q"/>
        </referencePoint>
    </element>
</ldm>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_B43B92D6_DE84_4481_9483_B92CC02C264C"
name="AmountOfSubstanceMeasurementSystem" description="Collection of elements applicable
to Amount Of Substance measurements.">
    <element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_DC62CAA1_21DA_4849_8464_F08A23263D53" name="AmountOfSubstance_MeasSys"
description="The measurement system for amount of substance is a quantity proportional to
the number of entities N in a sample. The proportionality constant is the same for all
substances and is the reciprocal of the Avogadro constant."
measurementSystemAxis="EAID_EA62EF67_9A36_4f82_BCF9_74E7F11310BB"
coordinateSystem="EAID_D73E1979_E607_48ce_A01F_2EAD5226614D" orientation="Right-Handed">
        <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_7B50FCD5_19F1_4317_B1F1_85C69EC70BD6"
name="OneMoleAmountOfSubstanceReferencePoint" description="The mole represents an amount
of substance in the unit of Avogadro's constant (6.022x10^23) of atoms or molecules."
landmark="EAID_E586CBA3_83E6_448e_86FC_785FB8EA3435">
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_4FEC69AA_F25D_40e4_95E4_BD3CCE7F0723"
axis="EAID_EA62EF67_9A36_4f82_BCF9_74E7F11310BB" value="1"
valueTypeUnit="EAID_B50F1085_EE30_4408_9028_ECD2D1151D8A"/>
        </referencePoint>
        <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_96FB2447_6EF4_4b14_BEA8_563C1FD96A85"
name="ZeroAmountOfSubstanceReferencePoint" description="Represents the absence, lack of
or zero amount of substance." landmark="EAID_396D9821_327B_4ed3_ABD0_A4ABACE8B529">
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_AE87CB5B_D6DC_4003_891B_192B059DBD95"
axis="EAID_EA62EF67_9A36_4f82_BCF9_74E7F11310BB" value="0"
valueTypeUnit="EAID_B50F1085_EE30_4408_9028_ECD2D1151D8A"/>
        </referencePoint>
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    <element xmi:type="logical:MeasurementSystemAxis"
xmi:id="EAID_EA62EF67_9A36_4f82_BCF9_74E7F11310BB" name="AmountOfSubstance_MeasSysAxis"
description="The measurement system axis to describe the basis of amount of substance
measurement." axis="EAID_3EFC05DA_4D3A_4e3d_8AEC_C9FEC8D85087"
defaultValueTypeUnit="EAID_B50F1085_EE30_4408_9028_ECD2D1151D8A"/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_366DA623_E546_4a9a_A390_77191A5F2A10"
name="ControlSurfacePositionMeasurementSystem">
    <element xmi:type="logical:Landmark"
xmi:id="EAID_E859DE19_488B_4fdd_B76D_8D08525E448D"
name="MotivatorComponentReferenceOrigin" description="An arbitrary point on the motivator
where the values along the X, Y, and Z axes are 0."/>
    <element xmi:type="logical:Landmark"
xmi:id="EAID_37C534F8_F045_49c3_9F08_4AF28F426288" name="MotivatorComponentX_Landmark"

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description="A position in the motivator reference plane (XZ plane) and on the motivator
reference axis. This point sets the reference axis."/>
<element xmi:type="logical:Landmark"
xmi:id="EAID_97ECE4DD_A2B2_45d3_9DF9_E7FEB42B1929" name="MotivatorComponentZ_Landmark"
description="A position in the motivator reference plane (XZ plane) perpendicular to the
motivator reference axis at the origin. This point sets the Z axis."/>
<element xmi:type="logical:Landmark"
xmi:id="EAID_3056DEAB_C27F_40a1_AB50_F09477678706" name="MotivatorComponentY_Landmark"
description="A position tangent to the motivator reference plane (XZ plane) at the origin
that sets the Y axis."/>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_B63B860E_DE90_4a34_9DAA_3C93BB824D39"
name="MotivatorPosition2AxisMeasurementSystem">
<element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_E09A4940_74EC_4c0a_A747_602015FF02A2" name="Position_Motivator_2D_MeasSys"
description="A 2 dimensional MS fixed in an Aerodynamic Motivator component. Origin at an
arbitrary reference point Q,E x-axis positive forward Q,E z-axis positive down. Locates
the motivator in the Control Surface component reference frame."
measurementSystemAxis="EAID_F1776DE9_22E2_414e_A70F_7E346D7C9551
EAID_6DA5DEB1_0C07_48ed_B088_3B14702AD3DD"
coordinateSystem="EAID_91380EB8_66EF_4d12_AC1D_84FF7F719080"
externalStandardReference="ISO 1151, 1.8.3.5" orientation="Right-handed Orthogonal">
<referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_8310DF15_95C8_43c1_945D_59F37C475BB9" name="MotivatorOrigin"
description="The coordinate values of the Origin for a body referenced measurement
system." landmark="EAID_E859DE19_488B_4fdd_B76D_8D08525E448D">
<referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_617A7591_400B_4963_B395_BCED960D0541"
axis="EAID_F1776DE9_22E2_414e_A70F_7E346D7C9551" value="0"
valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
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axis="EAID_6DA5DEB1_0C07_48ed_B088_3B14702AD3DD" value="0"
valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
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<referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_FADED135_367A_44cb_B642_6DBC211CAC17" name="MotivatorReferenceAxisDatum"
description="The coordinate values of the X axis Datum for a motivator referenced
measurement system." landmark="EAID_E49CAB52_7C08_4eb1_BDD4_EC09FF21617E">
<referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_6D16E119_A547_498e_8995_6983556FD39D"
axis="EAID_F1776DE9_22E2_414e_A70F_7E346D7C9551" value="Reference Value"
valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
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axis="EAID_6DA5DEB1_0C07_48ed_B088_3B14702AD3DD" value="0"
valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
</referencePoint>
<referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_3C390A62_C3B6_4bbc_A8B2_0F004183F477" name="MotivatorYAxisDatum"
description="The coordinate values of the Y axis Datum for a motivator referenced
measurement system." landmark="EAID_89DC18C3_B7D5_44a8_867B_861E120A4261">
<referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_4C1575B8_D1AB_4b57_AA3A_9E6B66A225A2"
axis="EAID_F1776DE9_22E2_414e_A70F_7E346D7C9551" value="0"
valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
<referencePointPart xmi:type="logical:ReferencePointPart"
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axis="EAID_6DA5DEB1_0C07_48ed_B088_3B14702AD3DD" value="Reference Value"
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</element>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_F53EEF9D_E446_4fa6_AA3C_99D77849593E"
name="MotivatorPositionMeasurementSystem">
<element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_B8F81069_3DB7_49e5_B224_839422617E1F" name="Position_Motivator_MeasSys"
description="A Measurement System fixed in an Aerodynamic Motivator component. Origin at
an arbitrary reference point Q,E x-axis positive forward Q,E z-axis positive down. y-axis
positive to the right. Locates the motivator in the Control Surface component reference

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frame." measurementSystemAxis="EAID_F1776DE9_22E2_414e_A70F_7E346D7C9551
EAID_6DA5DEB1_0C07_48ed_B088_3B14702AD3DD EAID_FC3052EB_7B28_4e03_8A7E_78D2D121B9E4"
coordinateSystem="EAID_E16B78B2_B2BA_43e5_837E_018DC1FD621C"
externalStandardReference="ISO 1151, 1.8.3.5" orientation="Right-handed Orthogonal">
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name="MotivatorReferencePlaneAxisDatum" description="The coordinate values of the Z axis
Datum for a motivator referenced measurement system. The Z Datum and the X Datum
establish the reference plane." landmark="EAID_0B59FCBD_32A1_4a9a_B428_3506CEB2BF8B">
    <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_8731910D_D613_4756_930F_1C4C49BB35ED"
axis="EAID_F1776DE9_22E2_414e_A70F_7E346D7C9551" value="0"
valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
    <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_0A3C9916_746F_482e_B36E_58A6B2688F9D"
axis="EAID_6DA5DEB1_0C07_48ed_B088_3B14702AD3DD" value="0"
valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
    <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_975640D1_AB41_4a41_AB6A_5A9116E53404"
axis="EAID_FC3052EB_7B28_4e03_8A7E_78D2D121B9E4" value="Reference Value"
valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
    </referencePoint>
    <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_5C7361BE_37FE_4cae_93E8_111654FA03AB" name="MotivatorOrigin"
description="The coordinate values of the Origin for a body referenced measurement
system." landmark="EAID_E859DE19_488B_4fdd_B76D_8D08525E448D">
    <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_8255AC51_D722_4008_A6EC_552B69E7190A"
axis="EAID_F1776DE9_22E2_414e_A70F_7E346D7C9551" value="0"
valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
    <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_AB2A126C_2621_4b20_B431_F3325BA7127F"
axis="EAID_6DA5DEB1_0C07_48ed_B088_3B14702AD3DD" value="0"
valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
    <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_885E32D7_ED25_447c_B3F6_2F7160E54572"
axis="EAID_FC3052EB_7B28_4e03_8A7E_78D2D121B9E4" value="0"
valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
    </referencePoint>
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xmi:id="EAID_3BE722C1_7F80_4b06_AF41_5C2F41BC4158" name="MotivatorReferenceAxisDatum"
description="The coordinate values of the X axis Datum for a motivator referenced
measurement system." landmark="EAID_E49CAB52_7C08_4eb1_BDD4_EC09FF21617E">
    <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_11DD2D80_8769_4dac_929B_EE6BD76ADAF3"
axis="EAID_F1776DE9_22E2_414e_A70F_7E346D7C9551" value="Reference Value"
valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
    <referencePointPart xmi:type="logical:ReferencePointPart"
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axis="EAID_6DA5DEB1_0C07_48ed_B088_3B14702AD3DD" value="0"
valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
    <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_E8D98E7_170C_45ce_BADC_2D57B088D478"
axis="EAID_FC3052EB_7B28_4e03_8A7E_78D2D121B9E4" value="0"
valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
    </referencePoint>
    <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_05FF12E1_8E08_4838_BB97_D4AEB1E8AFDA" name="MotivatorYAxisDatum"
description="The coordinate values of the Y axis Datum for a motivator referenced
measurement system." landmark="EAID_89DC18C3_B7D5_44a8_867B_861E120A4261">
    <referencePointPart xmi:type="logical:ReferencePointPart"
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axis="EAID_F1776DE9_22E2_414e_A70F_7E346D7C9551" value="0"
valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
    <referencePointPart xmi:type="logical:ReferencePointPart"
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axis="EAID_6DA5DEB1_0C07_48ed_B088_3B14702AD3DD" value="Reference Value"
valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
    <referencePointPart xmi:type="logical:ReferencePointPart"
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axis="EAID_FC3052EB_7B28_4e03_8A7E_78D2D121B9E4" value="0"
valueTypeUnit="vZiY3wg5EeSFspy8Kj3F4Q"/>
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</element>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel">
xmi:id="EAID_8F510ED3_B94E_49b6_BBD6_EC677FBDC5B0"
name="MotivatorPositionSingleXAxisMeasurementSystem">
    <element xmi:type="logical:MeasurementSystem">
xmi:id="EAID_181186D4_7DBB_42f6_A2C0_AE70625AD3E2" name="Position_Motivator_X_MeasSys"
description="The single x axis of a MS fixed in an Aerodynamic Motivator component.
Origin at an arbitrary reference point Q,E x-axis positive forward. Locates the motivator
in the Control Surface component reference frame."
measurementSystemAxis="EAID_F1776DE9_22E2_414e_A70F_7E346D7C9551"
coordinateSystem="EAID_D73B1979_E607_48ce_A01F_2EAD5226614D"
externalStandardReference="ISO 1151, 1.8.3.5" orientation="Right-handed Orthogonal">
    <referencePoint xmi:type="logical:ReferencePoint">
xmi:id="EAID_1D51FC21_01D2_4d93_8BFC_AD6329A9E30A" name="MotivatorReferenceAxisDatum"
description="The coordinate values of the X axis Datum for a motivator referenced
measurement system." landmark="EAID_E49CAB52_7C08_4eb1_BDD4_EC09FF21617E">
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axis="EAID_F1776DE9_22E2_414e_A70F_7E346D7C9551" value="Reference Value"
valueTypeUnit="vZiY3wg5EeSFspy8Kj3F4Q"/>
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description="The coordinate values of the Origin for a body referenced measurement
system." landmark="EAID_E859DE19_488B_4fdd_B76D_8D08525E448D">
        <referencePointPart xmi:type="logical:ReferencePointPart">
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axis="EAID_F1776DE9_22E2_414e_A70F_7E346D7C9551" value="0"
valueTypeUnit="vZiY3wg5EeSFspy8Kj3F4Q"/>
    </referencePoint>
</element>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel">
xmi:id="EAID_999FC404_D76A_4361_9ABD_39FCFEEAD952"
name="MotivatorPositionSingleYAxisMeasurementSystem">
    <element xmi:type="logical:MeasurementSystem">
xmi:id="EAID_23A54772_B0B3_4e13_A2AE_2E525943026F" name="Position_Motivator_Y_MeasSys"
description="The single y axis of a MS fixed in an Aerodynamic Motivator component.
Origin at an arbitrary reference point Q,E x-axis positive forward. Locates the motivator
in the Control Surface component reference frame."
measurementSystemAxis="EAID_6DA5DEB1_0C07_48ed_B088_3B14702AD3DD"
coordinateSystem="EAID_9031FA4E_6689_4891_B4D8_6A87899FD6F7"
externalStandardReference="ISO 1151, 1.8.3.5" orientation="Right-handed Orthogonal">
    <referencePoint xmi:type="logical:ReferencePoint">
xmi:id="EAID_DAE57CCE_63C4_4688_BC97_44335A8A8142" name="MotivatorYAxisDatum"
description="The coordinate values of the Y axis Datum for a motivator referenced
measurement system." landmark="EAID_89DC18C3_B7D5_44a8_867B_861E120A4261">
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axis="EAID_6DA5DEB1_0C07_48ed_B088_3B14702AD3DD" value="Reference Value"
valueTypeUnit="vZiY3wg5EeSFspy8Kj3F4Q"/>
    </referencePoint>
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xmi:id="EAID_B9B37F51_79D6_4b75_91F7_A8BFE2926BD1" name="MotivatorOrigin"
description="The coordinate values of the Origin for a body referenced measurement
system." landmark="EAID_E859DE19_488B_4fdd_B76D_8D08525E448D">
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axis="EAID_6DA5DEB1_0C07_48ed_B088_3B14702AD3DD" value="0"
valueTypeUnit="vZiY3wg5EeSFspy8Kj3F4Q"/>
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</element>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel">
xmi:id="EAID_605E5552_4B5A_46f5_8BB2_797EED6C54B9"
name="MotivatorPositionSingleZAxisMeasurementSystem">

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description="The single z axis of a MS fixed in an Aerodynamic Motivator component.
Origin at an arbitrary reference point Q,E x-axis positive forward. Locates the motivator
in the Control Surface component reference frame."
measurementSystemAxis="EAID_FC3052EB_7B28_4e03_8A7E_78D2D121B9E4"
coordinateSystem="EAID_552BE1D7_4AE9_43a8_81DC_0CEE6F135F61"
externalStandardReference="ISO 1151, 1.8.3.5" orientation="Right-handed Orthogonal">
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xmi:id="EAID_75963A76_F234_4f3a_9002_547D84BEDDCE"
name="MotivatorReferencePlaneAxisDatum" description="The coordinate values of the Z axis
Datum for a motivator referenced measurement system. The Z Datum and the X Datum
establish the reference plane." landmark="EAID_0B59FCBD_32A1_4a9a_B428_3506CEB2BF8B">
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axis="EAID_FC3052EB_7B28_4e03_8A7E_78D2D121B9E4" value="Reference Value"
valueTypeUnit="vZiY3wg5EeSFsp8Kj3F4Q"/>
    </referencePoint>
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xmi:id="EAID_39F4C339_9A4A_4042_846D_5AC82929AFB2" name="MotivatorOrigin"
description="The coordinate values of the Origin for a body referenced measurement
system." landmark="EAID_E859DE19_488B_4fdd_B76D_8D08525E448D">
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axis="EAID_FC3052EB_7B28_4e03_8A7E_78D2D121B9E4" value="0"
valueTypeUnit="vZiY3wg5EeSFsp8Kj3F4Q"/>
    </referencePoint>
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<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_56269F0B_8282_4c19_A244_DC614C031E66" name="BodyAttitudeMeasurementSystem">
    <element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_449F4D2F_6805_4049_BD5B_FA27FD570EEF" name="Body_Attitude_MeasSys"
description="Measurement system that provides rotational angle measurements of the local
body frame with respect to an external fixed inertial frame using Tait-Bryan system."
measurementSystemAxis="EAID_A4B9B253_9061_4f28_A8F7_89BFA86EE91A
EAID_309DE716_2AA8_4eb3_A6EA_C0C37AA8CA84 EAID_1B9ED73D_796D_487c_85CC_15170C5E25E5"
coordinateSystem="EAID_A32C05F7_2731_4820_938D_5D7CE852CE37"
externalStandardReference="ISO 1151-2: 1985/Add 1: 1987" orientation="NED right handed
orthogonal Tait-Bryan (z,y',x"); measurement system">
        <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_6E1B977A_72E0_4ab8_B306_536A8C90598D"
name="BodyAttitudeOriginReferencePoint" description="Zero pitch, roll, and yaw rotation
about the vehicle lateral, longitudinal, and vertical axes relative to the local tangent
inertial reference frame at the location of the vehicle."
landmark="EAID_39753BD3_1FF4_47ca_A367_845117E99553">
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_EDC548A1_5637_4908_A4D2_0A899EC2956D"
axis="EAID_A4B9B253_9061_4f28_A8F7_89BFA86EE91A" value="0"
valueTypeUnit="EAID_AADC4D73_088F_4aad_BEE1_9117FD97AE1E"/>
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axis="EAID_309DE716_2AA8_4eb3_A6EA_C0C37AA8CA84" value="0"
valueTypeUnit="EAID_AADC4D73_088F_4aad_BEE1_9117FD97AE1E"/>
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axis="EAID_1B9ED73D_796D_487c_85CC_15170C5E25E5" value="0"
valueTypeUnit="EAID_AADC4D73_088F_4aad_BEE1_9117FD97AE1E"/>
            </referencePoint>
            <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_E60C87D2_31CD_4b48_B135_BEDAD66FC83F" name="LeftWingDownRoll12"
description="Counter-Clockwise rotation about the vehicle longitudinal axis to a roll
orientation with left wing pointing along the Z axis relative to the local tangent
inertial reference frame at the location of the vehicle (a roll left to "wing
down")." landmark="EAID_913ABE8D_D741_4b8e_AA57_E015677CB52D">
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_E28610F6_BE61_482a_AD1A_0EA1CDA3F273"
axis="EAID_309DE716_2AA8_4eb3_A6EA_C0C37AA8CA84" value="-Pi/2"
valueTypeUnit="EAID_AADC4D73_088F_4aad_BEE1_9117FD97AE1E"/>

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valueTypeUnit="EAID_AADC4D73_088F_4aad_BEE1_9117FD97AE1E"/>
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axis="EAID_1B9ED73D_796D_487c_85CC_15170C5E25E5" value="0"
valueTypeUnit="EAID_AADC4D73_088F_4aad_BEE1_9117FD97AE1E"/>
    </referencePoint>
    <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_08D02DA1_7BF3_48bb_A71F_1B4CFF80BA79" name="VerticalPitch1"
description="Rotation to a vertical pitch orientation about the vehicle lateral axis
relative to the local tangent inertial reference frame at the location of the vehicle."
landmark="EAID_3E7D915F_92BA_4d27_BC1A_52D9915CAFEB">
        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_9BDD51F2_B21E_48df_A00E_5BF0A5DF7B40"
axis="EAID_A4B9B253_9061_4f28_A8F7_89BFA86EE91A" value="Pi/2"
valueTypeUnit="EAID_AADC4D73_088F_4aad_BEE1_9117FD97AE1E"/>
        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_7AA3C4FB_564D_4029_85D7_6EF0FE9BAD11"
axis="EAID_309DE716_2AA8_4eb3_A6EA_C0C37AA8CA84" value="0"
valueTypeUnit="EAID_AADC4D73_088F_4aad_BEE1_9117FD97AE1E"/>
        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_21776D5C_E4FE_43f0_9D07_1C6499C3E931"
axis="EAID_1B9ED73D_796D_487c_85CC_15170C5E25E5" value="0"
valueTypeUnit="EAID_AADC4D73_088F_4aad_BEE1_9117FD97AE1E"/>
    </referencePoint>
    <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_5A69D685_5CB3_456b_9EB5_1362DEC20D73" name="NoseLeftYaw2"
description="Counter-Clockwise rotation about the vehicle vertical axis to a yaw
orientation with nose pointing along the positive y axis relative to the local tangent
inertial reference frame at the location of the vehicle (a yaw left)."
landmark="EAID_F8CB773_7EC3_4cf3_A6BF_322F5E0611A2">
        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_A6FD8A95_4692_4947_A93B_58B5A5A3D625"
axis="EAID_1B9ED73D_796D_487c_85CC_15170C5E25E5" value="-Pi/2"
valueTypeUnit="EAID_AADC4D73_088F_4aad_BEE1_9117FD97AE1E"/>
        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_A660FC74_BA5D_4baF_9057_163ED0282462"
axis="EAID_A4B9B253_9061_4f28_A8F7_89BFA86EE91A" value="0"
valueTypeUnit="EAID_AADC4D73_088F_4aad_BEE1_9117FD97AE1E"/>
        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_C5187DAA_C4FB_43b0_839F_9BCD601F1C19"
axis="EAID_309DE716_2AA8_4eb3_A6EA_C0C37AA8CA84" value="0"
valueTypeUnit="EAID_AADC4D73_088F_4aad_BEE1_9117FD97AE1E"/>
    </referencePoint>
</element>
<element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_5CDB3F7E_0762_43c5_ABBD_F6F8B4685244" name="Body_Pitch_MeasSys"
description="Measurement system that provides angle measurement with respect to the local
vehicle lateral axis (y' axis)"
measurementSystemAxis="EAID_A4B9B253_9061_4f28_A8F7_89BFA86EE91A"
coordinateSystem="EAID_ACBA8135_5E56_4151_9CF0_493DA097012A"
externalStandardReference="ISO 1151-2: 1985/Add 1: 1987" orientation="Right handed
orthogonal Tait-Bryan (z,y',x&quot;) coordinate system">
        <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_5824A4D4_3275_47bb_BC09_195A99F20E8D" name="VerticalPitch2"
description="Rotation to a vertical pitch orientation about the vehicle lateral axis
relative to the local tangent inertial reference frame at the location of the vehicle."
landmark="EAID_46C2DBA8_097E_4920_BA96_7CC8F27215AC">
        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_4DA3CB8F_B0CD_415d_A4B0_A763CEE911E7"
axis="EAID_A4B9B253_9061_4f28_A8F7_89BFA86EE91A" value="Pi/2"
valueTypeUnit="EAID_AADC4D73_088F_4aad_BEE1_9117FD97AE1E"/>
    </referencePoint>
    <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_402CEA8A_0A55_40a8_85B9_FFD8375203B9" name="ZeroPitch" description="Zero
pitch rotation about the vehicle lateral axis relative to the local tangent inertial
reference frame at the location of the vehicle."
landmark="EAID_7E2AA6B0_4E32_428e_B420_674937EB807B">

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        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_975E1A8A_61D6_4080_8209_27B035F9ED95"
axis="EAID_A4B9B253_9061_4f28_A8F7_89BFA86EE91A" value="0"
valueTypeUnit="EAID_AADC4D73_088F_4aad_BEE1_9117FD97AE1E"/>
    </referencePoint>
</element>
<element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_5044E59D_C305_465e_944E_4DA6187EF0DC" name="Body_Roll_MeasSys"
description="Measurement system that provides angle measurement with respect to the
local vehicle longitudinal axis (x,"/>
measurementSystemAxis="EAID_309DE716_2AA8_4eb3_A6EA_C0C37AA8CA84"
coordinateSystem="EAID_6C57DC8D_F08C_468b_AA55_C5A9D42C6206"
externalStandardReference="ISO 1151-2: 1985/Add 1: 1987" orientation="Right handed
orthogonal Tait-Bryan (z,y,x); coordinate system">
    <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_74D6CF40_D216_43d7_9AE1_F2D9BB50063A" name="ZeroRoll" description="Zero roll
rotation about the vehicle longitudinal axis relative to the local tangent inertial
reference frame at the location of the vehicle."
landmark="EAID_7E2AA6B0_4E32_428e_B420_674937EB807B">
        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_28496158_2831_44c5_975B_7F80612DBC6B"
axis="EAID_309DE716_2AA8_4eb3_A6EA_C0C37AA8CA84" value="0"
valueTypeUnit="EAID_AADC4D73_088F_4aad_BEE1_9117FD97AE1E"/>
    </referencePoint>
    <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_8B9FCAB8_0D79_481b_A091_F9313EFEF4AD" name="LeftWingDownRoll11"
description="Counter-Clockwise rotation about the vehicle longitudinal axis to a roll
orientation with left wing pointing along the Z axis relative to the local tangent
inertial reference frame at the location of the vehicle (a roll left to "wing
down")." landmark="EAID_EB421BF8_9BA2_4b2c_9F12_89947506FFAC">
        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_DA448C7A_2D62_4276_9490_AFD7BB7D8A3E"
axis="EAID_309DE716_2AA8_4eb3_A6EA_C0C37AA8CA84" value="-Pi/2"
valueTypeUnit="EAID_AADC4D73_088F_4aad_BEE1_9117FD97AE1E"/>
    </referencePoint>
</element>
<element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_9F30D0CA_14E4_4d03_9B4B_6E859FE51594" name="Body_Yaw_MeasSys"
description="Measurement system that provides angle measurement with respect to the local
vehicle vertical axis (z axis)" measurementSystemAxis="EAID_1B9ED73D_796D_487c_85CC_15170C5E25E5"
coordinateSystem="EAID_C2593E69_B148_46a4_9C24_09E0E87EEB08"
externalStandardReference="ISO 1151-2: 1985/Add 1: 1987" orientation="Right handed
orthogonal Tait-Bryan (z,y,x); coordinate system">
    <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_6E09D18A_D50D_4b76_9537_EB05FFD8256E" name="ZeroYaw" description="Zero yaw
rotation about the vehicle longitudinal axis relative to the local tangent inertial
reference frame at the location of the vehicle."
landmark="EAID_7E2AA6B0_4E32_428e_B420_674937EB807B">
        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_9A3CAADF_5147_4276_86E1_94F9D00E26C2"
axis="EAID_1B9ED73D_796D_487c_85CC_15170C5E25E5" value="0"
valueTypeUnit="EAID_AADC4D73_088F_4aad_BEE1_9117FD97AE1E"/>
    </referencePoint>
    <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_37757E5_7A9F_4d5c_840C_9E456D90643D" name="NoseLeftYaw1"
description="Counter-Clockwise rotation about the vehicle vertical axis to a yaw
orientation with nose pointing along the positive y axis relative to the local tangent
inertial reference frame at the location of the vehicle (a yaw left)."
landmark="EAID_7BA5AA9E_8487_4169_8591_E8A62103DE76">
        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_8DFE9652_ACCA_4cf7_A11F_9F0194AE2751"
axis="EAID_1B9ED73D_796D_487c_85CC_15170C5E25E5" value="-Pi/2"
valueTypeUnit="EAID_AADC4D73_088F_4aad_BEE1_9117FD97AE1E"/>
    </referencePoint>
</element>
<element xmi:type="logical:MeasurementSystemAxis"
xmi:id="EAID_A4B9B253_9061_4f28_A8F7_89BFA86EE91A"
name="Body_Attitude_Pitch_Rotation_MeasSysAxis" description="An axis running from the
pilot's left to right in piloted aircraft Q,E and parallel to the wings of a fixed winged
aircraft. Rotation about this axis is called pitch."/>

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axis="EAID_0A7B1219_906D_4aa0_A81F_9D397C9F60E0"
defaultValueTypeUnit="EAID_AADC4D73_088F_4aad_BEE1_9117FD97AE1E"/>
<element xmi:type="logical:MeasurementSystemAxis"
xmi:id="EAID_309E716_2AA8_4eb3_A6EA_C0C37AA8CA84"
name="Body_Attitude_Roll_Rotation_MeasSysAxis" description="An axis drawn through the
body of the vehicle from tail to nose in the direction of flight Q,E or the direction the
pilot faces. Rotation about this axis is called bank or roll."
axis="EAID_683B5E99_B521_4b62_B781_93BADAEEAF8DA"
defaultValueTypeUnit="EAID_AADC4D73_088F_4aad_BEE1_9117FD97AE1E"/>
<element xmi:type="logical:MeasurementSystemAxis"
xmi:id="EAID_1B9ED73D_796D_487c_85CC_15170C5E25E5"
name="Body_Attitude_Yaw_Rotation_MeasSysAxis" description="Also known as the Normal axis
is drawn from top to bottom Q,E and perpendicular to the other two axes. Rotation about
this axis is called yaw." axis="EAID_E788C011_C6AB_4a7a_99EF_3F872C23AF74"
defaultValueTypeUnit="EAID_AADC4D73_088F_4aad_BEE1_9117FD97AE1E"/>
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<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="SDM_34E1AD3A_20BF_4B63_AB0E_17CBEE43542F" name="CovarianceMeasurementSystem">
<element xmi:type="logical:MeasurementSystem"
xmi:id="SDM_0D9E50AD_86C6_4F1B_B1D3_F73A38036A29" name="CovarianceMeasurementSystem"
description="Measurement system for covariance measurements."
measurementSystemAxis="SDM_253A6361_E2F8_481D_BFC7_0E025D8AFBA7"
coordinateSystem="EAID_D73E1979_E607_48ce_A01F_2EAD5226614D">
<referencePoint xmi:type="logical:ReferencePoint"
xmi:id="SDM_75AF617E_D371_4AF8_9545_6925CF05366C" name="ZeroValueReferencePoint"
description="The zero point for a covariance scale."
landmark="SDM_06467E5A_8024_4295_960C_9EBFC0833ED3">
<referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="SDM_0911A6DF_58D5_4B19_A90B_A3B472E1BD15"
axis="SDM_253A6361_E2F8_481D_BFC7_0E025D8AFBA7" value="0.0"
valueTypeUnit="SDM_E23833E7_EC26_48D2_AA3E_519AF74C9200"/>
</referencePoint>
<referencePoint xmi:type="logical:ReferencePoint"
xmi:id="SDM_24F2AB95_A043_45C5_92FB_B80CAE75DC88" name="PositiveOneValueReferencePoint"
description="The one point for a covariance scale that indicates a positive correlation."
landmark="SDM_03DAC63E_46E2_4EB8_98C4_E17820ADC892">
<referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="SDM_D51EBBE_B0AE1_44FB_9E04_422F6AA86941"
axis="SDM_253A6361_E2F8_481D_BFC7_0E025D8AFBA7" value="1.0"
valueTypeUnit="SDM_E23833E7_EC26_48D2_AA3E_519AF74C9200"/>
</referencePoint>
</element>
<element xmi:type="logical:MeasurementSystemAxis"
xmi:id="SDM_253A6361_E2F8_481D_BFC7_0E025D8AFBA7" name="CovarianceMeasurementSystemAxis"
description="Measurement system axis for covariance measurement system."
axis="EAID_3EFC05DA_4D3A_4e3d_8AEC_C9FEC8D85087"
defaultValueTypeUnit="SDM_E23833E7_EC26_48D2_AA3E_519AF74C9200"/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_0FED2250_B777_4607_961E_0F297E38BF33"
name="MotivatorAngleMeasurementSystems">
<element xmi:type="logical:MeasurementSystemAxis"
xmi:id="EAID_B9A4674C_EF3F_4c3b_B084_0AE83A7EDE82" name="Motivator_X_MeasSysAxis"
description="Rotation about the fixed x axis of the motivator MeasurementSystem"
axis="EAID_0DDF191A_235E_4bf5_A2EE_53C3973AE3F0"
defaultValueTypeUnit="EAID_FE60D41B_86AF_4f9e_B507_96A5730B1E52"/>
<element xmi:type="logical:MeasurementSystemAxis"
xmi:id="EAID_755E2E3E_7159_44b6_8C08_3DA8DE7E52A9" name="Motivator_Y_MeasSysAxis"
description="Rotation about the fixed y axis of the motivator MeasurementSystem"
axis="EAID_3B8A3C01_021F_433a_AEFE_9DC9298A4DA5"
defaultValueTypeUnit="EAID_FE60D41B_86AF_4f9e_B507_96A5730B1E52"/>
<element xmi:type="logical:MeasurementSystemAxis"
xmi:id="EAID_C899BE01_4890_4853_A178_936DA868CBF9" name="Motivator_Z_MeasSysAxis"
description="Rotation about the fixed z axis of the motivator MeasurementSystem"
axis="EAID_6F0C456F_1968_46d9_BAEF_2229D40F786F"
defaultValueTypeUnit="EAID_FE60D41B_86AF_4f9e_B507_96A5730B1E52"/>
</ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_EF802D12_A05C_4f78_B836_771AED12EAC5"
name="MotivatorAngle2AxisMeasurementSystem">
<element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_12ED032C_B616_4cd6_AAA1_E1B66A5E8BDA" name="Angle_Motivator_YZ_MeasSys"

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description="The geometric deflection in 2 (y Q,E z) axis of a motivator component's
movement about a hinge line axis. A hinge line axis is one of the axes of the motivator
coordinate system." measurementSystemAxis="EAID_755E2E3E_7159_44b6_8C08_3DA8DE7E52A9
EAID_C899BE01_4890_4853_A178_936DA868CBF9"
coordinateSystem="EAID_B05EB8BF_DD0C_47d8_9C21_842C4B4BFBC9"
externalStandardReference="ISO 1151, 1.8.3.6" orientation="Right-handed Orthogonal">
    <referencePoint xmi:type="logical:ReferencePoint">
        xmi:id="EAID_D483F5F9_83B3_4815_AF54_3B93C7F1E7A2"
        name="MotivatorReferencePlaneAxisDatum" description="The angular coordinate values of the
Z axis Datum for a motivator referenced measurement system. The Z Datum and the X Datum
establish the reference plane." landmark="EAID_89DC18C3_B7D5_44a8_867B_861E120A4261">
    <referencePointPart xmi:type="logical:ReferencePointPart">
        xmi:id="EAID_6EF99660_51B5_4e4b_B240_413CD7B81A33"
        axis="EAID_755E2E3E_7159_44b6_8C08_3DA8DE7E52A9" value="0"
        valueTypeUnit="EAID_FE60D41B_86AF_4f9e_B507_96A5730B1E52"/>
    <referencePointPart xmi:type="logical:ReferencePointPart">
        xmi:id="EAID_D677B163_3C19_4beb_BED7_B2D6BA3D99BA"
        axis="EAID_C899BE01_4890_4853_A178_936DA868CBF9" value="Reference Value"
        valueTypeUnit="EAID_FE60D41B_86AF_4f9e_B507_96A5730B1E52"/>
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        description="The angular coordinate values of the Y axis Datum for a motivator referenced
measurement system." landmark="EAID_89DC18C3_B7D5_44a8_867B_861E120A4261">
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        xmi:id="EAID_B3EDE7C8_049B_48cc_9498_EC8901109AA4"
        axis="EAID_755E2E3E_7159_44b6_8C08_3DA8DE7E52A9" value="Reference Value"
        valueTypeUnit="EAID_FE60D41B_86AF_4f9e_B507_96A5730B1E52"/>
    <referencePointPart xmi:type="logical:ReferencePointPart">
        xmi:id="EAID_5FEFBFA8_8E7F_4a95_AB14_331CD5FA7728"
        axis="EAID_C899BE01_4890_4853_A178_936DA868CBF9" value="0"
        valueTypeUnit="EAID_FE60D41B_86AF_4f9e_B507_96A5730B1E52"/>
    </referencePoint>
    <referencePoint xmi:type="logical:ReferencePoint">
        xmi:id="EAID_DB9676B3_E32F_4c05_8395_CE94E0733885" name="MotivatorOrigin"
        description="The angular coordinate values of the Origin for a body referenced
measurement system." landmark="EAID_E859DE19_488B_4fdd_B76D_8D08525E448D">
    <referencePointPart xmi:type="logical:ReferencePointPart">
        xmi:id="EAID_6CE5EA88_2D60_4784_89E6_23F72A3BE3EF"
        axis="EAID_755E2E3E_7159_44b6_8C08_3DA8DE7E52A9" value="0"
        valueTypeUnit="EAID_FE60D41B_86AF_4f9e_B507_96A5730B1E52"/>
    <referencePointPart xmi:type="logical:ReferencePointPart">
        xmi:id="EAID_3883C8C6_5E56_4e40_9129_E4BDC377E428"
        axis="EAID_C899BE01_4890_4853_A178_936DA868CBF9" value="0"
        valueTypeUnit="EAID_FE60D41B_86AF_4f9e_B507_96A5730B1E52"/>
    </referencePoint>
</element>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel">
    xmi:id="EAID_113031CC_4FD8_486e_A902_12B7259EAAFD"
    name="MotivatorAngleMeasurementSystem">
        <element xmi:type="logical:MeasurementSystem">
            xmi:id="EAID_F71A06C9_43D2_4f02_9732_5BD8A6821820" name="Angle_Motivator_MeasSys"
            description="The geometric deflection in 3 axis of a motivator component's movement about
a hinge line axis. A hinge line axis is one of the axes of the motivator coordinate
system." measurementSystemAxis="EAID_B9A4674C_EF3F_4c3b_B084_0AE83A7EDE82
EAID_755E2E3E_7159_44b6_8C08_3DA8DE7E52A9 EAID_C899BE01_4890_4853_A178_936DA868CBF9"
coordinateSystem="EAID_B07E29DC_621C_4130_ACDC_17B4424EB688"
externalStandardReference="ISO 1151, 1.8.3.6" orientation="Right-handed Orthogonal">
            <referencePoint xmi:type="logical:ReferencePoint">
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                description="The angular coordinate values of the Origin for a body referenced
measurement system." landmark="EAID_E859DE19_488B_4fdd_B76D_8D08525E448D">
            <referencePointPart xmi:type="logical:ReferencePointPart">
                xmi:id="EAID_AEA61F4F_BD16_435d_A471_A644EA248F31"
                axis="EAID_B9A4674C_EF3F_4c3b_B084_0AE83A7EDE82" value="0"
                valueTypeUnit="EAID_FE60D41B_86AF_4f9e_B507_96A5730B1E52"/>
            <referencePointPart xmi:type="logical:ReferencePointPart">
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                axis="EAID_755E2E3E_7159_44b6_8C08_3DA8DE7E52A9" value="0"
                valueTypeUnit="EAID_FE60D41B_86AF_4f9e_B507_96A5730B1E52"/>
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    </ldm>

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        <referencePointPart xmi:type="logical:ReferencePointPart"
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axis="EAID_C899BE01_4890_4853_A178_936DA868CBF9" value="0"
valueTypeUnit="EAID_FE60D41B_86AF_4f9e_B507_96A5730B1E52"/>
    </referencePoint>
    <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_74E7FB56_6B78_43ca_9AB3_E167648A0C0D" name="MotivatorReferenceAxisDatum"
description="The angular coordinate values of the X axis Datum for a motivator referenced
measurement system." landmark="EAID_E49CAB52_7C08_4eb1_BDD4_EC09FF21617E">
        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_C4170821_7BC8_4de0_A008_8F6506C84C1F"
axis="EAID_B9A4674C_EF3F_4c3b_B084_0AE83A7EDE82" value="Reference Value"
valueTypeUnit="EAID_FE60D41B_86AF_4f9e_B507_96A5730B1E52"/>
        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_5FBE38F2_F28F_4e31_B854_6CBB0A0D9A21"
axis="EAID_755E2E3E_7159_44b6_8C08_3DA8DE7E52A9" value="0"
valueTypeUnit="EAID_FE60D41B_86AF_4f9e_B507_96A5730B1E52"/>
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axis="EAID_C899BE01_4890_4853_A178_936DA868CBF9" value="0"
valueTypeUnit="EAID_FE60D41B_86AF_4f9e_B507_96A5730B1E52"/>
    </referencePoint>
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xmi:id="EAID_009339A7_DA3A_4958_9FA3_2DB9ED8BF7BC"
name="MotivatorReferencePlaneAxisDatum" description="The angular coordinate values of the
Z axis Datum for a motivator referenced measurement system. The Z Datum and the X Datum
establish the reference plane." landmark="EAID_89DC18C3_B7D5_44a8_867B_861E120A4261">
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name="SingleXAxisMotivatorAngleMeasurementSystem">
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description="The geometric deflection in the x axis hinge line of a motivator component's
movement." measurementSystemAxis="EAID_B9A4674C_EF3F_4c3b_B084_0AE83A7EDE82"
coordinateSystem="EAID_69977E30_FDD9_4fe9_808B_19F526B3A196"
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valueTypeUnit="EAID_FE60D41B_86AF_4f9e_B507_96A5730B1E52"/>
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valueTypeUnit="EAID_FE60D41B_86AF_4f9e_B507_96A5730B1E52"/>
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movement." measurementSystemAxis="EAID_755E2E3E_7159_44b6_8C08_3DA8DE7E52A9"
coordinateSystem="EAID_B440AC4B_2F9D_42ff_96F2_5179733187F8"
externalStandardReference="ISO 1151, 1.8.3.6" orientation="Right-handed Orthogonal">
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description="The angular coordinate values of the Origin for a body referenced
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valueTypeUnit="EAID_FE60D41B_86AF_4f9e_B507_96A5730B1E52"/>
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description="The geometric deflection in the z axis hinge line of a motivator component's
movement." measurementSystemAxis="EAID_C899BE01_4890_4853_A178_936DA868CBF9"
coordinateSystem="EAID_7490A578_E527_45f2_9F84_437BD4E50D25"
externalStandardReference="ISO 1151, 1.8.3.6" orientation="Right-handed Orthogonal">
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            </referencePoint>
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name="MotivatorReferencePlaneAxisDatum" description="The angular coordinate values of the
Z axis Datum for a motivator referenced measurement system. The Z Datum and the X Datum
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name="LocationCenteredMagneticVariationMeasurementSystem">
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name="Location_Centered_MagneticVariation_MeasSys" description="The angle on the
horizontal plane between magnetic north Q,E and true north at a geographic position."
measurementSystemAxis="EAID_EC7DEAAE_86A2_453a_BA97_5647A5D28037"
coordinateSystem="EAID_39EAB02D_1E49_4b97_AAB0_2DFEB064700A" orientation="NED Azimuth">
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landmark="EAID_9EB09F9B_3761_4d81_B802_BEB61ABA6D4">
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valueTypeUnit="EAID_D4022E84_FA1B_4733_9756_2E8993224B63"/>
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axis="EAID_EC7DEAAE_86A2_453a_BA97_5647A5D28037" value="Geographical Position"
valueTypeUnit="EAID_D4022E84_FA1B_4733_9756_2E8993224B63"/>
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name="VehicleCenteredMagneticVariationMeasurementSystem">
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name="Vehicle_Centered_MagneticVariation_MeasSys" description="The angle on the
horizontal plane between magnetic north Q,E and true north at the position of the
vehicle." measurementSystemAxis="EAID_EC7DEAAE_86A2_453a_BA97_5647A5D28037"
coordinateSystem="EAID_39EAB02D_1E49_4b97_AAB0_2DFEB064700A" orientation="NED Azimuth">
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valueTypeUnit="EAID_D4022E84_FA1B_4733_9756_2E8993224B63"/>
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description="Specifies the height axis for WGS-84." axis="_vZiY1Qg5EeSFspy8Kj3F4Q"
defaultValueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
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defaultValueTypeUnit="EAID_49C4825B_9D02_47e6_B56D_C6DD3C26FAB7"/>
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description="Specifies the longitude axis for WGS-84." axis="_vZiY1gg5EeSFspy8Kj3F4Q"
defaultValueTypeUnit="EAID_4F1038CC_792E_45bb_98D7_C8EF9D196BA6"/>
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name="WGS84PositionAGLMeasurementSystem">
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description="Describes the WGS84 Frame of Reference in terms of coordinate system Q,E
origin Q,E and axis orientation. Altitude is given as Above Ground Level."
measurementSystemAxis="_vZiY2Qg5EeSFspy8Kj3F4Q _vZiY2gg5EeSFspy8Kj3F4Q
_vZiY2wg5EeSFspy8Kj3F4Q" coordinateSystem="_vZiY1wg5EeSFspy8Kj3F4Q"
externalStandardReference="Reference: http://earth-
info.nga.mil/GandG/publications/tr8350.2/wgs84fin.pdf DEPARTMENT OF DEFENSE WORLD
GEODETIC SYSTEM 1984 Its Definition and Relationships with Local Geodetic Systems"
orientation="Right-handed orthogonal">
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coordinate values of the point of the Intersection of the prime meridian, the rotational
axis of the earth, and the earth's surface (land or water as applicable)."
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WGS84 Frame of Reference in terms of coordinate system Q,E origin Q,E and axis
orientation." measurementSystemAxis="_vZiY2Qg5EeSFspy8Kj3F4Q _vZiY2gg5EeSFspy8Kj3F4Q
_vZiY2wg5EeSFspy8Kj3F4Q" coordinateSystem="_vZiY1wg5EeSFspy8Kj3F4Q"
externalStandardReference="Reference: http://earth-
info.nga.mil/GandG/publications/tr8350.2/wgs84fin.pdf DEPARTMENT OF DEFENSE WORLD
GEODETIC SYSTEM 1984 Its Definition and Relationships with Local Geodetic Systems"
orientation="Right-handed orthogonal">
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valueTypeUnit="EAID_49C4825B_9D02_47e6_B56D_C6DD3C26FAB7"/>
                <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="_XACMcAg7EeSFspy8Kj3F4Q" axis="_vZiY2wg5EeSFspy8Kj3F4Q" value="0"
valueTypeUnit="EAID_4F1038CC_792E_45bb_98D7_C8EF9D196BA6"/>
            </referencePoint>
            <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="_SvmAEAg9EeSFspy8Kj3F4Q" name="LatLonZero" description="The coordinate values of
the point of the Intersection of the prime meridian, the equator, and the geoid of the
earth." landmark="_jDNG8AE2EeSj3_IywtjKpA">
                <referencePointPart xmi:type="logical:ReferencePointPart"
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valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
                <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="_XQ8EUQg9EeSFspy8Kj3F4Q" axis="_vZiY2gg5EeSFspy8Kj3F4Q" value="0"
valueTypeUnit="EAID_49C4825B_9D02_47e6_B56D_C6DD3C26FAB7"/>
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xmi:id="_XQ8EUgg9EeSFspy8Kj3F4Q" axis="_vZiY2wg5EeSFspy8Kj3F4Q" value="0"
valueTypeUnit="EAID_4F1038CC_792E_45bb_98D7_C8EF9D196BA6"/>
            </referencePoint>
            <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_9A651DDB_7929_4c47_AC0E_9D3ADE1EEE7B" name="Lat90LonZero" description="The
coordinate values of the point of the Intersection of the prime meridian, and the
rotational axis of the earth." landmark="EAID_9EB09F9B_3761_4d81_B802_BEB61ABA64">
                <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_D4FA0467_765A_4061_9C73_9297AC9A3DE4" axis="_vZiY2Qg5EeSFspy8Kj3F4Q"
value="0" valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>

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        <referencePointPart xmi:type="logical:ReferencePointPart"
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value="90" valueTypeUnit="EAID_49C4825B_9D02_47e6_B56D_C6DD3C26FAB7"/>
        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_B3ED7EC0_2102_4df4_9052_36D657BCD2E" axis="_vZiY2wg5EeSFspy8Kj3F4Q"
value="0" valueTypeUnit="EAID_4F1038CC_792E_45bb_98D7_C8EF9D196BA6"/>
        </referencePoint>
    </element>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_530004BA_80CF_49c2_ADD0_F8D52181ED3A"
name="WGS84PositionMSLMeasurementSystem">
    <element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_9C714858_8B94_42ff_B7AF_4952323C24C0" name="Position_WGS84_MSL_MeasSys"
description="Describes the WGS84 Frame of Reference in terms of coordinate system Q,E
origin Q,E and axis orientation. Altitude is given as Above Mean Sea Level."
measurementSystemAxis="_vZiY2Qg5EeSFspy8Kj3F4Q" _vZiY2gg5EeSFspy8Kj3F4Q
_vZiY2wg5EeSFspy8Kj3F4Q" coordinateSystem="_vZiY1wg5EeSFspy8Kj3F4Q"
externalStandardReference="Reference: http://earth-
info.nga.mil/GandG/publications/tr8350.2/wgs84fin.pdf DEPARTMENT OF DEFENSE WORLD
GEODETIC SYSTEM 1984 Its Definition and Relationships with Local Geodetic Systems"
orientation="Right-handed orthogonal">
        <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_865F05B5_24B2_40ca_A455_B11485FCD7FF" name="EarthOrigin" description="The
coordinate values of the Origin for WGS84 Reference Frame using earth surface datum."
landmark="_qfQeQAE1EeSj3_IywtjKpA">
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_8BAE0662_4A51_48b2_B12A_F7EB2CA039A7" axis="_vZiY2wg5EeSFspy8Kj3F4Q"
value="0" valueTypeUnit="EAID_4F1038CC_792E_45bb_98D7_C8EF9D196BA6"/>
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_138AB12D_094B_405b_A172_ADB812DE294E" axis="_vZiY2gg5EeSFspy8Kj3F4Q"
value="0" valueTypeUnit="EAID_49C4825B_9D02_47e6_B56D_C6DD3C26FAB7"/>
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_6BCB6389_E350_4463_942D_EF855405D5A0" axis="_vZiY2Qg5EeSFspy8Kj3F4Q"
value="-6, 378, 155.329" valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
            </referencePoint>
            <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_AF70A3DE_4F90_4df4_96C2_3023F4FB466" name="LatLonZero" description="The
coordinate values of the point of the Intersection of the prime meridian, the equator,
and the Geoid datum of the earth." landmark="_jDNG8AE2EeSj3_IywtjKpA">
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_EFEF0956_8E94_495f_A1B6_85CE81B11658" axis="_vZiY2Qg5EeSFspy8Kj3F4Q"
value="0" valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_9C7F8E1F_C470_480e_B09D_0BAAD0F20577" axis="_vZiY2gg5EeSFspy8Kj3F4Q"
value="0" valueTypeUnit="EAID_49C4825B_9D02_47e6_B56D_C6DD3C26FAB7"/>
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_5219FFAO_6E72_402a_92B1_9BBE82DA5E96" axis="_vZiY2wg5EeSFspy8Kj3F4Q"
value="0" valueTypeUnit="EAID_4F1038CC_792E_45bb_98D7_C8EF9D196BA6"/>
            </referencePoint>
            <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_8BFC5851_96D9_44bb_AB21_625510B29B68" name="Lat90LonZero" description="The
coordinate values of the point of the Intersection of the prime meridian, the rotational
axis of the earth, and the earth Geoid."
landmark="EAID_9EB09F9B_3761_4d81_B802_BEB61ABA64">
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_EB180147_4762_4a25_8D09_3714D8BE0216" axis="_vZiY2Qg5EeSFspy8Kj3F4Q"
value="0" valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_AED8A665_7813_4bc9_9DE1_FB4BAE4E6C68" axis="_vZiY2gg5EeSFspy8Kj3F4Q"
value="90" valueTypeUnit="EAID_49C4825B_9D02_47e6_B56D_C6DD3C26FAB7"/>
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_BB5BA3B1_505B_4762_B00E_30F55506C59F" axis="_vZiY2wg5EeSFspy8Kj3F4Q"
value="0" valueTypeUnit="EAID_4F1038CC_792E_45bb_98D7_C8EF9D196BA6"/>
            </referencePoint>
        </element>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_974A59E5_BD31_4322_ADC9_580341D2ADED"
name="WGS84Position2AxisMeasurementSystem">

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        <element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_CA32646B_15B3_4c77_936B_1728D0FA521B" name="Position_WGS84_LatLon_MeasSys"
description="Latitude and Longitude Measurement System using the WGS84 Frame of
Reference. Assumes constant altitude of MSL"
measurementSystemAxis="_vZiY2wg5EeSFspy8Kj3F4Q _vZiY2gg5EeSFspy8Kj3F4Q"
coordinateSystem="EAID_B6E3492E_47BE_44a5_B53B_BC44765EBCCD"
externalStandardReference="Reference: http://earth-
info.nga.mil/GandG/publications/tr8350.2/wgs84fin.pdf DEPARTMENT OF DEFENSE WORLD
GEODETIC SYSTEM 1984 Its Definition and Relationships with Local Geodetic Systems"
orientation="right-handed orthogonal">
        <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_E675BCD6_C8FF_4e80_B76E_71A0D1EEAD42" name="Lat90LonZero" description="The
coordinate values of the point of the Intersection of the prime meridian, and the
rotational axis of the earth." landmark="EAID_9EB09F9B_3761_4d81_B802_BEB61ABA6D4">
        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_D6E8CA37_9F76_42d7_9BA6_A5D4F5221399" axis=_vZiY2gg5EeSFspy8Kj3F4Q"
value="90" valueTypeUnit="EAID_49C4825B_9D02_47e6_B56D_C6DD3C26FAB7"/>
        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_08E5882A_DE0B_4835_ABCC_E6B76B7A1C21" axis=_vZiY2wg5EeSFspy8Kj3F4Q"
value="0" valueTypeUnit="EAID_4F1038CC_792E_45bb_98D7_C8EF9D196BA6"/>
        </referencePoint>
        <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_7DDFDE01_EF63_4fa1_9091_B60A98F9AAE6" name="LatLonZero" description="The
coordinate values of the point of the Intersection of the prime meridian, and the
equator," landmark=_JDNG8AE2EeSj3_IywtjKpA">
        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_CBDDDB28_F0F6_42cb_B64E_65C796FC43C0" axis=_vZiY2gg5EeSFspy8Kj3F4Q"
value="0" valueTypeUnit="EAID_49C4825B_9D02_47e6_B56D_C6DD3C26FAB7"/>
        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_C098C1FE_D73C_4e7e_A41C_4D98F9F067C4" axis=_vZiY2wg5EeSFspy8Kj3F4Q"
value="0" valueTypeUnit="EAID_4F1038CC_792E_45bb_98D7_C8EF9D196BA6"/>
        </referencePoint>
        <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_C4115095_38FE_4bab_B8B4_1265C92693C7" name="EarthOrigin" description="The
coordinate values of the Origin for WGS84 Surface Reference Frame. Assuming altitude =
MSL." landmark=_qfQeQAE1EeSj3_IywtjKpA">
        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_67C6BBB7_246C_4645_A6B7_2B71773ABA1" axis=_vZiY2gg5EeSFspy8Kj3F4Q"
value="0" valueTypeUnit="EAID_49C4825B_9D02_47e6_B56D_C6DD3C26FAB7"/>
        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_5FA7C776_74A5_40db_942F_68A0E6C26B1A" axis=_vZiY2wg5EeSFspy8Kj3F4Q"
value="0" valueTypeUnit="EAID_4F1038CC_792E_45bb_98D7_C8EF9D196BA6"/>
        </referencePoint>
    </element>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_D68F5654_0097_4eeb_94FF_CD4F1112BA6A"
name="WGS84PositionSingleAxisMeasurementSystem">
    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_9C1268B8_8F68_47d6_A6D1_F0AAAA37279E"
name="WGS84PositionAltitudeAGLMeasurementSystem">
        <element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_D0F8D635_52DE_41f7_B5FE_7D2C306E433A"
name="Position_WGS84_Altitude_AGL_MeasSys" description="The Altitude measurement in a
WGS84 Frame of Reference. Measured along a ray from the origin to the measured position
above the earth surface." measurementSystemAxis=_vZiY2Qg5EeSFspy8Kj3F4Q"
coordinateSystem="EAID_55E0A12F_4A1A_421e_ABA8_FC11DB1A3095"
externalStandardReference="Reference: http://earth-
info.nga.mil/GandG/publications/tr8350.2/wgs84fin.pdf" orientation="right-handed
orthogonal">
        <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_705EC334_878B_40af_B3E5_6FCBFF033800" name="WGS84AGL" description="The
coordinate value of the earth Surface Reference Frame. Lat=Lon= 0."
landmark="EAID_FDA77403_098B_48e3_836D_B7C4A19EECA4">
        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_74A67CB2_F018_421e_8D92_14CF587509E4" axis=_vZiY2Qg5EeSFspy8Kj3F4Q"
value="-6,356,752.3" valueTypeUnit=_vZiY3wg5EeSFspy8Kj3F4Q"/>
        </referencePoint>
        <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_52D0B751_BD25_43d2_92E6_A67CF7552A0A" name="EarthOrigin" description="The

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coordinate values of the Origin for WGS84 Surface Reference Frame. Lat=Lon= 0."
landmark="_qfQeQAE1EeSj3_IywtjKpA">
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xmi:id="EAID_4DE12B84_8646_4ddf_B002_03C6BA2F348F" axis="_vZiY2Qg5EeSFspy8Kj3F4Q"
value="-6,356,752.3" valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
    </referencePoint>
    </element>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
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name="WGS84PositionAltitudeMeasurementSystem">
    <element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_69892068_4206_47ae_9DA3_60A9A0144C3F" name="Position_WGS84_Altitude_MeasSys"
description="The Altitude measurement in a WGS84 Frame of Reference. Measured along a ray
from the earth origin to the measured position above the WGS84 ellipsoid. "
measurementSystemAxis="_vZiY2Qg5EeSFspy8Kj3F4Q"
coordinateSystem="EAID_55E0A12F_4A1A_421e_ABA8_FC11DB1A3095"
externalStandardReference="Reference: http://earth-
info.nga.mil/GandG/publications/tr8350.2/wgs84fin.pdf" orientation="right-handed
orthogonal">
        <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_DDB3BAD1_251D_4199_8906_09FC15A8C8B3" name="EarthOrigin" description="The
coordinate values of the Origin for WGS84 Surface Reference Frame. Lat=Lon= 0."
landmark="_qfQeQAE1EeSj3_IywtjKpA">
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_A80C76D1_3CA8_4ecf_97B0_09DE1040B9CC" axis="_vZiY2Qg5EeSFspy8Kj3F4Q"
value="-6,356,752.3" valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
            </referencePoint>
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coordinate value of the WGS84 ellipsoid Surface Reference Frame. Lat=Lon= 0."
landmark="EAID_C61CD9D1_AD77_486c_BDCA_6F51188A81C4">
                <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_4060784F_5B86_46fb_923E_90F7366D74BA" axis="_vZiY2Qg5EeSFspy8Kj3F4Q"
value="-6,356,752.3" valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
                </referencePoint>
                </element>
            </ldm>
            <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_0B2AF672_2A14_4ac5_AA5C_75645B96C008"
name="WGS84PositionAltitudeMSLMeasurementSystem">
                <element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_74FB7368_A05A_4b14_92F8_1A2FE66F073C"
name="Position_WGS84_Altitude_MSL_MeasSys" description="The Altitude measurement in a
WGS84 Frame of Reference. Measured along a ray from the origin to the measured position
above the WGS84 ellipsoid. " measurementSystemAxis="_vZiY2Qg5EeSFspy8Kj3F4Q"
coordinateSystem="EAID_55E0A12F_4A1A_421e_ABA8_FC11DB1A3095"
externalStandardReference="Reference: http://earth-
info.nga.mil/GandG/publications/tr8350.2/wgs84fin.pdf" orientation="right-handed
orthogonal">
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coordinate value of the WGS84 ellipsoid Surface Reference Frame. Lat=Lon= 0."
landmark="EAID_CCAECCA6_A8E7_4b19_8372_3B124CCC9CB2">
                        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_7DDC28C6_6CB5_4a68_A9C2_A4EF4143A4FB" axis="_vZiY2Qg5EeSFspy8Kj3F4Q"
value="-6,356,752.3" valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
                        </referencePoint>
                        <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_4E0FD13D_E70E_4aa6_974D_17E338441C71" name="EarthOrigin" description="The
coordinate values of the Origin for WGS84 Surface Reference Frame. Lat=Lon= 0."
landmark="_qfQeQAE1EeSj3_IywtjKpA">
                            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_AB5E784D_01EB_4688_88A0_242A39088825" axis="_vZiY2Qg5EeSFspy8Kj3F4Q"
value="-6,356,752.3" valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
                            </referencePoint>
                        </element>
                    </ldm>
                    <ldm xmi:type="datamodel:LogicalDataModel"
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name="WGS84PositionLatitudeMeasurementSystem">

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        <element xmi:type="logical:MeasurementSystem"
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description="A Measurement System for the latitude measurement in a WGS84 Frame of
Reference Q,E " measurementSystemAxis="_vZiY2gg5EeSFspy8Kj3F4Q"
coordinateSystem="EAID_B6CBB90E_3A43_44ca_B1B9_78FED0DA3C7D"
externalStandardReference="Reference: http://earth-
info.nga.mil/GandG/publications/tr8350.2/wgs84fin.pdf" orientation="right-handed
orthogonal">
        <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_36F72EB7_95A0_4d92_9279_130721BB4C5E" name="LatLonZero" description="The
coordinate values of the point of the Intersection of the prime meridian, and the
equator," landmark="_jDNG8AE2EeSj3_IywtjKpA">
        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_FA473C1A_EB5F_4c1c_8806_04873DAF64CB" axis="_vZiY2gg5EeSFspy8Kj3F4Q"
value="0" valueTypeUnit="EAID_49C4825B_9D02_47e6_B56D_C6DD3C26FAB7"/>
        </referencePoint>
    </element>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_B36FE58E_7295_4256_A660_B54B09C700B8"
name="WGS84PositionLongitudeMeasurementSystem">
        <element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_20426BB1_88F4_4862_94D1_E45BC487D266"
name="Position_WGS84_Longitude_MeasSys" description="A Measurement System for the
longitude measurement in a WGS84 Frame of Reference Q,E "
measurementSystemAxis="_vZiY2wg5EeSFspy8Kj3F4Q"
coordinateSystem="EAID_2EF70F5A_7A56_468e_AC75_6663CE3CB2F4"
externalStandardReference="Reference: http://earth-
info.nga.mil/GandG/publications/tr8350.2/wgs84fin.pdf" orientation="right-handed
orthogonal">
        <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_5EC59D11_5311_401f_A232_704D0F46674B" name="Lat90LonZero" description="The
coordinate values of the point of the Intersection of the prime meridian, and the
rotational axis of the earth." landmark="EAID_9EB09F9B_3761_4d81_B802_BEB61ABA9D64">
        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_BB83ED83_6F13_4880_B8A3_B383C49F385D" axis="_vZiY2wg5EeSFspy8Kj3F4Q"
value="0" valueTypeUnit="EAID_4F1038CC_792E_45bb_98D7_C8EF9D196BA6"/>
        </referencePoint>
    </element>
</ldm>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_C5E533B1_762D_4e2f_B8BA_3B71567F1AOB" name="ECEFPositionMeasurementSystem">
        <element xmi:type="logical:MeasurementSystem"
xmi:id="HIqhBAExEeSj3_IywtjKpA" name="Position_ECEF_MeasSys" description="Describes the
Earth-centered Q,E earth-fixed measurement system."
measurementSystemAxis="HIqhCAExEeSj3_IywtjKpA_HIqhCgExEeSj3_IywtjKpA
_HIqhDAExEeSj3_IywtjKpA" coordinateSystem="EAID_E16B78B2_B2BA_43e5_837E_018DC1FD621C">
        <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="o70fsAE1EeSj3_IywtjKpA" name="EarthOrigin" description="The coordinate values of
the Origin for Earth Centered, Earth Fixed Inertial Reference Frames"
landmark="_qfQeQAE1EeSj3_IywtjKpA">
        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="50RQYAE1EeSj3_IywtjKpA" axis="HIqhCAExEeSj3_IywtjKpA" value="0"
valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="9Hm5cAE1EeSj3_IywtjKpA" axis="HIqhCgExEeSj3_IywtjKpA" value="0"
valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="9wJgIAE1EeSj3_IywtjKpA" axis="HIqhDAExEeSj3_IywtjKpA" value="0"
valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
        </referencePoint>
        <referencePoint xmi:type="logical:ReferencePoint" xmi:id="Ukc-
YAE2EeSj3_IywtjKpA" name="ECEF_XAxis" description="The coordinate values of the point of
the Intersection of the prime meridian, the equator, and the geoid of the earth."
landmark="_jDNG8AE2EeSj3_IywtjKpA">
        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="xCHR0AE2EeSj3_IywtjKpA" axis="HIqhCAExEeSj3_IywtjKpA" value="6,378,137"
valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>

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        <referencePointPart xmi:type="logical:ReferencePointPart"
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valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="_yHm6QAE2EeSj3_IywtjKpA" axis="_HIqhDAExEeSj3_IywtjKpA" value="0"
valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
    </referencePoint>
    <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_C33EEB20_8E9F_419c_B655_E809A1E7D361" name="ECEF_ZAxis" description="The
coordinate values of the point of the intersection of the prime meridian, and the
rotational axis of the earth." landmark="EAID_9EB09FB_3761_4d81_B802_BEB61ABAFD64">
    <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_90205A69_04F4_4ad2_AE40_E7361A36A3A1" axis="_HIqhCAExEeSj3_IywtjKpA"
value="0" valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
    <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_CF4716C1_9404_4121_8490_50CF99FA4A3" axis="_HIqhCgExEeSj3_IywtjKpA"
value="0" valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
    <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_9D9E5630_8317_4158_925F_F972A8882A2C" axis="_HIqhDAExEeSj3_IywtjKpA"
value="6,356,752" valueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
    </referencePoint>
</element>
<element xmi:type="logical:MeasurementSystemAxis"
xmi:id="_HIqhCAExEeSj3_IywtjKpA" name="Position_ECEF_X_MeasSysAxis"
description="Specifies a link to the ECEF X measurement system axis."
axis="EAID_3EFC05DA_4D3A_4e3d_8AEC_C9FEC8D85087"
defaultValueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
    <element xmi:type="logical:MeasurementSystemAxis"
xmi:id="_HIqhCgExEeSj3_IywtjKpA" name="Position_ECEF_Y_MeasSysAxis"
description="Specifies a link to the ECEF Y measurement system axis."
axis="EAID_185CD9A8_B677_41ab_907D_C7F232756DCE"
defaultValueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
    <element xmi:type="logical:MeasurementSystemAxis"
xmi:id="_HIqhDAExEeSj3_IywtjKpA" name="Position_ECEF_Z_MeasSysAxis"
description="Specifies a link to the ECEF Z measurement system axis."
axis="EAID_C74601C9_0E7A_483b_AD4C_28D64BE141E3"
defaultValueTypeUnit="_vZiY3wg5EeSFspy8Kj3F4Q"/>
</ldm>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_A657F579_91F9_4f14_8D18_C4BE6225ECA3" name="AreaMeasurementSystem">
    <element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_ECDCA729_FCAC_4488_912E_705D7772C930" name="Area_MeasSys"
description="Measurement system for values of area."
measurementSystemAxis="EAID_94BB6EBD_0C38_4569_935D_E3B57B432375"
coordinateSystem="EAID_D73E1979_E607_48ce_A01F_2EAD5226614D" orientation="Values increase
as area increases.">
        <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_D1E57CDE_A82D_4668_B0DE_E92152F46E28" name="ZeroAreaReferencePoint"
description="Reference point representing an area of zero."
landmark="EAID_C47A25DB_FE40_4b10_A43F_B646B6B2FDE2">
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_65DCF42F_4765_48de_87C5_57060488196"
axis="EAID_94BB6EBD_0C38_4569_935D_E3B57B432375" value="0.0"
valueTypeUnit="EAID_D936F85E_17F7_417a_9240_849DECFAA5FE"/>
        </referencePoint>
        <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_FA4C5A80_2A2B_4c98_A2C0_E5C7656F7946" name="UnitAreaReferencePoint"
description="Reference point defining a value of one square meter of area."
landmark="EAID_E9E460F3_91B4_4bc3_887F_68AC7C7D5133">
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_1682646B_31E8_466f_92B6_17F54A3F4EEB"
axis="EAID_94BB6EBD_0C38_4569_935D_E3B57B432375" value="1.0"
valueTypeUnit="EAID_D936F85E_17F7_417a_9240_849DECFAA5FE"/>
        </referencePoint>
    </element>
    <element xmi:type="logical:MeasurementSystemAxis"
xmi:id="EAID_94BB6EBD_0C38_4569_935D_E3B57B432375" name="Area_MeasSysAxis"
description="Primary axis for the measurement of areas."
axis="EAID_3EFC05DA_4D3A_4e3d_8AEC_C9FEC8D85087"
defaultValueTypeUnit="EAID_D936F85E_17F7_417a_9240_849DECFAA5FE"/>

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        </ldm>
        <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_C80A4994_9D13_4137_9F88_B18B7B9E7930" name="CountingMeasurementSystem">
            <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_7DF4C5DE_EFEE_4b63_BDCB_C53F275064A6" name="CountMeasurementSystem">
                <element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_C47A17E6_C71A_476e_BE60_180AF8419F3F" name="Count_MeasSys"
description="Measurement system for event occurrences measured in Counts."
measurementSystemAxis="EAID_0BC3E999_77C6_4c63_AF7D_ABF70A593686"
coordinateSystem="EAID_D73E1979_E607_48ce_A01F_2EAD5226614D" orientation="Value increases
as event occurrences increases."
                    <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_1FC9AD43_49BA_4ee5_BBEB_D0F6F8AC21F5" name="ZeroCountReferencePoint"
description="No occurrences of an event"
landmark="EAID_96044A9F_18B8_4b8f_B293_2E6A8EE88CED">
                        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_14274BEE_EF95_48af_9095_33186A88F6D7"
axis="EAID_0BC3E999_77C6_4c63_AF7D_ABF70A593686" value="0"
valueTypeUnit="EAID_87ABB560_138F_4984_908E_3D7C00EFFCC5"/>
                    </referencePoint>
                    <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_2EDF9D15_B08E_4890_AB43_0D607A7CB33B" name="OneCountReferencePoint"
description="One counted event" landmark="EAID_23090211_4137_49e3_BE03_478F7B076C5A">
                        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_9CAB63B4_4535_44db_BD42_E9A4A8B29E5E"
axis="EAID_0BC3E999_77C6_4c63_AF7D_ABF70A593686" value="1"
valueTypeUnit="EAID_87ABB560_138F_4984_908E_3D7C00EFFCC5"/>
                    </referencePoint>
                </element>
                <element xmi:type="logical:MeasurementSystemAxis"
xmi:id="EAID_0BC3E999_77C6_4c63_AF7D_ABF70A593686" name="Count_MeasSysAxis"
description="Measurement system axis for Counts measured in counts with integers."
axis="EAID_3EFC05DA_4D3A_4e3d_8AEC_C9FEC8D85087"
defaultValueTypeUnit="EAID_87ABB560_138F_4984_908E_3D7C00EFFCC5"/>
            </ldm>
            <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_B0F4D136_C746_421e_AC20_CCD2912DA500" name="ResolutionMeasurementSystem">
                <element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_4FE8838C_BDBB_4d71_BB05_B6665A4465B9" name="Resolution_MeasSys"
description="Measurement system for screen resolution measurements."
measurementSystemAxis="EAID_68D640BD_4D6B_4d01_BE52_5CDF213BC3EB
EAID_ADF21458_AA79_4492_AB79_71DE58A8D6DE"
coordinateSystem="EAID_91380EB8_66EF_4d12_AC1D_84FF7F719080" orientation="Value increases
as Pixel Count increase">
                    <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_F4FA9B7F_4286_4f34_9D52_B8B4810DE16C" name="OriginResolutionReferencePoint"
description="screen (x,y) origin" landmark="EAID_58DED9B5_477F_4054_AA12_9877FDC7782B">
                        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_F83C22E7_CA3F_4405_A97B_C8388252225D"
axis="EAID_68D640BD_4D6B_4d01_BE52_5CDF213BC3EB" value="0"
valueTypeUnit="EAID_888A1206_11E0_434b_A43D_1CC0091F92BB"/>
                        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_16B296C2_5A87_4c1f_8E7E_9ADE3D4087F9"
axis="EAID_ADF21458_AA79_4492_AB79_71DE58A8D6DE" value="0"
valueTypeUnit="EAID_888A1206_11E0_434b_A43D_1CC0091F92BB"/>
                    </referencePoint>
                    <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_CFDDFAC6_32C7_4a89_AFDA_019DD2B5B204"
name="UnitHorizontalResolutionReferencePoint" description="Unit resolution in the
horizontal direction (x,0)" landmark="EAID_57C5E3B5_6C67_4d1b_89B9_6EFD08E28F1B">
                        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_6106A8C5_C4B4_4051_A516_394C4DE0A589"
axis="EAID_68D640BD_4D6B_4d01_BE52_5CDF213BC3EB" value="1"
valueTypeUnit="EAID_888A1206_11E0_434b_A43D_1CC0091F92BB"/>
                        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_319F870C_336A_4ca9_97AE_D7458E9EB116"
axis="EAID_ADF21458_AA79_4492_AB79_71DE58A8D6DE" value="0"
valueTypeUnit="EAID_888A1206_11E0_434b_A43D_1CC0091F92BB"/>
                    </referencePoint>
                    <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_67B2D930_02EF_4ab1_B71F_2CC1F29D9024"

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name="UnitVerticalResolutionReferencePoint" description="Unit resolution in the vertical
direction (0,y)" landmark="EAID_57C5E3B5_6C67_4d1b_89B9_6EFD08E28F1B">
    <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_214991A8_A94D_403a_BC8B_FBBB22535241">
        axis="EAID_68D640BD_4D6B_4d01_BE52_5CDF213BC3EB" value="0"
        valueTypeUnit="EAID_888A1206_11E0_434b_A43D_1CC0091F92BB"/>
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_2CEFF5D9_0C5A_4970_8E17_CE3D64BA38F1"
axis="EAID_ADF21458_AA79_4492_AB79_71DE58A8D6DE" value="1"
valueTypeUnit="EAID_888A1206_11E0_434b_A43D_1CC0091F92BB"/>
        </referencePoint>
    </element>
    <element xmi:type="logical:MeasurementSystemAxis"
xmi:id="EAID_68D640BD_4D6B_4d01_BE52_5CDF213BC3EB"
name="Resolution_Horizontal_MeasSysAxis" description="Horizontal axis for the Horizontal
Resolution Measurement System" axis="EAID_3EFC05DA_4D3A_4e3d_8AEC_C9FEC8D85087"
defaultValueTypeUnit="EAID_888A1206_11E0_434b_A43D_1CC0091F92BB"/>
        <element xmi:type="logical:MeasurementSystemAxis"
xmi:id="EAID_ADF21458_AA79_4492_AB79_71DE58A8D6DE" name="Resolution_Vertical_MeasSysAxis"
description="Vertical axis for the Vertical Resolution Measurement System"
axis="EAID_185CD9A8_B677_41ab_907D_C7F232756DCE"
defaultValueTypeUnit="EAID_888A1206_11E0_434b_A43D_1CC0091F92BB"/>
    </ldm>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_5F6621A1_6A3B_47ef_BDE2_6876DA9B7838" name="DensityMeasurementSystem">
    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_DAC1E95A_198D_4400_87B1_E8C99B2C9FC5" name="DensityMeasurementSystem">
        <element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_824295E2_26C0_4f6b_AC04_AAD0D5331862" name="Density_Meassys"
description="Measurement system used in the measurement of density (mass per unit
volume)" measurementSystemAxis="EAID_EAFBC1AF_4737_43c5_842B_282D3FCEBF0D"
coordinateSystem="EAID_D73E1979_E607_48ce_A01F_2EAD5226614D" orientation="Values increase
as density increases">
            <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_C4FE9A96_0B55_4772_A566_8C3B434AA18E" name="ZeroDensityReferencePoint"
description="Reference point corresponding to a density of zero (no mass in a defined
volume)" landmark="EAID_ED886DCA_4126_41d7_88CF_DEB43A2462C8">
                <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_4082573B_B06E_4a62_B5B4_E35307277C38"
axis="EAID_EAFBC1AF_4737_43c5_842B_282D3FCEBF0D" value="0.0"
valueTypeUnit="EAID_1194AAE8_DD2D_44c0_BD43_58C01BD29FFF"/>
                    </referencePoint>
                    <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_B67544D5_0574_43c3_B6AC_02BD0A4D8F76" name="WaterDensityReferencePoint"
description="Reference point corresponding to the density of water at 4 degrees C and 1
atmosphere of pressure." landmark="EAID_9F7700F1_01DE_4525_A353_EFB98340E64A">
                        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_C035D78E_D6F3_47d9_BE86_AA03FD77F6F5"
axis="EAID_EAFBC1AF_4737_43c5_842B_282D3FCEBF0D" value="1000.0"
valueTypeUnit="EAID_1194AAE8_DD2D_44c0_BD43_58C01BD29FFF"/>
                    </referencePoint>
                </element>
                <element xmi:type="logical:MeasurementSystemAxis"
xmi:id="EAID_EAFBC1AF_4737_43c5_842B_282D3FCEBF0D" name="Density_MeasSysAxis"
description="Primary axis for measurements of density"
axis="EAID_3EFC05DA_4D3A_4e3d_8AEC_C9FEC8D85087"
defaultValueTypeUnit="EAID_1194AAE8_DD2D_44c0_BD43_58C01BD29FFF"/>
            </ldm>
            <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_D4D37FFD_C368_4525_AD63_F8DAFBEB1B63" name="HumidityMeasurementSystem">
                <element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_249E210D_69CB_4315_BCF4_0DD0B5EE9AF0" name="Relative_Humidity_MeasSys"
description="Measurement system for relative humidity measurements."
measurementSystemAxis="EAID_95FFC181_60A9_41cf_9486_008968CEDD17"
coordinateSystem="EAID_D73E1979_E607_48ce_A01F_2EAD5226614D" orientation="Values increase
as relative humidity increases.">
                    <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_491801C6_9ECC_40a9_985D_32EE6BEB4E77"
name="SaturatedRelativeHumidityReferencePoint" description="Saturated (100%) relative
humidity." landmark="EAID_E9D530D6_1823_4e71_BB7D_1271C64B263C"/>

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        <referencePointPart xmi:type="logical:ReferencePointPart"
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axis="EAID_95FFC181_60A9_41cf_9486_008968CEDD17" value="100.0"
valueTypeUnit="EAID_32D64A1E_4E12_41f2_802F_E09F36EC367A"/>
    </referencePoint>
    <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_D81383B1_A3A6_42ca_BA77_7A31D3F3A932"
name="ZeroRelativeHumidityReferencePoint" description="Zero relative humidity."
landmark="EAID_4AA2689D_30FC_46a2_9429_1B3741351F35">
        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_9E81DE98_8EC9_46b3_91E8_2E3DABFE3A3C"
axis="EAID_95FFC181_60A9_41cf_9486_008968CEDD17" value="0.0"
valueTypeUnit="EAID_32D64A1E_4E12_41f2_802F_E09F36EC367A"/>
    </referencePoint>
</element>
<element xmi:type="logical:MeasurementSystemAxis"
xmi:id="EAID_95FFC181_60A9_41cf_9486_008968CEDD17" name="Relative_Humidity_MeasSysAxis"
description="Axis for relative humidity" axis="EAID_3EFC05DA_4D3A_4e3d_8AEC_C9FEC8D85087"
defaultValueTypeUnit="EAID_32D64A1E_4E12_41f2_802F_E09F36EC367A"/>
</ldm>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_BD342AA8_E37A_4d3f_A53D_BD4D59A598CD" name="ElectricityMeasurementSystem">
    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_10CC9195_10BE_4103_9B78_7FF765EF835C"
name="ElectricCapacitanceMeasurementSystem" description="Collection of elements
applicable to Electric Capacitance measurements.">
        <element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_5EB6B860_4679_41b4_AB31_F06F93C6F5E3" name="Electric_Capacitance_MeasSys"
description="The measurement system to describe an objects ability to store an electrical
charge." measurementSystemAxis="EAID_4F1DFAAF_75EF_460f_B55F_D3876B433EFA"
coordinateSystem="EAID_D73E1979_E607_48ce_A01F_2EAD5226614D" orientation="Values increase
as capacitance increases.">
            <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_AEDA2D5B_F743_4e70_A597_17CBDA09232E" name="ZeroCapacitanceReferencePoint"
description="Representative of no measurable electrical capacitance."
landmark="EAID_425AD038_620E_4728_AAEA_06C1B85F4160">
                <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_84D9B296_E078_4453_AEE4_7BC3C0234C45"
axis="EAID_4F1DFAAF_75EF_460f_B55F_D3876B433EFA" value="0"
valueTypeUnit="EAID_88944113_E0D8_475b_90B9_A0BF53FE5027"/>
            </referencePoint>
            <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_181F8DE7_E8CE_432c_860D_8F8331EB3CSA"
name="OneFaradCapacitanceReferencePoint" description="Representative of ability to store
one farad unit of electrical charge."
landmark="EAID_79DB8969_ED34_45fa_B559_C6C84BCA72C0">
                <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_768FA36A_E0E1_434d_9747_F9A6E94AAD31"
axis="EAID_4F1DFAAF_75EF_460f_B55F_D3876B433EFA" value="1"
valueTypeUnit="EAID_88944113_E0D8_475b_90B9_A0BF53FE5027"/>
            </referencePoint>
        </element>
        <element xmi:type="logical:MeasurementSystemAxis"
xmi:id="EAID_4F1DFAAF_75EF_460f_B55F_D3876B433EFA"
name="Electric_Capacitance_MeasSysAxis" description="The measurement system axis to
describe the nature of the electric capacitance measurement."
axis="EAID_3EFC05DA_4D3A_4e3d_8AEC_C9FEC8D85087"
defaultValueTypeUnit="EAID_88944113_E0D8_475b_90B9_A0BF53FE5027"/>
    </ldm>
    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_B49ADC07_54D4_48f1_B515_15C57852A118"
name="ElectricChargeDensityMeasurementSystem" description="Collection of elements
applicable to Electric Charge Density measurements.">
        <element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_61840E8B_6722_437e_8E66_BF5B091BA1BA"
name="Electric_Charge_LinearDensity_MeasSys" description="Measurement system to describe
the electric charge density of per unit length."
measurementSystemAxis="EAID_B383AED6_CE79_452a_83B5_3D3452624D24"
coordinateSystem="EAID_D73E1979_E607_48ce_A01F_2EAD5226614D" orientation="Values increase
as charge density increases."/>

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        <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_D9D49BE6_E438_4e43_8A62_2702AD15CF9D" name="ZeroChargeDensity"
description="Representative of no measurable linear electric charge density."
landmark="EAID_3099F886_D076_4f49_98A5_452E887259DA">
    <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_DFDF7387_5899_49d8_9EB7_CD2BBC89BDA9"
axis="EAID_B383AED6_CE79_452a_83B5_3D3452624D24" value="0"
valueTypeUnit="EAID_FC0CC9EF_5264_46f8_97E5_BD9B4B98D732"/>
</referencePoint>
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xmi:id="EAID_73DE5CE4_CA7B_45e8_8CB5_2A91EA022C59" name="OneCoulombPerMeterChargeDensity"
description="Representative of one unit of linear electric charge density measured in
coulombs per meter" landmark="EAID_E266B00D_B505_41f8_8219_9AF152973344">
    <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_7AA65249_F422_4a22_AB8E_70BCDE44CF8B"
axis="EAID_B383AED6_CE79_452a_83B5_3D3452624D24" value="1"
valueTypeUnit="EAID_FC0CC9EF_5264_46f8_97E5_BD9B4B98D732"/>
</referencePoint>
</element>
<element xmi:type="logical:MeasurementSystemAxis"
xmi:id="EAID_B383AED6_CE79_452a_83B5_3D3452624D24"
name="Electric_ChargeDensity_Linear_MeasSysAxis" description="The measurement system axis
to describe the electric charge density of per unit length."
axis="EAID_3EFC05DA_4D3A_4e3d_8AEC_C9FEC8D85087"
defaultValueTypeUnit="EAID_FC0CC9EF_5264_46f8_97E5_BD9B4B98D732"/>
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xmi:id="EAID_401CE94F_7F8C_48d9_ADA8_44A6B97B093D" name="ElectricChargeMeasurementSystem"
description="Collection of elements applicable to Electric Charge measurements.">
    <element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_3B0BCA26_22AB_4c9e_9047_D9107BD68377" name="Electric_Charge_MeasSys"
description="The measurement system to describe the physical property of matter that
causes it to experience a force when close to other electrically charged matter."
measurementSystemAxis="EAID_8D1D2442_0110_4250_BA82_97688EC62F37"
coordinateSystem="EAID_D73E1979_E607_48ce_A01F_2EAD5226614D" orientation="Values increase
as electric charge increases.">
        <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_5707B670_489F_489d_B3C5_C2BD1628A293" name="OneCoulombChargeReferencePoint"
description="Representative of positively charged characteristic as defined by having
more protons than electrons and measured as one coulomb of electric charge."
landmark="EAID_7C6FB1B9_F9F9_4b44_94F3_E6883ACC835F">
            <referencePointPart xmi:type="logical:ReferencePointPart"
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axis="EAID_8D1D2442_0110_4250_BA82_97688EC62F37" value="1"
valueTypeUnit="EAID_38E03039_78D2_40f5_AB1B_9AF607B5C0E1"/>
</referencePoint>
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name="ZeroElectricChargeReferencePoint" description="Representative of no measurable
electric charge." landmark="EAID_C4DAF340_8D6D_494b_A77D_B012BDCC2CB0">
    <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_2ACA012F_0D85_47a9_9AA8_BABAEE5EEF839"
axis="EAID_8D1D2442_0110_4250_BA82_97688EC62F37" value="0"
valueTypeUnit="EAID_38E03039_78D2_40f5_AB1B_9AF607B5C0E1"/>
</referencePoint>
</element>
<element xmi:type="logical:MeasurementSystemAxis"
xmi:id="EAID_8D1D2442_0110_4250_BA82_97688EC62F37" name="Electric_Charge_MeasSysAxis"
description="The measurement system axis to describe the nature of the electrical charge
measurement." axis="EAID_3EFC05DA_4D3A_4e3d_8AEC_C9FEC8D85087"
defaultValueTypeUnit="EAID_38E03039_78D2_40f5_AB1B_9AF607B5C0E1"/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_EC9832A6_925E_44fc_BAD1_E0C0252F3BBF"
name="ElectricCurrentDensityMeasurementSystem" description="Collection of elements
applicable to Electric Current Density measurements.">
    <element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_9353FDDBC_EFFD_4501_BDE0_71B036A925B8" name="Electric_ChargeDensity_MeasSys"
description="The measurement system to describe the electric current density as a vector
whose magnitude is the electric current per cross-sectional area at a given point in
space." measurementSystemAxis="EAID_6146F258_1614_44a4_92C3_D40E23FF89B9

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EAID_5489D8EA_46AC_4632_8A58_B90539C4B59D EAID_E044265D_45C5_4ed4_8A99_C51C425DF2F9"
coordinateSystem="EAID_E16B78B2_B2BA_43e5_837E_018DC1FD621C" orientation="Right-Handed">
    <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_6683DC3F_6D13_4687_8EFB_8FE9B32550D8"
name="ZeroElectricCurrentDensityReferencePoint" description="Representative of no
measurable electric current density for any axis, acting as the origin for the
measurement system." landmark="EAID_4EFDCA88_21D2_413e_A8E7_C237BAAD6EF8">
    <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_CC06C503_486F_48fa_B6BC_961B9EB360C9"
axis="EAID_6146F258_1614_44a4_92C3_D40E23FF89B9" value="0"
valueTypeUnit="EAID_D0606B2C_8462_4b2d_969A_CA3E6A32276C"/>
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axis="EAID_5489D8EA_46AC_4632_8A58_B90539C4B59D" value="0"
valueTypeUnit="EAID_D0606B2C_8462_4b2d_969A_CA3E6A32276C"/>
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xmi:id="EAID_9D903B93_3EAD_4844_AC2D_11E322C40A74"
axis="EAID_E044265D_45C5_4ed4_8A99_C51C425DF2F9" value="0"
valueTypeUnit="EAID_D0606B2C_8462_4b2d_969A_CA3E6A32276C"/>
</referencePoint>
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xmi:id="EAID_F483C36F_331D_4d0c_9EDD_912DCD43CE91"
name="OneAmpPerSquareMeterDensityYDirection" description="Representative of measurable
vector direction of electric current density in the Y direction."
landmark="EAID_97227095_5555_43bc_A29F_18C21EF95AD1">
    <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_OBE0740D_F248_449a_963A_22D8F1B93DB0"
axis="EAID_6146F258_1614_44a4_92C3_D40E23FF89B9" value="0.0"
valueTypeUnit="EAID_D0606B2C_8462_4b2d_969A_CA3E6A32276C"/>
    <referencePointPart xmi:type="logical:ReferencePointPart"
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axis="EAID_5489D8EA_46AC_4632_8A58_B90539C4B59D" value="1.0"
valueTypeUnit="EAID_D0606B2C_8462_4b2d_969A_CA3E6A32276C"/>
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axis="EAID_E044265D_45C5_4ed4_8A99_C51C425DF2F9" value="0.0"
valueTypeUnit="EAID_D0606B2C_8462_4b2d_969A_CA3E6A32276C"/>
</referencePoint>
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xmi:id="EAID_1D428E76_D0B4_4d52_89A9_046287D3630A"
name="OneAmpPerSquareMeterDensityZDirection" description="Representative of measurable
vector direction of electric current density in the Z direction."
landmark="EAID_3812651D_A79A_4181_8D48_8E7D2B39160E">
    <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_57A067CF_8E75_4aad_8C21_B5012315F693"
axis="EAID_6146F258_1614_44a4_92C3_D40E23FF89B9" value="0.0"
valueTypeUnit="EAID_D0606B2C_8462_4b2d_969A_CA3E6A32276C"/>
    <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_71B1245A_ECD5_4a92_9B94_6802ECE82FDC"
axis="EAID_5489D8EA_46AC_4632_8A58_B90539C4B59D" value="0.0"
valueTypeUnit="EAID_D0606B2C_8462_4b2d_969A_CA3E6A32276C"/>
    <referencePointPart xmi:type="logical:ReferencePointPart"
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axis="EAID_E044265D_45C5_4ed4_8A99_C51C425DF2F9" value="1.0"
valueTypeUnit="EAID_D0606B2C_8462_4b2d_969A_CA3E6A32276C"/>
</referencePoint>
    <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_FF2A9D86_F4E3_43b1_911B_F038297B2D75"
name="OneAmpPerSquareMeterDensityXDirection" description="Representative of measurable
vector direction of electric current density in the X direction."
landmark="EAID_D906AAE7_5FE3_46a0_8164_81A17CE49BDB">
    <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_29043933_0AAF_4908_B83F_7663090F50B9"
axis="EAID_6146F258_1614_44a4_92C3_D40E23FF89B9" value="1.0"
valueTypeUnit="EAID_D0606B2C_8462_4b2d_969A_CA3E6A32276C"/>
    <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_D98A1665_F1C9_4ada_B665_63FF3240D6E5"
axis="EAID_5489D8EA_46AC_4632_8A58_B90539C4B59D" value="0.0"
valueTypeUnit="EAID_D0606B2C_8462_4b2d_969A_CA3E6A32276C"/>
    <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_78D0A7CE_1478_4a1f_Ad1F_68BE0293C1FC"

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axis="EAID_E044265D_45C5_4ed4_8A99_C51C425DF2F9" value="0.0"
valueTypeUnit="EAID_D0606B2C_8462_4b2d_969A_CA3E6A32276C"/>
    </referencePoint>
</element>
<element xmi:type="logical:MeasurementSystemAxis"
xmi:id="EAID_6146F258_1614_44a4_92C3_D40E23FF89B9"
name="Electric_CurrentDensity_X_MeasSysAxis" description="The measurement system axis to
describe the nature of the electric current density measurement X direction."
axis="EAID_3EFC05DA_4D3A_4e3d_8AEC_C9FEC8D85087"
defaultValueTypeUnit="EAID_D0606B2C_8462_4b2d_969A_CA3E6A32276C"/>
    <element xmi:type="logical:MeasurementSystemAxis"
xmi:id="EAID_5489D8EA_46AC_4632_8A58_B90539C4B59D"
name="Electric_CurrentDensity_Y_MeasSysAxis" description="The measurement system axis to
describe the nature of the electric current density measurement Y direction."
axis="EAID_185CD9A8_B677_41ab_907D_C7F232756DCE"
defaultValueTypeUnit="EAID_D0606B2C_8462_4b2d_969A_CA3E6A32276C"/>
    <element xmi:type="logical:MeasurementSystemAxis"
xmi:id="EAID_E044265D_45C5_4ed4_8A99_C51C425DF2F9"
name="Electric_CurrentDensity_Z_MeasSysAxis" description="The measurement system axis to
describe the nature of the electric current density measurement Z direction."
axis="EAID_C74601C9_0E7A_483b_AD4C_28D64BE141E3"
defaultValueTypeUnit="EAID_D0606B2C_8462_4b2d_969A_CA3E6A32276C"/>
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xmi:id="EAID_36935DC1_A845_4466_AE64_5917C02AA51C"
name="ElectricCurrentMeasurementSystem" description="Collection of elements applicable to
Electric Current measurements.">
    <element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_0BECB23_57B7_42d6_B9FD_4D5DC34E99B8" name="Electric_Current_MeasSys"
description="The measurement system to describe electrical current as the rate at which a
charge flows past a point on a circuit."
measurementSystemAxis="EAID_50C42368_AC6D_49d2_8BE4_652F6B4AD446"
coordinateSystem="EAID_D73E1979_E607_48ce_A01F_2EAD5226614D" orientation="Right-Handed">
        <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_D788B9DC_6BF3_4d81_B245_7B9C4F2C57A7" name="ZeroCurrentReferencePoint"
description="No electric current is the absence of flow of electric charge moving through
a wire." landmark="EAID_C4DAF340_8D6D_494b_A77D_B012BDCC2CB0">
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_65041C17_2ED2_4ee0_9AE8_24A640DBF3F8"
axis="EAID_50C42368_AC6D_49d2_8BE4_652F6B4AD446" value="0"
valueTypeUnit="EAID_08C169D6_365F_4573_BB2D_87F29AFF3BF0"/>
            </referencePoint>
            <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_F20FBF46_F3AE_44ff_AC38_CD7A65FCC0ED" name="OneAmpCurrentReferencePoint"
description="A positive one amp current value means that the actual direction of current
through that circuit element is same direction of the chosen reference direction."
landmark="EAID_1F30EE79_9169_465b_865B_96D6C06844B4">
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_BDAFE115_24F6_4bae_A3DF_1A0606219BE9"
axis="EAID_50C42368_AC6D_49d2_8BE4_652F6B4AD446" value="1"
valueTypeUnit="EAID_08C169D6_365F_4573_BB2D_87F29AFF3BF0"/>
            </referencePoint>
        </element>
        <element xmi:type="logical:MeasurementSystemAxis"
xmi:id="EAID_50C42368_AC6D_49d2_8BE4_652F6B4AD446" name="Electric_Current_MeasSysAxis"
description="The measurement system axis to describe the nature of the electrical current
measurement." axis="EAID_3EFC05DA_4D3A_4e3d_8AEC_C9FEC8D85087"
defaultValueTypeUnit="EAID_08C169D6_365F_4573_BB2D_87F29AFF3BF0"/>
    </ldm>
    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_C483A13F_5B24_477c_8E58_86F70A7F330F"
name="ElectricPotentialMeasurementSystem">
        <element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_6FE2873F_6DC7_416e_B5B4_C25387FF0D58" name="Electric_Potential_MeasSys"
description="Measurement system to describe the amount of potential energy per unit of
charge." measurementSystemAxis="EAID_387376D6_BB43_44ac_9375_40F79A2E3641"
coordinateSystem="EAID_D73E1979_E607_48ce_A01F_2EAD5226614D" orientation="Values increase
as electric potential increases.">
            <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_FE16C2DC_AFB9_4763_AE36_8D3FE34ADBAA" name="ZeroVoltageReferencePoint"

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description="Representative of no measurable electric potential energy."
landmark="EAID_02BD4EDE_A62E_44d3_806E_5F0959476547">
    <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_AD4BEBEF_5FA7_4e6b_AF5B_E314614DE4B7"
axis="EAID_387376D6_BB43_44ac_9375_40F79A2E3641" value="0"
valueTypeUnit="EAID_BB71A3BE_09B3_4824_95EF_19A4464F51B8"/>
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    <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_7BA0F893_82EE_44b6_99C6_B3C6830EA306" name="OneVoltReferencePoint"
description="Representative of voltage measured as one volt of electric potential."
landmark="EAID_36E07197_7892_4ac1_A1DE_03F74C4423F3">
    <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_0CE5E2ED_452F_4ec0_A6D7_290C550B4E7E"
axis="EAID_387376D6_BB43_44ac_9375_40F79A2E3641" value="1"
valueTypeUnit="EAID_BB71A3BE_09B3_4824_95EF_19A4464F51B8"/>
    </referencePoint>
</element>
<element xmi:type="logical:MeasurementSystemAxis"
xmi:id="EAID_387376D6_BB43_44ac_9375_40F79A2E3641" name="Electric_Potential_MeasSysAxis"
description="The measurement system axis to describe the nature of the electrical
potential measurement." axis="EAID_3EFC05DA_4D3A_4e3d_8AEC_C9FEC8D85087"
defaultValueTypeUnit="EAID_BB71A3BE_09B3_4824_95EF_19A4464F51B8"/>
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<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_F59575EF_F110_4521_A525_42D4963B5643" name="EnergyMeasurementSystem">
    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_61BAE311_8AF8_456c_996D_4DC29D366847" name="AbsorbedDoseMeasurementSystems">
        <element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_B590A760_ABD9_4fce_AB3E_FC4F371B75D5" name="Absorbed_Dose_MeasSys"
description="System for measuring absorbed doses of energy."
measurementSystemAxis="EAID_48DD6F0C_0129_4d4a_B28C_90CE92C8B6E3"
coordinateSystem="EAID_D73E1979_E607_48ce_A01F_2EAD5226614D" orientation="Values increase
as absorbed dose increases.">
            <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_EE7DE422_A0CF_43ba_9A18_BBA1E4BE3979"
name="OneGrayAbsorbedDoseReferencePoint" description="Represents 1 Gray of absorbed
dose." landmark="EAID_F1759756_0DA4_49d7_B58C_1B2DD187B77E">
                <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_1DF9B37F_72F2_46f4_9750_A29F0B7DAC2E"
axis="EAID_48DD6F0C_0129_4d4a_B28C_90CE92C8B6E3" value="1.0"
valueTypeUnit="EAID_E6457D6B_6D62_4e74_8BDB_21EC7A0254E2"/>
                </referencePoint>
                <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_84CD1D40_9F0E_4f87_AD2A_C2C97CA8B8BE" name="ZeroAbsorbedDosReferencePoint"
description="Represents zero absorbed dose."
landmark="EAID_E7A24B06_5DDB_4231_8E10_D0B9CC02B13C">
                    <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_4E6AE9B9_0B42_45db_BB21_A2D9016F893B"
axis="EAID_48DD6F0C_0129_4d4a_B28C_90CE92C8B6E3" value="0.0"
valueTypeUnit="EAID_E6457D6B_6D62_4e74_8BDB_21EC7A0254E2"/>
                    </referencePoint>
                </element>
                <element xmi:type="logical:MeasurementSystemAxis"
xmi:id="EAID_48DD6F0C_0129_4d4a_B28C_90CE92C8B6E3" name="Absorbed_Dose_MeasSysAxis"
description="Axis for measuring absorbed doses of energy."
axis="EAID_3EFC05DA_4D3A_4e3d_8AEC_C9FEC8D85087"
defaultValueTypeUnit="EAID_E6457D6B_6D62_4e74_8BDB_21EC7A0254E2">
                    <constraint xmi:type="logical:MeasurementConstraint"
xmi:id="EAID_565C6DD2_355F_42c1_9D79_D72DD2C15A88" constraintText="Always >= 0"/>
                </element>
            </ldm>
            <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_07764EF4_A8F3_45b9_9103_6FFC3BAFE6E8"
name="AbsorbedDosRateMeasurementSystem">
                <element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_480C3917_A3B2_485d_BE04_C95A1B7ACA62" name="Absorbed_DoseRate_MeasSys"
description="System for measuring absorbed doses of energy."
measurementSystemAxis="EAID_2061E509_E576_4a46_9159_FE533C475099"
coordinateSystem="EAID_D73E1979_E607_48ce_A01F_2EAD5226614D" orientation="Values increase
as absorbed dose rate increases."/>

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name="OneGrayPerSecondAbsorbedDoseRateReferencePoint" description="Represents 1 unit
value of absorbed dose rate." landmark="EAID_47DED456_6C3D_44c7_9586_CAFE4585DB0E">
    <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_E6673EA7_F2FC_4b52_B5DA_963F9C7A3D45"
axis="EAID_2061E509_E576_4a46_9159_FE533C475099" value="1.0"
valueTypeUnit="EAID_AC8A2C1D_F694_403a_A8A3_79014B281D10"/>
    </referencePoint>
    <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_FA33F6E2_A38C_4fd8_8236_0F33D7875D1B"
name="ZeroAbsorbedDoseRateReferencePoint" description="Represents a zero value of
absorbed dose rate" landmark="EAID_FD255658_0DE4_4a8c_8C24_E8A7983EA13D">
    <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_5A89051E_0E85_490b_903D_289958F27BF6"
axis="EAID_2061E509_E576_4a46_9159_FE533C475099" value="0.0"
valueTypeUnit="EAID_AC8A2C1D_F694_403a_A8A3_79014B281D10"/>
    </referencePoint>
<element xmi:type="logical:MeasurementSystemAxis"
xmi:id="EAID_2061E509_E576_4a46_9159_FE533C475099" name="Absorbed_DoseRate_MeasSysAxis"
description="The measurement system axis to describe the nature of measuring absorbed
doses of energy." axis="EAID_3EFC05DA_4D3A_4e3d_8AEC_C9FEC8D85087"
defaultValueTypeUnit="EAID_AC8A2C1D_F694_403a_A8A3_79014B281D10">
    <constraint xmi:type="logical:MeasurementConstraint"
xmi:id="EAID_1F5B2E71_5834_4214_85AC_A8BC0FEEC1EA" constraintText="Always >= 0"/>
</element>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_C73089B7_D748_467b_A674_AB298B91299B"
name="DoseEquivalentMeasurementSystem">
    <element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_B4EBE367_B3E2_40d8_ABED_E1C8BE743AA2" name="Equivalent_Dose_MeasSys"
description="Measurement system for measuring dose equivalent."
measurementSystemAxis="EAID_BB03831D_9E78_4a66_82E2_40B4EB76F437"
coordinateSystem="EAID_D73E1979_E607_48ce_A01F_2EAD5226614D" orientation="Values increase
as dose equivalent increases.">
        <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_00C8A671_0B68_4506_B0E6_E0C87D23C5BB"
name="ZeroDoseEquivalentReferencePoint" description="zero amount of dose equivalent
reference point" landmark="EAID_DA54FC44_ED7D_48f6_AB58_4EB88B717F97">
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_D92AE307_9C49_45ed_9F50_56959A048DA4"
axis="EAID_BB03831D_9E78_4a66_82E2_40B4EB76F437" value="0.0"
valueTypeUnit="EAID_46C7930A_5384_4f0e_BF83_DF1D0ABF6026"/>
        </referencePoint>
        <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_6DC57B3A_3E40_4338_8F01_C7F4DA9B22FD"
name="OneSievertDoseEquivalentReferencePoint" description="Unit amount of dose equivalent
reference point" landmark="EAID_FDC373B4_972D_4e28_BF96_F2C36D7ADDD3">
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_C4AF5F2C_8209_4659_9EC1_C66804F0C374"
axis="EAID_BB03831D_9E78_4a66_82E2_40B4EB76F437" value="1.0"
valueTypeUnit="EAID_46C7930A_5384_4f0e_BF83_DF1D0ABF6026"/>
        </referencePoint>
    </element>
    <element xmi:type="logical:MeasurementSystemAxis"
xmi:id="EAID_BB03831D_9E78_4a66_82E2_40B4EB76F437" name="Equivalent_Dose_MeasSysSys"
description="Measurement system axis for dose equivalent measurements."
axis="EAID_3EFC05DA_4D3A_4e3d_8AEC_C9FEC8D85087"
defaultValueTypeUnit="EAID_46C7930A_5384_4f0e_BF83_DF1D0ABF6026"/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_CEEA5986_F492_4abb_AB84_669D28B6B047" name="EnergyMeasurementSystem">
    <element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_35B208F2_17F0_4a5e_B767_DC3DA3ADFF87" name="Energy_MeasSys"
description="Measurement system for measuring energy."
measurementSystemAxis="EAID_02569D51_133C_46a1_B2B6_87A5DB877565"
coordinateSystem="EAID_D73E1979_E607_48ce_A01F_2EAD5226614D" orientation="Values increase
as energy increases.">

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        <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_B093293A_1525_47dc_B734_9A5808F8D22A" name="ZeroEnergyReferencePoint"
description="Zero energy reference point"
landmark="EAID_52901778_4D76_4bb1_8A71_C9462DF5B4E8">
    <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_48047EA4_DB1A_4ff7_B59B_110F151814CD"
axis="EAID_02569D51_133C_46a1_B2B6_87A5DB877565" value="0.0"
valueTypeUnit="EAID_CBAB96B0_9F89_4e60_A472_F652D5F52946"/>
    </referencePoint>
    <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_99371D94_822A_492c_A43C_09FC3F89F409" name="OneJouleEnergyReferencePoint"
description="Unit amount of energy reference point."
landmark="EAID_FC5FCA4E_4789_465a_A59A_5ABF75EC9B83">
    <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_DF63DDCC_C4E0_415c_B27B_E89AA9F43FCA"
axis="EAID_02569D51_133C_46a1_B2B6_87A5DB877565" value="1.0"
valueTypeUnit="EAID_CBAB96B0_9F89_4e60_A472_F652D5F52946"/>
    </referencePoint>
</element>
<element xmi:type="logical:MeasurementSystemAxis"
xmi:id="EAID_02569D51_133C_46a1_B2B6_87A5DB877565" name="Energy_MeasSysAxis"
description="Measurement system axis for energy measurements."
axis="EAID_3EFC05DA_4D3A_4e3d_8AEC_C9FEC8D85087"
defaultValueTypeUnit="EAID_CBAB96B0_9F89_4e60_A472_F652D5F52946"/>
</ldm>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_311116F7_8BA6_4c24_8190_C88BBC94C7F8" name="EnumerationMeasurementSystem">
    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_F4C72C8B_7433_4eca_B397_0C9B4186E6F8"
name="AbstractDiscreteSetMeasurementSystem">
        <element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_0D6D5FAF_71A2_4452_B2F9_AB8F15C4D13F"
name="AbstractDiscreteSetMeasurementSystem" description="A template MeasurementSystem
referenced by all Measurements whose value is one of a set of selected discrete states
(e.g. Q,E enumerations and multi-state variables). The Measurement must specify the real
state set in it's MeasurementAxis discrete set."
measurementSystemAxis="EAID_A60E666A_2E05_4c81_A7CB_BDE7B7C3A189"
coordinateSystem="EAID_9073ABED_00F3_4b1f_8045_9AE46DBC3456" orientation="n/a"/>
        <element xmi:type="logical:MeasurementSystemAxis"
xmi:id="EAID_A60E666A_2E05_4c81_A7CB_BDE7B7C3A189"
name="Abstract_DiscreteSet_MeasSysAxis" description="Axis for the
AbstractDiscreteSetMeasurementSystem. All &quot;&quot;real&quot;&quot; MeasurementAxes
must reference this MSAxis and must override the ValueTypeUnitPair with one that
specifies the real states in the Measurement's discrete set.&quot;"'
axis="EAID_DBE6EC88_CB55_4a45_8937_D79C72C5D688"
defaultValueTypeUnit="EAID_1356F678_1656_494d_9587_5615F7840EFA"/>
    </ldm>
    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_488C14A6_E447_4141_8FD3_EAFCF9EDC4B1" name="ValidityMeasurementSystem"/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_6D87E41A_B923_492d_B486_CEFDD329FC1F" name="ForceMeasurementSystem">
    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_A1FF4BC8_634C_4fe2_99BE_47273C78E79D" name="ForceMeasurementSystem">
        <element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_1811EA5E_350D_45ca_9BE1_1E9D148DB99F" name="Force_MeasSys"
description="Measurement system used to measure values of force"
measurementSystemAxis="EAID_763EF3D5_B7E4_4c88_88A6_5843A9D2A1FF"
coordinateSystem="EAID_D73E1979_E607_48ce_A01F_2EAD5226614D" orientation="Values increase
as force increases.">
            <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_50ED91CE_76C8_485c_A7B9_4CCF2F142A08" name="KilopondForceReferencePoint"
description="Reference point indicating a value of 1 kilopond of applied force"
landmark="EAID_75F976AD_CA44_4adb_8D48_8BA2B25A1DCD">
                <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_9FB666DC_BBE3_4bdf_A369_F70CE02C7F96"
axis="EAID_763EF3D5_B7E4_4c88_88A6_5843A9D2A1FF" value="9.80665"
valueTypeUnit="EAID_D40F5AB0_A485_4b81_AA5B_E668E0ACB798"/>
            </referencePoint>

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        <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_F11A00B4_2F80_425e_B134_9FB2542E1B61" name="ZeroForceReferencePoint"
description="Reference point indicating a value of zero applied force"
landmark="EAID_7EB3F434_82EC_4375_A434_5085A142F9BA">
    <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_C20DB0BF_1455_4f4a_BF97_EF2679C53818"
axis="EAID_763EF3D5_B7E4_4c88_88A6_5843A9D2A1FF" value="0.0"
valueTypeUnit="EAID_D40F5AB0_A485_4b81_AA5B_E668E0ACB798"/>
    </referencePoint>
</element>
<element xmi:type="logical:MeasurementSystemAxis"
xmi:id="EAID_763EF3D5_B7E4_4c88_88A6_5843A9D2A1FF" name="Force_MeasSysAxis"
description="Measurement system axis used to measure values of force."
axis="EAID_3EFC05DA_4D3A_4e3d_8AEC_C9FEC8D85087"
defaultValueTypeUnit="EAID_D40F5AB0_A485_4b81_AA5B_E668E0ACB798"/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_F2AB5E2B_3EB4_4603_B191_9DB594494BD8" name="TorqueMeasurementSystem">
    <element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_A7098479_C56F_4dae_B04A_092FA4562F75" name="Torque_MeasSys"
description="Measurement system used to measure values of torque"
measurementSystemAxis="EAID_B2CA99C4_C812_4ecf_AE6E_BA15A40467E3"
coordinateSystem="EAID_D73E1979_E607_48ce_A01F_2EAD5226614D" orientation="Values increase
as torque increases">
        <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_DCB29640_5B46_4820_93A6_2001AF13D37B" name="ZeroTorqueReferencePoint"
description="Reference point indicating a value measurement of zero torque"
landmark="EAID_0A16B1C3_3293_4b6d_AE0B_CD5DB0606EC2">
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_15D18789_956D_468e_BA59_191A890A8425"
axis="EAID_B2CA99C4_C812_4ecf_AE6E_BA15A40467E3" value="0.0"
valueTypeUnit="EAID_2E982ED3_8795_413c_9E7D_AF1362B8E313"/>
            </referencePoint>
        <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_43B3D3A9_8135_4f01_928D_AB6B81E910E2" name="OneNewtonMeterReferencePart"
description="Reference point indicating a value of 1 newton meter of torque"
landmark="EAID_12C94E15_7436_4c2e_891F_279398A2CD96">
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_557E626E_36BA_4f7d_AA78_86B92FE57834"
axis="EAID_B2CA99C4_C812_4ecf_AE6E_BA15A40467E3" value="1.0"
valueTypeUnit="EAID_2E982ED3_8795_413c_9E7D_AF1362B8E313"/>
            </referencePoint>
        </element>
        <element xmi:type="logical:MeasurementSystemAxis"
xmi:id="EAID_B2CA99C4_C812_4ecf_AE6E_BA15A40467E3" name="Torque_MeasSysAxis"
description="Measurement system axis used to measure values of torque."
axis="EAID_3EFC05DA_4D3A_4e3d_8AEC_C9FEC8D85087"
defaultValueTypeUnit="EAID_2E982ED3_8795_413c_9E7D_AF1362B8E313"/>
    </ldm>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_C005853C_D850_4518_B59A_2D040AC7E223" name="IdentifiersMeasurementSystem"/>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_COBA83CB_F844_4fd9_AFE6_18A48620D54" name="IlluminanceMeasurementSystem">
    <element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_E3FD4AE5_1A21_48b3_9ACF_777A59094757" name="Illuminance_MeasSys"
description="Measurement system for Illuminance"
measurementSystemAxis="EAID_E26914E4_539B_42b8_B009_473AF3E4A2B2"
coordinateSystem="EAID_D73E1979_E607_48ce_A01F_2EAD5226614D" orientation="Value increases
as Illuminance increases.">
        <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_24D5F2A8_867B_4030_98CD_E76FF0EE616E" name="ZeroIlluminanceReferencePoint"
description="zero illuminance reference point"
landmark="EAID_4ED560B6_21E8_4034_AC6A_3E13CA23DB34">
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_A7D05736_71DB_46c4_9808_8F6640C0532B"
axis="EAID_E26914E4_539B_42b8_B009_473AF3E4A2B2" value="0.0"
valueTypeUnit="EAID_D7BCB56E_6A7C_49a8_BC34_45FCEB45A6C3"/>
            </referencePoint>
        <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_39843784_5939_45af_ACE8_145D4D4DEAB0" name="OneLuxIlluminanceReferencePoint"

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description="one lux illuminance reference point"
landmark="EAID_72916D9B_2F88_4238_BEFC_6BE360FECB2D">
    <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_BD603318_A062_46aa_9DE9_42B388DB3CBD"
axis="EAID_E26914E4_539B_42b8_B009_473AF3E4A2B2" value="1.0"
valueTypeUnit="EAID_D7BCB56E_6A7C_49a8_BC34_45FCEB45A6C3"/>
    </referencePoint>
</element>
<element xmi:type="logical:MeasurementSystemAxis">
xmi:id="EAID_E26914E4_539B_42b8_B009_473AF3E4A2B2" name="Illuminance_MeasSysAxis"
description="Measurement system axis for illuminance"
axis="EAID_3EFC05DA_4D3A_4e3d_8AEC_C9FEC8D85087"
defaultValueTypeUnit="EAID_D7BCB56E_6A7C_49a8_BC34_45FCEB45A6C3"/>
    </ldm>
    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_8B522310_F0EE_4b36_A5D8_82664EFF0251"
name="InformationElementMeasurementSystem">
        <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_D3DABF9D_36F9_4b7b_97CA_49D419B4AAB8" name="TextMeasurementSystem">
            <element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_7D050F4C_30FC_4424_A982_E2F8FF846BFB" name="Text_ASCII_MeasSys"
description="Representation of the ASCII character standard."
measurementSystemAxis="EAID_53E5C75D_0FAB_4090_9AB4_763E7AEF327C"
coordinateSystem="EAID_9073ABED_00F3_4b1f_8045_9AE46DBC3456"
externalStandardReference="ASCII" orientation="N/A"/>
            <element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_3328F5AF_7CAE_4149_A03E_EB78F6653396" name="Text_UTF8_MeasSys"
description="A TextMeasurementSystem supports definition of a single text element. UTF-8
was chosen as the default string encoding."
measurementSystemAxis="EAID_53E5C75D_0FAB_4090_9AB4_763E7AEF327C"
coordinateSystem="EAID_9073ABED_00F3_4b1f_8045_9AE46DBC3456"
externalStandardReference="UTF-8" orientation="N/A"/>
            <element xmi:type="logical:MeasurementSystemAxis"
xmi:id="EAID_53E5C75D_0FAB_4090_9AB4_763E7AEF327C" name="Text_MeasSysAxis"
description="Representation of a single text based axis."
axis="EAID_DBE6EC88_CB55_4a45_8937_D79C72C5D688"
defaultValueTypeUnit="EAID_D0C34A2D_4DF4_435b_BD0D_39375F4DC173"/>
        </ldm>
    </ldm>
    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_783B5129_3231_46a9_AB3B_21A42BFFF9B8" name="LengthMeasurementSystem">
        <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_CDEEE592_702E_4842_AD6E_72C39B337181" name="DistanceMeasurementSystem">
            <element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_63B53D7F_65B9_4808_94CB_79D57291FFF1" name="Distance_MeasSys"
description="Measurement system for distance"
measurementSystemAxis="EAID_28497806_74F7_4473_A56D_C9978462C722"
coordinateSystem="EAID_D73E1979_E607_48ce_A01F_2EAD5226614D" orientation="Value increases
as distance increases">
                <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_6654049D_9954_49fe_9D11_31C05FCC2076" name="ZeroDistanceReferencePoint"
description="zero distance reference point"
landmark="EAID_DD4089D3_E5F9_459f_AF68_2E7D03864E85">
                    <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_9BC877DD_877F_495b_8D94_8B2D61BB0FCE"
axis="EAID_28497806_74F7_4473_A56D_C9978462C722" value="0.0"
valueTypeUnit="EAID_08FEE312_2D6C_498d_B43C_0A241BED52B2"/>
                </referencePoint>
                <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_C095602A_9B87_446b_88FB_860C39785536" name="OneMeterDistanceReferencePoint"
description="Unit distance reference point"
landmark="EAID_80F96761_0360_479d_98D0_300A625D8793">
                    <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_B3526424_147A_4bfe_9E72_C0DD95FFD0C0"
axis="EAID_28497806_74F7_4473_A56D_C9978462C722" value="1.0"
valueTypeUnit="EAID_08FEE312_2D6C_498d_B43C_0A241BED52B2"/>
                </referencePoint>
            </element>
            <element xmi:type="logical:MeasurementSystemAxis">
xmi:id="EAID_28497806_74F7_4473_A56D_C9978462C722" name="Distance_MeasSysAxis"
description="Measurement System Axis for the Distance Measurement System"

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axis="EAID_3EFC05DA_4D3A_4e3d_8AEC_C9FEC8D85087"
defaultValueTypeUnit="EAID_08FEE312_2D6C_498d_B43C_0A241BED52B2"/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_5EA28638_8A2C_45a6_8C1F_7C9EC5DA8FED" name="ExtentMeasurementSystem">
<element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_CA5FF699_AFF6_41b4_A05F_9FB0BFCF2BA8" name="Extent_MeasSys"
description="Measrement system for range or space to which an object extends."
measurementSystemAxis="EAID_9670FC89_77BA_435e_8566_E620BCF11743
EAID_A7E348A5_3B56_4b27_BCDF_5CCD3E178C10"
coordinateSystem="EAID_91380EB8_66EF_4d12_AC1D_84FF7F719080" orientation="Right-Handed">
<referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_793FB81C_7F87_4a3a_B36E_EAAA895857F9" name="ZeroExtentReferencePoint"
description="Zero value of measurement as origin."
landmark="EAID_DD4089D3_E5F9_459f_AF68_2E7D03864E85">
<referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_09352C06_62D4_4a08_8E31_CAE8BE5E619"
axis="EAID_9670FC89_77BA_435e_8566_E620BCF11743" value="0"
valueTypeUnit="EAID_08FEE312_2D6C_498d_B43C_0A241BED52B2"/>
<referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_45F69B16_F62D_4046_BC4C_C0E4B77661D0"
axis="EAID_A7E348A5_3B56_4b27_BCDF_5CCD3E178C10" value="0"
valueTypeUnit="EAID_08FEE312_2D6C_498d_B43C_0A241BED52B2"/>
</referencePoint>
<referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_CFFBDE99_1B33_4240_96D3_37F158CCAB2A"
name="OneMeterLengthExtentReferencePoint" description="One meter unit of a length extent
measurement system." landmark="EAID_80F96761_0360_479d_98D0_300A625D8793">
<referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_2B79AF9F_2F9E_4cbf_84E3_6730812BB38A"
axis="EAID_9670FC89_77BA_435e_8566_E620BCF11743" value="1"
valueTypeUnit="EAID_08FEE312_2D6C_498d_B43C_0A241BED52B2"/>
<referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_6429E9EC_9D96_4e5f_87E9_13CBA42894D8"
axis="EAID_A7E348A5_3B56_4b27_BCDF_5CCD3E178C10" value="0"
valueTypeUnit="EAID_08FEE312_2D6C_498d_B43C_0A241BED52B2"/>
</referencePoint>
<referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_2B1887BC_83AA_45b0_A86B_AD9CAAA2D031"
name="OneMeterWidthExtentReferencePoint" description="One meter unit of a width extent
measurement system." landmark="EAID_BE2755D6_D723_4955_A378_04212C88ACF3">
<referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_61F58ACB_097C_4522_8939_60C04EF8458E"
axis="EAID_9670FC89_77BA_435e_8566_E620BCF11743" value="0"
valueTypeUnit="EAID_08FEE312_2D6C_498d_B43C_0A241BED52B2"/>
<referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_8189E2CC_402F_4cfb_B1EA_0ECB696DF67E"
axis="EAID_A7E348A5_3B56_4b27_BCDF_5CCD3E178C10" value="1"
valueTypeUnit="EAID_08FEE312_2D6C_498d_B43C_0A241BED52B2"/>
</referencePoint>
</element>
<element xmi:type="logical:MeasurementSystemAxis"
xmi:id="EAID_9670FC89_77BA_435e_8566_E620BCF11743" name="Length_Extent_MeasSysAxis"
description="The width measurement system axis to describe the nature of the extent
measurement." axis="EAID_185CD9A8_B677_41ab_907D_C7F232756DCE"
defaultValueTypeUnit="EAID_08FEE312_2D6C_498d_B43C_0A241BED52B2"/>
<element xmi:type="logical:MeasurementSystemAxis"
xmi:id="EAID_A7E348A5_3B56_4b27_BCDF_5CCD3E178C10" name="Width_Extent_MeasSysAxis"
description="The length measurement system axis to describe the nature of the extent
measurement." axis="EAID_3EFC05DA_4D3A_4e3d_8AEC_C9FEC8D85087"
defaultValueTypeUnit="EAID_08FEE312_2D6C_498d_B43C_0A241BED52B2"/>
</ldm>
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<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_36CD1855_3C72_48b8_BE7D_B1E6C4FFE78C"
name="LuminousIntensityMeasurementSystem">
<element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_76A044C2_309B_4032_9FD0_493AEA64E632" name="Luminous_Intensity_MeasSys"
description="Measurement system for LuminousIntensity measured in Candelas"
measurementSystemAxis="EAID_C186715F_C942_416c_A08C_EF95261E82E7"

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coordinateSystem="EAID_D73E1979_E607_48ce_A01F_2EAD5226614D" orientation="Value increases
as luminous intensity increases.">
    <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_E9211DAA_1222_4019_95A2_F071E6D2ADF6" name="LuminousIntensityOfOne"
description="Luminous Intensity of a single Candela"
landmark="EAID_899B5AFF_D42E_4649_8089_0D7F02146AB6">
    <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_676B6DD7_9FE4_4a2d_B188_D7FEEA48A712"
axis="EAID_C186715F_C942_416c_A08C_EF95261E82E7" value="1"
valueTypeUnit="EAID_2AD72CD8_0C70_4620_A675_683A13073D43"/>
</referencePoint>
    <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_C5E6F1A5_72B4_411d_BD92_6E9F9B037BEB" name="AbsenceOfLuminousInstenisty"
description="No Luminous Intensity" landmark="EAID_E55AD9BB_D33A_4a81_8ED1_1B0833BA91BF">
    <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_E92B3DB6_5A52_44bc_9C98_7049BC2A6EAF"
axis="EAID_C186715F_C942_416c_A08C_EF95261E82E7" value="0"
valueTypeUnit="EAID_2AD72CD8_0C70_4620_A675_683A13073D43"/>
</referencePoint>
</element>
<element xmi:type="logical:MeasurementSystemAxis"
xmi:id="EAID_C186715F_C942_416c_A08C_EF95261E82E7" name="Luminous_Intensity_MeasSysAxis"
description="Luminous Intensity increases as values increase"
axis="EAID_3EFC05DA_4D3A_4e3d_8AEC_C9FEC8D85087"
defaultValueTypeUnit="EAID_2AD72CD8_0C70_4620_A675_683A13073D43"/>
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<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_E6CF394B_57A0_4c45_9667_D2DA98E78F23" name="MassMeasurementSystem"
description="Collection of elements applicable to Mass measurements.">
    <element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_E10C27FD_D46D_48f8_AD45_1B1B7BAFBBBE" name="Mass_MeasSys"
description="Inertial mass is a measure of an object's resistance to changing its state
of motion when a force is applied."
measurementSystemAxis="EAID_1B100E6A_9C51_4e2a_A9A7_0DD7B2772F94"
coordinateSystem="EAID_D73E1979_E607_48ce_A01F_2EAD5226614D" orientation="Values increase
as mass increases.">
        <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_2B113B56_BEDB_4c25_8685_7E4F610ACD2B" name="OneKilogramReferencePoint"
description="The minimum amount of weight necessary to keep the measured object from free
fall." landmark="EAID_F5EE0165_F768_43ea_8E46_19F80DA779FF">
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_C9B17E5E_5705_4311_A3FC_66FF76EB0BFE"
axis="EAID_1B100E6A_9C51_4e2a_A9A7_0DD7B2772F94" value="0"
valueTypeUnit="EAID_B4409B5D_DA7B_4d42_9A81_C62B97A89B11"/>
        </referencePoint>
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xmi:id="EAID_FDCBB799_98CE_4a7f_873A_633370C1D5B6" name="ZeroMassReferencePoint"
description="This is the value of the force acting on the object to change its state of
motion." landmark="EAID_894D6C59_4EAA_470a_B61A_D5561C678545">
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_BB6C5E54_554A_4c0e_AA0D_856061A0AC49"
axis="EAID_1B100E6A_9C51_4e2a_A9A7_0DD7B2772F94" value="0"
valueTypeUnit="EAID_B4409B5D_DA7B_4d42_9A81_C62B97A89B11"/>
        </referencePoint>
    </element>
    <element xmi:type="logical:MeasurementSystemAxis"
xmi:id="EAID_1B100E6A_9C51_4e2a_A9A7_0DD7B2772F94" name="Mass_MeasSysAxis"
description="The measurement system axis describing an objects resistance to changing its
state of motion." axis="EAID_3EFC05DA_4D3A_4e3d_8AEC_C9FEC8D85087"
defaultValueTypeUnit="EAID_B4409B5D_DA7B_4d42_9A81_C62B97A89B11"/>
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<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_56D715E7_8CED_48af_B72E_77C63DDD1F52" name="OrientationMeasurementSystem">
    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_DC63F103_FFE0_42f2_8621_E4227EF91B45" name="Course">
        <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_187F96EC_731F_489f_9711_BD69D702D251" name="MagneticNorth">
            <element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_A78C3701_402E_4280_9640_91B55E9D852F" name="Course_MagneticNorth_MeasSys"
description="The azimuth or bearing of a line along which a ship or aircraft is to travel
or does travel Q,E without change of direction; the line drawn on a chart or map as the

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intended track. (JP1) " measurementSystemAxis="EAID_EC7DEAAE_86A2_453a_BA97_5647A5D28037"
coordinateSystem="EAID_39EAB02D_1E49_4b97_AAB0_2DFEB064700A"
externalStandardReference="ISO 1151" orientation="NED Azimuth">
    <referencePoint xmi:type="logical:ReferencePoint">
        xmi:id="EAID_E5007890_E7A6_4097_8181_9BFE3C41D3DC" name="CourseMagneticNorthOrigin"
description="The coordinate values of the Origin for vehicle heading."
landmark="EAID_937ABD7C_68C2_47e5_BB64_B914F6B00A5A">
    <referencePointPart xmi:type="logical:ReferencePointPart">
xmi:id="EAID_719923C9_2DC1_4d88_8182_7E481D03F06E"
axis="EAID_EC7DEAAE_86A2_453a_BA97_5647A5D28037" value="0"
valueTypeUnit="EAID_D4022E84_FA1B_4733_9756_2E8993224B63"/>
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xmi:id="EAID_6AFB2EA5_7FD7_4b8b_B5AC_FEFA431FEBFF" name="MagneticNorthDatum"
description="The coordinate values of Magnetic North datum for vehicle heading."
landmark="EAID_97F860D8_5B30_4a8e_AFCE_720EF01E8527">
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xmi:id="EAID_421BDAD3_A0D4_401c_93C9_EB298939DF9F"
axis="EAID_EC7DEAAE_86A2_453a_BA97_5647A5D28037" value="0"
valueTypeUnit="EAID_D4022E84_FA1B_4733_9756_2E8993224B63"/>
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xmi:id="EAID_BC866699_0C0E_4e3e_86FE_B50B3511517B" name="VehicleCourseDatum"
description="The coordinate values of Vehicle Heading datum for vehicle heading."
landmark="EAID_EB968219_ABA4_4258_B28D_3EB10CC30198">
    <referencePointPart xmi:type="logical:ReferencePointPart">
xmi:id="EAID_A21A5A81_63A9_4d3c_BCD4_1FD42F8C240A"
axis="EAID_EC7DEAAE_86A2_453a_BA97_5647A5D28037" value="Measured Value"
valueTypeUnit="EAID_D4022E84_FA1B_4733_9756_2E8993224B63"/>
    </referencePoint>
</element>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel">
xmi:id="EAID_1D6CDB86_BC64_407d_9F09_E28F4C7B7A6A" name="TrueNorth">
    <element xmi:type="logical:MeasurementSystem">
xmi:id="EAID_73EC595C_9563_4b43_9BF2_85CCF4EE4F9D" name="Course_TrueNorth_MeasSys"
description="The azimuth or bearing of a line along which a ship or aircraft is to travel
or does travel Q,E without change of direction; the line drawn on a chart or map as the
intended track. (JP1) " measurementSystemAxis="EAID_EC7DEAAE_86A2_453a_BA97_5647A5D28037"
coordinateSystem="EAID_39EAB02D_1E49_4b97_AAB0_2DFEB064700A"
externalStandardReference="ISO 1151" orientation="NED Azimuth">
    <referencePoint xmi:type="logical:ReferencePoint">
xmi:id="EAID_754D6C38_FC97_4a15_B409_51983CD1D86D" name="VehicleOrigin" description="The
coordinate values of the Origin for vehicle course."
landmark="EAID_937ABD7C_68C2_47e5_BB64_B914F6B00A5A">
    <referencePointPart xmi:type="logical:ReferencePointPart">
xmi:id="EAID_AA8725A6_E470_47bb_AEED_1CB8460A0B6C"
axis="EAID_EC7DEAAE_86A2_453a_BA97_5647A5D28037" value="0"
valueTypeUnit="EAID_D4022E84_FA1B_4733_9756_2E8993224B63"/>
    </referencePoint>
    <referencePoint xmi:type="logical:ReferencePoint">
xmi:id="EAID_484A4F0F_166B_423a_9E39_3638EAB4106C" name="TrueNorthDatum" description="The
coordinate values of the True North Datum for vehicle course."
landmark="EAID_9EB09F9B_3761_4d81_B802_BEB61ABA0F64">
    <referencePointPart xmi:type="logical:ReferencePointPart">
xmi:id="EAID_DC90272F_16BF_45d7_8AA5_8FEDC43BF5FD"
axis="EAID_EC7DEAAE_86A2_453a_BA97_5647A5D28037" value="0"
valueTypeUnit="EAID_D4022E84_FA1B_4733_9756_2E8993224B63"/>
    </referencePoint>
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xmi:id="EAID_77C2EC89_5144_45e2_8237_830F38603B4B" name="VehicleCourseDatum"
description="The coordinate values of the Vehicle Heading Datum for vehicle course."
landmark="EAID_ED7BF052_B664_43ca_863C_98065DF8ABDC">
    <referencePointPart xmi:type="logical:ReferencePointPart">
xmi:id="EAID_89898488_4146_4874_B8D7_C6EC83F6E590"
axis="EAID_EC7DEAAE_86A2_453a_BA97_5647A5D28037" value="Measured Value"
valueTypeUnit="EAID_D4022E84_FA1B_4733_9756_2E8993224B63"/>
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xmi:id="EAID_89813264_1A6E_4ccf_BF2F_C4400233A558" name="Heading">
  <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_E5F61C2A_19E9_475f_8AC6_35989CE8C809" name="MagneticNorth">
    <element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_AB0C125C_517B_4192_806D_E80922525CB4" name="Heading_MagneticNorth_MeasSys"
description="The direction in which the longitudinal axis of an aircraft or ship is
pointed Q,E usually expressed in degrees or radians clockwise from north (true Q,E
magnetic Q,E compass Q,E or grid). (JP1)"
measurementSystemAxis="EAID_EC7DEAAE_86A2_453a_BA97_5647A5D28037"
coordinateSystem="EAID_39EAB02D_1E49_4b97_AAB0_2DFEB064700A"
externalStandardReference="ISO 1151" orientation="NED Azimuth">
    <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_5C6C39C8_8CE8_494d_A0D8_71651D59D300" name="HeadingMagneticNorthOrigin"
description="The coordinate values of the Origin for vehicle heading."
landmark="EAID_937ABD7C_68C2_47e5_BB64_B914F6B00A5A">
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xmi:id="EAID_0C3295EC_4ED2_4501_9127_8A0A17F5F81E"
axis="EAID_EC7DEAAE_86A2_453a_BA97_5647A5D28037" value="0"
valueTypeUnit="EAID_D4022E84_FA1B_4733_9756_2E8993224B63"/>
    </referencePoint>
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xmi:id="EAID_A19FB44_BB88_45c4_AF66_4446B55480CB" name="MagneticNorthDatum"
description="The coordinate values of Magnetic North datum for vehicle heading."
landmark="EAID_97F860D8_5B30_4a8e_AFCF_720EF01E8527">
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axis="EAID_EC7DEAAE_86A2_453a_BA97_5647A5D28037" value="0"
valueTypeUnit="EAID_D4022E84_FA1B_4733_9756_2E8993224B63"/>
    </referencePoint>
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description="The coordinate values of Vehicle Heading datum for vehicle heading."
landmark="EAID_EB968219_ABA4_4258_B28D_3EB10CC30198">
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xmi:id="EAID_9FA98951_B65F_4601_8AED_66794AEAE0F1"
axis="EAID_EC7DEAAE_86A2_453a_BA97_5647A5D28037" value="Measured Value"
valueTypeUnit="EAID_D4022E84_FA1B_4733_9756_2E8993224B63"/>
    </referencePoint>
  </ldm>
  <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_F3F6E557_9829_4c6d_B982_A778EB33B051" name="TrueNorth">
    <element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_01EAC27C_9F97_405f_92A1_80FD50C8EDA1" name="Heading_TrueNorth_MeasSys"
description="The direction in which the longitudinal axis of an aircraft or ship is
pointed Q,E usually expressed in degrees or radians clockwise from north (true Q,E
magnetic Q,E compass Q,E or grid). (JP1)"
measurementSystemAxis="EAID_EC7DEAAE_86A2_453a_BA97_5647A5D28037"
coordinateSystem="EAID_39EAB02D_1E49_4b97_AAB0_2DFEB064700A"
externalStandardReference="ISO 1151" orientation="NED Azimuth">
    <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_A33B1793_9318_4215_8ECE_B21254205C32" name="VehicleOrigin" description="The
coordinate values of the Origin for vehicle heading."
landmark="EAID_937ABD7C_68C2_47e5_BB64_B914F6B00A5A">
      <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_BE63F3B7_59AB_42ab_835E_9D51ACD6FA5A"
axis="EAID_EC7DEAAE_86A2_453a_BA97_5647A5D28037" value="0"
valueTypeUnit="EAID_D4022E84_FA1B_4733_9756_2E8993224B63"/>
    </referencePoint>
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xmi:id="EAID_668A6D99_9D99_427c_8A1D_E2608D3C2937" name="TrueNorthDatum" description="The
coordinate values of the True North Datum for vehicle heading."
landmark="EAID_9EB09F9B_3761_4d81_B802_BEB61ABA64">
      <referencePointPart xmi:type="logical:ReferencePointPart"
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axis="EAID_EC7DEAAE_86A2_453a_BA97_5647A5D28037" value="0"
valueTypeUnit="EAID_D4022E84_FA1B_4733_9756_2E8993224B63"/>
    </referencePoint>
    <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_E67604FC_B57F_4eec_83AB_8F0088A27774" name="VehicleHeadingDatum"

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description="The coordinate values of the Vehicle Heading Datum for vehicle heading."
landmark="EAID_EB968219_ABA4_4258_B28D_3EB10CC30198">
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axis="EAID_EC7DEAAE_86A2_453a_BA97_5647A5D28037" value="Measured Value"
valueTypeUnit="EAID_D4022E84_FA1B_4733_9756_2E8993224B63"/>
    </referencePoint>
</element>
<element xmi:type="logical:MeasurementSystemAxis"
xmi:id="EAID_EC7DEAAE_86A2_453a_BA97_5647A5D28037" name="Local_Azimuth_MeasSysAxis"
description="The rotational axis coincident with the NED down axis. rotation about this
axis is called azimuth Q,E or heading Q,E or course etc depending upon the use."
axis="EAID_E788C011_C6AB_4a7a_99EF_3F872C23AF74"
defaultValueTypeUnit="EAID_D4022E84_FA1B_4733_9756_2E8993224B63"/>
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<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_2860132F_B7AB_4de4_9064_8A5A6FB7589C" name="AttitudeMeasurementSystems">
    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_0384A349_1EB3_4f7a_80BE_3FEB25F9BC52" name="EarthFrameMeasurementSystem"/>
    </ldm>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_7FDDBB961_78D3_460a_8AF9_8D80A56C8176" name="PowerMeasurementSystem">
    <element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_AC33E859_EF4E_4f9e_B9F1_9E8EFA9D1497" name="Power_MeasSys"
description="Measurement system for power measurements."
measurementSystemAxis="EAID_E60055A6_AAF7_4b15_9B96_2E85E42CB36A"
coordinateSystem="EAID_D73E1979_E607_48ce_A01F_2EAD5226614D" orientation="Values increase
as power increases.">
        <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_7339EEA0_71EF_41b1_83BB_E100EB114AA0" name="ZeroPowerReferencePoint"
description="Reference point for zero power"
landmark="EAID_8D7C54F8_850B_443a_8875_DDA859EDDF8E">
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_FE80FA6F_6444_4bce_A8F9_1FD2601E8044"
axis="EAID_E60055A6_AAF7_4b15_9B96_2E85E42CB36A" value="0.0"
valueTypeUnit="EAID_5F476114_19FC_45df_B348_DE6F26145C2D"/>
        </referencePoint>
        <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_B192F6E9_5EB8_466e_A1A1_3F8CB39EB23B" name="OneWattPowerReferencePoint"
description="Reference point for 1 Watt of power"
landmark="EAID_6B2B9037_EBBE_44ea_B0D3_1A9DA3542A18">
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_8712F59A_B2F4_41bf_8F9A_6569B0263D72"
axis="EAID_E60055A6_AAF7_4b15_9B96_2E85E42CB36A" value="1.0"
valueTypeUnit="EAID_5F476114_19FC_45df_B348_DE6F26145C2D"/>
        </referencePoint>
    </element>
    <element xmi:type="logical:MeasurementSystemAxis"
xmi:id="EAID_E60055A6_AAF7_4b15_9B96_2E85E42CB36A" name="Power_MeasSysAxis"
description="Measurement system axis for power measurements."
axis="EAID_3EFC05DA_4D3A_4e3d_8AEC_C9FEC8D85087"
defaultValueTypeUnit="EAID_5F476114_19FC_45df_B348_DE6F26145C2D">
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    </element>
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xmi:id="EAID_AF15887F_BE6E_4707_BC6A_5A7503505584" name="PressureMeasurementSystem">
    <element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_FE7D5B8A_FF57_4418_A928_E78D52681907" name="Pressure_MeasSys"
description="Measurement system for pressure."
measurementSystemAxis="EAID_3DE8B358_7FA3_4f96_AEF9_B36F9DCC3E6E"
coordinateSystem="EAID_D73E1979_E607_48ce_A01F_2EAD5226614D" orientation="Value increases
as pressure increases">
        <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_BE496D32_F9EA_4203_8E96_0BF7EB86FE21" name="ZeroPressureReferencePoint"
description="zero pressure reference point"
landmark="EAID_5E2A754E_190C_41fb_92DA_1C9627E027DA"/>

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valueTypeUnit="EAID_19E866E6_D186_469f_8670_97CDF785C2D9"/>
    </referencePoint>
    <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_3CC8A464_0727_4da4_83C3_E28FC922F77F" name="OnePascalReferencePoint"
description="unit amount of pressure"
landmark="EAID_CF1128BC_C286_4666_BAD7_F91AD3BA58FC">
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axis="EAID_3DE8B358_7FA3_4f96_AEF9_B36F9DCC3E6E" value="1.0"
valueTypeUnit="EAID_19E866E6_D186_469f_8670_97CDF785C2D9"/>
    </referencePoint>
</element>
<element xmi:type="logical:MeasurementSystemAxis"
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description="measurement axis for pressure"
axis="EAID_3EFC05DA_4D3A_4e3d_8AEC_C9FEC8D85087"
defaultValueTypeUnit="EAID_19E866E6_D186_469f_8670_97CDF785C2D9"/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_4FA00CD8_39E0_4327_B5F1_E431920B491E" name="RateMeasurementSystem">
    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_61BF2F18_591A_4929_AAB2_6AEA3C2291EA" name="AccelerationMeasurementSystem">
        <element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_F9D8A82F_C1F7_44f8_92AD_535912C28E4C" name="Acceleration_MeasSys"
description="System for measuring vector acceleration."
measurementSystemAxis="EAID_F160EF73_8C7D_496f_93C7_020262ED8563
EAID_C8DCFFF3_1918_49fb_B7EE_0A801B03FE9E EAID_5446A913_78FE_4af0_BDAD_17593E11AAFE"
coordinateSystem="EAID_E16B78B2_B2BA_43e5_837E_018DC1FD621C" orientation="right handed">
            <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_C01943E2_09A4_470c_9C38_05637F047A66"
name="OneMeterPerSecondPerSecondAccelerationZAxisReferencePoint" description="One
meter/sec in positive Z direction,0 in X and Y"
landmark="EAID_B317A567_5F73_4116_B993_B97BBEF86098">
                <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_8D4EF853_154F_40f0_8AFA_36DAC5BCE616"
axis="EAID_5446A913_78FE_4af0_BDAD_17593E11AAFE" value="1.0"
valueTypeUnit="EAID_BC96F5E1_6F63_462c_84A3_61CFB36D8011"/>
                <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_8B13499B_A6A6_404a_8C85_3BAD93522D30"
axis="EAID_F160EF73_8C7D_496f_93C7_020262ED8563" value="0.0"
valueTypeUnit="EAID_BC96F5E1_6F63_462c_84A3_61CFB36D8011"/>
                <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_22B3E877_F6C4_4bad_9909_779EEE3D5206"
axis="EAID_C8DCFFF3_1918_49fb_B7EE_0A801B03FE9E" value="0.0"
valueTypeUnit="EAID_BC96F5E1_6F63_462c_84A3_61CFB36D8011"/>
            </referencePoint>
            <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_0BB5D96B_BB8E_4a00_AFDB_2C3DC4E146DF"
name="OneMeterPerSecondPerSecondAccelerationYAxisReferencePoint" description="One
meter/sec in positive Y direction,0 in X and Z"
landmark="EAID_323305A0_518D_4ce4_8088_588354B84E57">
                <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_251B16D3_41F8_454e_977C_320DEEEAA2C3"
axis="EAID_C8DCFFF3_1918_49fb_B7EE_0A801B03FE9E" value="1.0"
valueTypeUnit="EAID_BC96F5E1_6F63_462c_84A3_61CFB36D8011"/>
                <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_4A2B13FC_BD1C_4579_9DCE_64E6A057A985"
axis="EAID_F160EF73_8C7D_496f_93C7_020262ED8563" value="0.0"
valueTypeUnit="EAID_BC96F5E1_6F63_462c_84A3_61CFB36D8011"/>
                <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_D7F0CE70_1956_4b8b_A38E_18C4533DC4B1"
axis="EAID_5446A913_78FE_4af0_BDAD_17593E11AAFE" value="0.0"
valueTypeUnit="EAID_BC96F5E1_6F63_462c_84A3_61CFB36D8011"/>
            </referencePoint>
            <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_5631F1B3_161E_4e32_B02B_2C1840480007" name="ZeroAccelerationReferencePoint"
description="Zero velocity in any direction"
landmark="EAID_D136372D_418A_4f80_B84C_9244DE95A17A">

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        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_C3FA5A2C_FC0C_4da9_B381_C4A0BE591BA0"
axis="EAID_F160EF73_8C7D_496f_93C7_020262ED8563" value="0.0"
valueTypeUnit="EAID_BC96F5E1_6F63_462c_84A3_61CFB36D8011"/>
        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_327AB049_B6C4_4c50_A3F7_AF2F27CC0874"
axis="EAID_C8DCFFF3_1918_49fb_B7EE_0A801B03FE9E" value="0.0"
valueTypeUnit="EAID_BC96F5E1_6F63_462c_84A3_61CFB36D8011"/>
        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_7EFA9382_A10A_455f_8921_8F54CFCF9352"
axis="EAID_5446A913_78FE_4af0_BDAD_17593E11AAFE" value="0.0"
valueTypeUnit="EAID_BC96F5E1_6F63_462c_84A3_61CFB36D8011"/>
    </referencePoint>
    <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_A9E08B88_6502_4fdB_B913_12760C6778FF"
name="OneMeterPerSecondPerSecondAccelerationXAxisReferencePoint" description="One
meter/sec in positive X direction, 0 in Y and Z"
landmark="EAID_09ABA2E4_B0C7_44a8_BE55_4EA8AAA0A739">
        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_1EFC0410_9438_40e2_875A_A55F6BC00C84"
axis="EAID_F160EF73_8C7D_496f_93C7_020262ED8563" value="1.0"
valueTypeUnit="EAID_BC96F5E1_6F63_462c_84A3_61CFB36D8011"/>
        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_59B7A04D_ED38_434a_82CE_9738801152AE"
axis="EAID_C8DCFFF3_1918_49fb_B7EE_0A801B03FE9E" value="0.0"
valueTypeUnit="EAID_BC96F5E1_6F63_462c_84A3_61CFB36D8011"/>
        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_2DD10E44_31F6_4795_B009_CB1206F691ED"
axis="EAID_5446A913_78FE_4af0_BDAD_17593E11AAFE" value="0.0"
valueTypeUnit="EAID_BC96F5E1_6F63_462c_84A3_61CFB36D8011"/>
    </referencePoint>
</element>
<element xmi:type="logical:MeasurementSystemAxis"
xmi:id="EAID_F160EF73_8C7D_496f_93C7_020262ED8563" name="Acceleration_X_MeasSysAxis"
description="X Axis for the Acceleration Measurement System"
axis="EAID_3EFC05DA_4D3A_4e3d_8AEC_C9FEC8D85087"
defaultValueTypeUnit="EAID_BC96F5E1_6F63_462c_84A3_61CFB36D8011"/>
<element xmi:type="logical:MeasurementSystemAxis"
xmi:id="EAID_C8DCFFF3_1918_49fb_B7EE_0A801B03FE9E" name="Acceleration_Y_MeasSysAxis"
description="Y Axis for the Acceleration Measurement System"
axis="EAID_185CD9A8_B677_41ab_907D_C7F232756DCE"
defaultValueTypeUnit="EAID_BC96F5E1_6F63_462c_84A3_61CFB36D8011"/>
<element xmi:type="logical:MeasurementSystemAxis"
xmi:id="EAID_5446A913_78FE_4af0_BDAD_17593E11AAFE" name="Acceleration_Z_MeasSysAxis"
description="Z Axis for the Acceleration Measurement System"
axis="EAID_C74601C9_0E7A_483b_AD4C_28D64BE141E3"
defaultValueTypeUnit="EAID_BC96F5E1_6F63_462c_84A3_61CFB36D8011"/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_E8ACE295_224A_4a91_BD1F_214E6361B3AA"
name="AngularAccelerationMeasurementSystem">
    <element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_20463F5D_4D0E_4f2f_917D_A96A001118FC" name="Angular_Acceleration_MeasSys"
description="Measurement system for values of angular acceleration."
measurementSystemAxis="EAID_4178F53A_5F5A_45a3_B674_461B48DA2C25"
coordinateSystem="EAID_D73E1979_E607_48ce_A01F_2EAD5226614D" orientation="Values increase
as angular acceleration increases.">
        <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_F8285533_7BAB_456b_A304_E9C5E22CF507"
name="ZeroAngularAccelerationReferencePoint" description="Reference point for a zero
angular acceleration." landmark="EAID_00FDA1C5_DB08_435d_B0B5_3EB09EB42534">
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_00ED9EDA_372A_4b04_A8B8_5074264039D0"
axis="EAID_4178F53A_5F5A_45a3_B674_461B48DA2C25" value="0.0"
valueTypeUnit="EAID_8AB5E4C7_4D23_411d_B40D_01DD8CDD2525"/>
        </referencePoint>
        <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_64484363_074D_415d_8B91_01830C2E288A"
name="PiRadiansPerSecondPerSecondReferencePoint" description="Reference point for Pi
radians per second/second angular acceleration."
landmark="EAID_D2BEEBE6_6083_41a1_A2D1_218FFEB94D37">

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        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_C420B85B_F89E_4208_8B0D_BCEC3FB42C45"
axis="EAID_4178F53A_5F5A_45a3_B674_461B48DA2C25" value="3.1415927"
valueTypeUnit="EAID_8AB5E4C7_4D23_411d_B40D_01DD8CDD2525"/>
    </referencePoint>
</element>
<element xmi:type="logical:MeasurementSystemAxis"
xmi:id="EAID_4178F53A_5F5A_45a3_B674_461B48DA2C25"
name="Angular_Acceleration_MeasSysAxis" description="Measurement system axis for values
of angular acceleration." axis="EAID_3EFC05DA_4D3A_4e3d_8AEC_C9FEC8D85087"
defaultValueTypeUnit="EAID_8AB5E4C7_4D23_411d_B40D_01DD8CDD2525"/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_25B92824_DA70_48aa_8813_9E761AF322C8" name="AngularVelocityMeasures">
    <element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_2CC7D8B4_09A7_4c7f_8066_A2D51355D1FE" name="Angular_Velocity_MeasSys"
description="Measurement system for expressing values of angular velocity."
measurementSystemAxis="EAID_89BC6B2D_8DE0_4dde_AC7C_66F795A553C2"
coordinateSystem="EAID_D73E1979_E607_48ce_A01F_2EAD5226614D" orientation="Angular rate
increases as value increase.">
        <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_E8A8690E_BD6E_4b1d_9BA5_9B9A75952D48"
name="ZeroAngularVelocityReferencePoint" description="Reference point for zero radians
per second (no rotation)" landmark="EAID_3D64786C_A7B2_496d_818E_3D426333E4B7">
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_B3DD7932_FC3F_4445_9D0E_5743C99FECCA"
axis="EAID_89BC6B2D_8DE0_4dde_AC7C_66F795A553C2" value="0.0"
valueTypeUnit="EAID_7C107E2B_CDC3_4f2f_86AD_DBEC40A0C0E3"/>
        </referencePoint>
        <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_162DFA87_A40D_419f_8119_29AF0BDC65AF"
name="PiRadiansPerSecondAngularVelocityReferencePoint" description="Reference point for
pi radians per second." landmark="EAID_C33668AC_6B16_4868_B8DF_EFCD6DF0F440">
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_5D2C477B_3CC0_4e30_B5E5_F4C821ACC9C0"
axis="EAID_89BC6B2D_8DE0_4dde_AC7C_66F795A553C2" value="3.1415927"
valueTypeUnit="EAID_7C107E2B_CDC3_4f2f_86AD_DBEC40A0C0E3"/>
        </referencePoint>
        <element xmi:type="logical:MeasurementSystemAxis"
xmi:id="EAID_89BC6B2D_8DE0_4dde_AC7C_66F795A553C2" name="Angular_Velocity_MeasSysAxis"
description="Measurement system axis used to express values of angular rate."
axis="EAID_3EFC05DA_4D3A_4e3d_8AEC_C9FEC8D85087"
defaultValueTypeUnit="EAID_7C107E2B_CDC3_4f2f_86AD_DBEC40A0C0E3"/>
    </ldm>
    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_FC3E4C9E_730D_40e2_8390_8799BA899FA0" name="CountRateMeasurementSystem">
        <element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_1B1757D9_6651_468a_93E2_FDD643FC0B28" name="Count_Rate_MeasSys"
description="Measurement system for Count Rate."
measurementSystemAxis="EAID_05CB9A19_1A96_4048_8133_20D818840B1C"
coordinateSystem="EAID_D73E1979_E607_48ce_A01F_2EAD5226614D" orientation="Value increases
as counts per second increases">
            <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_6C9BA7F4_0B69_451c_890A_C7D5758A1560" name="ZeroCountRateReferencePoint"
description="No occurrences of an event per second"
landmark="EAID_19BA6F6F_BB75_4d4e_BB33_192B0F9C4222">
                <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_44DE62CA_912F_4df5_A3D5_1E0B7C9CE79E"
axis="EAID_05CB9A19_1A96_4048_8133_20D818840B1C" value="0.00"
valueTypeUnit="EAID_6E69624B_5262_42bc_B6F2_6972D125FC06"/>
            </referencePoint>
            <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_FAFA05377_6D9B_4208_A3C1_2DCE8648EFB9" name="OneCountPerSecondReferencePoint"
description="One countable event per second"
landmark="EAID_175292B7_54B4_4291_8319_AAC132B024F7">
                <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_BDE7FC36_B7AF_4289_8F91_44752BB589F4"
axis="EAID_05CB9A19_1A96_4048_8133_20D818840B1C" value="1.00"
valueTypeUnit="EAID_6E69624B_5262_42bc_B6F2_6972D125FC06"/>
            </referencePoint>

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        </element>
        <element xmi:type="logical:MeasurementSystemAxis"
xmi:id="EAID_05CB9A19_1A96_4048_8133_20D818840B1C" name="Count_Rate_MeasSysAxis"
description="Measurement axis for CountsPerSecond"
axis="EAID_3EFC05DA_4D3A_4e3d_8AEC_C9FEC8D85087"
defaultValueTypeUnit="EAID_6E69624B_5262_42bc_B6F2_6972D125FC06"/>
    </ldm>
    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_F0BE05FE_0C81_4148_851D_6788C30BDC4C" name="DataRateMeasurementSystem">
        <element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_67D02CF0_6F36_4512_9A72_79FC782D1877" name="Data_Rate_MeasSys"
description="Measurement system for data rate."
measurementSystemAxis="EAID_CA4F5AB4_B6C5_4e43_AB25_8C2FBDBCCC48"
coordinateSystem="EAID_D73E1979_E607_48ce_A01F_2EAD5226614D" orientation="Value increases
as data rate increases">
            <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_9D0A8CEE_93F1_422a_B8B2_D33EEF1E3960"
name="OneBitPerSecondDataRateReferencePoint" description="One bit per second"
landmark="EAID_BE0A312C_18B3_4bab_AB14_66F783441FB7">
                <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_4EE2A836_8AC3_4665_B834_31E344A78461"
axis="EAID_CA4F5AB4_B6C5_4e43_AB25_8C2FBDBCCC48" value="1.00"
valueTypeUnit="EAID_22D33FCC_F623_427d_B954_D2AFD978990E"/>
            </referencePoint>
            <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_DA83A96E_5D75_468b_AD74_FA565EDA2677" name="ZeroDataRateReferencePoint"
description="No data movement" landmark="EAID_21588F8E_3D75_4d1b_8D50_3C1D7B234FA8">
                <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_E061979C_47D3_48a7_886B_648ADCBBF48E"
axis="EAID_CA4F5AB4_B6C5_4e43_AB25_8C2FBDBCCC48" value="0.00"
valueTypeUnit="EAID_22D33FCC_F623_427d_B954_D2AFD978990E"/>
            </referencePoint>
        <element xmi:type="logical:MeasurementSystemAxis"
xmi:id="EAID_CA4F5AB4_B6C5_4e43_AB25_8C2FBDBCCC48" name="Data_Rate_MeasSysAxis"
description="Measurement axis for data rate measured in bits per second with real
numbers." axis="EAID_3EFC05DA_4D3A_4e3d_8AEC_C9FEC8D85087"
defaultValueTypeUnit="EAID_22D33FCC_F623_427d_B954_D2AFD978990E"/>
    </ldm>
    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_CA8C757D_A295_460f_9959_5DE864FF17E9" name="MassFlowRateMeasurementSystem">
        <element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_B4355855_DB71_47d9_85BD_518369AC3D82" name="Mass_Flow_Rate_MeasSys"
description="Measurement system for MassFlowRate measured in KilogramsPerSecond with Real
numbers" measurementSystemAxis="EAID_4ACDE562_CF5E_4822_81E7_C8E9AD21F208"
coordinateSystem="EAID_D73E1979_E607_48ce_A01F_2EAD5226614D" orientation="Value increases
as rate of mass change per second increases">
            <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_A9510FFE_F48E_406c_BFF4_FBB504C99755"
name="OneKilogramPerSecondReferencePoint" description="One kilogram per second rate of
change in mass" landmark="EAID_4432BF37_F8E1_4711_810A_C0F63807C62A">
                <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_2FDE3ED0_77E9_4616_9E07_3511D11C94D8"
axis="EAID_4ACDE562_CF5E_4822_81E7_C8E9AD21F208" value="1.00"
valueTypeUnit="EAID_9A891B27_936C_4ffb_A999_2D737950B1E6"/>
            </referencePoint>
            <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_D86DFF34_BBA0_4609_BB21_E17C59387C85"
name="ZeroKilogramPerSecondReferencePoint" description="No change in mass per second"
landmark="EAID_8C6E7A81_45EB_4bbc_AADC_A8626F0B16D4">
                <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_D25B176E_C31D_439c_9DE9_70BF92086C07"
axis="EAID_4ACDE562_CF5E_4822_81E7_C8E9AD21F208" value="0.00"
valueTypeUnit="EAID_9A891B27_936C_4ffb_A999_2D737950B1E6"/>
            </referencePoint>
        </element>
        <element xmi:type="logical:MeasurementSystemAxis"
xmi:id="EAID_4ACDE562_CF5E_4822_81E7_C8E9AD21F208" name="Mass_Flow_Rate_MeasSysAxis"
description="Measurement axis for mass flow rate measurements.."
axis="EAID_3EFC05DA_4D3A_4e3d_8AEC_C9FEC8D85087"
defaultValueTypeUnit="EAID_9A891B27_936C_4ffb_A999_2D737950B1E6"/>

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</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_16A44413_1469_46bd_BA9F_9280B514D1B4"
name="OrientationAccelerationMeasurementSystem" description="Logical package to capture
orientation acceleration measurement system elements.>
    <element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_C0798AAE_A69A_44b5_AEE1_2AA620670786"
name="Orientation_Acceleration_MeasSys" description="Measurement system representing the
rate change of acceleration applied to the orientation angles: pitch Q,E roll and yaw"
measurementSystemAxis="EAID_D1088725_2FE5_41e1_8EE4_3A5867309583
EAID_B735596A_CC53_4799_99A1_48A8D7846841 EAID_394EB610_0E99_47a3_B0D7_9F458AD50B21"
coordinateSystem="EAID_E16B78B2_B2BA_43e5_837E_018DC1FD621C" orientation="Right-Handed">
        <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_F6D7F8E4_C0F8_47c7_ADA6_C220FBB4BD_CD" name="PitchMomentPoint" description="A
pitching moment is a vertical force applied at a distance forward or aft from the center
of gravity of the aircraft, that causes it to undergo angular acceleration about its
lateral axis. " landmark="EAID_ABE2EA4A_7F83_4b9e_817F_592893C43816">
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_2F4D0F41_22ED_474c_9560_23CFDF3E89A0"
axis="EAID_D1088725_2FE5_41e1_8EE4_3A5867309583" value="Pi/4"
valueTypeUnit="EAID_D2F368C7_B356_4229_B15D_89F2E1A76DC7"/>
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_EB8C9772_2564_438d_AD85_28326A3FCC1A"
axis="EAID_B735596A_CC53_4799_99A1_48A8D7846841" value="0"
valueTypeUnit="EAID_D2F368C7_B356_4229_B15D_89F2E1A76DC7"/>
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_52330337_35F8_4c13_B601_39653319EBD0"
axis="EAID_394EB610_0E99_47a3_B0D7_9F458AD50B21" value="0"
valueTypeUnit="EAID_D2F368C7_B356_4229_B15D_89F2E1A76DC7"/>
        </referencePoint>
        <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_489E8E99_D971_4523_82A1_531645182D07" name="RollMomentPoint" description="A
roll moment is the vertical force applied at a distance from an aircraft's center of
mass that causes the aircraft to undergo angular acceleration about its longitudinal
axis. " landmark="EAID_0F69C644_7864_4e70_9C0C_97365921347E">
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_EDA4F4BE_0900_45f7_BBA7_854EE53B54A9"
axis="EAID_B735596A_CC53_4799_99A1_48A8D7846841" value="-Pi/2"
valueTypeUnit="EAID_D2F368C7_B356_4229_B15D_89F2E1A76DC7"/>
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_53E6F3C4_3645_4251_89A0_A1B6CA78783C"
axis="EAID_D1088725_2FE5_41e1_8EE4_3A5867309583" value="0"
valueTypeUnit="EAID_D2F368C7_B356_4229_B15D_89F2E1A76DC7"/>
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_F560F233_CE7E_41fe_9F57_92B1BD8FE655"
axis="EAID_394EB610_0E99_47a3_B0D7_9F458AD50B21" value="0"
valueTypeUnit="EAID_D2F368C7_B356_4229_B15D_89F2E1A76DC7"/>
        </referencePoint>
        <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_BEFAC062_6355_4715_983F_5968C835270F" name="YawMomentPoint" description="A
yaw moment is a horizontal force applied to rotate an airplane about its vertical axis,
with a rotation to the right considered positive and rotation to the left as negative."
landmark="EAID_8F4761A5_A3AE_46f8_B499_319860B64B8D">
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_E7F60801_8515_4c7a_A37E_36E713168C8B"
axis="EAID_394EB610_0E99_47a3_B0D7_9F458AD50B21" value="-Pi/6"
valueTypeUnit="EAID_D2F368C7_B356_4229_B15D_89F2E1A76DC7"/>
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_7C4874E4_8E28_46fb_B466_09FBBD80A9F2"
axis="EAID_D1088725_2FE5_41e1_8EE4_3A5867309583" value="0"
valueTypeUnit="EAID_D2F368C7_B356_4229_B15D_89F2E1A76DC7"/>
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_53957466_7975_4111_A0F0_367A0685CB0D"
axis="EAID_B735596A_CC53_4799_99A1_48A8D7846841" value="0"
valueTypeUnit="EAID_D2F368C7_B356_4229_B15D_89F2E1A76DC7"/>
        </referencePoint>
        <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_0E9282DC_C8CD_4d3e_8244_5F9ABC152DA6" name="MassMomentOfInertia"
description="Measures the extent to which an object resists rotational acceleration about
an axis." landmark="EAID_FEB346B7_0463_40ca_BDEF_CC2F44B8CF5A">

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        <referencePointPart xmi:type="logical:ReferencePointPart"
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axis="EAID_D1088725_2FE5_41e1_8EE4_3A5867309583" value="0"
valueTypeUnit="EAID_D2F368C7_B356_4229_B15D_89F2E1A76DC7"/>
        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_E571F250_8452_40e3_B92A_EC0F26E57305"
axis="EAID_B735596A_CC53_4799_99A1_48A8D7846841" value="0"
valueTypeUnit="EAID_D2F368C7_B356_4229_B15D_89F2E1A76DC7"/>
        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_483AC7FE_8D99_400a_B71D_5098AD6DD0B0"
axis="EAID_394EB610_0E99_47a3_B0D7_9F458AD50B21" value="0"
valueTypeUnit="EAID_D2F368C7_B356_4229_B15D_89F2E1A76DC7"/>
        </referencePoint>
    </element>
    <element xmi:type="logical:MeasurementSystemAxis"
xmi:id="EAID_D1088725_2FE5_41e1_8EE4_3A5867309583"
name="Lateral_Acceleration_MeasSysAxis" description="Change of orientation acceleration
about the lateral axis." axis="EAID_185CD9A8_B677_41ab_907D_C7F232756DCE"
defaultValueTypeUnit="EAID_D2F368C7_B356_4229_B15D_89F2E1A76DC7"/>
        <element xmi:type="logical:MeasurementSystemAxis"
xmi:id="EAID_B735596A_CC53_4799_99A1_48A8D7846841"
name="Longitudinal_Acceleration_MeasSysAxis" description="Change of orientation
acceleration about the longitudinal axis."
axis="EAID_3EFC05DA_4D3A_4e3d_8AEC_C9FEC8D85087"
defaultValueTypeUnit="EAID_D2F368C7_B356_4229_B15D_89F2E1A76DC7"/>
        <element xmi:type="logical:MeasurementSystemAxis"
xmi:id="EAID_394EB610_0E99_47a3_B0D7_9F458AD50B21"
name="Vertical_Acceleration_MeasSysAxis" description="Change of orientation acceleration
about the vertical axis." axis="EAID_C74601C9_0E7A_483b_AD4C_28D64BE141E3"
defaultValueTypeUnit="EAID_D2F368C7_B356_4229_B15D_89F2E1A76DC7"/>
    </ldm>
    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_12F876C2_E11E_4f1d_9C11_037BEB2FD997"
name="OrientationVelocityMeasurementSystem">
        <element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_B0F6E3C3_4CA7_44fa_93FD_C211F4F956B0" name="Orientation_Velocity_MeasSys"
description="Measurement system representing the rate change of velocity applied to the
orientation angles: pitch Q, E roll and yaw"
measurementSystemAxis="EAID_06891598_E070_4ae8_AEE7_67A5B8BBCA90
EAID_D695C2CA_5B48_483e_A5EC_31D7A40CCA0D EAID_48607400_E718_4ac3_ACC8_78052AA684CB"
coordinateSystem="EAID_E16B78B2_B2BA_43e5_837E_018DC1FD621C" orientation="Right-Handed">
        <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_5422D41E_2CF8_4d14_8F11_BB6DF0421437" name="YawRatePoint"
description="Represents the change of 20 degrees in yaw angle resulting the necessary
change in velocity rate." landmark="EAID_EF97A4DA_ED5B_4704_B17D_2A4FA62603C6">
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_8FC47AC2_AF60_487b_82EF_C60D6683D8BF"
axis="EAID_48607400_E718_4ac3_ACC8_78052AA684CB" value="-Pi/6"
valueTypeUnit="EAID_222F7273_01B5_4e83_B616_DFEC1E04ABED"/>
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_001CEA74_FD44_4a88_A29E_020C9C780800"
axis="EAID_06891598_E070_4ae8_AEE7_67A5B8BBCA90" value="0"
valueTypeUnit="EAID_222F7273_01B5_4e83_B616_DFEC1E04ABED"/>
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_1581437E_5E34_4dec_B736_6DE35872A4D1"
axis="EAID_D695C2CA_5B48_483e_A5EC_31D7A40CCA0D" value="0"
valueTypeUnit="EAID_222F7273_01B5_4e83_B616_DFEC1E04ABED"/>
        </referencePoint>
        <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_A9CC8532_D91E_4932_AF87_DBF096389F27" name="RollRatePoint"
description="Represents the change of 90 degrees in roll angle resulting the necessary
change in velocity rate." landmark="EAID_6A77CF2F_C9B8_47e5_BF5B_6B243F14AAB6">
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_B30A8DB8_EF19_4581_8FC9_12E7D77A8BFD"
axis="EAID_D695C2CA_5B48_483e_A5EC_31D7A40CCA0D" value="Pi/2"
valueTypeUnit="EAID_222F7273_01B5_4e83_B616_DFEC1E04ABED"/>
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_B92398BE_6176_43bb_85F9_915925C6DBDF"
axis="EAID_06891598_E070_4ae8_AEE7_67A5B8BBCA90" value="0"
valueTypeUnit="EAID_222F7273_01B5_4e83_B616_DFEC1E04ABED"/>

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xmi:id="EAID_22EC6337_816E_4de3_8045_06029D6D09AD"
axis="EAID_48607400_E718_4ac3_ACC8_78052AA684CB" value="0"
valueTypeUnit="EAID_222F7273_01B5_4e83_B616_DFEC1E04ABED"/>
    </referencePoint>
    <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_962FB837_2091_483a_816D_C42829589B73" name="PitchRatePoint"
description="Represents the change of 45 degrees in pitch angle resulting the necessary
change in velocity rate." landmark="EAID_37236D77_26DF_45fd_B528_88F78467EE4C">
    <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_2AE136A8_CF32_469b_9F40_FF56601F36FC"
axis="EAID_06891598_E070_4ae8_AEE7_67A5B8BBCA90" value="Pi/4"
valueTypeUnit="EAID_222F7273_01B5_4e83_B616_DFEC1E04ABED"/>
    <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_E113A791_7FF0_44c9_BF9C_5F68E5073AAE"
axis="EAID_D695C2CA_5B48_483e_A5EC_31D7A40CCA0D" value="0"
valueTypeUnit="EAID_222F7273_01B5_4e83_B616_DFEC1E04ABED"/>
    <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_89F679DD_F970_4a34_ABA4_8FF2CEA2581C"
axis="EAID_48607400_E718_4ac3_ACC8_78052AA684CB" value="0"
valueTypeUnit="EAID_222F7273_01B5_4e83_B616_DFEC1E04ABED"/>
    </referencePoint>
    <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_2E155A18_3673_4016_961E_4993A104E118" name="NoRateChangeOrientation"
description="Represents no change in velocity rate with the net result of no changes to
pitch, yaw or roll angles of orientation."
landmark="EAID_874C6C78_DAD9_4ef9_8CBE_6213F4FA5252">
    <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_B8B8C87A_7DA7_494a_A56E_C8A7AF737212"
axis="EAID_06891598_E070_4ae8_AEE7_67A5B8BBCA90" value="0"
valueTypeUnit="EAID_222F7273_01B5_4e83_B616_DFEC1E04ABED"/>
    <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_6DD6A468_46BC_4c61_B5F2_E59E94417CFD"
axis="EAID_D695C2CA_5B48_483e_A5EC_31D7A40CCA0D" value="0"
valueTypeUnit="EAID_222F7273_01B5_4e83_B616_DFEC1E04ABED"/>
    <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_CE0C671F_061C_469a_8794_7C86AD9A880F"
axis="EAID_48607400_E718_4ac3_ACC8_78052AA684CB" value="0"
valueTypeUnit="EAID_222F7273_01B5_4e83_B616_DFEC1E04ABED"/>
    </referencePoint>
</element>
<element xmi:type="logical:MeasurementSystemAxis"
xmi:id="EAID_06891598_E070_4ae8_AEE7_67A5B8BBCA90" name="Lateral_Velocity_MeasSysAxis"
description="Change of orientation velocity about the lateral axis."
axis="EAID_185CD9A8_B677_41ab_907D_C7F232756DCE"
defaultValueTypeUnit="EAID_222F7273_01B5_4e83_B616_DFEC1E04ABED"/>
<element xmi:type="logical:MeasurementSystemAxis"
xmi:id="EAID_D695C2CA_5B48_483e_A5EC_31D7A40CCA0D"
name="Longitudinal_Velocity_MeasSysAxis" description="Change of orientation velocity
about the longitudinal axis." axis="EAID_3EFC05DA_4D3A_4e3d_8AEC_C9FEC8D85087"
defaultValueTypeUnit="EAID_222F7273_01B5_4e83_B616_DFEC1E04ABED"/>
<element xmi:type="logical:MeasurementSystemAxis"
xmi:id="EAID_48607400_E718_4ac3_ACC8_78052AA684CB" name="Vertical_Velocity_Axis"
description="Change of orientation velocity about the vertical axis."
axis="EAID_C74601C9_0E7A_483b_AD4C_28D64BE141E3"
defaultValueTypeUnit="EAID_222F7273_01B5_4e83_B616_DFEC1E04ABED"/>
</ldm>
<lsm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_9F2C3797_6B4E_4fd7_B987_D714D0D2FA05"
name="ScalarAccelerationMeasurementSystem">
    <element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_7A26FFB7_E420_4c15_8E7F_BC831D7FE3A2" name="Scalar Acceleration_MeasSys"
description="System for measuring scalar acceleration ie: speeding up or slowing down."
measurementSystemAxis="EAID_DCE9B393_1F4E_472a_A293_0587767C6BB2"
coordinateSystem="EAID_D73E1979_E607_48ce_A01F_2EAD5226614D" orientation="Values increase
as object speeds up in a forward direction.">
        <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_9B745EC7_EF25_40dc_8229_1958086F7BD4" name="ZeroAccelerationReferencePoint"
description="Zero velocity in any direction"
landmark="EAID_79DDE6C7_4797_4dfd_975D_116B337B8E63">

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xmi:id="EAID_CCCC2DEC_4AC5_42ce_8B9D_D6453DB54293"
axis="EAID_DCE9B393_1F4E_472a_A293_0587767C6BB2" value="0"
valueTypeUnit="EAID_BC96F5E1_6F63_462c_84A3_61CFB36D8011"/>
    </referencePoint>
    <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_OED24CF4_E1D9_4b2e_83A8_15FFC5161CDE"
name="OneMeterPerSecondPerSecondAccelerationReferencePoint" description="One meter/sec in
positive acceleration." landmark="EAID_816CEBC9_F8B9_4002_8383_997BAA6C63DB">
    <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_8BB3FE11_741F_4801_8125_C9DA48BB10E9"
axis="EAID_DCE9B393_1F4E_472a_A293_0587767C6BB2" value="1"
valueTypeUnit="EAID_BC96F5E1_6F63_462c_84A3_61CFB36D8011"/>
    </referencePoint>
</element>
<element xmi:type="logical:MeasurementSystemAxis"
xmi:id="EAID_DCE9B393_1F4E_472a_A293_0587767C6BB2" name="Scalar_Acceleration_MeasSysAxis"
description="The measurement system axis to describe the nature of measuring scalar
acceleration of an object." axis="EAID_3EFC05DA_4D3A_4e3d_8AEC_C9FEC8D85087"
defaultValueTypeUnit="EAID_BC96F5E1_6F63_462c_84A3_61CFB36D8011"/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_A6A59C8E_19E5_4248_8C6C_A203F150BC84" name="SpeedMeasurementSystem">
    <element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_CA7165EF_5605_49ab_8B6F_24B78C4842AF" name="Speed_MeasSys"
description="Measurement system for measuring speed."
measurementSystemAxis="EAID_34208C77_1C32_4838_89B7_FC6777140322"
coordinateSystem="EAID_D73E1979_E607_48ce_A01F_2EAD5226614D" orientation="Value increases
as speed increases">
        <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_5A0740C1_C539_41b0_8E59_BC3163D70547" name="ZeroSpeedReferencePoint"
description="zero speed reference point"
landmark="EAID_7D5FCB19_24EB_4641_BA39_BD21319038CD">
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_F1CC04E6_3801_4835_9AB8_48F6007DC0D8"
axis="EAID_34208C77_1C32_4838_89B7_FC6777140322" value="0.0"
valueTypeUnit="EAID_21572174_353B_4fb9_92AB_66D35B6D1D45"/>
        </referencePoint>
        <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_9589609F_BFE9_48fa_BAC5_5E2BE1D3D4F6" name="OneMeterPerSecondReferencePoint"
description="unit speed reference point"
landmark="EAID_E463202C_BB78_4ea0_ACCE_34527B0C18C5">
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_A42AC528_2AC6_4a19_8DDA_CB965EB271B9"
axis="EAID_34208C77_1C32_4838_89B7_FC6777140322" value="1.0"
valueTypeUnit="EAID_21572174_353B_4fb9_92AB_66D35B6D1D45"/>
        </referencePoint>
    </element>
    <element xmi:type="logical:MeasurementSystemAxis"
xmi:id="EAID_34208C77_1C32_4838_89B7_FC6777140322" name="Speed_MeasSysAxis"
description="Measurement system axis for speed measurements"
axis="EAID_3EFC05DA_4D3A_4e3d_8AEC_C9FEC8D85087"
defaultValueTypeUnit="EAID_21572174_353B_4fb9_92AB_66D35B6D1D45"/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_5CB4F2D0_60BC_4706_8678_BC030735133D" name="VelocityMeasurementSystem">
    <element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_9A7494F0_FA99_4291_B943_D13D93CB8970" name="Velocity_MeasSys"
description="Measurement system for values of velocity."
measurementSystemAxis="EAID_00AA39C5_5552_4b3c_B216_E8BB9C034583
EAID_3DDF59AE_D3CF_4af4_B961_74B4767B82F4 EAID_5ED509C3_48D9_4c7f_9047_B636C7162F68"
coordinateSystem="EAID_E16B78B2_B2BA_43e5_837E_018DC1FD621C" orientation="right handed">
        <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_6AC32D56_19A0_4f1c_98B6_7936DDC88E8E" name="ZeroVelocityReferencePoint"
description="Zero velocity in any direction"
landmark="EAID_924F91D1_E7B0_41f0_9E35_9A5EABAD0DDC">
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_9F9DD44A_D086_4418_B650_0D75E6DBCCC7"
axis="EAID_00AA39C5_5552_4b3c_B216_E8BB9C034583" value="0.0"
valueTypeUnit="EAID_A3E35DAE_F099_4f94_814A_3CCBD68FD08E"/>

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axis="EAID_3DDF59AE_D3CF_4af4_B961_74B4767E82F4" value="0.0"
valueTypeUnit="EAID_A3E35DAE_F099_4f94_814A_3CCBD68FD08E"/>
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_C3523237_D62D_4f01_8E0E_2BA6AA763C56"
axis="EAID_5ED509C3_48D9_4c7f_9047_B636C7162F68" value="0.0"
valueTypeUnit="EAID_A3E35DAE_F099_4f94_814A_3CCBD68FD08E"/>
        </referencePoint>
        <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_45983774_5CFB_4a1b_9715_1B2629E17515"
name="OneMeterPerSecondXAxisReferencePoint" description="One meter/sec in positive X
direction, 0 in Y and Z" landmark="EAID_C4B225CB_048A_4847_8BB7_5FE18049CAA5">
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_86B761F3_23AE_45a3_BA90_906B69840266"
axis="EAID_00AA39C5_5552_4b3c_B216_E8BB9C034583" value="1.0"
valueTypeUnit="EAID_A3E35DAE_F099_4f94_814A_3CCBD68FD08E"/>
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_5550D503_6FDA_4db3_BE7E_203862F9AD7B"
axis="EAID_3DDF59AE_D3CF_4af4_B961_74B4767E82F4" value="0.0"
valueTypeUnit="EAID_A3E35DAE_F099_4f94_814A_3CCBD68FD08E"/>
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_13578EF5_F7C5_41af_844E_69EF05398BFE"
axis="EAID_5ED509C3_48D9_4c7f_9047_B636C7162F68" value="0.0"
valueTypeUnit="EAID_A3E35DAE_F099_4f94_814A_3CCBD68FD08E"/>
        </referencePoint>
        <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_F95D223E_6EF2_4c32_8E38_1CA62862018F"
name="OneMeterPerSecondZAxisReferencePoint" description="One meter/sec in positive Z
direction, 0 in X and Y" landmark="EAID_0456CB67_FDB8_48db_B9AF_0690B41F3AA1">
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_07682483_985F_4214_B49F_A234FF69FB8A"
axis="EAID_5ED509C3_48D9_4c7f_9047_B636C7162F68" value="1.0"
valueTypeUnit="EAID_A3E35DAE_F099_4f94_814A_3CCBD68FD08E"/>
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_4B2C2FEF_4D56_403d_9DF0_2C43D27F484E"
axis="EAID_00AA39C5_5552_4b3c_B216_E8BB9C034583" value="0.0"
valueTypeUnit="EAID_A3E35DAE_F099_4f94_814A_3CCBD68FD08E"/>
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_2616C879_E949_499b_874E_1F11111FFBBF"
axis="EAID_3DDF59AE_D3CF_4af4_B961_74B4767E82F4" value="0.0"
valueTypeUnit="EAID_A3E35DAE_F099_4f94_814A_3CCBD68FD08E"/>
        </referencePoint>
        <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_9F05FEE4_416D_479c_80F1_225CE6158569"
name="OneMeterPerSecondYAxisReferencePoint" description="One meter/sec in positive Y
direction, 0 in X and Z" landmark="EAID_BA313E72_BA10_4b3f_B184_7B146075F771">
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_1C3A6560_8113_4aeb_8883_913E93D23CB0"
axis="EAID_3DDF59AE_D3CF_4af4_B961_74B4767E82F4" value="1.0"
valueTypeUnit="EAID_A3E35DAE_F099_4f94_814A_3CCBD68FD08E"/>
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_30A352AD_9A94_4c4c_8106_B3DDA79ECA07"
axis="EAID_00AA39C5_5552_4b3c_B216_E8BB9C034583" value="0.0"
valueTypeUnit="EAID_A3E35DAE_F099_4f94_814A_3CCBD68FD08E"/>
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_56A58262_5F02_4fad_B563_DD4384BA0142"
axis="EAID_5ED509C3_48D9_4c7f_9047_B636C7162F68" value="0.0"
valueTypeUnit="EAID_A3E35DAE_F099_4f94_814A_3CCBD68FD08E"/>
        </referencePoint>
    <element xmi:type="logical:MeasurementSystemAxis"
xmi:id="EAID_00AA39C5_5552_4b3c_B216_E8BB9C034583" name="Velocity_X_MeasSysAxis"
description="X Axis for the Velocity Measurement System"
axis="EAID_3EFC05DA_4D3A_4e3d_8AEC_C9FEC8D85087"
defaultValueTypeUnit="EAID_A3E35DAE_F099_4f94_814A_3CCBD68FD08E"/>
    <element xmi:type="logical:MeasurementSystemAxis"
xmi:id="EAID_3DDF59AE_D3CF_4af4_B961_74B4767E82F4" name="Velocity_Y_MeasSysAxis"
description="Y Axis for the Velocity Measurement System"
axis="EAID_185CD9A8_B677_41ab_907D_C7F232756DCE"
defaultValueTypeUnit="EAID_A3E35DAE_F099_4f94_814A_3CCBD68FD08E"/>

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        <element xmi:type="logical:MeasurementSystemAxis"
xmi:id="EAID_5ED509C3_48D9_4c7f_9047_B636C7162F68" name="Velocity_Z_MeasSysAxis"
description="Z Axis for the Velocity Measurement System"
axis="EAID_C74601C9_0E7A_483b_AD4C_28D64BE141E3"
defaultValueTypeUnit="EAID_A3E35DAE_F099_4f94_814A_3CCBD68FD08E"/>
    </ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_93166DCD_0CF7_452e_B424_EF549ECE6E99" name="TemperatureMeasurementSystem">
    <element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_170CE113_B44C_4e3d_900C_145AD5038DA1" name="Temperature_MeasSys"
description="Measurement system to represent temperature values in Kelvin degrees"
measurementSystemAxis="EAID_E023E619_ED37_429a_B3FC_653CDC4D5C26"
coordinateSystem="EAID_D73E1979_E607_48ce_A01F_2EAD5226614D" orientation="Values increase
as temperature increases">
        <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_0CA2F5C3_2423_43be_9498_6D20DB65235E" name="WaterFreezingPoint"
description="Represents waters freezing point."
landmark="EAID_F1FC1D80_0D3E_402b_B1BE_6271F0BC9DED">
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_4970F1ED_D7DB_4aa_f_90A1_32AE8116864C"
axis="EAID_E023E619_ED37_429a_B3FC_653CDC4D5C26" value="273.15"
valueTypeUnit="EAID_8AEE5DA4_5925_412c_9D23_D625B93B0665"/>
        </referencePoint>
        <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_37E7441D_FC5F_4ba4_8742_4F66FB54367E" name="WaterBoilingPoint"
description="Represents waters boiling point"
landmark="EAID_CED1C8C6_F278_4501_A043_E59507D5CF90">
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_4DD11403_BD01_4ca6_8D23_D74104E5FB42"
axis="EAID_E023E619_ED37_429a_B3FC_653CDC4D5C26" value="373.15"
valueTypeUnit="EAID_8AEE5DA4_5925_412c_9D23_D625B93B0665"/>
        </referencePoint>
        <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_4154DA2F_D4A4_484a_933F_4A0FC6D8565E" name="AbsoluteZeroPoint"
description="Represents zero point of temperature"
landmark="EAID_99B14262_EA23_4511_A3F0_3546D028849D">
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_255054E2_0E11_469b_9A82_CDC964ACB70D"
axis="EAID_E023E619_ED37_429a_B3FC_653CDC4D5C26" value="0"
valueTypeUnit="EAID_8AEE5DA4_5925_412c_9D23_D625B93B0665"/>
        </referencePoint>
    </element>
    <element xmi:type="logical:MeasurementSystemAxis"
xmi:id="EAID_E023E619_ED37_429a_B3FC_653CDC4D5C26" name="Temperature_MeasSysAxis"
description="Axis for Real number values in degrees Kelvin"
axis="EAID_3EFC05DA_4D3A_4e3d_8AEC_C9FEC8D85087"
defaultValueTypeUnit="EAID_8AEE5DA4_5925_412c_9D23_D625B93B0665"/>
    </ldm>
    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_A5F8A3E6_5697_4518_AD3D_965EAFF72F4B"
name="TemporalFrequencyMeasurementSystem">
        <element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_FFDFA047_BDBD_4ab3_A66D_B8AB68DBA582" name="Temporal_Frequency_MeasSys"
description="Measurement system for frequency of periodic events."
measurementSystemAxis="EAID_FB000C46_0D64_4280_8E88_5C967757A7BE"
coordinateSystem="EAID_D73E1979_E607_48ce_A01F_2EAD5226614D"
externalStandardReference="International System of Units (SI)" orientation="Value
increases as frequency increases.">
            <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_7881F6C4_434F_4197_B3C3_001A14EC2BDA" name="OneHertzReferencePoint"
description="One occurrence per second"
landmark="EAID_173741CF_C731_4508_AFC9_DB1919375D9C">
                <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_0CDFCF20_54D5_49fd_870A_8B329ABF6C87"
axis="EAID_FB000C46_0D64_4280_8E88_5C967757A7BE" value="1.00"
valueTypeUnit="EAID_AFB6D10F_59C7_4f0b_882F_858971C1E91D"/>
            </referencePoint>
            <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_1CF7F1AF_B4BF_408c_8CDB_6B7AC1939E01" name="ZeroFrequencyReferencePoint"

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description="No occurrences per second"
landmark="EAID_4221DC2B_A11C_4974_B680_59E35E5F3D34">
    <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_5E653C8A_BDA4_4470_A3DF_CBF01A408367"
axis="EAID_FB000C46_0D64_4280_8E88_5C967757A7BE" value="0.00"
valueTypeUnit="EAID_AFB6D10F_59C7_4f0b_882F_858971C1E91D"/>
    </referencePoint>
</element>
<element xmi:type="logical:MeasurementSystemAxis"
xmi:id="EAID_FB000C46_0D64_4280_8E88_5C967757A7BE" name="Temporal_Frequency_MeasSysAxis"
description="Measurement axis for frequency."
axis="EAID_3EFC05DA_4D3A_4e3d_8AEC_C9FEC8D85087"
defaultValueTypeUnit="EAID_AFB6D10F_59C7_4f0b_882F_858971C1E91D"/>
    </ldm>
    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_9F42ED6A_8EC3_489c_9AEF_D1916FCEB4D3" name="TimeMeasurementSystem">
        <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_88109987_2B7A_4359_BF72_824220B1B26D" name="TimeDurationMeasurementSystem">
            <element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_4C31C156_E6E2_4115_AF63_8794199664AA" name="Time_Duration_MeasSys"
description="Measurement system for time duration."
measurementSystemAxis="EAID_13D5B7DF_48FF_4ad4_B66E_AA8AD7621A42"
coordinateSystem="EAID_D73E1979_E607_48ce_A01F_2EAD5226614D"
externalStandardReference="International System of Units - Second" orientation="Value
increases as time moves towards the future">
                <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_8E969EF7_1154_4619_88E5_A384897359FF" name="ZeroDurationReferencePoint"
description="Duration origin" landmark="EAID_3149A12E_1AB1_4ffd_9D14_1466FA5DCDE0">
                    <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_3632CAB3_6D8C_4605_A19E_449E330C68CE"
axis="EAID_13D5B7DF_48FF_4ad4_B66E_AA8AD7621A42" value="0.0"
valueTypeUnit="EAID_D4E6F91B_E17A_42b5_9D3F_A5A852B8519E"/>
                </referencePoint>
                <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_E1F77F65_7D13_4ac2_B7FE_207A831259B4" name="OneSecondDurationReferencePoint"
description="Duration on positive one second"
landmark="EAID_26121EAF_96C4_4e3b_90B5_568E427782FE">
                    <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_6326CE28_99C7_4c52_9584_D40D5451D565"
axis="EAID_13D5B7DF_48FF_4ad4_B66E_AA8AD7621A42" value="1.0"
valueTypeUnit="EAID_D4E6F91B_E17A_42b5_9D3F_A5A852B8519E"/>
                </referencePoint>
            </element>
            <element xmi:type="logical:MeasurementSystemAxis"
xmi:id="EAID_13D5B7DF_48FF_4ad4_B66E_AA8AD7621A42" name="Time_Duration_MeasSysAxis"
description="Axis for time duration in seconds"
axis="EAID_3EFC05DA_4D3A_4e3d_8AEC_C9FEC8D85087"
defaultValueTypeUnit="EAID_D4E6F91B_E17A_42b5_9D3F_A5A852B8519E"/>
        </ldm>
        <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_69800871_BDC1_4b18_8A05_965A0D6AA56B" name="PosixTimeMeasurementSystem">
            <element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_3E078B08_3024_4dfc_B01E_74929C579251" name="Time_Posix_Meassys"
description="Measurement system for time in accordance with the Posix."
measurementSystemAxis="EAID_789E08B1_DC02_497e_A8C9_75BC1AB027CD"
coordinateSystem="EAID_D73E1979_E607_48ce_A01F_2EAD5226614D"
externalStandardReference="IEEE Std 1003.1-2008" orientation="Value increases as time
moves towards the future">
                <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_BD9DFD8C_8109_4fcA_AE6D_751BDFE80A13"
name="PositiveOneSecondAfterEpochStart" description="Duration on positive one second"
landmark="EAID_26121EAF_96C4_4e3b_90B5_568E427782FE">
                    <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_4412FD57_2CF3_444c_81F6_A45CDB5C4DB3"
axis="EAID_789E08B1_DC02_497e_A8C9_75BC1AB027CD" value="1"
valueTypeUnit="EAID_D4E6F91B_E17A_42b5_9D3F_A5A852B8519E"/>
                </referencePoint>
                <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_284CB1EC_7ABC_4b2a_9318_7BC671B9CE47" name="PosixEpochTimeStart"
description="POSIX/Unix time origin"
landmark="EAID_E3DB5E79_28F5_4546_AF37_5C5C59EAA687">

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        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_100655DF_5991_4cfa_AE21_558FBE47C299"
axis="EAID_789E08B1_DC02_497e_A8C9_75BC1AB027CD" value="0"
valueTypeUnit="EAID_D4E6F91B_E17A_42b5_9D3F_A5A852B8519E"/>
    </referencePoint>
</element>
<element xmi:type="logical:MeasurementSystemAxis"
xmi:id="EAID_789E08B1_DC02_497e_A8C9_75BC1AB027CD" name="Time_Posix_MeasSysAxis"
description="Axis for time durationin seconds since Epoch Start."
axis="EAID_3EFC05DA_4D3A_4e3d_8AEC_C9FEC8D85087"
defaultValueTypeUnit="EAID_D4E6F91B_E17A_42b5_9D3F_A5A852B8519E"/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_DB5F3FD5_6C95_4a75_919D_81F51C907608" name="UTC_MeasurementSystem"
description="Time measurements based on Universal Coordinated Time.">
    <element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_919C63A9_0165_4912_8EB0_2385631BEDF5" name="Time_LocalOffset_UTC_MeasSys"
description="Primary time system the world uses to regulate clocks and date-times Q,E a
main goal of which is to correlate one rotation of the earth with one 24 hour day by
making occasional 1 second corrections to the duration of a day. "
measurementSystemAxis="EAID_5464AD82_2C21_4ad1_9FF8_77A64C196E82"
coordinateSystem="EAID_D73B1979_E607_48ce_A01F_2EAD5226614D"
externalStandardReference="Coordinated Universal Time defined by International
Telecommunications Union Recommendation (ITU-R TF.460-6), Standard-frequency and time-
signal emissions" orientation="see UTC standard">
        <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_7F44601B_B222_40d1_9D07_AA758F940631" name="UTC_GregorianCalendarOrigin"
description="Start of Gregorian Calendar - Jan 1, 0:0:0 Zulu"
landmark="EAID_712C56C3_07E9_4693_B56E_4DD0BD9C13A3">
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_AC478CA1_3ACF_4953_8EF2_9EEBF661D4A2"
axis="EAID_5464AD82_2C21_4ad1_9FF8_77A64C196E82" value="1"
valueTypeUnit="EAID_770A3B26_286B_4669_9D59_28EEEDDFA38D"/>
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_053D2DC3_22B8_44cc_AB89_2F4A923E8255"
axis="EAID_5464AD82_2C21_4ad1_9FF8_77A64C196E82" value="1"
valueTypeUnit="EAID_E2FA4AF7_5100_4797_A1BD_B5E448ED93EE"/>
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_227EA9B2_E102_478f_90E4_FC9669A86248"
axis="EAID_5464AD82_2C21_4ad1_9FF8_77A64C196E82" value="0"
valueTypeUnit="EAID_4363AD8C_A1ED_447c_8074_A9C2C1BFAD59"/>
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_3E5CD4B1_D330_433d_B4A0_7C3AD7875818"
axis="EAID_5464AD82_2C21_4ad1_9FF8_77A64C196E82" value="0"
valueTypeUnit="EAID_7CE0FD03_E2B8_4a2b_BEF3_AC063A10AF19"/>
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_FAB26483_9965_4a52_9866_41A72E9BBB5D"
axis="EAID_5464AD82_2C21_4ad1_9FF8_77A64C196E82" value="0"
valueTypeUnit="EAID_6BBAF578_C863_44a7_A3E6_EDCF0E358B65"/>
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_3924559C_8AEC_4891_BB6D_EB07EBB21AA4"
axis="EAID_5464AD82_2C21_4ad1_9FF8_77A64C196E82" value="0"
valueTypeUnit="EAID_C6177FOA_A31C_496d_8F54_D3C02C9FA020"/>
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_E650AB59_CDB4_4173_9B24_41D273F8722F"
axis="EAID_5464AD82_2C21_4ad1_9FF8_77A64C196E82" value="0"
valueTypeUnit="EAID_F525FE9D_FC27_4971_AB94_AAB65C8FD169"/>
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_2C814F58_6FEA_43fc_8614_60031F3462C8"
axis="EAID_5464AD82_2C21_4ad1_9FF8_77A64C196E82" value="0"
valueTypeUnit="EAID_DA807F63_757D_47ee_9A1A_4C45CFA6E054"/>
        </referencePoint>
        <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_3E8BE104_A9BD_4f7d_9E57_C0066E58B660" name="UTC_UnixEpochTime"
description="Unix Epoch Time - Jan 1,1970 0:0:0 UTC"
landmark="EAID_E3DB5E79_28F5_4546_AF37_5C5C59EAA687">
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_659DD027_C82C_48f9_ADC6_571A156A2CB9"
axis="EAID_5464AD82_2C21_4ad1_9FF8_77A64C196E82" value="1"
valueTypeUnit="EAID_770A3B26_286B_4669_9D59_28EEEDDFA38D"/>

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        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_652FD54A_1EC2_49a7_A85A_FAC77D3FB135"
axis="EAID_5464AD82_2C21_4ad1_9FF8_77A64C196E82" value="1"
valueTypeUnit="EAID_E2FA4AF7_5100_4797_A1BD_B5E448ED93EE"/>
        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_A665040B_20B6_45d3_B8F9_F9DAC9CE5986"
axis="EAID_5464AD82_2C21_4ad1_9FF8_77A64C196E82" value="1970"
valueTypeUnit="EAID_4363AD8C_A1ED_447c_8074_A9C2C1BFAD59"/>
        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_42C27C48_F64D_4fd9_9097_9D1138D8C112"
axis="EAID_5464AD82_2C21_4ad1_9FF8_77A64C196E82" value="0"
valueTypeUnit="EAID_7CE0FD03_E2B8_4a2b_BEF3_AC063A10AF19"/>
        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_798AF305_1CE8_4ea_96A3_620F0CC6BC12"
axis="EAID_5464AD82_2C21_4ad1_9FF8_77A64C196E82" value="0"
valueTypeUnit="EAID_6BBAF578_C863_44a7_A3E6_EDCF0E358B65"/>
        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_B49E1C0E_B45E_43f8_B957_DF81D9BCB4ED"
axis="EAID_5464AD82_2C21_4ad1_9FF8_77A64C196E82" value="0"
valueTypeUnit="EAID_C6177FOA_A31C_496d_8F54_D3C02C9FA020"/>
        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_C66BB73F_A016_4fd9_95DE_4C176E4A2DBC"
axis="EAID_5464AD82_2C21_4ad1_9FF8_77A64C196E82" value="0"
valueTypeUnit="EAID_F525FE9D_FC27_4971_AB94_AAB65C8FD169"/>
        <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_7DE63EBC_2574_42a6_9CF8_F6F402BB4A6D"
axis="EAID_5464AD82_2C21_4ad1_9FF8_77A64C196E82" value="0"
valueTypeUnit="EAID_DA807F63_757D_47ee_9A1A_4C45CFA6E054"/>
        </referencePoint>
    </element>
<element xmi:type="logical:MeasurementSystemAxis"
xmi:id="EAID_5464AD82_2C21_4ad1_9FF8_77A64C196E82" name="Time_LocalTime_UTC_MeasSysAxis"
description="Represents calendar day using Gregorian calendar (year Q,E month of year Q,E and day of month) Q,E time of day as hour of day Q,E minute of hour Q,E and second of minute Q,E and local offset from UTC as count of hours Q,E count of minutes."
axis="EAID_3EFC05DA_4D3A_4e3d_8AEC_C9FEC8D85087"
defaultValueTypeUnit="EAID_4363AD8C_A1ED_447c_8074_A9C2C1BFAD59
EAID_7CE0FD03_E2B8_4a2b_BEF3_AC063A10AF19 EAID_E2FA4AF7_5100_4797_A1BD_B5E448ED93EE
EAID_6BBAF578_C863_44a7_A3E6_EDCF0E358B65 EAID_770A3B26_286B_4669_9D59_28EEEDDFA38D
EAID_C6177FOA_A31C_496d_8F54_D3C02C9FA020 EAID_F525FE9D_FC27_4971_AB94_AAB65C8FD169
EAID_DA807F63_757D_47ee_9A1A_4C45CFA6E054"/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_A01C0685_A0EE_4fb8_BF7F_DC92C48FB6EB" name="UTC_TimeOfDayMeasurementSystem">
    <element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_C5B2FCE6_50D5_49bd_B283_E3C5F1C922CC" name="Time_TimeOfDay_UTC_MeasSys"
description="Measurement system for time duration in seconds"
measurementSystemAxis="EAID_A9475213_1F9D_4967_9F5B_5454DF64813D"
coordinateSystem="EAID_D73E1979_E607_48ce_A01F_2EAD5226614D"
externalStandardReference="Universal Coordinated Time" orientation="Value increases as time moves towards the future">
        <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_1C36C981_7243_4fa0_B185_9A11CCA96E08" name="UTC_DayStart" description="Start of UTC day" landmark="EAID_07D5AF61_422D_4fff_8E3F_EBADE19C9743">
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_27226E3A_C2A6_46ba_8D1C_71C6EB8FB7FF"
axis="EAID_A9475213_1F9D_4967_9F5B_5454DF64813D" value="0"
valueTypeUnit="EAID_7CE0FD03_E2B8_4a2b_BEF3_AC063A10AF19"/>
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_5E09C042_D984_4514_9904_00741A524CBC"
axis="EAID_A9475213_1F9D_4967_9F5B_5454DF64813D" value="0"
valueTypeUnit="EAID_6BBAF578_C863_44a7_A3E6_EDCF0E358B65"/>
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axis="EAID_A9475213_1F9D_4967_9F5B_5454DF64813D" value="0"
valueTypeUnit="EAID_C6177FOA_A31C_496d_8F54_D3C02C9FA020"/>
        </referencePoint>
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xmi:id="EAID_EDF032ED_4EB4_4a22_B0CB_7B3105DFB92D" name="UTC_Noon" description="Noon of UTC day" landmark="EAID_0F3F8CEA_7F8A_4d9d_B338_692BCEA4F9EB">

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axis="EAID_A9475213_1F9D_4967_9F5B_5454DF64813D" value="0"
valueTypeUnit="EAID_6BBAF578_C863_44a7_A3E6_EDCF0E358B65"/>
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axis="EAID_A9475213_1F9D_4967_9F5B_5454DF64813D" value="0"
valueTypeUnit="EAID_C6177FOA_A31C_496d_8F54_D3C02C9FA020"/>
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axis="EAID_A9475213_1F9D_4967_9F5B_5454DF64813D" value="12"
valueTypeUnit="EAID_7CE0FD03_E2B8_4a2b_BEF3_AC063A10AF19"/>
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    </element>
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xmi:id="EAID_A9475213_1F9D_4967_9F5B_5454DF64813D" name="Time_TimeOfDay_UTC_MeasSysAxis"
description="Axis for time duration in HMS"
axis="EAID_3EFC05DA_4D3A_4e3d_8AEC_C9FEC8D85087"
defaultValueTypeUnit="EAID_7CE0FD03_E2B8_4a2b_BEF3_AC063A10AF19
EAID_6BBAF578_C863_44a7_A3E6_EDCF0E358B65 EAID_C6177FOA_A31C_496d_8F54_D3C02C9FA020"/>
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<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_BD4F6588_11A8_4e6e_A629_2EA89CA038CB" name="NATO4586_TimeMeasurementSystem">
    <element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_2DF64042_C1E0_4f0e_B52E_96FE4DCBFDF" name="Time_NATO4586UTC_MeasSys"
description="NATO STANAG 4586 time system represented in Universal Time Coordinated (UTC)
in seconds since Jan 1 Q,E 2000 with a precision of 0.001 seconds"
measurementSystemAxis="EAID_B048ED04_3BC0_4afe_ACB2_5CBF1601E5B6"
coordinateSystem="EAID_D73E1979_E607_48ce_A01F_2EAD5226614D"
externalStandardReference="NATO STANAG 4586 modification of UTC" orientation="see UTC
standard">
        <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_CBB717D5_A5C6_474c_83FF_04E0AA98B247" name="UTC_GregorianCalendarOrigin"
description="Start of Gregorian Calendar - Jan 1, 0:0:0 Zulu"
landmark="EAID_712C56C3_07E9_4693_B56E_4DD0BD9C13A3">
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_238853F6_1DDB_4e58_BAD2_A21861AB6EF4"
axis="EAID_B048ED04_3BC0_4afe_ACB2_5CBF1601E5B6" value="-63113904000"
valueTypeUnit="EAID_A558BC68_B8EF_43d8_8889_65E126114613"/>
        </referencePoint>
        <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_0A2CC28F_0D64_4fc6_BA43_375B9DC185E7" name="PositiveOneSecondAfter20000000"
description="Duration of positive one second"
landmark="EAID_26121EAF_96C4_4e3b_90B5_568E427782FE">
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_5F683923_C09D_4d4a_9431_76CAD56765D9"
axis="EAID_B048ED04_3BC0_4afe_ACB2_5CBF1601E5B6" value="1"
valueTypeUnit="EAID_A558BC68_B8EF_43d8_8889_65E126114613"/>
        </referencePoint>
    </element>
<element xmi:type="logical:MeasurementSystemAxis"
xmi:id="EAID_B048ED04_3BC0_4afe_ACB2_5CBF1601E5B6" name="Time_NATO4586_UTC_MeasSysAxis"
description="NATO STANAG 4586 time system represented in Universal Time Coordinated (UTC)
in seconds since Jan 1 Q,E 2000 with a precision of 0.001 seconds"
axis="EAID_3EFC05DA_4D3A_4e3d_8AEC_C9FEC8D85087"
defaultValueTypeUnit="EAID_A558BC68_B8EF_43d8_8889_65E126114613"/>
</ldm>
</ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_41793635_F913_4906_9FD9_C5C087776998" name="ViscosityMeasurementSystem">
    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_DF37DABA_0A48_4e42_8697_CF92B9D8EFC9"
name="DynamicViscosityMeasurementSystem">
        <element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_ABE06F26_4180_4736_BB0D_CF8FE9B05010" name="Dynamic_Viscosity_MeasSys"
description="Measurement system for dynamic (shear) viscosity."
measurementSystemAxis="EAID_2CA8F2E2_0148_48c7_BA65_555A7CEED7EF"
coordinateSystem="EAID_D73E1979_E607_48ce_A01F_2EAD5226614D" orientation="Values increase
as viscosity increases">
        <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_EB720FFC_942A_41de_88DE_362C5C31D500"

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name="WaterDynamicViscosityAt100DegreesC" description="Reference point for dynamic
viscosity of liquid water at 100 degrees Celsius"
landmark="EAID_2F0D69A5_4129_4c17_9019_E5E7887CF69B">
    <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_9B78B3A4_8A08_49f0_92DC_44D610044196"
axis="EAID_2CA8F2E2_0148_48c7_BA65_555A7CEED7EF" value="0.0002822"
valueTypeUnit="EAID_B31A800C_880E_4285_8914_12871094C4EE"/>
    </referencePoint>
    <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_D7BF3B19_656B_49c8_A910_3A29EB42B993"
name="WaterDynamicViscosityAt20DegreesC" description="Dynamic viscosity of liquid water
at 20 degrees Celsius" landmark="EAID_4A5A23A8_A843_4a9e_AD4A_123D5C05C2E1">
    <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_53BE9E6D_168D_445f_86D8_65FE73FA216C"
axis="EAID_2CA8F2E2_0148_48c7_BA65_555A7CEED7EF" value="0.001002"
valueTypeUnit="EAID_B31A800C_880E_4285_8914_12871094C4EE"/>
    </referencePoint>
</element>
<element xmi:type="logical:MeasurementSystemAxis"
xmi:id="EAID_2CA8F2E2_0148_48c7_BA65_555A7CEED7EF" name="Dynamic_Viscosity_MeasSysAxis"
description="Measurement system axis for dynamic (shear) viscosity in SI units of pascal-
seconds" axis="EAID_3EFC05DA_4D3A_4e3d_8AEC_C9FEC8D85087"
defaultValueTypeUnit="EAID_B31A800C_880E_4285_8914_12871094C4EE"/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_183AE636_B48A_42cb_A42F_74FA6AA88C5D"
name="KinematicViscosityMeasurementSystem">
    <element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_426F4C83_FAEB_42ae_BA99_51EF798EA3CD" name="Kinematic_Viscosity_MeasSys"
description="Measurement system for kinematic viscosity"
measurementSystemAxis="EAID_3D69C939_50F0_4bf9_8699_8CCB6784F721"
coordinateSystem="EAID_D73E1979_E607_48ce_A01F_2EAD5226614D" orientation="Values increase
as viscosity increases.">
        <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_5323E41C_24F5_4555_9F35_FF80A60D65D0"
name="WaterKinematicViscosityAt20DegreesC" description="Reference point for kinematic
viscosity of liquid water at 20 degrees Celsius"
landmark="EAID_1EC36204_738B_488c_91FF_A5D749D60501">
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_B7D20687_4C07_4838_BDCC_4DCBBB36E5D0"
axis="EAID_3D69C939_50F0_4bf9_8699_8CCB6784F721" value="0.000001038"
valueTypeUnit="EAID_C5E6300B_BD72_485e_83C1_63975AF70D50"/>
            </referencePoint>
            <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_9227B12E_F220_488c_A7F4_AB3595EE4C96"
name="GlycerinKinematicViscosityAt20point3DegreesC" description="Reference point for
kinematic viscosity of glycerin at 20.3 degrees Celsius"
landmark="EAID_BB1C688B_89B0_4870_91D0_859F5F6528B">
            <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_F0509B19_F852_44cc_8FFC_8EF7C7E55C77"
axis="EAID_3D69C939_50F0_4bf9_8699_8CCB6784F721" value="0.000648"
valueTypeUnit="EAID_C5E6300B_BD72_485e_83C1_63975AF70D50"/>
            </referencePoint>
        </element>
        <element xmi:type="logical:MeasurementSystemAxis"
xmi:id="EAID_3D69C939_50F0_4bf9_8699_8CCB6784F721" name="Kinematic_Viscosity_MeasSysAxis"
description="Measurement system axis for kinematic viscosity in SI units of meters
squared per second" axis="EAID_3EFC05DA_4D3A_4e3d_8AEC_C9FEC8D85087"
defaultValueTypeUnit="EAID_C5E6300B_BD72_485e_83C1_63975AF70D50"/>
    </ldm>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_BA0C3A35_FA8A_411f_8D1E_8BF51136EFC5" name="VolumeMeasurementSystem">
    <element xmi:type="logical:MeasurementSystem"
xmi:id="EAID_A1ED4E98_B10D_4e7f_BFAD_86BA34D7C3DB" name="Volume_MeasSys"
description="Measurement system for values of volume."
measurementSystemAxis="EAID_F7F3A12A_7530_4370_9235_928317E0BC98"
coordinateSystem="EAID_D73E1979_E607_48ce_A01F_2EAD5226614D" orientation="Values increase
as volume increases.">
        <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_E74EA2A2_D555_4371_9AC2_C14B2243D666" name="ZeroVolumeReferencePoint"

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description="Reference point for a zero volume"
landmark="EAID_2205BF3D_7A57_4440_A3B4_1D1EE359EFDF">
    <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_A1182165_AEE6_4671_8589_54799FFD9E3C"
axis="EAID_F7F3A12A_7530_4370_9235_928317E0BC98" value="0.0"
valueTypeUnit="EAID_F77FC9A7_BB84_4e52_96C5_088210366367"/>
    </referencePoint>
    <referencePoint xmi:type="logical:ReferencePoint"
xmi:id="EAID_18278755_32E3_4550_A88E_C57EE92ECFEF" name="OneCubicMeterReferencePoint"
description="reference point for a volume of one cubic meter."
landmark="EAID_1550FA6E_1F8C_4b47_9DC2_F36336B730F0">
    <referencePointPart xmi:type="logical:ReferencePointPart"
xmi:id="EAID_5F2E34BC_46ED_4b54_8866_4878F80D86BB"
axis="EAID_F7F3A12A_7530_4370_9235_928317E0BC98" value="1.0"
valueTypeUnit="EAID_F77FC9A7_BB84_4e52_96C5_088210366367"/>
    </referencePoint>
</element>
<element xmi:type="logical:MeasurementSystemAxis"
xmi:id="EAID_F7F3A12A_7530_4370_9235_928317E0BC98" name="Volume_MeasSysAxis"
description="Measurement system axis for values of volume."
axis="EAID_3EFC05DA_4D3A_4e3d_8AEC_C9FEC8D85087"
defaultValueTypeUnit="EAID_F77FC9A7_BB84_4e52_96C5_088210366367"/>
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xmi:id="EAID_0AC531F9_F91B_460e_A7C3_27859F3E8A79" name="Measurements" description="FACE
data model logical measurements.">
    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_E5D26C4F_5745_4521_962D_2B4732FD50A0F" name="AmountOfConcentrationMeasures">
        <element xmi:type="logical:Measurement"
xmi:id="EAID_92EAD331_F512_45ab_83C3_17934647991B" name="Chemical_Concentration_Meas"
description="Measurement used to describe observable properties of a chemical
concentration." measurementAxis="EAID_C243BE2B_1EC9_4458_B02B_A4101462D1A5"
measurementSystem="EAID_4EEF0F23_1874_450c_BB7D_52DBBE50A712"
realizes="EAID_0016984E_BB39_4f54_95F7_41C62B101EBF"/>
        <element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_C243BE2B_1EC9_4458_B02B_A4101462D1A5" name="Chemical_Concentration_MeasAxis"
measurementSystemAxis="EAID_46FC50D2_7494_46f3_8494_DDA55E45A2F"
realizes="EAID_0016984E_BB39_4f54_95F7_41C62B101EBF"/>
        </ldm>
        <ldm xmi:type="LogicalDataModel"
xmi:id="EAID_C038CD82_5CA1_459a_B2EC_0285C602DD57" name="AttitudeMeasures">
            <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_2599B789_CB20_440f_B297_B743757DDEA6" name="BodyFrameAttitudeMeasure">
                <element xmi:type="logical:Measurement"
xmi:id="EAID_F3BCEF2A_D08A_4d6e_80AB_FE9DCC68D515" name="Body_Frame_Pitch_Degrees_Meas"
description="Describe the Pitch attitude of an aircraft in flight with the initial
orientation body-fixed Q,E with origins moving along with the aircraft Q,E at the center
of gravity" measurementAxis="EAID_1E4718CF_69A1_459d_B69A_73171E3B4B38"
measurementSystem="EAID_5CD83F7E_0762_43c5_ABBD_F6F8B4685244"
realizes="EAID_AB3FAE18_6F92_4a74_812F_77AF2DCD6F6F"/>
                <element xmi:type="logical:Measurement"
xmi:id="EAID_1AAE633D_6950_425f_912B_2C05ADE15808" name="Body_Frame_Roll_Degrees_Meas"
description="Describe the Roll attitude of an aircraft in flight with the initial
orientation body-fixed Q,E with origins moving along with the aircraft Q,E at the center
of gravity" measurementAxis="EAID_FAE1C598_8B37_4329_A065_0AAE5E518F65"
measurementSystem="EAID_5044E59D_C305_465e_944E_4DA6187EF0DC"
realizes="EAID_AB3FAE18_6F92_4a74_812F_77AF2DCD6F6F"/>
                <element xmi:type="logical:Measurement"
xmi:id="EAID_47E9C746_C75C_4e50_B742_1DACEF953996" name="Body_Frame_Yaw_Degrees_Meas"
description="Describe the Yaw attitude of an aircraft in flight with the initial
orientation body-fixed Q,E with origins moving along with the aircraft Q,E at the center
of gravity" measurementAxis="EAID_C6705DC3_8C55_4de3_A7A6_C7B36A93C5A3"
measurementSystem="EAID_9F3D0CA_14E4_4d03_9B4B_6E859FE51594"
realizes="EAID_AB3FAE18_6F92_4a74_812F_77AF2DCD6F6F"/>
                <element xmi:type="logical:Measurement"
xmi:id="EAID_71E81CF0_EAF6_44d4_BD02_86707A5FC113" name="Body_Frame_Attitude_Meas"
description="The measure to describe the attitude of an aircraft in flight with the
relative orientation is body-fixed Q,E with origins moving along with the aircraft Q,E
typically at the center of gravity"
measurementAxis="EAID_D2CAC852_73A3_4aec_9790_9640043C825C

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EAID_C3BAB08D_406E_4267_B08C_E97972CB018C EAID_821137A0_2FF0_4ad2_8E68_8EC50128AD03"
measurementSystem="EAID_449F4D2F_6805_4049_BD5B_FA27FD570EEF"
realizes="EAID_AB3FAE18_6F92_4a74_812F_77AF2DCD6F6F"/>
    <element xmi:type="logical:Measurement"
xmi:id="EAID_199CAB4E_D00F_4e3c_BB08_00DCC2C374AC"
name="Body_Frame_Attitude_Degrees_Meas" description="The measure to describe the attitude
of an aircraft in flight with the initial orientation body-fixed Q,E with origins moving
along with the aircraft Q,E at the center of gravity Q,E expressed as real degrees 0 to
360 inclusive" measurementAxis="EAID_1E4718CF_69A1_459d_B69A_73171E3B4B38
EAID_FAE1C598_8B37_4329_A065_0AEE5E518F65 EAID_C6705DC3_8C55_4de3_A7A6_C7B36A93C5A3"
measurementSystem="EAID_449F4D2F_6805_4049_BD5B_FA27FD570EEF"
realizes="EAID_AB3FAE18_6F92_4a74_812F_77AF2DCD6F6F"/>
    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_F8D4CE33_D33E_4592_A072_3F5AED57D0CF" name="BodyFrameMeasurementAxis">
        <element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_D2CAC852_73A3_4aec_9790_9640043C825C" name="Body_Frame_Pitch_MeasAxis"
description="Pitch Axis (Lateral Axis) passes through the plane from wingtip to wingtip.
Pitch changes the vertical direction the aircraft's nose is pointing."
measurementSystemAxis="EAID_A4B9B253_9061_4f28_A8F7_89BFA86EE91A"
realizes="EAID_5977632F_0313_4d51_82A4_E716D94C7D7D"/>
        <element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_C3BAB08D_406E_4267_B08C_E97972CB018C" name="Body_Frame_Roll_MeasAxis"
description="Roll Axis (Longitudinal Axis) passes through the plane from nose to tail.
Roll changes the orientation of the aircraft's wings with respect to the downward force
of gravity." measurementSystemAxis="EAID_309DE716_2AA8_4eb3_A6EA_C0C37AA8CA84"
realizes="EAID_5977632F_0313_4d51_82A4_E716D94C7D7D"/>
        <element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_821137A0_2FF0_4ad2_8E68_8EC50128AD03" name="Body_Frame_Yaw_MeasAxis"
description="Yaw Axis (Normal Axis) is the vertical axis through an aircraft Q,E rocket
or similar body about which the body yaws."
measurementSystemAxis="EAID_1B9ED73D_796D_487c_85CC_15170C5E25E5"
realizes="EAID_5977632F_0313_4d51_82A4_E716D94C7D7D"/>
    </ldm>
    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_A734C35A_5D32_456a_97BD_D2A02279EC6D"
name="BodyFrameMeasurementAxisDegrees">
        <element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_1E4718CF_69A1_459d_B69A_73171E3B4B38"
name="Body_Frame_Pitch_Degrees_MeasAxis" description="Pitch Axis (Lateral Axis) passes
through the plane from wingtip to wingtip. Pitch changes the vertical direction the
aircraft's nose is pointing." valueTypeUnit="EAID_C5AE86FF_FB90_4d95_A739_4025CA644CDF"
measurementSystemAxis="EAID_A4B9B253_9061_4f28_A8F7_89BFA86EE91A"
realizes="EAID_5977632F_0313_4d51_82A4_E716D94C7D7D"/>
        <element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_FAE1C598_8B37_4329_A065_0AEE5E518F65"
name="Body_Frame_Roll_Degrees_MeasAxis" description="Roll Axis (Longitudinal Axis) passes
through the plane from nose to tail. Roll changes the orientation of the aircraft's wings
with respect to the downward force of gravity."
valueTypeUnit="EAID_C5AE86FF_FB90_4d95_A739_4025CA644CDF"
measurementSystemAxis="EAID_309DE716_2AA8_4eb3_A6EA_C0C37AA8CA84"
realizes="EAID_5977632F_0313_4d51_82A4_E716D94C7D7D"/>
        <element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_C6705DC3_8C55_4de3_A7A6_C7B36A93C5A3" name="Body_Frame_Yaw_Degrees_MeasAxis"
description="Yaw Axis (Normal Axis) is the vertical axis through an aircraft Q,E rocket
or similar body about which the body yaws."
valueTypeUnit="EAID_C5AE86FF_FB90_4d95_A739_4025CA644CDF"
measurementSystemAxis="EAID_1B9ED73D_796D_487c_85CC_15170C5E25E5"
realizes="EAID_5977632F_0313_4d51_82A4_E716D94C7D7D"/>
    </ldm>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_85A5AF60_6477_47dc_B465_7159E6A57CD8" name="EarthFrameOrientation">
    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_B3416515_3465_4461_B253_892E21E6F182" name="Course">
        <element xmi:type="logical:Measurement"
xmi:id="EAID_5B4278E1_2171_4c2b_9F42_B0833CC8ABE4"
name="Course_MagneticNorthDegrees_Meas" description="Describes the heading Q,E or
orientation of the object relative to Magnetic North Q,E measured in real degrees from 0
to 360." measurementAxis="EAID_78E789A6_F368_4a32_A1FD_05FAE4E2775D"
measurementSystem="EAID_AB0C125C_517B_4192_806D_E80922525CB4"
realizes="EAID_5977632F_0313_4d51_82A4_E716D94C7D7D"/>

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        <element xmi:type="logical:Measurement"
xmi:id="EAID_4AEF2B2C_3432_4bc9_8A06_DDF118E9055B" name="Course_MagneticNorth_Meas"
description="Describes the course or direction of travel of the object relative to
Magnetic North Q,E measured in real radians from 0 to 2Pi."
measurementAxis="EAID_B6DB52D2_745B_467c_B960_C0F6348864B4"
measurementSystem="EAID_AB0C125C_517B_4192_806D_E80922525CB4"
realizes="EAID_5977632F_0313_4d51_82A4_E716D94C7D7D"/>
        <element xmi:type="logical:Measurement"
xmi:id="EAID_F63E8756_98D1_4937_8B26_70BEC9015CA4" name="Course_TrueNorthDegrees_Meas"
description="Describes the course Q,E or direction of travel of the object relative to
True North Q,E measured in real degrees from 0 to 360."
measurementAxis="EAID_78E789A6_F368_4a32_A1FD_05FAE4E2775D"
measurementSystem="EAID_01EAC27C_9F97_405f_92A1_80FD50C8EDA1"
realizes="EAID_5977632F_0313_4d51_82A4_E716D94C7D7D"/>
        <element xmi:type="logical:Measurement"
xmi:id="EAID_E278B893_43C9_4ffd_80E9_9BFA9A45AD22" name="Course_TrueNorth_Meas"
description="Describes the course Q,E or direction of travel of the object relative to
True North Q,E measured in real radians from 0 to 2Pi."
measurementAxis="EAID_B6DB52D2_745B_467c_B960_C0F6348864B4"
measurementSystem="EAID_01EAC27C_9F97_405f_92A1_80FD50C8EDA1"
realizes="EAID_5977632F_0313_4d51_82A4_E716D94C7D7D"/>
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<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_515EF917_8F7F_49b8_8CF9_DE9BD5CD36F4" name="Heading">
        <element xmi:type="logical:Measurement"
xmi:id="EAID_1D0D44DC_4FC4_42f8_ACD6_996D840C7466"
name="Heading_MagneticNorthDegrees_Meas" description="Describes the heading Q,E or
orientation of the object relative to Magnetic North Q,E measured in real degrees from 0
to 360 inclusive." measurementAxis="EAID_78E789A6_F368_4a32_A1FD_05FAE4E2775D"
measurementSystem="EAID_AB0C125C_517B_4192_806D_E80922525CB4"
realizes="EAID_5977632F_0313_4d51_82A4_E716D94C7D7D"/>
        <element xmi:type="logical:Measurement"
xmi:id="EAID_AAFBC643_6333_4a34_808E_D10D621A5C3F" name="Heading_MagneticNorth_Meas"
description="Describes the heading Q,E or orientation of the object relative to Magnetic
North Q,E measured in real radians from 0 to 2Pi."
measurementAxis="EAID_B6DB52D2_745B_467c_B960_C0F6348864B4"
measurementSystem="EAID_AB0C125C_517B_4192_806D_E80922525CB4"
realizes="EAID_5977632F_0313_4d51_82A4_E716D94C7D7D"/>
        <element xmi:type="logical:Measurement"
xmi:id="EAID_D7184FC_8878_4737_8EAD_41946CF3799B" name="Heading_TrueNorthDegrees_Meas"
description="Describes the heading Q,E or orientation of the object relative to True
North Q,E measured in real degrees from 0 to 360 inclusive."
measurementAxis="EAID_78E789A6_F368_4a32_A1FD_05FAE4E2775D"
measurementSystem="EAID_01EAC27C_9F97_405f_92A1_80FD50C8EDA1"
realizes="EAID_5977632F_0313_4d51_82A4_E716D94C7D7D"/>
        <element xmi:type="logical:Measurement"
xmi:id="EAID_00BB6AFB_D00E_4777_A20D_E5D55D19A827" name="Heading_TrueNorth_Meas"
description="Describes the heading Q,E or orientation of the object relative to True
North Q,E measured in real radians from 0 to 2Pi."
measurementAxis="EAID_B6DB52D2_745B_467c_B960_C0F6348864B4"
measurementSystem="EAID_01EAC27C_9F97_405f_92A1_80FD50C8EDA1"
realizes="EAID_5977632F_0313_4d51_82A4_E716D94C7D7D"/>
        <element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_78E789A6_F368_4a32_A1FD_05FAE4E2775D" name="Local_Azimuth_Degrees_MeasAxis"
description="Describes the azimuth measurement axis for real degrees measures."
valueTypeUnit="EAID_BB939174_23D5_4298_8575_7F5A0CD0FFE3"
measurementSystemAxis="EAID_EC7DEAAE_86A2_453a_BA97_5647A5D28037"
realizes="EAID_5977632F_0313_4d51_82A4_E716D94C7D7D"/>
        <element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_B6DB52D2_745B_467c_B960_C0F6348864B4" name="Local_Azimuth_MeasAxis"
description="Describes the azimuth measurement axis for real radian measures."
measurementSystemAxis="EAID_EC7DEAAE_86A2_453a_BA97_5647A5D28037"
realizes="EAID_5977632F_0313_4d51_82A4_E716D94C7D7D"/>
</ldm>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_4AD8CC67_0181_4553_A1D4_0811D74BC14D" name="UniqueIdentifierMeasurements">
        <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_0BD8A566_C880_4ab6_AB23_FBE5ED9F5B25" name="UniqueID_Unbounded_Integer">

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<element xmi:type="logical:Measurement"
xmi:id="EAID_EB46C80F_53C9_4d1f_A356_5808475F4992" name="UniqueID_Unbounded_Integer_Meas"
description="A measurement for uniqueIdentifiers that use integers and are not governed
by an organization or standard"
measurementAxis="EAID_038611A6_9DDF_4dfb_8A16_56F60364486E"
measurementSystem="EAID_C47A17E6_C71A_476e_BE60_180AF8419F3F"
realizes="EAID_B14C698C_13F8_434c_9D67_54CF514CA74E"/>
<element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_038611A6_9DDF_4dfb_8A16_56F60364486E"
name="UniqueID_Unbounded_Integer_MeasAxis" description="An instance of the
CountMeasurementSystemAxis with a uniqueness constraint."
measurementSystemAxis="EAID_0BC3E999_77C6_4c63_AF7D_ABF70A593686"
realizes="EAID_B14C698C_13F8_434c_9D67_54CF514CA74E">
<constraint xmi:type="logical:MeasurementConstraint"
xmi:id="EAID_0C8E9623_FD05_453e_B9DE_2B4C69DEA2C6" constraintText="IsUnique"/>
</element>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_F4CFD102_3A5A_44eb_B548_EB9BC13EBFC6" name="UniqueID_Unbounded_Text">
<element xmi:type="logical:Measurement"
xmi:id="EAID_37987436_DB8D_4c30_B508_C84431136B28" name="UniqueID_Unbounded_Text_Meas"
description="A measurement for uniqueIdentifiers that use UTF8 strings and are not
governed by an organization or standard"
measurementAxis="EAID_B2D8EA0F_F077_4946_985D_3FC15360B8EA"
measurementSystem="EAID_3328F5AF_7CAE_4149_A03E_EB78F6653396"
realizes="EAID_B14C698C_13F8_434c_9D67_54CF514CA74E"/>
<element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_B2D8EA0F_F077_4946_985D_3FC15360B8EA"
name="UniqueID_Unbounded_Text_MeasAxis" description="An instance of the
TextUTF8MeasurementSystemAxis with a uniqueness constraint."
measurementSystemAxis="EAID_53E5C75D_0FAB_4090_9AB4_763E7AEF327C"
realizes="EAID_B14C698C_13F8_434c_9D67_54CF514CA74E">
<constraint xmi:type="logical:MeasurementConstraint"
xmi:id="EAID_D8F3559D_AD96_41e0_886F_1D23E75221D0" constraintText="IsUnique"/>
</element>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_CB43DB27_3B4E_41ba_BF1C_B6BEDCD7682A" name="UniqueID_UUID_Text">
<element xmi:type="logical:Measurement"
xmi:id="EAID_6B02E545_2AFD_4542_B70D_0733A337E54E" name="UniqueID_UUID_Text_Meas"
description="A measurement for uniqueIdentifiers that use UTF8 strings and are governed
by the UUID (RFC 4122) standard."
measurementAxis="EAID_20D9A85A_639A_49ca_8B03_1FF9070B294A"
measurementSystem="EAID_3328F5AF_7CAE_4149_A03E_EB78F6653396"
realizes="EAID_B14C698C_13F8_434c_9D67_54CF514CA74E"/>
<element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_20D9A85A_639A_49ca_8B03_1FF9070B294A" name="UniqueID_UUID_Text_MeasAxis"
description="An instance of the TextUTF8MeasurementSystemAxis with a UUID constraint."
measurementSystemAxis="EAID_53E5C75D_0FAB_4090_9AB4_763E7AEF327C"
realizes="EAID_B14C698C_13F8_434c_9D67_54CF514CA74E">
<constraint xmi:type="logical:MeasurementConstraint"
xmi:id="EAID_13BCA207_52F6_4552_B26B_8AA10B9CF116" constraintText="UUID_RFC 4122"/>
</element>
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<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_C39FE4A0_A543_485f_9E48_280DB21A5EBC" name="AmountOfSubstanceMeasures">
<element xmi:type="logical:Measurement"
xmi:id="EAID_BAB39D5C_4C60_4915_B31B_4F1E398424CD" name="AmountOfSubstance_Meas"
description="A measure of the number of entities (atoms, Q, E molecules) present in a
substance." measurementAxis="EAID_50838858_BB3A_4378_849A_0A29801BEB06"
measurementSystem="EAID_DC62CAA1_21DA_4849_8464_F08A23263D53"
realizes="EAID_280D1606_DD95_455c_B535_04810D45E721"/>
<element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_50838858_BB3A_4378_849A_0A29801BEB06" name="AmountofSubstance_MeasAxis"
description="Value increases as amount of substance increases."
measurementSystemAxis="EAID_EA62EF67_9A36_4f82_BCF9_74E7F11310BB"
realizes="EAID_280D1606_DD95_455c_B535_04810D45E721"/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_6C48A902_376D_42c4_8C6C_1125EDE3A04A" name="AngleMeasures">

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<lsm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_04F52B3A_CD05_4773_B93D_B45595296870" name="CrabAngle"/>
<lsm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_2AD4FB4A_A65E_4472_BB42_776266E16FE8" name="CenterOfGravity"
description="Angle measurements based on the Center of Gravity Reference Frame."/>
<lsm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_9045FC94_4B15_4749_8BD1_F614009C4435" name="LocalHorizontal"
description="Angle measurements based on the Local Horizontal Reference Frame."/>
<lsm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_DF1556E6_BCD8_48c6_BF80_FE2DC143C1CD" name="LocalMagneticNorth"
description="Angle measurements based on the Local Magnetic North Reference Frame."/>
<lsm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_9FC06FBB_AC1A_4f69_ACC5_162B6AEFCB0D"
name="ControlSurfaceDeflectionMeasurements">
<element xmi:type="logical:Measurement"
xmi:id="EAID_A2F7B002_9A38_4cd8_AAFC_FAE4DAA5335A"
name="Control_Surface_2D_Rotation_Meas" description="The measure of geometric deflection
in 2 axis (y Q,E z) of a motivator component's movement about a hinge line axis. A hinge
line axis is one of the axes of the motivator coordinate system. Used for coupled
motivators such as ruddervator."
measurementAxis="EAID_F00C573D_C42C_4970_94CB_B53BBBB8A9EF
EAID_18E2EDD7_7BE7_4679_9867_3E03FC1926BE"
measurementSystem="EAID_12ED0032C_B616_4cd6_AAA1_E1B66A5E8BDA"
realizes="EAID_5977632F_0313_4d51_82A4_E716D94C7D7D"/>
<element xmi:type="logical:Measurement"
xmi:id="EAID_8A1D5A42_58C1_4f1e_BEA8_A1A3EBA33FA1"
name="Control_Surface_3D_Rotation_Meas" description="The measure of geometric deflection
in 3 axis of a motivator component's movement about a hinge line axis. A hinge line axis
is one of the axes of the motivator coordinate system."
measurementAxis="EAID_2D251A0D_0160_4d8b_B928_0DE7D0FCF72F
EAID_F00C573D_C42C_4970_94CB_B53BBBB8A9EF EAID_18E2EDD7_7BE7_4679_9867_3E03FC1926BE"
measurementSystem="EAID_F71A06C9_43D2_4f02_9732_5BD8A6821820"
realizes="EAID_5977632F_0313_4d51_82A4_E716D94C7D7D"/>
<element xmi:type="logical:Measurement"
xmi:id="EAID_E47E81B7_6C9B_434a_AD69_BCC84B86976A"
name="Control_Surface_Aileron_Rotation_Meas" description="The measure of geometric
deflection about the y axis hinge line of an aileron motivator component's movement. Used
for motivators that produce a torque about the x axis such as ailerons. Positive
deflection produces a positive roll."
measurementAxis="EAID_F00C573D_C42C_4970_94CB_B53BBBB8A9EF"
measurementSystem="EAID_FADFAE25_AB4B_4101_A2BF_6F5270334C73"
realizes="EAID_5977632F_0313_4d51_82A4_E716D94C7D7D"/>
<element xmi:type="logical:Measurement"
xmi:id="EAID_1DBD1EC6_943B_472d_BA47_9EEEC51958DF" name="Control_Surface_X_Rotation_Meas"
description="The measure of geometric deflection about the x axis hinge line of a
motivator component's movement. A hinge line axis is one of the axes of the motivator
coordinate system. Used for motivators that produce a torque about the x axis."
measurementAxis="EAID_2D251A0D_0160_4d8b_B928_0DE7D0FCF72F"
measurementSystem="EAID_228EBC8A_F2FA_4cc9_BB9_D2A92F4D2120"
realizes="EAID_5977632F_0313_4d51_82A4_E716D94C7D7D"/>
<element xmi:type="logical:Measurement"
xmi:id="EAID_52D5F9C2_C068_47df_9D5B_EB9B6B6921F8" name="Control_Surface_Y_Rotation_Meas"
description="The measure of geometric deflection about the y axis hinge line of a
motivator component's movement. Used for motivators that produce a torque about the y
axis such as elevators. Negative deflection produces a positive pitch."
measurementAxis="EAID_F00C573D_C42C_4970_94CB_B53BBBB8A9EF"
measurementSystem="EAID_FADFAE25_AB4B_4101_A2BF_6F5270334C73"
realizes="EAID_5977632F_0313_4d51_82A4_E716D94C7D7D"/>
<element xmi:type="logical:Measurement"
xmi:id="EAID_25616A52_1D97_4c45_8A99_A951D9F335BA" name="Control_Surface_Z_Rotation_Meas"
description="The measure of geometric deflection about the z axis hinge line of a
motivator component's movement. Used for motivators that produce a torque about the z
axis such as rudders. Positive deflection produces a negative yaw."
measurementAxis="EAID_18E2EDD7_7BE7_4679_9867_3E03FC1926BE"
measurementSystem="EAID_BE85F385_EAC6_4362_834C_504973501D1E"
realizes="EAID_5977632F_0313_4d51_82A4_E716D94C7D7D"/>
<element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_2D251A0D_0160_4d8b_B928_0DE7D0FCF72F"
name="Control_Surface_X_Rotation_MeasAxis" description="The axis for geometric deflection
values about the x axis hinge line of a motivator component's movement. A hinge line axis
is one of the axes of the motivator coordinate system. Used for motivators that produce a

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torque about the x axis."
measurementSystemAxis="EAID_B9A4674C_EF3F_4c3b_B084_0AE83A7EDE82"
realizes="EAID_5977632F_0313_4d51_82A4_E716D94C7D7D"/>
<element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_F00C573D_C42C_4970_94CB_B53BBBB8A9EF"
name="Control_Surface_Y_Rotation_MeasAxis" description="The axis for geometric deflection
values about the y axis hinge line of a motivator component's movement. Used for
motivators that produce a torque about the y axis such as elevators. Negative deflection
produces a positive pitch."
measurementSystemAxis="EAID_755E2E3E_7159_44b6_8C08_3DA8DE7E52A9"
realizes="EAID_5977632F_0313_4d51_82A4_E716D94C7D7D"/>
<element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_18E2EDD7_7BE7_4679_9867_3E03FC1926BE"
name="Control_Surface_Z_Rotation_MeasAxis" description="The axis for geometric deflection
values about the z axis hinge line of a motivator component's movement. Used for
motivators that produce a torque about the z axis such as rudders. Positive deflection
produces a negative yaw."
measurementSystemAxis="EAID_C899BE01_4890_4853_A178_936DA868CBF9"
realizes="EAID_5977632F_0313_4d51_82A4_E716D94C7D7D"/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_182EEBF4_489D_4818_9783_C3CC0B714ED2" name="NorthSouthMeridians"
description="Angle measurements based on the North South Meridians Reference Frame."/>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_98B2A3BD_3829_42d4_818A_71BE46E26E0B" name="TrueNorth" description="Angle
measurements based on the True North Reference Frame."/>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_2D6950A8_64BA_4d5d_9627_BDC97E3BEB09" name="MagneticVariationMeasurements">
<element xmi:type="logical:Measurement"
xmi:id="EAID_52144763_CC29_4377_98F3_B45B63AE9F3D"
name="Location_Centered_MagneticVariation_Meas" description="The angle on the horizontal
plane between magnetic north Q,E and true north at the vehicle position Q,E expressed in
radians." measurementAxis="EAID_B6DB52D2_745B_467c_B960_C0F6348864B4"
measurementSystem="EAID_F455A0C8_B3C8_4825_A8A0_BA5DFB411788"
realizes="EAID_5977632F_0313_4d51_82A4_E716D94C7D7D"/>
<element xmi:type="logical:Measurement"
xmi:id="EAID_AA94BAE1_9BCA_4d53_82AB_2A55F80EFB8A"
name="Vehicle_Centered_MagneticVariation_Meas" description="The angle on the horizontal
plane between magnetic north Q,E and true north at a geographic position Q,E expressed
in radians." measurementAxis="EAID_B6DB52D2_745B_467c_B960_C0F6348864B4"
measurementSystem="EAID_E88B2256_E2B8_439a_96F5_9A8BDCB4D566"
realizes="EAID_5977632F_0313_4d51_82A4_E716D94C7D7D"/>
</ldm>
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<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_2E96FCE3_39D7_46b6_8A16_3A62E88F6FE7" name="AreaMeasures">
<element xmi:type="logical:Measurement"
xmi:id="EAID_942D7E12_8F27_4ebf_8FDE_6CC2F8ECC087" name="Area_Meas"
description="Measurement used to describe observable properties of area."
measurementAxis="EAID_2A8986A5_EB0D_4fba_BC35_61EE8CAF5AC0"
measurementSystem="EAID_ECDC0729_FCAC_4488_912E_705D7772C930"
realizes="EAID_4B94E0C3_63C2_4166_9A21_564E6B39FEE1"/>
<element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_2A8986A5_EB0D_4fba_BC35_61EE8CAF5AC0" name="Area_MeasAxis"
description="Measurement axis for describing observable properties of area."
measurementSystemAxis="EAID_94BB6EBD_0C38_4569_935D_E3B57B432375"
realizes="EAID_4B94E0C3_63C2_4166_9A21_564E6B39FEE1"/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_47C74EF3_1379_4dd4_9F3F_097501DF2E4F" name="BodyAngleMeasures"
description="Angle measurements based on the Local Vehicle Reference Frame.">
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_D5D8AF8D_9169_4cf0_A80F_8F0F07BD0AD6" name="BodyAngleMeasurementDegrees">
<element xmi:type="logical:Measurement"
xmi:id="EAID_37710E35_3DC5_4489_B0D0_92E98E890F06" name="Lateral_Rotation_Degrees_Meas"
description="Specifies the rotation about the latitudinal axis (pitch) measured as an
angle with respect to the vertical axis as viewed from the origin of the local vehicle
frame of reference." measurementAxis="EAID_B1CF8E91_53B6_4940_A3C5_98F8828300D4"
measurementSystem="EAID_5CDB3F7E_0762_43c5_ABBD_F6F8B4685244"
realizes="EAID_5977632F_0313_4d51_82A4_E716D94C7D7D"/>

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<element xmi:type="logical:Measurement"
xmi:id="EAID_EFF46CEF_7F12_424c_B5CF_6DF0F0D67A09"
name="Longitudinal_Rotation_Degrees_Meas" description="Specifies the rotation about the
longitudinal axis (roll) measure as a angle with respect to the lateral axis as viewed
from the origin of the Local Vehicle Frame of Reference."
measurementAxis="EAID_9F6F8C29_7A0A_414c_A920_246C93235289"
measurementSystem="EAID_5044E59D_C305_465e_944E_4DA6187EF0DC"
realizes="EAID_5977632F_0313_4d51_82A4_E716D94C7D7D"/>
<element xmi:type="logical:Measurement"
xmi:id="EAID_644D6734_5BB4_461b_A37F_11DB3385BACA" name="Vertical_Rotation_Degrees_Meas"
description="Specifies the rotation about the vertical axis (yaw) measure as a angle with
respect to the longitudinal axis as viewed from the origin of the Local Vehicle Frame of
Reference." measurementAxis="EAID_BFC17479_9D79_4762_BCDB_CEB6B869A8FB"
measurementSystem="EAID_9F30D0CA_14E4_4d03_9B4B_6E859FE51594"
realizes="EAID_5977632F_0313_4d51_82A4_E716D94C7D7D"/>
<element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_B1CF8E91_53B6_4940_A3C5_98F8828300D4"
name="Lateral_Rotation_Degrees_MeasAxis" description="Pitch Axis (Lateral Axis) passes
through the plane from wingtip to wingtip. Pitch changes the vertical direction the
aircraft's nose is pointing." valueTypeUnit="EAID_C5AE86FF_FB90_4d95_A739_4025CA644CDF"
measurementSystemAxis="EAID_A4B9B253_9061_4f28_A8F7_89BFA86EE91A"
realizes="EAID_5977632F_0313_4d51_82A4_E716D94C7D7D">
<constraint xmi:type="logical:MeasurementConstraint"
xmi:id="EAID_83FE7B24_DB9C_4220_A419_4F326C52A5F7" constraintText="-180 <= value &lt;
180"/>
</element>
<element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_9F6F8C29_7A0A_414c_A920_246C93235289"
name="Longitudinal_Rotation_Degrees_MeasAxis" description="Roll Axis (Longitudinal Axis)
passes through the plane from nose to tail. Roll changes the orientation of the
aircraft's wings with respect to the downward force of gravity."
valueTypeUnit="EAID_C5AE86FF_FB90_4d95_A739_4025CA644CDF"
measurementSystemAxis="EAID_309DE716_2AA8_4eb3_A6EA_C0C37AA8CA84"
realizes="EAID_5977632F_0313_4d51_82A4_E716D94C7D7D">
<constraint xmi:type="logical:MeasurementConstraint"
xmi:id="EAID_FA20FFE7_2899_4717_B74F_4F0546D64D61" constraintText="-180 <= value &lt;
180"/>
</element>
<element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_BFC17479_9D79_4762_BCDB_CEB6B869A8FB"
name="Vertical_Rotation_Degrees_MeasAxis" description="Yaw Axis (Normal Axis) is the
vertical axis through an aircraft, Q,E rocket or similar body about which the body yaws."
valueTypeUnit="EAID_C5AE86FF_FB90_4d95_A739_4025CA644CDF"
measurementSystemAxis="EAID_1B9ED73D_796D_487c_85CC_15170C5E25E5"
realizes="EAID_5977632F_0313_4d51_82A4_E716D94C7D7D">
<constraint xmi:type="logical:MeasurementConstraint"
xmi:id="EAID_B43C1E49_38A4_4f74_B438_C8F42A70316F" constraintText="-180 <= value &lt;
180"/>
</element>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_E85CF7BF_F349_4e79_A032_1C5B9874F3F5" name="BodyAngleMeasurement">
<element xmi:type="logical:Measurement"
xmi:id="EAID_F34BA7FF_1BEF_41e1_B694_812BE1BFCD49" name="Lateral_Rotation_Meas"
description="Specifies the rotation about the latitudinal axis (pitch) measured as an
angle with respect to the vertical axis as viewed from the origin of the local vehicle
frame of reference." measurementAxis="EAID_A322E2DF_714C_45ae_AF5C_9D42179B6E83"
measurementSystem="EAID_5CDB3F7E_0762_43c5_ABBD_F6F8B4685244"
realizes="EAID_5977632F_0313_4d51_82A4_E716D94C7D7D"/>
<element xmi:type="logical:Measurement"
xmi:id="EAID_99BA0E0C_1417_4ff9_9B37_E18BD579FBF9" name="Longitudinal_Rotation_Meas"
description="Specifies the rotation about the longitudinal axis (roll) measure as a angle
with respect to the latitudinal axis as viewed from the origin of the Local Vehicle Frame
of Reference." measurementAxis="EAID_D5479935_C658_4188_AD63_965007CA6583"
measurementSystem="EAID_5044E59D_C305_465e_944E_4DA6187EF0DC"
realizes="EAID_5977632F_0313_4d51_82A4_E716D94C7D7D"/>
<element xmi:type="logical:Measurement"
xmi:id="EAID_94E1CAC3_2D40_40fd_9A11_3A8F53B0E484" name="Vertical_Rotation_Meas"
description="Specifies the rotation about the vertical axis (yaw) measure as a angle with
respect to the longitudinal axis as viewed from the origin of the Local Vehicle Frame of
Reference." measurementAxis="EAID_371B3270_F224_4dbc_B1E1_9482D3E91066"

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measurementSystem="EAID_9F30D0CA_14E4_4d03_9B4B_6E859FE51594"
realizes="EAID_5977632F_0313_4d51_82A4_E716D94C7D7D"/>
    <element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_A322E2DF_714C_45ae_AF5C_9D42179B6E83" name="Lateral_Rotation_MeasAxis"
description="Pitch Axis (Lateral Axis) passes through the plane from wingtip to wingtip.
Pitch changes the vertical direction the aircraft's nose is pointing."
measurementSystemAxis="EAID_A4B9B253_9061_4f28_A8F7_89BFA86EE91A"
realizes="EAID_5977632F_0313_4d51_82A4_E716D94C7D7D">
        <constraint xmi:type="logical:MeasurementConstraint"
xmi:id="EAID_FF4C0E70_6155_4dae_8A6E_3557D56AC874" constraintText="-Pi <= value &lt;
Pi"/>
    </element>
    <element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_D5479935_C658_4188_AD63_965007CA6583" name="Longitudinal_Rotation_MeasAxis"
description="Roll Axis (Longitudinal Axis) passes through the plane from nose to tail.
Roll changes the orientation of the aircraft's wings with respect to the downward force
of gravity." measurementSystemAxis="EAID_309DE716_2AA8_4eb3_A6EA_C0C37AA8CA84"
realizes="EAID_5977632F_0313_4d51_82A4_E716D94C7D7D">
        <constraint xmi:type="logical:MeasurementConstraint"
xmi:id="EAID_9F201858_916A_44b1_B1DA_8D8C3700A2E7" constraintText="-Pi <= value &lt;
Pi"/>
    </element>
    <element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_371B3270_F224_4dbc_B1E1_9482D3E91066" name="Vertical_Rotation_MeasAxis"
description="Yaw Axis (Normal Axis) is the vertical axis through an aircraft Q,E rocket
or similar body about which the body yaws."
measurementSystemAxis="EAID_1B9ED73D_796D_487c_85CC_15170C5E25E5"
realizes="EAID_5977632F_0313_4d51_82A4_E716D94C7D7D">
        <constraint xmi:type="logical:MeasurementConstraint"
xmi:id="EAID_724651ED_8E31_4fb3_9D5E_B74AB317EC4B" constraintText="-Pi <= value &lt;
Pi"/>
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</ldm>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_8B7A7415_09ED_466a_95DA_0D8D6CC83444" name="CountingMeasures">
    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_286F6050_A606_4fb0_B0FC_932A5F9549BF" name="Resolution">
        <element xmi:type="logical:Measurement"
xmi:id="EAID_5D28C028_8095_430f_8895_6F63883D7B63" name="Resolution_Distance_CM_Meas"
description="Single dimensional measurement of resolution."
measurementAxis="EAID_5AB4559C_2CA6_451a_BCE3_4452F18480C2"
measurementSystem="EAID_63B53D7F_65B9_4808_94CB_79D57291FFF1"
realizes="EAID_D6D476D1_7FDC_4375_B79B_785E5E9EBA3D"/>
            <element xmi:type="logical:Measurement"
xmi:id="EAID_3A0FDB20_5D89_4e8c_A4B3_FC7719F166BA" name="Resolution_Meas"
measurementAxis="EAID_99FB9D82_EA30_4b1e_AB91_811010E0A1E5
EAID_76F671A6_9D73_4c82_A243_5BF51576FBA0"
measurementSystem="EAID_4FE8838C_BDFB_4d71_BB05_B6665A4465B9"
realizes="EAID_D6D476D1_7FDC_4375_B79B_785E5E9EBA3D"/>
            <element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_99FB9D82_EA30_4b1e_AB91_811010E0A1E5" name="Horizontal_Resolution_MeasAxis"
measurementSystemAxis="EAID_68D640BD_4D6B_4d01_BE52_5CDF213BC3EB"
realizes="EAID_D6D476D1_7FDC_4375_B79B_785E5E9EBA3D"/>
            <element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_5AB4559C_2CA6_451a_BCE3_4452F18480C2" name="Distance_Resolution_CM_MeasAxis"
description="Single dimensional Measurement of resolution Q,E an indication of scale of
resolution." valueTypeUnit="EAID_48B35E80_41DF_45be_890D_92A511EE778E"
measurementSystemAxis="EAID_28497806_74F7_4473_A56D_C9978462C722"/>
            <element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_76F671A6_9D73_4c82_A243_5BF51576FBA0" name="Vertical_Resolution_MeasAxis"
measurementSystemAxis="EAID_ADF21458_AA79_4492_AB79_71DE58A8D6DE"
realizes="EAID_D6D476D1_7FDC_4375_B79B_785E5E9EBA3D"/>
        </ldm>
        <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_D60F2512_A1F0_4e57_A1E8_6AE444CF1B02" name="Count" description="Logical
model for the number of occurrences of a repeating event per unit time">
            <element xmi:type="logical:Measurement"
xmi:id="EAID_E627B572_0133_4045_AA2A_2244CB7F53F5" name="Count_Meas"
description="Measurement of event occurrences measured in Counts with non-negative
Integers" measurementAxis="EAID_CE66B9CB_E529_468a_A4F4_4FC5690CE902"

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measurementSystem="EAID_C47A17E6_C71A_476e_BE60_180AF8419F3F"
realizes="EAID_39CB7F84_FBC5_4861_BD11_FAC97574B2A2"/>
    <element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_CE66B9CB_E529_468a_A4F4_4FC5690CE902" name="Count_MeasAxis"
measurementSystemAxis="EAID_0BC3E999_77C6_4c63_AF7D_ABF70A593686"
realizes="EAID_39CB7F84_FBC5_4861_BD11_FAC97574B2A2"/>
    </ldm>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_A6B2FEB4_F4FF_4b7b_973C_1CB5F0BB5FB6" name="DensityMeasures">
    <element xmi:type="logical:Measurement"
xmi:id="EAID_069A0A6A_83E0_408f_9A38_D2A5CFAC0962" name="Density_Meas"
description="Measurement used to describe observable properties of density."
measurementAxis="EAID_57E6F76F_CAE2_4230_AFC1_CBC9C319C84E"
measurementSystem="EAID_824295E2_26C0_4f6b_AC04_AAD0D5331862"
realizes="EAID_4D9CB92E_1010_4fd8_9520_0184188C4374"/>
    <element xmi:type="logical:Measurement"
xmi:id="EAID_B983D025_1147_429e_A693_68357EA7B8D8" name="Relative_Humidity_Meas"
description="Measure of relative humidity."
measurementAxis="EAID_9D3B6233_550D_4b5e_95C2_E3A06AE6CA15"
measurementSystem="EAID_249E210D_69CB_4315_BCF4_0DD0B5EE9AF0"
realizes="EAID_29F6EF02_F3F2_4590_8A84_3F28FE25B16F"/>
    <element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_57E6F76F_CAE2_4230_AFC1_CBC9C319C84E" name="Density_MeasAxis"
measurementSystemAxis="EAID_EAFBC1AF_4737_43c5_842B_282D3FCEBF0D"
realizes="EAID_4D9CB92E_1010_4fd8_9520_0184188C4374"/>
    <element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_9D3B6233_550D_4b5e_95C2_E3A06AE6CA15" name="Relative_Humidity_MeasAxis"
measurementSystemAxis="EAID_95FFC181_60A9_41cf_9486_008968CEDD17"
realizes="EAID_29F6EF02_F3F2_4590_8A84_3F28FE25B16F"/>
    <constraint xmi:type="logical:MeasurementConstraint"
xmi:id="EAID_316ED692_652D_4082_AAB4_294CD0350A62" constraintText="Values are constrained
to the range of 0 to 100%."/>
</element>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_849E8A14_5414_4e08_9CFB_A19CF061BBA6" name="ElectricityMeasures">
    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_2FOBAF61_326D_4c89_968F_9B4598739E75" name="ElectricCapacitance"
description="Root package for Electric capacitance measure">
        <element xmi:type="logical:Measurement"
xmi:id="EAID_E96F42F8_30BD_443f_BB26_0E186EE6E4F1" name="Electric_Capacitance_Meas"
description="The measurement to describe a body's ability to store an electrical charge."
measurementAxis="EAID_DF3ED095_E9A6_4372_AF6B_1E95C547D029"
measurementSystem="EAID_5EB6B860_4679_41b4_AB31_F06F93C6F5E3"
realizes="EAID_FFF9F507_6448_48bd_B548_5B85F4057903"/>
        <element xmi:type="logical:Measurement"
xmi:id="EAID_F20BBE62_4A3E_4237_B10B_62696C8034F7"
name="Electric_Capacitance_MicroFarads_Meas" description="The measurement to describe a
body's ability to store an electrical charge."
measurementAxis="EAID_37C9B33F_D967_4ee4_8DF4_29C3A93114CB"
measurementSystem="EAID_5EB6B860_4679_41b4_AB31_F06F93C6F5E3"
realizes="EAID_FFF9F507_6448_48bd_B548_5B85F4057903"/>
        <element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_DF3ED095_E9A6_4372_AF6B_1E95C547D029" name="Electric_Capacitance_MeasAxis"
measurementSystemAxis="EAID_4F1DFAAF_75EF_460f_B55F_D3876B433EFA"
realizes="EAID_FFF9F507_6448_48bd_B548_5B85F4057903">
            <constraint xmi:type="logical:MeasurementConstraint"
xmi:id="EAID_E9A0F554_2BFC_4e45_A7EF_BFECDE6796B4" constraintText="Always >= 0"/>
        </element>
        <element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_37C9B33F_D967_4ee4_8DF4_29C3A93114CB"
name="Electric_Capacitance_MicroFarads_MeasAxis"
measurementSystemAxis="EAID_4F1DFAAF_75EF_460f_B55F_D3876B433EFA"
realizes="EAID_FFF9F507_6448_48bd_B548_5B85F4057903">
            <constraint xmi:type="logical:MeasurementConstraint"
xmi:id="EAID_6547DB5A_FA45_4e86_83E2_84DFAA7E3289" constraintText="Always >= 0"/>
        </element>
    </ldm>

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<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_9AA6CDE5_4DDE_4e2a_8A65_B28A159A7A85" name="ElectricCharge"
description="Root package for Electric Charge measure">
    <element xmi:type="logical:Measurement"
xmi:id="EAID_B48F7C3A_377D_4969_A199_C77B8B11BBCA" name="Electric_Charge_AmpHour_Meas"
description="The physical property of matter that causes it to experience a force when close to other electrically charged matter; the charge is either positive: having more protons than electrons or negative: having more electrons than protons."
measurementAxis="EAID_BE0B46F9_1387_40b3_86E4_3AFB6476CBFD"
measurementSystem="EAID_3B0BCA26_22AB_4c9e_9047_D9107BD68377"
realizes="EAID_0B869DF6_099A_4526_95F5_4BFC7393718E"/>
    <element xmi:type="logical:Measurement"
xmi:id="EAID_2BA7BCEA_FA7F_48dc_BEEF_B83BA9D7F83C" name="Electric_Charge_Meas"
description="The physical property of matter that causes it to experience a force when close to other electrically charged matter; the charge is either positive: having more protons than electrons or negative: having more electrons than protons."
measurementAxis="EAID_5BD43CDE_4522_40cf_8AE6_C65552E0BCF9"
measurementSystem="EAID_3B0BCA26_22AB_4c9e_9047_D9107BD68377"
realizes="EAID_0B869DF6_099A_4526_95F5_4BFC7393718E"/>
    <element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_BE0B46F9_1387_40b3_86E4_3AFB6476CBFD"
name="Electric_Charge_AmpHour_MeasAxis"
valueTypeUnit="EAID_B1320CCC_42D6_40f1_ADFE_41BD8B26E069"
measurementSystemAxis="EAID_8D1D2442_0110_4250_BA82_97688EC62F37"
realizes="EAID_0B869DF6_099A_4526_95F5_4BFC7393718E"/>
    <element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_5BD43CDE_4522_40cf_8AE6_C65552E0BCF9" name="Electric_Charge_MeasAxis"
measurementSystemAxis="EAID_8D1D2442_0110_4250_BA82_97688EC62F37"
realizes="EAID_0B869DF6_099A_4526_95F5_4BFC7393718E"/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_2609AE41_3C23_4ec1_85CC_9BFDD255D721" name="ElectricChargeDensity"
description="Root package for Electric Charge Density measure">
    <element xmi:type="logical:Measurement"
xmi:id="EAID_371CC632_0DD9_41c2_8C37_8F47FA133E97"
name="Electric_Charge_Density_Linear_Meas" description="The measurement to describe the linear charge density as the amount of electric charge per unit length Q,E"
measurementAxis="EAID_CAD9C421_B858_4b9e ACA9_76BD811632ED"
measurementSystem="EAID_61840EFB_6722_437e_8E66_BF5B091BA1BA"
realizes="EAID_CAE607F9_8F99_4a23_854E_8B8536720799"/>
    <element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_CAD9C421_B858_4b9e ACA9_76BD811632ED"
name="Electric_Charge_Density_Linear_MeasAxis"
measurementSystemAxis="EAID_B383AED6_CE79_452a_83B5_3D3452624D24"
realizes="EAID_CAE607F9_8F99_4a23_854E_8B8536720799"/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_5C6DCB9B_9DEF_4ca7_AE1B_912C5ADD7AE5" name="ElectricCurrent"
description="Root package for electric current measure">
    <element xmi:type="logical:Measurement"
xmi:id="EAID_AB24DC3_5528_4clf_9B20_FB1962FA03F1" name="Electric_Current_Meas"
description="An electric current is a flow of electric charge when there is voltage present across a conductor." measurementAxis="EAID_AFAA7020_957F_4f96_A42A_DBFF475E676A"
measurementSystem="EAID_0BBECB23_57B7_42d6_B9FD_4D5DC34E99B8"
realizes="EAID_35DDCEBF_B184_4159_B5C4_932587A840B5"/>
    <element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_AFAA7020_957F_4f96_A42A_DBFF475E676A" name="Electric_Current_MeasAxis"
measurementSystemAxis="EAID_50C42368_AC6D_49d2_8BE4_652F6B4AD446"
realizes="EAID_35DDCEBF_B184_4159_B5C4_932587A840B5"/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_79AE1F63_682D_4261_98AB_511DBF2340C5" name="ElectricCurrentDensity"
description="Root package for Electric Current Density measure">
    <element xmi:type="logical:Measurement"
xmi:id="EAID_19A4B23D_A61C_4b1c_BA8F_3B4C13DB6336" name="Electric_Current_Density_Meas"
description="The measurement to describe the concept of electric current density as used to express the electric current per unit area of cross section."
measurementAxis="EAID_E9B727B7_C445_4a62_A301_DBB60EE73708
EAID_0873478C_D0CA_4585_8105_01F380080FFC EAID_BBDD89B1_3F23_486c_9B62_6B737E1C82CE"
measurementSystem="EAID_9353FDBC_EFFD_4501_BDE0_71B036A925B8"
realizes="EAID_60A46947_91C7_4bc7_A74D_1DE2137E5CC5"/>

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<element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_E9B727B7_C445_4a62_A301_DBB60EE73708"
name="Electric_Current_Density_X_MeasAxis"
measurementSystemAxis="EAID_6146F258_1614_44a4_92C3_D40E23FF89B9"
realizes="EAID_60A46947_91C7_4bc7_A74D_1DE2137E5CC5"/>
<element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_0873478C_D0CA_4585_8105_01F380080FFC"
name="Electric_Current_Density_Y_MeasAxis"
measurementSystemAxis="EAID_5489D8EA_46AC_4632_8A58_B90539C4B59D"
realizes="EAID_60A46947_91C7_4bc7_A74D_1DE2137E5CC5"/>
<element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_3BDD89B1_3F23_486c_9B62_6B737E1C82CE"
name="Electric_Current_Density_Z_MeasAxis"
measurementSystemAxis="EAID_E044265D_45C5_4ed4_8A99_C51C425DF2F9"
realizes="EAID_60A46947_91C7_4bc7_A74D_1DE2137E5CC5"/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_6DDBAB7E_514D_44a4_BC55_052F36901686" name="ElectricPotential"
description="Root package for Electric Potential measure">
<element xmi:type="logical:Measurement"
xmi:id="EAID_A6729EA2_89C1_47c8_A7CC_936E67DC2289" name="Electric_Potential_Meas"
description="The measurement to describe the concept of electric potential as used to
express the effect of an electric field of a source in terms of the location within the
electric field." measurementAxis="EAID_1078A57E_70F5_46a7_AEAC_574A46A5B0CA"
measurementSystem="EAID_6FE2873F_6DC7_416e_B5B4_C25387FF0D58"
realizes="EAID_FD27C3E6_3A30_45b8_B836_91CD599BD168"/>
<element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_1078A57E_70F5_46a7_AEAC_574A46A5B0CA" name="Electric_Potential_MeasAxis"
measurementSystemAxis="EAID_387376D6_BB43_44ac_9375_40F79A2E3641"
realizes="EAID_FD27C3E6_3A30_45b8_B836_91CD599BD168"/>
</ldm>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_E26B9376_676D_49b1_9B1D_53C60D15AB0B" name="EnergyMeasures">
<element xmi:type="logical:Measurement"
xmi:id="EAID_8235F89B_570F_44f3_8727_450838068E4E" name="Absorbed_Dose_Meas"
description="Measurement for absorbed doses of energy."
measurementAxis="EAID_D31D0AEB_C79B_459e_A73E_64936C46B1B0"
measurementSystem="EAID_B590A760_ABD9_4fce_AB3E_FC4F371B75D5"
realizes="EAID_AFCB75C7_863B_4112_8F1E_2FB4FE1D4D2A"/>
<element xmi:type="logical:Measurement"
xmi:id="EAID_D239BB0A_61E9_4d73_B220_267948315A3B" name="Absorbed_Dose_Rate_Meas"
description="Measurement for absorbed dose rates of energy."
measurementAxis="EAID_FA7A6735_EC09_41b6_8827_23E614353067"
measurementSystem="EAID_480C3917_A3B2_485d_BE04_C95A1B7ACA62"
realizes="EAID_EEED99B8_359B_41bf_B6B0_2BA8EC5E1B07"/>
<element xmi:type="logical:Measurement"
xmi:id="EAID_6C9FA1B6_8028_4e37_B5C2_DA1F53AE15B1" name="Equivalent_Dose_Meas"
description="Measurement of dose equivalence."
measurementAxis="EAID_B65BC791_44F7_4bf8_BC40_F903D9667248"
measurementSystem="EAID_B4E8E367_B3E2_40d8_ABED_E1C8BE743AA2"
realizes="EAID_29F32E46_EDB2_472d_80CA_7B91F8275889"/>
<element xmi:type="logical:Measurement"
xmi:id="EAID_EE720C4B_87E1_4002_849B_B49DB991A0AB" name="Energy_Meas"
description="Measurement for energy."
measurementAxis="EAID_CFD06888_1695_41c6_9409_2C79101B0BD1"
measurementSystem="EAID_35B208F2_17F0_4a5e_B767_DC3DA3ADFF87"
realizes="EAID_32D02294_1A54_48ee_AA9D_2EA0EDBC4B76"/>
<element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_D31D0AEB_C79B_459e_A73E_64936C46B1B0" name="Absorbed_Dose_MeasAxis"
measurementSystemAxis="EAID_48DD6F0C_0129_4d4a_B28C_90CE92C8B6E3"
realizes="EAID_AFCB75C7_863B_4112_8F1E_2FB4FE1D4D2A"/>
<element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_FA7A6735_EC09_41b6_8827_23E614353067" name="Absorbed_Dose_Rate_MeasAxis"
measurementSystemAxis="EAID_2061E509_E576_4a46_9159_FE533C475099"
realizes="EAID_EEED99B8_359B_41bf_B6B0_2BA8EC5E1B07"/>
<element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_B65BC791_44F7_4bf8_BC40_F903D9667248" name="Equivalent_Dose_MeasAxis"
measurementSystemAxis="EAID_BB03831D_9E78_4a66_82E2_40B4EB76F437"
realizes="EAID_29F32E46_EDB2_472d_80CA_7B91F8275889"/>

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<element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_CFD06888_1695_41c6_9409_2C79101B0BD1" name="Energy_MeasAxis"
measurementSystemAxis="EAID_02569D51_133C_46a1_B2B6_87A5DB877565"
realizes="EAID_32D02294_1A54_48ee_AA9D_2EA0EDBC4B76"/>
    </ldm>
    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_F2EDB867_9489_4262_BE19_4EDAC30BD4DB" name="ForceMeasures">
        <element xmi:type="logical:Measurement"
xmi:id="EAID_7B96051A_6A05_471b_BFC8_24B5DE1DE4E2" name="Force_Meas"
description="Measurement used to describe observable properties of force."
measurementAxis="EAID_D1CC7A3B_B4CE_4843_9413_FF9C7825A18D"
measurementSystem="EAID_1811EA5E_350D_45ca_9BE1_1E9D148DB99F"
realizes="EAID_B4FA8AFA_1FC5_4cc3_8E95_1956D00176DC"/>
            <element xmi:type="logical:Measurement"
xmi:id="EAID_0306815A_D122_4fa8_9C28_68ECDF99374F" name="Torque_Meas"
description="Measurement used to describe observable properties of torque"
measurementAxis="EAID_64EE472A_5E96_4dc7_B324_7B553E69BD99"
measurementSystem="EAID_A7098479_C56F_4dae_B04A_092FA4562F75"
realizes="EAID_69A1D868_1DE4_4fce_9C0B_7A47AB1FC46B"/>
                <element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_D1CC7A3B_B4CE_4843_9413_FF9C7825A18D" name="Force_MeasAxis"
measurementSystemAxis="EAID_763EF3D5_B7E4_4c88_88A6_5843A9D2A1FF"
realizes="EAID_B4FA8AFA_1FC5_4cc3_8E95_1956D00176DC"/>
                    <element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_64EE472A_5E96_4dc7_B324_7B553E69BD99" name="Torque_MeasAxis"
measurementSystemAxis="EAID_B2CA99C4_C812_4ecf_AE6E_BA15A40467E3"
realizes="EAID_69A1D868_1DE4_4fce_9C0B_7A47AB1FC46B"/>
                </ldm>
                <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_C83D14DB_1EF5_4bc1_87FA_DD3DAA43AE9E" name="IdentifierMeasures">
                    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_C3CC2106_FD0D_4caa_BE0B_66E1E48D167D" name="KindMeasures">
                        <element xmi:type="logical:Measurement"
xmi:id="EAID_7CF67564_C8A6_4662_9863_95B86AF625B4" name="Kind_Unbounded_Integer_Meas"
description="A measurement for a Kind identifier that use integers and are not directly governed by an organization or standard"
measurementAxis="EAID_FEC9B888_AE21_4bd6_B60A_7D82E8C22221"
measurementSystem="EAID_C47A17E6_C71A_476e_BE60_180AF8419F3F"
realizes="EAID_83B70E53_9E0D_4223_8D53_C07C30BD5CB3"/>
                        <element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_FEC9B888_AE21_4bd6_B60A_7D82E8C22221" name="Kind_Unbounded_Integer_MeasAxis"
description="An instance of the CountMeasurementSystemAxis with a uniqueness constraint."
measurementSystemAxis="EAID_0BC3E999_77C6_4c63_AF7D_ABF70A593686"
realizes="EAID_83B70E53_9E0D_4223_8D53_C07C30BD5CB3">
                            <constraint xmi:type="logical:MeasurementConstraint"
xmi:id="EAID_4D7C8466_A115_47f2_B860_0F08C2A9DF3D" constraintText="IsUnique"/>
                        </element>
                    </ldm>
                    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_C6D7E317_0882_4fc6_82CA_53AF7215D0EC" name="AddressMeasures">
                        <element xmi:type="logical:Measurement"
xmi:id="EAID_6BFAA031_458C_453a_97FA_A7EA8550B038" name="Address_IPv4_Meas"
description="IPv4 address expressed as an integer."
measurementAxis="EAID_219AD120_18A1_4f20_B517_B1DC14B4C002"
measurementSystem="EAID_7C841E32_654D_4db3_B4AC_52C6894EE330"
realizes="EAID_8AE4B471_6AD8_473b_A6B8_5FA79179F21A"/>
                        <element xmi:type="logical:Measurement"
xmi:id="EAID_B2C6897C_F51E_447e_9D8E_08E61A2313C3" name="Address_IPv6_Meas"
description="IPv6 address expressed as an integer."
measurementAxis="EAID_000FD3FA_ECF8_4d36_9082_A8A8FB5A0F51"
measurementSystem="EAID_C47BC771_08A1_4345_817E_B426E91997B8"
realizes="EAID_8AE4B471_6AD8_473b_A6B8_5FA79179F21A"/>
                        <element xmi:type="logical:Measurement"
xmi:id="EAID_576D1106_0E2D_4463_931E_66AF21A6CE35" name="Address_URI_Meas" description="A Uniform Resource Identifier (URI) is a string of ASCII characters used to identify a resource."
measurementAxis="EAID_4D165FF7_700A_458a_B835_1CE9E24EEE0B"
measurementSystem="EAID_4194D126_7036_415a_95F7_41B9A690F68C"
realizes="EAID_8AE4B471_6AD8_473b_A6B8_5FA79179F21A"/>
                        <element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_219AD120_18A1_4f20_B517_B1DC14B4C002" name="Address_IPv4_MeasAxis"
description="Set of integers for IPv4 address expressed as an integer."/>

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measurementSystemAxis="EAID_E955A716_98F4_4b0a_AD6E_58FC647EECBA"
realizes="EAID_8AE4B471_6AD8_473b_A6B8_5FA79179F21A"/>
    <element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_000FD3FA_ECF8_4d36_9082_A8A8FB5A0F51" name="Address_IPv6_MeasAxis"
description="Set of integers for IPv6 address expressed as an integer."
measurementSystemAxis="EAID_E955A716_98F4_4b0a_AD6E_58FC647EECBA"
realizes="EAID_8AE4B471_6AD8_473b_A6B8_5FA79179F21A"/>
    <element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_4D165FF7_700A_458a_B835_1CE9E24EEE0B" name="Address_URI_MeasAxis"
description="Axis of ASCII character sets for a Uniform Resource Identifier (URI) used to
identify a resource" measurementSystemAxis="EAID_026BA44E_881C_43ba_8CAB_A64F9D060456"
realizes="EAID_8AE4B471_6AD8_473b_A6B8_5FA79179F21A"/>
    </ldm>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_55B3FB0E_A77A_413a_8B8C_FEFA7AF455D8" name="IlluminanceMeasures">
    <element xmi:type="logical:Measurement"
xmi:id="EAID_C8E57B11_DD7B_445c_9000_3582226352A8" name="Illuminance_Meas"
description="Measurement of illuminance."
measurementAxis="EAID_2BD3908C_B758_4918_B282_12BE909F737A"
measurementSystem="EAID_E3FD4AE5_1A21_48b3_9ACF_777A59094757"
realizes="EAID_F07E3618_8CE7_4422_9D21_C8FBB9D77794"/>
    <element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_2BD3908C_B758_4918_B282_12BE909F737A" name="Illuminance_MeasAxis"
measurementSystemAxis="EAID_E26914E4_539B_42b8_B009_473AF3E4A2B2"
realizes="EAID_F07E3618_8CE7_4422_9D21_C8FBB9D77794">
        <constraint xmi:type="logical:MeasurementConstraint"
xmi:id="EAID_9C70827F_45C2_4fb5_AC8_E34A08518058" constraintText="Always >= 0"/>
    </element>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_45B09A4F_264A_412d_A307_58F430F2950C" name="InformationElementMeasures">
    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_FA430EBC_197D_4d57_A6C5_A42F743978B6" name="TextMeasurement">
        <element xmi:type="logical:Measurement"
xmi:id="EAID_6AB00B4C_3201_4a5e_B0CC_A52DDF2F4571" name="Description_Meas"
description="Measurement representing a Description as a single element"
measurementAxis="EAID_19947789_47A4_4add_A517_DF904813B923"
measurementSystem="EAID_3328F5AF_7CAE_4149_A03E_EB78F6653396"
realizes="EAID_137FD219_342E_47be_A785_7324D2954BAB"/>
        <element xmi:type="logical:Measurement"
xmi:id="EAID_29A7DF39_BC02_4cf3_8899_D586B7220C67" name="Name_Meas"
description="Measurement for representing a name."
measurementAxis="EAID_C1593D3F_5E10_4f8e_8DB3_E6D374FA42E3"
measurementSystem="EAID_3328F5AF_7CAE_4149_A03E_EB78F6653396"
realizes="EAID_B14C698C_13F8_434c_9D67_54CF514CA74E"/>
        <element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_19947789_47A4_4add_A517_DF904813B923" name="Description_MeasAxis"
measurementSystemAxis="EAID_53E5C75D_0FAB_4090_9AB4_763E7AEF327C"
realizes="EAID_137FD219_342E_47be_A785_7324D2954BAB"/>
        <element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_C1593D3F_5E10_4f8e_8DB3_E6D374FA42E3" name="Name_MeasAxis"
measurementSystemAxis="EAID_53E5C75D_0FAB_4090_9AB4_763E7AEF327C"
realizes="EAID_B14C698C_13F8_434c_9D67_54CF514CA74E"/>
        <element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_D64E0352_022A_4eeb_B9FD_BD7E6BDAD940" name="Name_Text_MeasAxis"
description="The primary name axis."
measurementSystemAxis="EAID_53E5C75D_0FAB_4090_9AB4_763E7AEF327C"
realizes="EAID_B14C698C_13F8_434c_9D67_54CF514CA74E"/>
    </ldm>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_67A5C16C_9418_41af_B588_2D7F0FDCF8ED" name="LengthMeasures">
    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_642F751C_E910_46ec_9EA5_066FF96764C1" name="DistanceMeasure">
        <element xmi:type="logical:Measurement"
xmi:id="EAID_8AA5E3A8_094B_4a89_A0CE_5E652A534005" name="Distance_Meas"
description="Measurement for distance"
measurementAxis="EAID_418E7BCF_83F3_4c3c_B7C9_ACA0796FB814"
measurementSystem="EAID_63B53D7F_65B9_4808_94CB_79D57291FFF1"
realizes="EAID_80D92BE8_8DFO_4f7c_82A6_CBF5DF17443A"/>

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<element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_418E7BCF_83F3_4c3c_B7C9_ACA0796FB814" name="Distance_MeasAxis"
measurementSystemAxis="EAID_28497806_74F7_4473_A56D_C9978462C722"
realizes="EAID_80D92BE8_8DF0_4f7c_82A6_CBF5DF17443A"/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_6F44EB0A_D348_4d67_A98B_4943DE4C339B" name="ExtentMeasures">
<element xmi:type="logical:Measurement"
xmi:id="EAID_9F6CBA03_9585_4e44_A3F2_4AB40FE76C7D" name="Extent_Meas" description="Length
dimension of the extent."
measurementAxis="EAID_025B2FE1_E76C_4b77_ABF9_8475DD97BCE5
EAID_E145CFA5_FCBB_4d8e_B452_DA9F6D17F2CF"
measurementSystem="EAID_CA5FF699_AFF6_41b4_A05F_9FB0BF2BA8"
realizes="EAID_0C0725EB_2FB1_46d2_A11A_716E6D6299E3"/>
<element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_025B2FE1_E76C_4b77_ABF9_8475DD97BCE5" name="Length_Extent_Meas"
measurementSystemAxis="EAID_9670FC89_77BA_435e_8566_E620BCF11743"
realizes="EAID_0C0725EB_2FB1_46d2_A11A_716E6D6299E3"/>
<element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_E145CFA5_FCBB_4d8e_B452_DA9F6D17F2CF" name="Width_Extent_Meas"
measurementSystemAxis="EAID_A7E348A5_3B56_4b27_BCD5CCD3E178C10"
realizes="EAID_0C0725EB_2FB1_46d2_A11A_716E6D6299E3"/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_E789B9AA_560D_437c_A519_E00704438780" name="LocalAir" description="Length
measurements based on the Local Air Reference Frame."/>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_47FB3278_127F_4372_90C5_026806D81CA2" name="LocalBody" description="Length
measurements based on the Local Body Reference Frame."/>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_C3B69079_5BCD_414b_AF59_DB18386970DE" name="LocalGround" description="Length
measurements based on the Local Ground Reference Frame."/>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_D2CEC778_6599_40a5_B974_E45C3FAD538B" name="LocalHorizontal"
description="Length measurements based on the Local Horizontal Reference Frame."/>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_4A531006_8DAE_4373_9413_FAA3AEDC7186" name="LocalNorthEastDown"
description="Length measurements based on the Local North East Down Reference Frame."/>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_A5691424_7631_47f7_85BE_0761869349F7" name="LocalVehicle"
description="Length measurements based on the Local Vehicle Reference Frame."/>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_BC6E8DBF_BC82_4eee_B57D_628DFD2E97DD" name="MeanSeaLevel"
description="Length measurements based on the Mean Sea Level Reference Frame."/>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_D6B2314B_B07A_4d2a_89CE_3F39060A3534" name="WGS84" description="Length
measurements based on the WGS-84 Reference Frame."/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_D2B4934D_072A_4582_8210_0E84B8CC846C" name="LuminousIntensityMeasures">
<element xmi:type="logical:Measurement"
xmi:id="EAID_8156220D_353F_4be1_95A6_FA2553A6F3DD" name="Luminous_Intensity_Meas"
description="Measurement of wavelength weighted power (as perceived by human eyes)
emitted by a light source per unit solid angle. "
measurementAxis="EAID_F322AA41_26F6_4dd1_A3C9_1CF2B763BFBA"
measurementSystem="EAID_76A044C2_309B_4032_9FD0_493AEA64E632"
realizes="EAID_8B463517_0982_4cd0_884D_DD91D17AC345"/>
<element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_F322AA41_26F6_4dd1_A3C9_1CF2B763BFBA" name="Luminous_Intensity_MeasAxis"
measurementSystemAxis="EAID_C186715F_C942_416c_A08C_EF95261E82E7"
realizes="EAID_8B463517_0982_4cd0_884D_DD91D17AC345"/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_52DEC862_E1FD_49a3_B8B4_086A76599A52" name="MassMeasures">
<element xmi:type="logical:Measurement"
xmi:id="EAID_AB8973A2_514B_4406_85DE_695868C93C82" name="Mass_Meas" description="The mass
measurement of an object determines its acceleration in the presence of an applied
force." measurementAxis="EAID_536925C8_E755_404d_B1DB_F180A081DA83"
measurementSystem="EAID_E10C27FD_D46D_48f8_4D45_1B1B7BAFBBB"
realizes="EAID_5D0D98B4_F3C5_4131 ACA9_A6CBCD8E8F6B"/>

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<element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_536925C8_E755_404d_B1DB_F180A081DA83" name="Mass_MeasAxis"
measurementSystemAxis="EAID_1B100E6A_9C51_4e2a_A9A7_0DD7B2772F94"
realizes="EAID_5D0D98B4_F3C5_4131 ACA9_A6CBCDDE8F6B">
    <constraint xmi:type="logical:MeasurementConstraint"
xmi:id="EAID_CEAA196F_C931_4dc9_8C92_CA8AD1D17A1C" constraintText="Always >= 0"/>
</element>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_8D89E667_43D0_40bd_9175_D2444B83B96E" name="OrientationMeasures">
    <element xmi:type="logical:Measurement"
xmi:id="EAID_32343311_9367_40b3_A405_B376A9FAEA05" name="Body_Frame_Roll_Meas"
description="Angle measurement with respect to the local vehicle longitudinal axis (x axis)" measurementAxis="EAID_C3BAB08D_406E_4267_B08C_E97972CB018C"
measurementSystem="EAID_5044E59D_C305_465e_944E_4DA6187EF0DC"
realizes="EAID_AB3FAE18_6F92_4a74_812F_77AF2DCD6F6F"/>
    <element xmi:type="logical:Measurement"
xmi:id="EAID_1535D3FF_B708_4d83_A8B1_17E045D27F89" name="Body_Frame_Pitch_Meas"
description="Angle measurement with respect to the local vehicle lateral axis (y axis)" measurementAxis="EAID_D2CAC852_73A3_4aec_9790_9640043C825C"
measurementSystem="EAID_5CDB3F7E_0762_43c5_ABBD_F6F8B4685244"
realizes="EAID_AB3FAE18_6F92_4a74_812F_77AF2DCD6F6F"/>
    <element xmi:type="logical:Measurement"
xmi:id="EAID_B843A564_CFC9_4f76_BC55_6AF5BAD6356" name="Body_Frame_Yaw_Meas"
description="Angle measurement with respect to the local vehicle vertical axis (z axis)" measurementAxis="EAID_821137A0_2FF0_4ad2_8E68_8EC50128AD03"
measurementSystem="EAID_9F30D0CA_14E4_4d03_9B4B_6E859FE51594"
realizes="EAID_AB3FAE18_6F92_4a74_812F_77AF2DCD6F6F"/>
    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_43008F72_D8DD_4a6b_B144_767CEE45E6F1" name="CenterOfGravity"
description="Orientation measurements based on the Center of Gravity Reference Frame."/>
    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_CDBB94DC_6048_422d_BD41_62B7DB15BA49" name="LocalVehicle"
description="Orientation measurements based on the Local Vehicle Reference Frame."/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_A02E9E72_52C6_4ebb_A39E_D9FBF4C98149" name="PositionMeasures">
    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_A8094015_98E2_4ffe_AA60_5ED65E11EAED" name="ECEFPosition">
        <element xmi:type="logical:Measurement" xmi:id="HIqhDQEExEeSj3_IywtjKpA"
name="Position_ECEF_Meas" description="Describes a position in the ECEF measurement system." measurementAxis="HIqhDwExEeSj3_IywtjKpA_HIqhEQExEeSj3_IywtjKpA_HIqhEwExEeSj3_IywtjKpA" measurementSystem="HIqhBAExEeSj3_IywtjKpA"
realizes="EAID_7CA3D9F9_0614_4f82_A971_D2367427403F"/>
        <element xmi:type="logical:MeasurementAxis" xmi:id="HIqhDwExEeSj3_IywtjKpA"
name="Position_ECEF_X_MeasAxis" description="ECEF X axis." measurementSystemAxis="HIqhCAExEeSj3_IywtjKpA"
realizes="EAID_80D92BE8_8DF0_4f7c_82A6_CBF5DF17443A"/>
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realizes="EAID_80D92BE8_8DF0_4f7c_82A6_CBF5DF17443A"/>
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name="Position_ECEF_Z_MeasAxis" description="ECEF Z axis." measurementSystemAxis="HIqhDAExEeSj3_IywtjKpA"
realizes="EAID_80D92BE8_8DF0_4f7c_82A6_CBF5DF17443A"/>
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name="Position_WGS84_AGL_Altitude_Meas" description="An Altitude in the WGS84 Frame of reference Q,E expressed as Above Ground Level (AGL)."
measurementAxis="vZiY4Ag5EeSFspy8Kj3F4Q"
measurementSystem="EAID_D0F8D635_52DE_41f7_B5FE_7D2C306E433A"
realizes="EAID_7CA3D9F9_0614_4f82_A971_D2367427403F"/>
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xmi:id="EAID_095E09BF_7709_4d03_9E48_8F6DB49E8006" name="Position_WGS84_AGL_Degrees_Meas"
description="Describes a location relative to the WGS-84 frame of reference Q,E with altitude given as Above Ground Level (AGL)." measurementAxis="vZiY4Ag5EeSFspy8Kj3F4Q_vZiY4wg5EeSFspy8Kj3F4Q_vZiY5Ag5EeSFspy8Kj3F4Q"

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measurementSystem="EAID_1E91B8FE_6451_4dcd_9BFD_601AA7DBDF1F"
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description="A Measurement for the latitude measurement in a WGS84 Frame of Reference
Q,E" measurementAxis="EAID_6F7100B2_A9CC_44fc_B090_EC07CC501491"
measurementSystem="EAID_B57661A8_A2F9_4363_BDDE_F730CA91221F"
realizes="EAID_7CA3D9F9_0614_4f82_A971_D2367427403F"/>
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name="Position_WGS84_MSL_Altitude_Meas" description="An Altitude in the WGS84 Frame of
reference Q,E expressed as Above Mean Sea Level (MSL)."
measurementAxis="_vZiY4Ag5EeSFspy8Kj3F4Q"
measurementSystem="EAID_74FB7368_A05A_4b14_92F8_1A2FE66F073C"
realizes="EAID_7CA3D9F9_0614_4f82_A971_D2367427403F"/>
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description="A Measurement for the longitude measurement in a WGS84 Frame of Reference
Q,E " measurementAxis="EAID_8F8F4F5C_B7A4_4971_B33A_62F7F6BFA505"
measurementSystem="EAID_20426BB1_88F4_4862_94D1_E45BC487D266"
realizes="EAID_7CA3D9F9_0614_4f82_A971_D2367427403F"/>
    <element xmi:type="logical:Measurement"
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description="Describes a location relative to the WGS-84 frame of reference Q,E with
altitude given as Above Mean Sea Level (MSL)." measurementAxis="_vZiY4Ag5EeSFspy8Kj3F4Q
_vZiY4wg5EeSFspy8Kj3F4Q _vZiY5Ag5EeSFspy8Kj3F4Q"
measurementSystem="EAID_9C714858_8B94_42ff_B7AF_4952323C24C0"
realizes="EAID_7CA3D9F9_0614_4f82_A971_D2367427403F"/>
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name="Position_WGS84_EarthSurface_Degrees_Meas" description="A WGS84 position on the
surface of the ellipsoid (GPS altitude)." measurementAxis="_vZiY4wg5EeSFspy8Kj3F4Q
_vZiY5Ag5EeSFspy8Kj3F4Q" measurementSystem="EAID_CA32646B_15B3_4c77_936B_1728D0FA521B"
realizes="EAID_7CA3D9F9_0614_4f82_A971_D2367427403F"/>
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name="Position_WGS84_Meas" description="Describes a location relative to the WGS-84 frame
of reference." measurementAxis="_vZiY4Ag5EeSFspy8Kj3F4Q _vZiY4wg5EeSFspy8Kj3F4Q
_vZiY5Ag5EeSFspy8Kj3F4Q" measurementSystem="_vZiY2Ag5EeSFspy8Kj3F4Q"
realizes="EAID_7CA3D9F9_0614_4f82_A971_D2367427403F"/>
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name="Position_WGS84_Altitude_Degrees_Meas" description="An Altitude in the WGS84 Frame
of reference" measurementAxis="_vZiY4Ag5EeSFspy8Kj3F4Q"
measurementSystem="EAID_69892068_4206_47ae_9DA3_60A9A0144C3F"
realizes="EAID_7CA3D9F9_0614_4f82_A971_D2367427403F"/>
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xmi:id="EAID_B0970C53_7369_4bbf_B7F0_B53ECCE42C43"
name="Position_WGS84_Latitude_Degrees_Meas" description="A latitude in the WGS84 Frame of
reference" measurementAxis="_vZiY4wg5EeSFspy8Kj3F4Q"
measurementSystem="EAID_B57661A8_A2F9_4363_BDDE_F730CA91221F"
realizes="EAID_7CA3D9F9_0614_4f82_A971_D2367427403F"/>
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name="Position_WGS84_Longitude_Degrees_Meas" description="A longitude in the WGS84 Frame
of reference" measurementAxis="_vZiY5Ag5EeSFspy8Kj3F4Q"
measurementSystem="EAID_20426BB1_88F4_4862_94D1_E45BC487D266"
realizes="EAID_7CA3D9F9_0614_4f82_A971_D2367427403F"/>
    <element xmi:type="logical:MeasurementAxis"
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name="Position_WGS84_Latitude_MeasAxis" description="Specifies the latitude axis for WGS-
84." valueTypeUnit="EAID_31A246CA_C815_43d1_B837_0E8B6EA17AB0"
measurementSystemAxis="_vZiY2gg5EeSFspy8Kj3F4Q"/>
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xmi:id="EAID_8F8F4F5C_B7A4_4971_B33A_62F7F6BFA505"
name="Position_WGS84_Longitude_MeasAxis" description="Specifies the longitude axis for
WGS-84." measurementSystemAxis="_vZiY2wg5EeSFspy8Kj3F4Q"/>
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name="Position_WGS84_Height_MeasAxis" description="Specifies the height component of
location." measurementSystemAxis="_vZiY2Qg5EeSFspy8Kj3F4Q"
realizes="EAID_80D92BE8_8DF0_4f7c_82A6_CBF5DF17443A"/>

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component of location." measurementSystemAxis="_vZiY2gg5EeSFspy8Kj3F4Q"
realizes="EAID_5977632F_0313_4d51_82A4_E716D94C7D7D"/>
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name="Position_WGS84_Longitude_Degrees_MeasAxis" description="Specifies the longitude
component of location." measurementSystemAxis="_vZiY2wg5EeSFspy8Kj3F4Q"
realizes="EAID_5977632F_0313_4d51_82A4_E716D94C7D7D"/>
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name="PositionCenteredAzElMeasurements">
<element xmi:type="logical:Measurement"
xmi:id="EAID_32598F3A_9D20_426c_BD94_57BF7DA9C3FC"
name="Position_Centered_Az_El_Dist_Meas" description="Azimuth Q,E elevation Q,E and
radial distance from the reference point of a position to an object. Positive values are
up Q,E and clockwise when viewing the xy plane from the top of the position. Angle
measurements in radians Q,E and distance in meters."
measurementAxis="EAID_031F3F2E_C2B5_478c_996D_C31FE5B0DF18
EAID_B5053E19_9AAC_43bf_B4B1_49A81A840E44 EAID_35E420E2_CF79_4b02_B5CD_98352B8E3820"
measurementSystem="EAID_868B018F_5CCB_4697_BF14_FC29199C78A2"
realizes="EAID_7CA3D9F9_0614_4f82_A971_D2367427403F"/>
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description="Azimuth Q,E and elevation from the reference point of a position to an
object. Positive values are up Q,E and clockwise when viewing the xy plane from the top
of the position. Angle measurements in radians."
measurementAxis="EAID_031F3F2E_C2B5_478c_996D_C31FE5B0DF18
EAID_35E420E2_CF79_4b02_B5CD_98352B8E3820"
measurementSystem="EAID_462D0E66_ACD7_4285_99CB_4F4BAE99792E"
realizes="EAID_7CA3D9F9_0614_4f82_A971_D2367427403F"/>
<element xmi:type="logical:Measurement"
xmi:id="EAID_A3FEDE1D_9502_400a_BDD1_E363A2101DB8" name="Position_Centered_Az_Meas"
description="Single axis Azimuth measurement from the reference point of a position to an
object. Positive are values clockwise when viewing the xy plane from the top of the
position. Angle measurements in radians."
measurementAxis="EAID_031F3F2E_C2B5_478c_996D_C31FE5B0DF18"
measurementSystem="EAID_EC0563FC_2701_4cdf_8F48_BD416161F307"
realizes="EAID_7CA3D9F9_0614_4f82_A971_D2367427403F"/>
<element xmi:type="logical:Measurement"
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description="Radial distance measurement from the reference point of a position of
component to an object. Distance measurements in meters."
measurementAxis="EAID_B5053E19_9AAC_43bf_B4B1_49A81A840E44"
measurementSystem="EAID_80451053_12ED_45b8_A2DD_AC2EF6A30F2D"
realizes="EAID_7CA3D9F9_0614_4f82_A971_D2367427403F"/>
<element xmi:type="logical:Measurement"
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description="Single axis Elevation measurement from the reference point of a position to
an object. Positive values are up when viewing the xy plane from the top of the position.
Angle measurements in radians."
measurementAxis="EAID_35E420E2_CF79_4b02_B5CD_98352B8E3820"
measurementSystem="EAID_9602996B_0A7C_4ee2_94AB_512E963D2E5C"
realizes="EAID_7CA3D9F9_0614_4f82_A971_D2367427403F"/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_F956E79B_A771_4e95_B26F_97C9A14287D1" name="VehicleCenteredMeasurements">
<element xmi:type="logical:Measurement"
xmi:id="EAID_5ECE669A_4B39_4a2d_9DAE_8B8DBB87920F"
name="Position_Vehicle_FrontMidline_X_Meas" description="A Measurement of a vehicle-fixed
set origin Q,E where the x-axis is coincident with the vehicle reference axis..Locate
points or components within the vehicle x-axis frame of reference."
measurementAxis="EAID_744ADA73_D29C_458b_B17C_03322F7D8007"
measurementSystem="EAID_D11F77F6_DD7B_4e42_A1FE_038CFcffadc4"
realizes="EAID_7CA3D9F9_0614_4f82_A971_D2367427403F"/>
<element xmi:type="logical:Measurement"
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name="Position_Vehicle_FrontMidline_XYZ_Meas" description="A Measurement of a vehicle-
fixed set origin Q,E where the x-axis is coincident with the vehicle reference axis Q,E
z-axis in the vehicle reference plane Q,E y-axis normal to the vehicle RP. Used to locate
points or components within the vehicle frame of reference."/>

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measurementAxis="EAID_744ADA73_D29C_458b_B17C_03322F7D8007
EAID_6EBA5D57_984B_450a_85C2_D1DC2CC702FA EAID_954A3C07_270E_4cf5_B0B8_A1C2964B367F"
measurementSystem="EAID_28B76EFB_1D16_4ecd_B846_238A9253FE41"
realizes="EAID_7CA3D9F9_0614_4f82_A971_D2367427403F"/>
<element xmi:type="logical:MeasurementAxis"
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name="Position_Vehicle_FrontMidline_X_MeasAxis" description="The X axis of a body fixed
reference plane (e.g. Q,E ISO 1151 Q,E 6.1.1). "
measurementSystemAxis="EAID_F1776DE9_22E2_414e_A70F_7E346D7C9551"/>
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xmi:id="EAID_6EBA5D57_984B_450a_85C2_D1DC2CC702FA"
name="Position_Vehicle_FrontMidline_Z_MeasAxis" description="The X axis of a body fixed
reference plane (e.g. Q,E ISO 1151 Q,E 6.1.1). "
measurementSystemAxis="EAID_FC3052EB_7B28_4e03_8A7E_78D2D121B9E4"/>
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name="Position_Vehicle_FrontMidline_Y_MeasAxis" description="The Y Axis of a body fixed
measurement system." measurementSystemAxis="EAID_6DA5DEB1_0C07_48ed_B088_3B14702AD3DD"/>
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name="ControlSurfacePositionMeasurements">
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name="Control_Surface_2D_Location_Meas" description="The 2 axis (x y) reference frame for
a control surface (aerodynamic motivator)."
measurementAxis="EAID_7AE4EB76_3277_454d_AEB9_2B879DC8F8C4
EAID_2598B9DA_613C_42f8_991A_76D532AF8F66"
measurementSystem="EAID_E09A4940_74EC_4c0a_A747_602015FF02A2"
realizes="EAID_7CA3D9F9_0614_4f82_A971_D2367427403F"/>
<element xmi:type="logical:Measurement"
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description="The 3 axis reference frame for a control surface (aerodynamic motivator)."
measurementAxis="EAID_7AE4EB76_3277_454d_AEB9_2B879DC8F8C4
EAID_2598B9DA_613C_42f8_991A_76D532AF8F66 EAID_1A4C46EE_F3CC_4873_8B38_AEBE728BE8E0"
measurementSystem="EAID_B8F81069_3DB7_49e5_B224_839422617E1F"
realizes="EAID_7CA3D9F9_0614_4f82_A971_D2367427403F"/>
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description="The single x axis reference frame for a control surface (aerodynamic
motivator)." measurementAxis="EAID_7AE4EB76_3277_454d_AEB9_2B879DC8F8C4"
measurementSystem="EAID_181186D4_7DBB_42f6_A2C0_AE70625AD3E2"
realizes="EAID_7CA3D9F9_0614_4f82_A971_D2367427403F"/>
<element xmi:type="logical:Measurement"
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description="The single y axis reference frame for a control surface (aerodynamic
motivator)." measurementAxis="EAID_2598B9DA_613C_42f8_991A_76D532AF8F66"
measurementSystem="EAID_23A54772_B0B3_4e13_A2AE_2E525943026F"
realizes="EAID_7CA3D9F9_0614_4f82_A971_D2367427403F"/>
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description="The single z axis reference frame for a control surface (aerodynamic
motivator)." measurementAxis="EAID_1A4C46EE_F3CC_4873_8B38_AEBE728BE8E0"
measurementSystem="EAID_937A46D9_EE6F_417c_83B8_84B3A83950BE"
realizes="EAID_7CA3D9F9_0614_4f82_A971_D2367427403F"/>
<element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_7AE4EB76_3277_454d_AEB9_2B879DC8F8C4" name="Control_Surface_X_MeasAxis"
description="The x axis of a control surface location measurement. This axis is oriented
similarly with the air frame longitudinal x axis."
measurementSystemAxis="EAID_F1776DE9_22E2_414e_A70F_7E346D7C9551"
realizes="EAID_7CA3D9F9_0614_4f82_A971_D2367427403F"/>
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description="The y axis of a control surface location measurement. This axis is oriented
similarly with the air frame lateral y axis."
measurementSystemAxis="EAID_6DA5DEB1_0C07_48ed_B088_3B14702AD3DD"
realizes="EAID_7CA3D9F9_0614_4f82_A971_D2367427403F"/>
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xmi:id="EAID_1A4C46EE_F3CC_4873_8B38_AEBE728BE8E0" name="Control_Surface_Z_MeasAxis"
description="The z axis of a control surface location measurement. This axis is oriented
similarly with the air frame vertical z axis."

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measurementSystemAxis="EAID_FC3052EB_7B28_4e03_8A7E_78D2D121B9E4"
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name="VehicleCenteredAzDepMeasurements">
<element xmi:type="logical:Measurement"
xmi:id="EAID_B133C0F0_4508_40cf_BF38_F6C767BF7CFED"
name="Vehicle_Centered_AzDep_Dist_Meas" description="Azimuth Q,E depression Q,E and
radial distance from the reference point of a Vehicle to an object. Positive values are
down Q,E and clockwise when viewing the xy plane from the top of the body. Angle
measurements in radians Q,E and distance in meters."
measurementAxis="EAID_031F3F2E_C2B5_478c_996D_C31FE5B0DF18
EAID_B5053E19_9AAC_43bf_B4B1_49A81A840E44 EAID_35E420E2_CF79_4b02_B5CD_98352B8E3820"
measurementSystem="EAID_DDD07A66_06E9_459e_B4C3_25634609B42D"
realizes="EAID_7CA3D9F9_0614_4f82_A971_D2367427403F"/>
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description="Azimuth Q,E and depression from the reference point of a Vehicle to an
object. Positive values are down Q,E and clockwise when viewing the xy plane from the top
of the body. Angle measurements in radians."
measurementAxis="EAID_031F3F2E_C2B5_478c_996D_C31FE5B0DF18
EAID_35E420E2_CF79_4b02_B5CD_98352B8E3820"
measurementSystem="EAID_259A788E_755E_4901_BDAE_4F3235F0B15A"
realizes="EAID_5977632F_0313_4d51_82A4_E716D94C7D7D"/>
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description="Single axis Depression measurement from the reference point of a Vehicle to
an object. Positive values are downwhen viewing the xy plane from the top of the body.
Angle measurements in radians."
measurementAxis="EAID_35E420E2_CF79_4b02_B5CD_98352B8E3820"
measurementSystem="EAID_94FFFCBF_884F_4aa9_9A7A_F3A88AFF000C"
realizes="EAID_7CA3D9F9_0614_4f82_A971_D2367427403F"/>
</ldm>
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xmi:id="EAID_3286A5AB_3BF2_4692_BA97_5EA7B1862918" name="Vehicle_Centered_AzEl_Dist_Meas"
description="Azimuth Q,E elevation Q,E and radial distance from the reference point of a
Vehicle to an object. Positive values are up Q,E and clockwise when viewing the xy plane
from the top of the body. Angle measurements in radians Q,E and distance in meters."
measurementAxis="EAID_031F3F2E_C2B5_478c_996D_C31FE5B0DF18
EAID_B5053E19_9AAC_43bf_B4B1_49A81A840E44 EAID_35E420E2_CF79_4b02_B5CD_98352B8E3820"
measurementSystem="EAID_CB8BEF2_8BEC_464f_AD7E_F37E47D642E2"
realizes="EAID_7CA3D9F9_0614_4f82_A971_D2367427403F"/>
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xmi:id="EAID_6523F31E_8FCD_4c91_9E05_E1DF7A4B4C26" name="Vehicle_Centered_AzEl_Meas"
description="Azimuth Q,E and elevation from the reference point of a Vehicle to an
object. Positive values are up Q,E and clockwise when viewing the xy plane from the top
of the body. Angle measurements in radians."
measurementAxis="EAID_031F3F2E_C2B5_478c_996D_C31FE5B0DF18
EAID_35E420E2_CF79_4b02_B5CD_98352B8E3820"
measurementSystem="EAID_462D0E66_ACD7_4285_99CB_4F4BAE99792E"
realizes="EAID_5977632F_0313_4d51_82A4_E716D94C7D7D"/>
<element xmi:type="logical:Measurement"
xmi:id="EAID_CF14B5EB_793D_41a9_9093_2C6F16F6F5DA" name="Vehicle_Centered_Az_Meas"
description="Single axis Azimuth measurement from the reference point of a Vehicle to an
object. Positive are values clockwise when viewing the xy plane from the top of the body.
Angle measurements in radians."
measurementAxis="EAID_031F3F2E_C2B5_478c_996D_C31FE5B0DF18"
measurementSystem="EAID_4077EA6C_C215_4c65_AA39_DF813710E8BC"
realizes="EAID_7CA3D9F9_0614_4f82_A971_D2367427403F"/>
<element xmi:type="logical:Measurement"
xmi:id="EAID_2292F15A_0468_42b4_B6D0_84CED55B8D29" name="Vehicle_Centered_Dist_Meas"
description="Radial distance measurement from the reference point of a Vehicle of
component to an object. Distance measurements in meters."
measurementAxis="EAID_B5053E19_9AAC_43bf_B4B1_49A81A840E44"
measurementSystem="EAID_651C1B44_EC57_4d09_B244_B7C13C317E07"
realizes="EAID_7CA3D9F9_0614_4f82_A971_D2367427403F"/>

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        <element xmi:type="logical:Measurement"
xmi:id="EAID_9C85CF27_F792_4cf2_9920_80FA2211D386" name="VehicleCentered_El_Meas"
description="Single axis Elevation measurement from the reference point of a Vehicle to
an object. Positive values are up when viewing the xy plane from the top of the body.
Angle measurements in radians."
measurementAxis="EAID_35E420E2_CF79_4b02_B5CD_98352B8E3820"
measurementSystem="EAID_BB969A49_C5B6_4a39_AA7C_EED017AE6BBB"
realizes="EAID_7CA3D9F9_0614_4f82_A971_D2367427403F"/>
<element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_031F3F2E_C2B5_478c_996D_C31FE5B0DF18"
name="Vehicle_Centered_Azimuth_MeasAxis" description="The azimuth axis collinear with the
z-down axis of the local body coordinate system. Default units of radians."
measurementSystemAxis="EAID_DB86FF39_07BB_4a57_9836_7B3B54986C22"
realizes="EAID_5977632F_0313_4d51_82A4_E716D94C7D7D"/>
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xmi:id="EAID_B5053E19_9AAC_43bf_B4B1_49A81A840E44"
name="Vehicle_Centered_Distance_MeasAxis" description="The distance from the vehicle Q,E
or component origin. Default units of meters."
measurementSystemAxis="EAID_B4BBE81D_D304_4b09_8641_27E2398843F8"
realizes="EAID_5977632F_0313_4d51_82A4_E716D94C7D7D"/>
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name="Vehicle_Centered_Elevation_MeasAxis" description="The azimuth axis anti-linear with
the y axis of the local body coordinate system. Positions with positive z values have
negative elevation values. Default units of radians."
measurementSystemAxis="EAID_FD4DFBE6_DDC2_452e_8DCC_063B42A14BF6"
realizes="EAID_5977632F_0313_4d51_82A4_E716D94C7D7D"/>
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xmi:id="EAID_16C3F0D3_66F4_4482_814F_DD6029B51906" name="PowerMeasures">
<element xmi:type="logical:Measurement"
xmi:id="EAID_F2DF1196_40EB_41a4_AC09_72D6A55D3C4F" name="Power_Meas"
description="Measurement for power."
measurementAxis="EAID_2B1F4E67_0284_4990_9F3F_37C03457F75E"
measurementSystem="EAID_AC33E859_EF4E_4f9e_B9F1_9E8EFA9D1497"
realizes="EAID_0FE1D4CF_7DB9_46c2_961B_2C3AB44B694F"/>
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measurementSystemAxis="EAID_E60055A6_AAF7_4b15_9B96_2E85E42CB36A"
realizes="EAID_0FE1D4CF_7DB9_46c2_961B_2C3AB44B694F"/>
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<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_C18C07A4_CB5D_4587_8803_C13190D7BAB5" name="PressureMeasures">
<element xmi:type="logical:Measurement"
xmi:id="EAID_CFA82AAB_E3FA_463d_8928_F13C9347D8A0" name="Pressure_Meas"
description="Measurement for pressure."
measurementAxis="EAID_694D6FB_F390_4072_960B_AFBC983A647F"
measurementSystem="EAID_FE7D5B8A_FF57_4418_A928_E78D52681907"
realizes="EAID_54D14004_BB23_4f72_95FB_9FF384A743A7"/>
<element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_694D6FB_F390_4072_960B_AFBC983A647F" name="Pressure_MeasAxis"
measurementSystemAxis="EAID_3DE8B358_7FA3_4f96_AEF9_B36F9DCC3E6E"
realizes="EAID_54D14004_BB23_4f72_95FB_9FF384A743A7"/>
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<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_E97DCBEF_91E8_4511_8334_4BF8F1476CEA" name="LocalAir" description="Pressure
measurements based on the Local Air Reference Frame."/>
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<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_3FE463AE_0E83_4e93_8E97_443FFEF54796" name="RateMeasures">
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_4F6B65DC_D0F5_4997_B653_D3E8BF595D9B" name="AngularAcceleration">
<element xmi:type="logical:Measurement"
xmi:id="EAID_15163722_EC03_48fc_BD03_A4303213DCC5" name="Angular_Acceleration_Meas"
description="Measurement for values of angular acceleration."
measurementAxis="EAID_F8F45C73_9387_4734_94DC_24DDADF11AF2"
measurementSystem="EAID_20463F5D_4D0E_4f2f_917D_A96A001118FC"
realizes="EAID_E0FD8349_12D2_40aa_9131_1FF4BA823E26"/>
<element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_F8F45C73_9387_4734_94DC_24DDADF11AF2" name="Angular_Acceleration_MeasAxis"

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description="Measurement axis for values of angular acceleration."
measurementSystemAxis="EAID_4178F53A_5F5A_45a3_B674_461B48DA2C25"
realizes="EAID_E0FD8349_12D2_40aa_9131_1FF4BA823E26"/>
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xmi:id="EAID_A720B675_477C_4ab5_96CD_B90229728579" name="AngularVelocity">
<element xmi:type="logical:MeasurementAxis">
xmi:id="EAID_00FEAF10_F102_46d1_9F47_15EAB262F4A1" name="Angular_Velocity_Meas"
description="Measurement for expressing values of angular rate in radians per second."
measurementAxis="EAID_9820B35F_7801_45a3_AF38_A8DCC094C8ED"
measurementSystem="EAID_2CC7D8B4_09A7_4c7f_8066_A2D51355D1FE"
realizes="EAID_21309243_2D0E_4536_8135_69F86BE3D515"/>
<element xmi:type="logical:MeasurementAxis">
xmi:id="EAID_9820B35F_7801_45a3_AF38_A8DCC094C8ED" name="Angular_Velocity_MeasAxis"
description="Measurement axis for expressing values of angular rate."
measurementSystemAxis="EAID_89BC6B2D_8DE0_4dde_AC7C_66F795A553C2"
realizes="EAID_21309243_2D0E_4536_8135_69F86BE3D515"/>
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description="Logical model representing the rate of orientation acceleration
measurement">
<ldm xmi:type="datamodel:LogicalDataModel">
<element xmi:type="logical:Measurement">
xmi:id="EAID_D7B238E2_71E3_4e71_A259_E98A96FF49DB"
name="OrientationAccelerationMeasurement" description="Root package orientation
acceleration in radians.">
<element xmi:type="logical:MeasurementAxis">
xmi:id="EAID_33B19387_B68E_4b45_8CE2_0A0BACE6F94F" name="Orientation_Acceleration_Meas"
description="Measurement representing the acceleration applied to the orientation angles:
pitch Q,E roll and yaw" measurementAxis="EAID_F8FC376A_2D5B_45a8_9C61_76AF25616387
EAID_D22FA4DD_BE4B_4a7f_BE0B_3863D495D7E3 EAID_3DF79A56_B732_4042_A1C6_F54295C8FB16"
measurementSystem="EAID_C0798AAE_A69A_44b5_AEE1_2AA620670786"
realizes="EAID_6A475A9C_9D31_4f7e_92EF_2D00DE6F7E66"/>
<element xmi:type="logical:MeasurementAxis">
xmi:id="EAID_F8FC376A_2D5B_45a8_9C61_76AF25616387" name="Acceleration_Pitch_MeasAxis"
description="Pitch Axis (Lateral Axis) passes through the plane from wingtip to wingtip.
Pitch changes the vertical direction the aircraft's nose is pointing."
measurementSystemAxis="EAID_D1088725_2FE5_41e1_8EE4_3A5867309583"
realizes="EAID_E0FD8349_12D2_40aa_9131_1FF4BA823E26"/>
<element xmi:type="logical:MeasurementAxis">
xmi:id="EAID_D22FA4DD_BE4B_4a7f_BE0B_3863D495D7E3" name="Acceleration_Roll_MeasAxis"
description="Roll Axis (Longitudinal Axis) passes through the plane from nose to tail.
Roll changes the orientation of the aircraft's wings with respect to the downward force
of gravity." measurementSystemAxis="EAID_B735596A_CC53_4799_99A1_48A8D7846841"
realizes="EAID_E0FD8349_12D2_40aa_9131_1FF4BA823E26"/>
<element xmi:type="logical:MeasurementAxis">
xmi:id="EAID_3DF79A56_B732_4042_A1C6_F54295C8FB16" name="Acceleration_Yaw_MeasAxis"
description="Yaw Axis (Normal Axis) is the vertical axis through an aircraft Q,E rocket
or similar body about which the body yaws."
measurementSystemAxis="EAID_394EB610_0E99_47a3_B0D7_9F458AD50B21"
realizes="EAID_E0FD8349_12D2_40aa_9131_1FF4BA823E26"/>
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name="OrientationAccelerationMeasurementDegreesPerSecondSquared" description="Root
package orientation acceleration in degrees.">
<element xmi:type="logical:Measurement">
xmi:id="EAID_D1495FA0_51A7_4150_A858_5B0B45C69E6E"
name="Acceleration_DegreesPerSecondPerSecond_Meas" description="Measurement representing
the acceleration applied to the orientation angles: pitch Q,E roll and yaw"
measurementAxis="EAID_95FF0623_8CCB_4996_AE16_329764E57003
EAID_D5B63EB9_052F_4b9c_9227_BE582BAD2B9D EAID_ACD9769F_0596_4877_9597_E34387B7B43E"
measurementSystem="EAID_C0798AAE_A69A_44b5_AEE1_2AA620670786"
realizes="EAID_6A475A9C_9D31_4f7e_92EF_2D00DE6F7E66"/>
<element xmi:type="logical:MeasurementAxis">
xmi:id="EAID_95FF0623_8CCB_4996_AE16_329764E57003"
name="Acceleration_Pitch_DegreePerSecondPerSecond_MeasAxis" description="Pitch Axis
(Lateral Axis) passes through the plane from wingtip to wingtip. Pitch changes the
vertical direction the aircraft's nose is pointing."
valueTypeUnit="EAID_06E92ADA_7777_4544_965E_B598909369E6"

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measurementSystemAxis="EAID_D1088725_2FE5_41e1_8EE4_3A5867309583"
realizes="EAID_E0FD8349_12D2_40aa_9131_1FF4BA823E26"/>
    <element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_D5B63EB9_052F_4b9c_9227_BE582BAD2B9D"
name="Acceleration_Roll_DegreePerSecondPerSecond_MeasAxis" description="Roll Axis (Longitudinal Axis) passes through the plane from nose to tail. Roll changes the orientation of the aircraft's wings with respect to the downward force of gravity."
valueTypeUnit="EAID_06E92ADA_7777_4544_965E_B598909369E6"
measurementSystemAxis="EAID_B735596A_CC53_4799_99A1_48A8D7846841"
realizes="EAID_E0FD8349_12D2_40aa_9131_1FF4BA823E26"/>
    <element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_ACD9769F_0596_4877_9597_E34387B7B43E"
name="Acceleration_Yaw_DegreePerSecondPerSecond_MeasAxis" description="Yaw Axis (Normal Axis) is the vertical axis through an aircraft Q,E rocket or similar body about which the body yaws." valueTypeUnit="EAID_06E92ADA_7777_4544_965E_B598909369E6"
measurementSystemAxis="EAID_394EB610_0E99_47a3_B0D7_9F458AD50B21"
realizes="EAID_E0FD8349_12D2_40aa_9131_1FF4BA823E26"/>
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description="Logical model representing the rate of acceleration velocity measurement.">
    <element xmi:type="logical:Measurement"
xmi:id="EAID_E2F2F982_3DEB_41a0_926D_785A61C449EA" name="Body_Frame_RollRate_Meas"
description="Measurement that provides angle rate measurement with respect to the local vehicle roll11 axis." measurementAxis="EAID_8AD5947B_643F_4f99_9FD2_331AAB6D7C77"
measurementSystem="EAID_5044E59D_C305_465e_944E_4DA6187EF0DC"
realizes="EAID_8A6BA64A_0232_41e4_AA18_CD71B80A66DC"/>
    <element xmi:type="logical:Measurement"
xmi:id="EAID_2AF1392D_86DB_4122_90D7_26B8859D6A95" name="Body_Frame_PitchRate_Meas"
description="Measurement that provides angle rate measurement with respect to the local pitch axis." measurementAxis="EAID_E395BC3E_1771_498b_9948_E5AC039EF3E6"
measurementSystem="EAID_5CDB3F7E_0762_43c5_ABBD_F6F8B4685244"
realizes="EAID_8A6BA64A_0232_41e4_AA18_CD71B80A66DC"/>
    <element xmi:type="logical:Measurement"
xmi:id="EAID_368DB023_06E5_4524_AA8A_3B3EEFA08B34" name="Body_Frame_YawRate_Meas"
description="Measurement that provides angle rate measurement with respect to the local vehicle yaw axis (z axis)" measurementAxis="EAID_C6238283_B413_476d_B930_E400F942B647"
measurementSystem="EAID_9F30D0CA_14E4_4d03_9B4B_6E859FE51594"
realizes="EAID_8A6BA64A_0232_41e4_AA18_CD71B80A66DC"/>
    <element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_8AD5947B_643F_4f99_9FD2_331AAB6D7C77" name="Body_Frame_Roll_Rate_MeasAxis"
description="An axis drawn through the body of the vehicle from tail to nose in the direction of flight Q,E or the direction the pilot faces. Rotation about this axis is called bank or roll." valueTypeUnit="EAID_222F7273_01B5_4e83_B616_DFEC1E04ABED"
measurementSystemAxis="EAID_309DE716_2AA8_4eb3_A6EA_C0C37AA8CA84"/>
    <element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_E395BC3E_1771_498b_9948_E5AC039EF3E6" name="Body_Frame_Pitch_Rate_MeasAxis"
description="An axis running from the pilot's left to right in piloted aircraft Q,E and parallel to the wings of a fixed winged aircraft. Rotation about this axis is called pitch." valueTypeUnit="EAID_222F7273_01B5_4e83_B616_DFEC1E04ABED"
measurementSystemAxis="EAID_A4B9B253_9061_4f28_A8F7_89BFA86EE91A"/>
    <element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_C6238283_B413_476d_B930_E400F942B647" name="Body_Frame_Yaw_Rate_MeasAxis"
description="Also known as the Normal axis is drawn from top to bottom Q,E and perpendicular to the other two axes. Rotation about this axis is called yaw."
valueTypeUnit="EAID_222F7273_01B5_4e83_B616_DFEC1E04ABED"
measurementSystemAxis="EAID_1B9ED73D_796D_487c_85CC_15170C5E25E5"/>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_5125DD20_87B4_48da_A40C_C868ABB44798" name="OrientationVelocityMeasurement">
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xmi:id="EAID_9833ED39_D532_4c00_AE09_3F2E0D7D92E8" name="Orientation_Velocity_Meas"
description="Measurement representing the velocity applied to the orientation angles: pitch Q,E roll and yaw" measurementAxis="EAID_A51D17A7_BB17_4ad6_A1A6_768845DA49D8
EAID_311A63BC_E7C6_4bd7_B2F5_CEE6948EBD1F EAID_BA8FDD80_1C31_4b7d_8321_CE5EF0D3B427"
measurementSystem="EAID_B0F6E3C3_4CA7_44fa_93FD_C211F4F956B0"
realizes="EAID_8A6BA64A_0232_41e4_AA18_CD71B80A66DC"/>
    <element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_A51D17A7_BB17_4ad6_A1A6_768845DA49D8" name="Velocity_Pitch_MeasAxis"
description="Passes through the plane from wingtip to wingtip. Pitch changes the vertical direction the aircraft's nose is pointing."

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measurementSystemAxis="EAID_06891598_E070_4ae8_AEE7_67A5B8BBCA90"
realizes="EAID_21309243_2D0E_4536_8135_69F86BE3D515"/>
    <element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_311A63BC_E7C6_4bd7_B2F5_CEE6948EBD1F" name="Velocity_Roll_MeasAxis"
description="Roll Axis (Longitudinal Axis) passes through the plane from nose to tail.
Roll changes the orientation of the aircraft's wings with respect to the downward force
of gravity." measurementSystemAxis="EAID_D695C2CA_5B48_483e_A5EC_31D7A40CCA0D"
realizes="EAID_21309243_2D0E_4536_8135_69F86BE3D515"/>
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xmi:id="EAID_BA8FDD80_1C31_4b7d_8321_CE5EF0D3B427" name="Velocity_Yaw_MeasAxis"
description="Yaw Axis (Normal Axis) is the vertical axis through an aircraft Q,E rocket
or similar body about which the body yaws."
measurementSystemAxis="EAID_48607400_E718_4ac3_ACC8_78052AA684CB"
realizes="EAID_21309243_2D0E_4536_8135_69F86BE3D515"/>
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name="OrientationVelocityMeasurementDegreesPerSecond">
    <element xmi:type="logical:Measurement"
xmi:id="EAID_C1B6A2C8_0039_4525_B633_4477709A79AB"
name="Orientation_Velocity_RealDegreePerSec_Meas" description="Measurement representing
the velocity applied to the orientation angles: pitch, Q,E roll and yaw"
measurementAxis="EAID_5C38BF81_64CA_4891_9B5D_ADC5367D2220
EAID_18E2FD63_A85D_496e_BB38_F6CC03F5E3F9 EAID_214A281F_382B_483b_87C4_9DF9EA6BA97E"
measurementSystem="EAID_B0F6E3C3_4CA7_44fa_93FD_C211F4F956B0"
realizes="EAID_8A6BA64A_0232_41e4_AA18_CD71B80A66DC"/>
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name="Velocity_Pitch_DegreePerSecond_MeasAxis" description="passes through the plane from
wingtip to wingtip. Pitch changes the vertical direction the aircraft's nose is
pointing." valueTypeUnit="EAID_B153F0A8_254B_414d_B9B4_F51B02D32419"
measurementSystemAxis="EAID_06891598_E070_4ae8_AEE7_67A5B8BBCA90"
realizes="EAID_21309243_2D0E_4536_8135_69F86BE3D515"/>
    <element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_18E2FD63_A85D_496e_BB38_F6CC03F5E3F9"
name="Velocity_Roll_DegreePerSecond_MeasAxis" description="Roll Axis (Longitudinal Axis)
passes through the plane from nose to tail. Roll changes the orientation of the
aircraft's wings with respect to the downward force of gravity."
valueTypeUnit="EAID_B153F0A8_254B_414d_B9B4_F51B02D32419"
measurementSystemAxis="EAID_D695C2CA_5B48_483e_A5EC_31D7A40CCA0D"
realizes="EAID_21309243_2D0E_4536_8135_69F86BE3D515"/>
    <element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_214A281F_382B_483b_87C4_9DF9EA6BA97E"
name="Velocity_Yaw_DegreePerSecond_MeasAxis" description="Yaw Axis (Normal Axis) is the
vertical axis through an aircraft Q,E rocket or similar body about which the body yaws."
valueTypeUnit="EAID_B153F0A8_254B_414d_B9B4_F51B02D32419"
measurementSystemAxis="EAID_48607400_E718_4ac3_ACC8_78052AA684CB"
realizes="EAID_21309243_2D0E_4536_8135_69F86BE3D515"/>
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    <element xmi:type="logical:Measurement"
xmi:id="EAID_61062334_5B0A_4e9b_8173_4AAB58D2248C" name="Scalar_Acceleration_Meas"
description="Measurement for the magnitude component of acceleration Q,E does not
consider direction." measurementAxis="EAID_9C551F3B_A775_4f31_AB23_A505CB49E061"
measurementSystem="EAID_7A26FFB7_E420_4c15_8E7F_BC831D7FE3A2"
realizes="EAID_CD425350_A680_49d4_974D_4052C9BAB30"/>
    <element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_9C551F3B_A775_4f31_AB23_A505CB49E061" name="Scalar_Acceleration_MeasAxis"
description="Measurement axis for the magnitude component of acceleration."
measurementSystemAxis="EAID_DCE9B393_1F4E_472a_A293_0587767C6BB2"
realizes="EAID_CD425350_A680_49d4_974D_4052C9BAB30"/>
</lsm>
<lsm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_DB69948B_BECE_44af_8C09_F694904A3E02" name="Speed">
    <element xmi:type="logical:Measurement"
xmi:id="EAID_8C5A362E_D672_4335_B72E_C2CC6252F884" name="Speed_Meas"
description="Measurement for speed."
measurementAxis="EAID_FA94A385_E790_4ab7_965F_D81D542D69F9"

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measurementSystem="EAID_CA7165EF_5605_49ab_8B6F_24B78C4842AF"
realizes="EAID_06B460A8_5CEC_4e63_9607_4413DB527E37"/>
    <element xmi:type="logical:Measurement"
xmi:id="EAID_19404409_94A6_498e_B419_BD492CAE745F" name="Speed_Mach_Meas"
description="Speed as described as a ratio between the magnitude of the current velocity
and the local speed of sound."
measurementAxis="EAID_8F252607_6D59_461a_9DB1_B5ABAB0C9513"
measurementSystem="EAID_31BC79FD_57E1_45bd_81EB_2FA5875F8A53"
realizes="EAID_06B460A8_5CEC_4e63_9607_4413DB527E37"/>
    <element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_FA94A385_E790_4ab7_965F_D81D542D69F9" name="Speed_MeasAxis"
measurementSystemAxis="EAID_34208C77_1C32_4838_89B7_FC6777140322"
realizes="EAID_06B460A8_5CEC_4e63_9607_4413DB527E37"/>
        <element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_8F252607_6D59_461a_9DB1_B5ABAB0C9513" name="Speed_Mach_MeasAxis"
description="A Speed measurement axis describing the ratio between the manitude of the
current velocity and the local speed of sound."
measurementSystemAxis="EAID_81EE33FE_5828_4ee9_ABC0_FB982F861E37"/>
    </ldm>
    <ldm xmi:type="datamodel:LogicalDataModel"
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        <element xmi:type="logical:Measurement"
xmi:id="EAID_5BCE61BE_2E0D_43b2_A9C7_F47F16B5F4DB" name="Acceleration_Meas"
description="3D acceleration vector in meters/sec/sec"
measurementAxis="EAID_B3BBA097_69D0_492a_80BC_68F77B3220BD
EAID_16A3F606_E73F_4801_88D5_D5118240ED53 EAID_BB810841_9A0C_445c_BA02_2833212B8314"
measurementSystem="EAID_F9D8A82F_C1F7_44f8_92AD_535912C28E4C"
realizes="EAID_A082A853_2D96_4222_8065_D06483A48AE8"/>
            <element xmi:type="logical:Measurement"
xmi:id="EAID_74905F64_61B1_47af_BC17_1C869E7A2483"
name="Body_Frame_XYZ_Acceleration_Meas" description="A vehicle fixed Q,E origin at the
CoG Q,E x-axis coincident with the vehicle reference axis Q,E z-axis in the vehicle
reference plane Q,E y-axis normal to the vehicle RP."
measurementAxis="EAID_61930B90_5A50_4ecc_88D6_D303C84C7D19
EAID_3F4936B8_E522_419f_A7A7_535AD73EAC5E EAID_DCEAD4E7_AEF3_4fb9_BCDD_1D397CB899DA"
measurementSystem="EAID_D620C106_5F28_4004_AC5D_E5AD2FEB6B33"
realizes="EAID_A082A853_2D96_4222_8065_D06483A48AE8"/>
            <element xmi:type="logical:Measurement"
xmi:id="EAID_DB98E386_721A_4d88_A903_6E9EB075D94C"
name="Acceleration_RealKnots_PerSecond_Meas" description="3D acceleration vector in knots
per second." measurementAxis="EAID_525334A4_8890_4d2a_934B_60569EABB02B
EAID_36A0966D_BFE6_4773_9F19_48B64D194799 EAID_7D8913CE_BE20_4951_8EC3_905757F265C0"
measurementSystem="EAID_F9D8A82F_C1F7_44f8_92AD_535912C28E4C"
realizes="EAID_A082A853_2D96_4222_8065_D06483A48AE8"/>
            <element xmi:type="logical:Measurement"
xmi:id="EAID_BE4F302D_060E_44d5_BFC9_46BD1997F192" name="Acceleration_U_Meas"
description="A geo measurement attached to a vehicle. The three axes are centered at the
vehicle CoG Q,E and oriented relative to features on the earth Q,E the North Pole (local
meridian) Q,E the east (local parallel) Q,E and tangent to the NE plane. North Axis"
measurementAxis="EAID_5E4C5696_ACEC_4ffe_AE01_120622EB61A0"
measurementSystem="EAID_EA2D7214_102B_47e6_96E1_AD39FEF7AA78"
realizes="EAID_A082A853_2D96_4222_8065_D06483A48AE8"/>
            <element xmi:type="logical:Measurement"
xmi:id="EAID_08DFDED3D_17AA_4ed6_90D1_FAE607D2AE82" name="Acceleration_V_Meas"
description="A geo measurement attached to a vehicle. The three axes are centered at the
vehicle CoG Q,E and oriented relative to features on the earth Q,E the North Pole (local
meridian) Q,E the east (local parallel) Q,E and tangent to the NE plane. EastAxis"
measurementAxis="EAID_693E3A5D_5D4C_488f_B4CC_00F274873788"
measurementSystem="EAID_72F721D5_CCAC_4228_B756_1B181EA9DB0E"
realizes="EAID_A082A853_2D96_4222_8065_D06483A48AE8"/>
            <element xmi:type="logical:Measurement"
xmi:id="EAID_73398986_E980_4c71_AACD_7861647CBCE8" name="Acceleration_W_Meas"
description="A geo measurement attached to a vehicle. The three axes are centered at the
vehicle CoG Q,E and oriented relative to features on the earth Q,E the North Pole (local
meridian) Q,E the east (local parallel) Q,E and tangent to the NE plane. Down Axis"
measurementAxis="EAID_92B54E37_72D3_4a6f_BE3B_25058B708FE0"
measurementSystem="EAID_DCBDAA534_F469_46bd_9579_21458BC958EF"
realizes="EAID_A082A853_2D96_4222_8065_D06483A48AE8"/>
            <element xmi:type="logical:Measurement"
xmi:id="EAID_11708A61_F515_4ee5_9868_8C91D84AFE14" name="Acceleration_UVW_Meas"
description="A geographical measurement attached to a vehicle. The three axes are

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centered at the vehicle CoG Q,E and oriented relative to features on the earth Q,E the North Pole (local meridian) Q,E the east (local parallel) Q,E and tangent to the NE plane." measurementAxis="EAID_5E4C5696_ACEC_4ffe_AE01_120622EB61A0
 EAID_693E3A5D_5D4C_488f_B4CC_00F274873788 EAID_92B54E37_72D3_4a6f_BE3B_25058B708FE0"
 measurementSystem="XyWdeMXpEeS20aHYOO_RKQ"
 realizes="EAID_A082A853_2D96_4222_8065_D06483A48AE8"/>
 <element xmi:type="logical:MeasurementAxis"
 xmi:id="EAID_B3BBA097_69D0_492a_80BC_68F77B3220BD" name="Acceleration_X_MeasAxis"
 measurementSystemAxis="EAID_F160EF73_8C7D_496f_93C7_020262ED8563"
 realizes="EAID_A082A853_2D96_4222_8065_D06483A48AE8"/>
 <element xmi:type="logical:MeasurementAxis"
 xmi:id="EAID_525334A4_8890_4d2a_934B_60569EABB02B"
 name="Acceleration_X_RealKnotPerSecond_MeasAxis" description="X"
 valueTypeUnit="EAID_CA989C3B_DF5E_4455_9105_18A186D41CD7"
 measurementSystemAxis="EAID_F160EF73_8C7D_496f_93C7_020262ED8563"
 realizes="EAID_A082A853_2D96_4222_8065_D06483A48AE8"/>
 <element xmi:type="logical:MeasurementAxis"
 xmi:id="EAID_16A3F606_E73F_4801_88D5_D5118240ED53" name="Acceleration_Y_MeasAxis"
 measurementSystemAxis="EAID_C8DCFFF3_1918_49fb_B7EE_0A801B03FE9E"
 realizes="EAID_A082A853_2D96_4222_8065_D06483A48AE8"/>
 <element xmi:type="logical:MeasurementAxis"
 xmi:id="EAID_36A0966D_BFE6_4773_9F19_48B64D194799"
 name="Acceleration_Y_RealKnotPerSecond_MeasAxis"
 valueTypeUnit="EAID_CA989C3B_DF5E_4455_9105_18A186D41CD7"
 measurementSystemAxis="EAID_C8DCFFF3_1918_49fb_B7EE_0A801B03FE9E"
 realizes="EAID_A082A853_2D96_4222_8065_D06483A48AE8"/>
 <element xmi:type="logical:MeasurementAxis"
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 measurementSystemAxis="EAID_5446A913_78FE_4af0_BDAD_17593E11AAFE"
 realizes="EAID_A082A853_2D96_4222_8065_D06483A48AE8"/>
 <element xmi:type="logical:MeasurementAxis"
 xmi:id="EAID_7D8913CE_BE20_4951_8EC3_905757F265C0"
 name="Acceleration_Z_RealKnotPerSecond_MeasAxis"
 valueTypeUnit="EAID_CA989C3B_DF5E_4455_9105_18A186D41CD7"
 measurementSystemAxis="EAID_5446A913_78FE_4af0_BDAD_17593E11AAFE"
 realizes="EAID_A082A853_2D96_4222_8065_D06483A48AE8"/>
 <element xmi:type="logical:MeasurementAxis"
 xmi:id="EAID_61930B90_5A50_4ecc_88D6_D303C84C7D19"
 name="Body_Frame_Acceleration_X_MeasAxis" description="The X axis of a body fixed reference plane (e.g. Q,E ISO 1151 Q,E 6.1.1)."
 valueTypeUnit="EAID_BC96F5E1_6F63_462c_84A3_61CFB36D8011"
 measurementSystemAxis="EAID_F1776DE9_22E2_414e_A70F_7E346D7C9551"
 realizes="EAID_A082A853_2D96_4222_8065_D06483A48AE8"/>
 <element xmi:type="logical:MeasurementAxis"
 xmi:id="EAID_3F4936B8_E522_419f_A7A7_535AD73EAC5E"
 name="Body_Frame_Acceleration_Y_MeasAxis" description="The Y Axis of a body fixed measurement system." valueTypeUnit="EAID_BC96F5E1_6F63_462c_84A3_61CFB36D8011"
 measurementSystemAxis="EAID_6DA5DEB1_0C07_48ed_B088_3B14702AD3DD"
 realizes="EAID_A082A853_2D96_4222_8065_D06483A48AE8"/>
 <element xmi:type="logical:MeasurementAxis"
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 name="Body_Frame_Acceleration_Z_MeasAxis" description="The Z axis of a body fixed reference plane (e.g. Q,E ISO 1151 Q,E 6.1.1)."
 valueTypeUnit="EAID_BC96F5E1_6F63_462c_84A3_61CFB36D8011"
 measurementSystemAxis="EAID_FC3052EB_7B28_4e03_8A7E_78D2D121B9E4"
 realizes="EAID_A082A853_2D96_4222_8065_D06483A48AE8"/>
 <element xmi:type="logical:MeasurementAxis"
 xmi:id="EAID_5E4C5696_ACEC_4ffe_AE01_120622EB61A0" name="Acceleration_U_MeasAxis"
 description="The North axis of an NED Measurement System."
 valueTypeUnit="EAID_BC96F5E1_6F63_462c_84A3_61CFB36D8011"
 measurementSystemAxis="XyWde8XpEeS20aHYOO_RKQ"/>
 <element xmi:type="logical:MeasurementAxis"
 xmi:id="EAID_693E3A5D_5D4C_488f_B4CC_00F274873788" name="Acceleration_V_MeasAxis"
 description="The East axis of an NED Measurement System."
 valueTypeUnit="EAID_BC96F5E1_6F63_462c_84A3_61CFB36D8011"
 measurementSystemAxis="XyWdfMXpEeS20aHYOO_RKQ"/>
 <element xmi:type="logical:MeasurementAxis"
 xmi:id="EAID_92B54E37_72D3_4a6f_BE3B_25058B708FE0" name="Acceleration_W_MeasAxis"
 description="The Down axis of an NED Measurement System."
 valueTypeUnit="EAID_BC96F5E1_6F63_462c_84A3_61CFB36D8011"
 measurementSystemAxis="XyWdesXpEeS20aHYOO_RKQ"/>

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xmi:id="EAID_05EDED37_CE18_4412_85ED_CC3B22CA864B" name="CenterOfGravity"
description="Rate measurements based on the Center of Gravity Reference Frame."/>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_BE7A14DF_5462_4db0_A0DD_382CBD47F2A6" name="CountRate" description="Logical
model for the number of occurrences of a repeating event per unit time">
<element xmi:type="logical:Measurement"
xmi:id="EAID_8562C3EE_E7A9_4c2f_80A7_88224E87F85A" name="Count_Rate_Meas"
description="Measurement of Count Rate measured in CountsPerSecond with Real numbers"
measurementAxis="EAID_96AB26FE_F38A_4d37_8733_8514CC518EAB"
measurementSystem="EAID_1B1757D9_6651_468a_93E2_FDD643FC0B28"
realizes="EAID_29913A1B_DFBB_4db4_AE2B_93C6CC1EF116"/>
<element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_96AB26FE_F38A_4d37_8733_8514CC518EAB" name="Count_Rate_MeasAxis"
measurementSystemAxis="EAID_05CB9A19_1A96_4048_8133_20D818840B1C"
realizes="EAID_29913A1B_DFBB_4db4_AE2B_93C6CC1EF116"/>
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<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_64A2A70D_8134_4dd2_B865_768418BE803A" name="DataRate" description="Logical
model for the number of occurrences of a repeating event per unit time">
<element xmi:type="logical:Measurement"
xmi:id="EAID_8FB0E728_5F04_4523_B308_CB1890B0CBD8" name="Data_Rate_Meas"
description="Measurement of data rate measured in bits per second with real numbers"
measurementAxis="EAID_A6D1CF56_59FA_41c5_B889_F2666586D756"
measurementSystem="EAID_67D02CF0_6F36_4512_9A72_79FC782D1877"
realizes="EAID_5C94882D_D81D_44fd_9A96_04915D63D7BD"/>
<element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_A6D1CF56_59FA_41c5_B889_F2666586D756" name="Data_Rate_MeasAxis"
measurementSystemAxis="EAID_CA4F5AB4_B6C5_4e43_AB25_8C2FBDBCCC48"
realizes="EAID_5C94882D_D81D_44fd_9A96_04915D63D7BD"/>
</ldm>
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xmi:id="EAID_3C0A8364_1658_4665_88CE_FD29B718C67E" name="LocalAir" description="Rate
measurements based on the Local Air Reference Frame."/>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_E49420B6_67AA_4440_8BB1_B736DD667A73" name="LocalGround" description="Rate
measurements based on the Local Ground Reference Frame."/>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_AB3D4B4_40B8_492e_B145_0C49070B2BA0" name="LocalHorizontal"
description="Rate measurements based on the Local Horizontal Reference Frame."/>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_D688AB1B_E65E_4d5d_9CD4_9A63E3BB04C8" name="LocalMagneticNorth"
description="Rate measurements based on the Local Magnetic North Reference Frame."/>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_AAA64CCF_46CE_44b4_A87E_50DFB4FD6224" name="LocalNorthEastDown"
description="Rate measurements based on the local North East Down Reference Frame."/>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_1BAC062C_CD2B_49e9_9120_B4BDEC36CC1D" name="MassFlowRate"
description="Logical model for the rate of change in Mass">
<element xmi:type="logical:Measurement"
xmi:id="EAID_D4F564A9_C7A8_4187_B7F8_D5D5D2D52EDF" name="Mass_Flow_Rate_Meas"
description="Measurement of mass flow rate. "
measurementAxis="EAID_B9141C5E_2CF4_4c3e_8791_1D7A7D678CCD"
measurementSystem="EAID_B4355855_DB71_47d9_85BD_518369AC3D82"
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<element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_B9141C5E_2CF4_4c3e_8791_1D7A7D678CCD" name="Mass_Flow_Rate_MeasAxis"
measurementSystemAxis="EAID_4ACDE562_CF5E_4822_81E7_C8E9AD21F208"
realizes="EAID_2435A700_DF6F_4e88_98FA_05AD14BA5F5D"/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_A7F66D1E_7524_4318_A343_C5682FCB63AB" name="Velocity">
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description="Measurement for 3D velocity vector in meters/sec."
measurementAxis="EAID_04695DE4_B19B_49ba_884F_ACF26F444B6B
EAID_DE69C0F8_4DC4_4a07_A0A9_F3314F74DBEA EAID_DCB13086_2312_460f_A6FB_B5AE29D9C94F"
measurementSystem="EAID_9A7494F0_FA99_4291_B943_D13D93C8970"
realizes="EAID_331BB7F2_6E37_433e_8027_991D9E82BA67"/>

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description="Measurement for 3D velocity vector in knots."
measurementAxis="EAID_7CE90824_A338_4b84_9E20_4AC763056349
EAID_66DB4E23_EE19_4baa_8587_649E0EBDD9E0 EAID_A3844C03_BC64_4ee2_AAAC_26846D39BF3A"
measurementSystem="EAID_9A7494F0_FA99_4291_B943_D13D93C8970"
realizes="EAID_331BB7F2_6E37_433e_8027_991D9E82BA67"/>
<element xmi:type="logical:Measurement"
xmi:id="EAID_2A3A8E69_5FA7_457e_870B_BBEF5B360F70" name="Velocity_U_Meas" description="A geo measurement system attached to a vehicle. The three axes are centered at the vehicle CoG Q,E and oriented relative to features on the earth Q,E the North Pole (local meridian) Q,E the east (local parallel) Q,E and tangent to the NE plane. North Axis."
measurementAxis="EAID_DE358A05_A753_4844_B3B9_73BBA357A0BE"
measurementSystem="EAID_EA2D7214_102B_47e6_96E1_AD39FEF7AA78"
realizes="EAID_331BB7F2_6E37_433e_8027_991D9E82BA67"/>
<element xmi:type="logical:Measurement"
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measurementAxis="EAID_35DC16C7_BB96_4680_8E9D_31CD20646CF5"
measurementSystem="EAID_72F721D5_CCAC_4228_B756_1B181EA9DB0E"
realizes="EAID_331BB7F2_6E37_433e_8027_991D9E82BA67"/>
<element xmi:type="logical:Measurement"
xmi:id="EAID_CBA3BC51_5177_405d_82B2_4345F9BA1038" name="Velocity_W_Meas" description="A geo measurement attached to a vehicle. The three axes are centered at the vehicle CoG Q,E and oriented relative to features on the earth Q,E the North Pole (local meridian) Q,E the east (local parallel) Q,E and tangent to the NE plane. Down Axis"
measurementAxis="EAID_BD7CD4C3_04CE_4b5a_A0D6_321F05BFFC48"
measurementSystem="EAID_DCBDAA534_F469_46bd_9579_21458BC958EF"
realizes="EAID_331BB7F2_6E37_433e_8027_991D9E82BA67"/>
<element xmi:type="logical:Measurement"
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description="A geographical measurement system attached to a vehicle. The three axes are centered at the vehicle CoG Q,E and oriented relative to features on the earth Q,E the North Pole (local meridian) Q,E the east (local parallel) Q,E and tangent to the NE plane." measurementAxis="EAID_DE358A05_A753_4844_B3B9_73BBA357A0BE
EAID_35DC16C7_BB96_4680_8E9D_31CD20646CF5 EAID_BD7CD4C3_04CE_4b5a_A0D6_321F05BFFC48"
measurementSystem="XyWdeMXpEeS20aHYOO_RKQ"
realizes="EAID_331BB7F2_6E37_433e_8027_991D9E82BA67"/>
<element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_04695DE4_B19B_49ba_884F_ACF26F444B6B" name="Velocity_X_MeasAxis"
measurementSystemAxis="EAID_00AA39C5_5552_4b3c_B216_E8BB9C034583"
realizes="EAID_331BB7F2_6E37_433e_8027_991D9E82BA67"/>
<element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_7CE90824_A338_4b84_9E20_4AC763056349" name="Velocity_X_RealKnots_MeasAxis"
valueTypeUnit="EAID_F6853D08_6D00_4844_AB9C_60686E09323F"
measurementSystemAxis="EAID_00AA39C5_5552_4b3c_B216_E8BB9C034583"
realizes="EAID_331BB7F2_6E37_433e_8027_991D9E82BA67"/>
<element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_DE69C0F8_4DC4_4a07_A0A9_F3314F74DBEA" name="Velocity_Y_MeasAxis"
measurementSystemAxis="EAID_3DDF59AE_D3CF_4af4_B961_74B4767E82F4"
realizes="EAID_331BB7F2_6E37_433e_8027_991D9E82BA67"/>
<element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_66DB4E23_EE19_4baa_8587_649E0EBDD9E0" name="Velocity_Y_RealKnots_MeasAxis"
valueTypeUnit="EAID_F6853D08_6D00_4844_AB9C_60686E09323F"
measurementSystemAxis="EAID_3DDF59AE_D3CF_4af4_B961_74B4767E82F4"
realizes="EAID_331BB7F2_6E37_433e_8027_991D9E82BA67"/>
<element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_DCB13086_2312_460f_A6FB_B5AE29D9C94F" name="Velocity_Z_MeasAxis"
measurementSystemAxis="EAID_5ED509C3_48D9_4c7f_9047_B636C7162F68"
realizes="EAID_331BB7F2_6E37_433e_8027_991D9E82BA67"/>
<element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_A3844C03_BC64_4ee2_AAAC_26846D39BF3A" name="Velocity_Z_RealKnots_MeasAxis"
valueTypeUnit="EAID_F6853D08_6D00_4844_AB9C_60686E09323F"
measurementSystemAxis="EAID_5ED509C3_48D9_4c7f_9047_B636C7162F68"
realizes="EAID_331BB7F2_6E37_433e_8027_991D9E82BA67"/>
<element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_DE358A05_A753_4844_B3B9_73BBA357A0BE" name="Velocity_U_MeasAxis"
description="The North axis of an NED Measurement System."/>

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valueTypeUnit="EAID_A3E35DAE_F099_4f94_814A_3CCBD68FD08E"
measurementSystemAxis=_XyWde8XpEeS20aHYOO_RKQ"/>
    <element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_35DC16C7_BB96_4680_8E9D_31CD20646CF5" name="Velocity_V_MeasAxis"
description="The East axis of an NED Measurement System."
valueTypeUnit="EAID_A3E35DAE_F099_4f94_814A_3CCBD68FD08E"
measurementSystemAxis=_XyWdfMXpEeS20aHYOO_RKQ"/>
        <element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_BD7CD4C3_04CE_4b5a_A0D6_321F05BF48" name="Velocity_W_MeasAxis"
description="The Down axis of an NED Measurement System."
valueTypeUnit="EAID_A3E35DAE_F099_4f94_814A_3CCBD68FD08E"
measurementSystemAxis=_XyWdēsXpEeS20aHYOO_RKQ"/>
    </ldm>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_472F515A_471B_46b8_B93A_34C59A3D56FA" name="TemperatureMeasures">
    <element xmi:type="logical:Measurement"
xmi:id="EAID_96A3005_C2CE_41c4_8B18_54D31F550C5C" name="Temperature_Delta_Meas"
description="Measurement for expressing temperature deltas"
measurementAxis="EAID_9A198C4A_7F41_49c8_8E88_A78CC6036D71"
measurementSystem="EAID_170CE113_B44C_4e3d_900C_145AD5038DA1"
realizes="EAID_413788BB_764C_45d6_BBB3_904F396F92A3"/>
        <element xmi:type="logical:Measurement"
xmi:id="EAID_4D93682B_D923_46db_BEBE_5316D34D5BA9" name="Temperature_Meas"
description="Thermodynamic temperature measures in degrees Kelvin."
measurementAxis="EAID_383C7B72_1F72_4471_8962_0676820582FD"
measurementSystem="EAID_170CE113_B44C_4e3d_900C_145AD5038DA1"
realizes="EAID_2912B4B3_E784_4796_A911_6CE50C6872FB"/>
        <element xmi:type="logical:Measurement"
xmi:id="EAID_4C0798C1_CC70_4d59_9836_14C5490A158D" name="Temperature_DegreesCelsius_Meas"
description="Thermodynamic temperature measures in degrees Celsius."
measurementAxis="EAID_AD359229_9EA5_4b17_BD48_3ACADEFBE806"
measurementSystem="EAID_170CE113_B44C_4e3d_900C_145AD5038DA1"
realizes="EAID_2912B4B3_E784_4796_A911_6CE50C6872FB"/>
        <element xmi:type="logical:Measurement"
xmi:id="EAID_4992D477_7343_44e0_BE44_8BB3DDDE001"
name="Temperature_DegreesFahrenheit_Meas" description="Thermodynamic temperature measures in degrees Fahrenheit." measurementAxis="EAID_985CF56E_0DC3_49a8_B45C_40933A0703B2"
measurementSystem="EAID_170CE113_B44C_4e3d_900C_145AD5038DA1"
realizes="EAID_2912B4B3_E784_4796_A911_6CE50C6872FB"/>
        <element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_9A198C4A_7F41_49c8_8E88_A78CC6036D71" name="Temperature_Delta_MeasAxis"
description="Measurement axis for values of temperature deltas."
measurementSystemAxis="EAID_E023E619_ED37_429a_B3FC_653CDC4D5C26"
realizes="EAID_413788BB_764C_45d6_BBB3_904F396F92A3"/>
        <element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_383C7B72_1F72_4471_8962_0676820582FD" name="Temperature_MeasAxis"
valueTypeUnit="EAID_8AEE5DA4_5925_412c_9D23_D625B93B0665"
measurementSystemAxis="EAID_E023E619_ED37_429a_B3FC_653CDC4D5C26"
realizes="EAID_2912B4B3_E784_4796_A911_6CE50C6872FB"/>
        <constraint xmi:type="logical:MeasurementConstraint"
xmi:id="EAID_233E9016_F98B_4932_B10B_C9111298BEF9" constraintText="Always >= absolute zero"/>
    </element>
    <element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_985CF56E_0DC3_49a8_B45C_40933A0703B2"
name="Temperature_DegreesFahrenheit_MeasAxis"
valueTypeUnit="EAID_E3839FOF_515A_4496_AE49_EA85C5A5F0AC"
measurementSystemAxis="EAID_E023E619_ED37_429a_B3FC_653CDC4D5C26"
realizes="EAID_2912B4B3_E784_4796_A911_6CE50C6872FB"/>
        <constraint xmi:type="logical:MeasurementConstraint"
xmi:id="EAID_D23D6885_FC6D_4ee1_852A_98E10C9DF1B4" constraintText="Always >= absolute zero"/>
    </element>
    <element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_AD359229_9EA5_4b17_BD48_3ACADEFBE806"
name="Temperature_DegreesCelsius_MeasAxis"
measurementSystemAxis="EAID_E023E619_ED37_429a_B3FC_653CDC4D5C26"
realizes="EAID_2912B4B3_E784_4796_A911_6CE50C6872FB"/>

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<constraint xmi:type="logical:MeasurementConstraint"
xmi:id="EAID_4AE4B31A_323C_4b0c_B0AB_201895AE1287" constraintText="Always >= absolute
zero."/>
</element>
<element xmi:type="logical:MeasurementConversion"
xmi:id="EAID_F027902E_D342_4e78_8E53_ADCCA7688954"
name="DegC_to_DegF_Temperature_Conversion" description="Conversion from Degrees Celsius
to Degrees Fahrenheit" conversionLossDescription="none"
source="EAID_4C0798C1_CC70_4d59_9836_14C5490A158D"
target="EAID_4992D477_7343_44e0_BE44_8BB3DDDDE001">
<equation>
    DegF=1.8*DegC+32
</equation>
</element>
<element xmi:type="logical:MeasurementConversion"
xmi:id="EAID_3409B03E_9DDA_4fef_B2BB_C07BE7EF6729"
name="DegC_to_DegK_Temperature_Conversion" description="Conversion from Degrees Celsius
to Degrees Kelvin" conversionLossDescription="none"
source="EAID_4C0798C1_CC70_4d59_9836_14C5490A158D"
target="EAID_4D93682B_D923_46db_BEBE_5316D34D5BA9">
<equation>
    DegK=DegC+273.15
</equation>
</element>
<element xmi:type="logical:MeasurementConversion"
xmi:id="EAID_E3B47DC7_E224_4876_9E21_81391DB7FB19"
name="DegF_to_DegC_Temperature_Conversion" description="Conversion from Degrees
Fahrenheit to Degrees Celsius" conversionLossDescription="none"
source="EAID_4992D477_7343_44e0_BE44_8BB3DDDDE001"
target="EAID_4C0798C1_CC70_4d59_9836_14C5490A158D">
<equation>
    DegC=(DegF-32)/1.8
</equation>
</element>
<element xmi:type="logical:MeasurementConversion"
xmi:id="EAID_341E3FF5_1C19_4d71_8773_FC266F97557F"
name="DegF_to_DegK_Temperature_Conversion" description="Conversion from Degrees
Fahrenheit to Degrees Kelvin" conversionLossDescription="none"
source="EAID_4992D477_7343_44e0_BE44_8BB3DDDDE001"
target="EAID_4D93682B_D923_46db_BEBE_5316D34D5BA9">
<equation>
    DegK=(DegF-459.67)/1.8
</equation>
</element>
<element xmi:type="logical:MeasurementConversion"
xmi:id="EAID_E1501D4D_D7EB_4cf9_86AB_260A75418C3E"
name="DegK_to_DegC_Temperature_Conversion" description="Conversion from Degrees Kelvin to
Degrees Celsius" conversionLossDescription="none"
source="EAID_4D93682B_D923_46db_BEBE_5316D34D5BA9"
target="EAID_4C0798C1_CC70_4d59_9836_14C5490A158D">
<equation>
    DegC=DegK-273.15
</equation>
</element>
<element xmi:type="logical:MeasurementConversion"
xmi:id="EAID_AF340A57_827E_4ec9_8DBF_773FB14BBD65"
name="DegK_to_DegF_Temperature_Conversion" description="Conversion from Degrees Kelvin to
Degrees Fahrenheit" conversionLossDescription="none"
source="EAID_4D93682B_D923_46db_BEBE_5316D34D5BA9"
target="EAID_4992D477_7343_44e0_BE44_8BB3DDDDE001">
<equation>

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DegF=1.8*DegK+459.67

        </equation>
    </element>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_8C083820_6466_483b_9047_3DF9D2990363" name="LocalAir"
description="Temperature measurements based on the Local Air Reference Frame.">
    <element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_528F4773_240A_4ac0_AA34_1F6F4C40D1BD"
name="Temperature_LocalAir_DegreesCelsius_MeasAxis"
measurementSystemAxis="EAID_E023E619_ED37_429a_B3FC_653CDC4D5C26">
        <constraint xmi:type="logical:MeasurementConstraint"
xmi:id="EAID_74F489DA_BA25_4578_A399_D0C72DA7834C" constraintText="Temperature range in
Earth atmosphere from surface through stratosphere (-70C to +70C)"/>
    </element>
    <element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_B58D75F6_F61A_4f66_A846_031A65AA3EF0"
name="Temperature_LocalAir_DegreesFahrenheit_MeasAxis"
measurementSystemAxis="EAID_E023E619_ED37_429a_B3FC_653CDC4D5C26">
        <constraint xmi:type="logical:MeasurementConstraint"
xmi:id="EAID_7B22CF80_557D_42c6_B26B_FD70DA877CEF" constraintText="Temperature range in
Earth atmosphere from surface through stratosphere (-100F to +160F)"/>
    </element>
    <element xmi:type="logical:MeasurementConversion"
xmi:id="EAID_9C5FFD4F_C2C7_404d_B8F8_B4BC7CD0C64D"
name="DegC_to_DegF_TAT_LocalAir_Temperature_Conversion" description="Conversion from
Degrees Celsius to Degrees Fahrenheit" conversionLossDescription="none"
source="EAID_4C0798C1_CC70_4d59_9836_14C5490A158D"
target="EAID_4992D477_7343_44e0_BE44_8BB3DDDE001">
        <equation>

            DegF=1.8*DegC+32

        </equation>
    </element>
    <element xmi:type="logical:MeasurementConversion"
xmi:id="EAID_071E1D6E_7654_4dd4_AF38_FECB88F6FB0A"
name="DegF_to_DegC_TAT_LocalAir_Température_Conversion" description="Conversion from
Degrees Fahrenheit to Degrees Celsius" conversionLossDescription="none"
source="EAID_4992D477_7343_44e0_BE44_8BB3DDDE001"
target="EAID_4C0798C1_CC70_4d59_9836_14C5490A158D">
        <equation>

            DegC=(DegF-32)/1.8

        </equation>
    </element>
</ldm>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_7A761013_2939_482c_9DBE_FBFEB3256BAF6" name="TemporalFrequency"
description="Logical model for the number of occurrences of a repeating event per unit
time">
    <element xmi:type="logical:Measurement"
xmi:id="EAID_2C068008_5E90_4c8f_95A3_0E3A0B58E47D" name="Temporal_Frequency_Meas"
description="Measurement of frequency measured in Hertz with Real numbers"
measurementAxis="EAID_4C2554B4_612B_4aae_A5E3_D82BD8F258F9"
measurementSystem="EAID_FFDFA047_BDBD_4ab3_A6D_B8AB68DBA582"
realizes="EAID_6576E8D2_2D88_4881_819E_7CA0B661B8A5">
        <element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_4C2554B4_612B_4aae_A5E3_D82BD8F258F9" name="Temporal_Frequency_MeasAxis"
measurementSystemAxis="EAID_FB000C46_0D64_4280_8E88_5C967757A7BE"
realizes="EAID_6576E8D2_2D88_4881_819E_7CA0B661B8A5">
            <constraint xmi:type="logical:MeasurementConstraint"
xmi:id="EAID_1AD1DBF7_E59A_4717_A123_3F3561C46C1C" constraintText="Always >= 0"/>
        </element>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_9314B184_811C_43b2_AB0D_F8D48CA1AD23" name="TimeMeasures">

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<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_E7A2C8B2_BF2F_43b2_AE9F_AACEFA4B26FA" name="CalendarTimeMeasures">
    <ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_B6E638E9_194C_407f_A1F3_BCC272577B5E" name="UTC_Measures">
        <element xmi:type="logical:Measurement"
xmi:id="EAID_8A676269_31C8_4328_887F_4A4037361262" name="Date_GregorianDate_Meas"
description="Gregorian calendar date measurement. Like UTC Time Q,E but without time of day components" measurementAxis="EAID_F668E99E_69A8_4f62_9E5E_AED67ECA8F4B"
measurementSystem="EAID_919C63A9_0165_4912_8EB0_2385631BEDF5"
realizes="EAID_6F2C6003_64FF_42a1_B4D1_00E34745B793"/>
        <element xmi:type="logical:Measurement"
xmi:id="EAID_7E0217AD_F3F9_460e_BCD2_0225B775B71F" name="Time_NATO4586Time_Meas"
description="Measurement describing a instant in time as the number of seconds that have elapsed since the NATO STANAG 4586 Epoch Time (00:00:00 Coordinated Universal Time (UTC) Q, ESaturday Q, E1 January 2000)."
measurementAxis="EAID_69522A3D_F9E4_440c_8F7A_700ED27E60C0"
measurementSystem="EAID_2DF64042_C1E0_4f0e_B52E_96FE4DCBFDFDA"
realizes="EAID_6F2C6003_64FF_42a1_B4D1_00E34745B793"/>
        <element xmi:type="logical:Measurement"
xmi:id="EAID_C37DD99D_2780_4d77_97C1_0C0B7E356E6F" name="Time_LocalTime_Meas"
description="Local calendar date and time in a time zone per the UTC standard Q,E using Gregorian calendar days (vs. Julian day number) and an hr:min offset from UTC"
measurementAxis="EAID_208221D0_6397_42f8_A95E_68D653800C9F"
measurementSystem="EAID_919C63A9_0165_4912_8EB0_2385631BEDF5"
realizes="EAID_6F2C6003_64FF_42a1_B4D1_00E34745B793"/>
        <element xmi:type="logical:Measurement"
xmi:id="EAID_E8FA7DE3_3604_472d_845F_1BC6324B3DA8" name="Time_ISO8601Basic_Meas"
description="A date-time expressed as a text string conforming to the ISO8601 standard's basic format (no separators between time and date components)"
measurementAxis="EAID_389549E1_3214_4ab6_AD52_31456B5B56D0"
measurementSystem="EAID_919C63A9_0165_4912_8EB0_2385631BEDF5"
realizes="EAID_6F2C6003_64FF_42a1_B4D1_00E34745B793"/>
        <element xmi:type="logical:Measurement"
xmi:id="EAID_EBA84EE8_B7C1_4235_B2D7_5E0E26CE9726" name="Time_ISO8601Extended_Meas"
description="A date-time expressed as a text string conforming to the ISO8601 standard's extended format (hyphens between date components Q,E colons between time components)"
measurementAxis="EAID_01B4E089_43BE_4fb0_8B2F_0E6D4F1D54C4"
measurementSystem="EAID_919C63A9_0165_4912_8EB0_2385631BEDF5"
realizes="EAID_6F2C6003_64FF_42a1_B4D1_00E34745B793"/>
        <element xmi:type="logical:Measurement"
xmi:id="EAID_35DA47A4_BE0D_429f_A3EB_884AA94E9F18" name="Time_UTCTime_Meas" description="Date and time per the UTC standard using Gregorian calendar days (vs. Julian day number). The measure does not include a local time offset."
measurementAxis="EAID_4B74DE56_0A5D_4f0e_9B46_9C2D5DDA1DCE"
measurementSystem="EAID_919C63A9_0165_4912_8EB0_2385631BEDF5"
realizes="EAID_6F2C6003_64FF_42a1_B4D1_00E34745B793"/>
        <element xmi:type="logical:Measurement"
xmi:id="EAID_BB3EA4C8_7C42_46ca_9FAC_2B2F97A6B421" name="Time_TimeOfDay_UTCTime_Meas"
description="A time in a specific calendar day indicating the number of hours Q,E minutes Q,E and seconds since the day start per the UTC standard"
measurementAxis="EAID_A742838B_04C5_4ac6_BE93_23DFB19E071D"
measurementSystem="EAID_C5B2FCE6_50D5_49bd_B283_E3C5F1C922C"
realizes="EAID_6F2C6003_64FF_42a1_B4D1_00E34745B793"/>
        <element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_69522A3D_F9E4_440c_8F7A_700ED27E60C0" name="Time_NATO4586Time_MeasAxis"
description="Measurement axis for NATO STANAG 4586 time duration in integer seconds"
measurementSystemAxis="EAID_B048ED04_3BC0_4afe_ACB2_5CBF1601E5B6"
realizes="EAID_6F2C6003_64FF_42a1_B4D1_00E34745B793"/>
        <element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_F668E99E_69A8_4f62_9E5E_AED67ECA8F4B" name="Date_GregorianDate_MeasAxis"
description="Measurement axis for Gregorian date. Same as UTCTimeAxis Q,E but without time of day components." valueTypeUnit="EAID_4363AD8C_A1ED_447c_8074_A9C2C1BFAD59
EAID_E2FA4AF7_5100_4797_A1BD_B5E448ED93EE EAID_770A3B26_286B_4669_9D59_28EEEDDFA38D"
measurementSystemAxis="EAID_5464AD82_2C21_4ad1_9FF8_77A64C196E82"
realizes="EAID_6F2C6003_64FF_42a1_B4D1_00E34745B793"/>
        <element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_208221D0_6397_42f8_A95E_68D653800C9F" name="Time_LocalTime_MeasAxis"
description="Measurement axis for UTC time with local time offset"
measurementSystemAxis="EAID_5464AD82_2C21_4ad1_9FF8_77A64C196E82"
realizes="EAID_6F2C6003_64FF_42a1_B4D1_00E34745B793"/>

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        <element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_389549E1_3214_4ab6_AD52_31456B5B56D0" name="Time_ISO8601Basic_MeasAxis"
description="Measurement axis to represent date-time expressed as a text string
conforming to the ISO8601 standard's basic format."
valueTypeUnit="EAID_78C708C0_6629_4464_B0DD_8D88EF3B63EC"
measurementSystemAxis="EAID_5464AD82_2C21_4ad1_9FF8_77A64C196E82"
realizes="EAID_6F2C6003_64FF_42a1_B4D1_00E34745B793">
    <constraint xmi:type="logical:MeasurementConstraint"
xmi:id="EAID_22C0D3D5_E274_4164_AA3C_3D900CBA4986" constraintText="Constrained per
ISO8601 Time Basic"/>
</element>
<element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_01B4E089_43BE_4fb0_8B2F_0E6D4F1D54C4" name="Time_ISO8601Extended_MeasAxis"
description="Measurement axis to represent date-time expressed as a text string
conforming to the ISO8601 standard's extended format"
valueTypeUnit="EAID_ED9E8C67_EADC_4e8b_AE9D_FDE127E74F8A"
measurementSystemAxis="EAID_5464AD82_2C21_4ad1_9FF8_77A64C196E82"
realizes="EAID_6F2C6003_64FF_42a1_B4D1_00E34745B793">
    <constraint xmi:type="logical:MeasurementConstraint"
xmi:id="EAID_7011F8EC_D7B5_484a_813F_F762F68C7A48" constraintText="Constrained per
ISO8601 Time Extended"/>
</element>
<element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_4B74DE56_0A5D_4f0e_9B46_9C2D5DDA1DCE" name="Time_UTC_MeasAxis"
description="Measurement axis for UTC time"
valueTypeUnit="EAID_770A3B26_286B_4669_9D59_28EEEDDFAA38D
EAID_E2FA4AF7_5100_4797_A1BD_B5E448ED93EE EAID_4363AD8C_A1ED_447c_8074_A9C2C1BFAD59
EAID_7CE0FD03_E2B8_4a2b_BEF3_AC063A10AF19 EAID_6BBAF578_C863_44a7_A3E6_EDCF0E358B65
EAID_C6177FOA_A31C_496d_8F54_D3C02C9FA020"
measurementSystemAxis="EAID_5464AD82_2C21_4ad1_9FF8_77A64C196E82"
realizes="EAID_6F2C6003_64FF_42a1_B4D1_00E34745B793"/>
<element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_A742838B_04C5_4ac6_BE93_23DFB19E071D" name="Time_TimeOfDay_UTC_MeasAxis"
description="Measurement axis for time offset since the start of a UTC/Gregorian calendar
day Q,E represented with HourOfDay Q,E MinuteOfHour Q,E and SecondOfMinute components"
valueTypeUnit="EAID_7CE0FD03_E2B8_4a2b_BEF3_AC063A10AF19
EAID_6BBAF578_C863_44a7_A3E6_EDCF0E358B65 EAID_C6177FOA_A31C_496d_8F54_D3C02C9FA020"
measurementSystemAxis="EAID_A9475213_1F9D_4967_9F5B_5454DF64813D"
realizes="EAID_6F2C6003_64FF_42a1_B4D1_00E34745B793">
    <constraint xmi:type="logical:MeasurementConstraint"
xmi:id="SDM_5B2AF5B1_22E1_4C19_A96A_F2A9A779E539" constraintText="This measurement
represents an instant within a calendar day"/>
</element>
</ldm>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_75917908_BE51_48a0_90FA_6112089129D3" name="TimeDurationMeasures">
    <element xmi:type="logical:Measurement"
xmi:id="EAID_B892AB87_32A2_4d24_AB2E_B903C6515760" name="Time_Posix_Meas"
description="Measurement describing a instant in time as the number of seconds that have
elapsed since the Unix Epoch Time (00:00:00 Coordinated Universal Time (UTC) Q,EThursday
Q,El January 1970) Q,Enot counting leap seconds."
measurementAxis="EAID_101C0D13_D395_47fb_8885_743191537CB9"
measurementSystem="EAID_3E078B08_3024_4dfe_B01E_74929C579251"
realizes="EAID_4E729952_4D4F_46f9_B372_04489372E9D4"/>
    <element xmi:type="logical:Measurement"
xmi:id="EAID_1A8D73E3_1037_43b2_BE82_A4F03B55274B" name="Time_Duration_IntegerHours_Meas"
description="The time duration to or from a specific reference time in hours."
measurementAxis="EAID_78BB6B9A_2D62_403e_B630_5908C9C2DCA1"
measurementSystem="EAID_4C31C156_E6E2_4115_AF63_8794199664AA"
realizes="EAID_4E729952_4D4F_46f9_B372_04489372E9D4"/>
    <element xmi:type="logical:Measurement"
xmi:id="EAID_C6874185_57C1_48c2_9D10_1C07854096FC"
name="Time_Duration_IntegerMinutes_Meas" description="The time duration to or from a
specific reference time in minutes."
measurementAxis="EAID_FD3C0CAF_58D2_4955_8E25_3D08220DF370"
measurementSystem="EAID_4C31C156_E6E2_4115_AF63_8794199664AA"
realizes="EAID_4E729952_4D4F_46f9_B372_04489372E9D4"/>
    <element xmi:type="logical:Measurement"
xmi:id="EAID_8728BC54_83E3_4539_8DD9_E585B96842D5"
name="Time_Duration_IntegerSeconds_Meas" description="The time duration to or from a

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specific reference time in seconds."
measurementAxis="EAID_94B8472E_5F5B_4f87_B89F_70B2B293D187"
measurementSystem="EAID_4C31C156_E6E2_4115_AF63_8794199664AA"
realizes="EAID_4E729952_4D4F_46f9_B372_04489372E9D4"/>
    <element xmi:type="logical:Measurement"
xmi:id="EAID_3BA75C1A_FDBB_4a94_A7F0_E5283B956F06"
name="Time_Duration_IntegerMicroseconds_Meas" description="The time duration to or from a specific reference time in microseconds."
measurementAxis="EAID_3F6678FA_B48F_41b2_8C42_35C4BC3901C0"
measurementSystem="EAID_4C31C156_E6E2_4115_AF63_8794199664AA"
realizes="EAID_4E729952_4D4F_46f9_B372_04489372E9D4"/>
    <element xmi:type="logical:Measurement"
xmi:id="EAID_4805C60A_CC31_45af_B3A1_57C9353A3B21"
name="Time_Duration_IntegerMilliseconds_Meas" description="The time duration to or from a specific reference time in milliseconds."
measurementAxis="EAID_3457128D_EDE7_4e41_9D0F_E05E81B52C4A"
measurementSystem="EAID_4C31C156_E6E2_4115_AF63_8794199664AA"
realizes="EAID_4E729952_4D4F_46f9_B372_04489372E9D4"/>
    <element xmi:type="logical:Measurement"
xmi:id="EAID_A41947AA_BEE6_4056_9BD2_D9862491D063"
name="Time_Duration_IntegerNanoseconds_Meas" description="The time duration to or from a specific reference time in minutes."
measurementAxis="EAID_9850C6AD_C2FE_44b1_B2E2_D25EE8E548B5"
measurementSystem="EAID_4C31C156_E6E2_4115_AF63_8794199664AA"
realizes="EAID_4E729952_4D4F_46f9_B372_04489372E9D4"/>
    <element xmi:type="logical:Measurement"
xmi:id="EAID_EDBCEFD8_B3FF_472d_ACAC_9E0A2C477AF1" name="Time_Duration_RealSeconds_Meas"
description="Measure of time duration as real with microsecond precision."
measurementAxis="EAID_C60479DC_124E_4445_82B5_55F128A30016"
measurementSystem="EAID_4C31C156_E6E2_4115_AF63_8794199664AA"
realizes="EAID_4E729952_4D4F_46f9_B372_04489372E9D4"/>
    <element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_101C0D13_D395_47fb_8885_743191537CB9" name="Time_Posix_MeasAxis"
description="Measurement axis for POSIX/Unix time duration in integer seconds"
measurementSystemAxis="EAID_789E08B1_DC02_497e_A8C9_75BC1AB027CD"
realizes="EAID_4E729952_4D4F_46f9_B372_04489372E9D4"/>
        <element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_78BB6B9A_2D62_403e_B630_5908C9C2DCA1"
name="Time_Duration_IntegerHours_MeasAxis" description="Measurement axis for time duration in integer hours." valueTypeUnit="EAID_A71F1148_7ED6_47bb_8D23_40879881A511"
measurementSystemAxis="EAID_13D5B7DF_48FF_4ad4_B66E_AA8AD7621A42"
realizes="EAID_4E729952_4D4F_46f9_B372_04489372E9D4"/>
        <element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_FD3C0CAF_58D2_4955_8E25_3D08220DF370"
name="Time_Duration_IntegerMinutes_MeasAxis" description="Measurement axis for time duration in integer minutes." valueTypeUnit="EAID_4F8968A0_E38F_4434_B511_EE50E0BD0A5A"
measurementSystemAxis="EAID_13D5B7DF_48FF_4ad4_B66E_AA8AD7621A42"
realizes="EAID_4E729952_4D4F_46f9_B372_04489372E9D4"/>
        <element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_94B8472E_5F5B_4f87_B89F_70B2B293D187"
name="Time_Duration_IntegerSeconds_MeasAxis" description="Measurement axis for time duration in integer seconds."
measurementSystemAxis="EAID_13D5B7DF_48FF_4ad4_B66E_AA8AD7621A42"
realizes="EAID_4E729952_4D4F_46f9_B372_04489372E9D4"/>
        <element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_3F6678FA_B48F_41b2_8C42_35C4BC3901C0"
name="Time_Duration_IntegerMicroseconds_MeasAxis" description="Measurement axis for time duration in integer microseconds."
valueTypeUnit="EAID_53D339BB_B8AB_4c87_8FCE_EF87F0CB7BEF"
measurementSystemAxis="EAID_13D5B7DF_48FF_4ad4_B66E_AA8AD7621A42"
realizes="EAID_4E729952_4D4F_46f9_B372_04489372E9D4"/>
        <element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_3457128D_EDE7_4e41_9D0F_E05E81B52C4A"
name="Time_Duration_IntegerMilliseconds_MeasAxis" description="Measurement axis for time duration in integer milliseconds."
valueTypeUnit="EAID_C9419C4D_A541_4810_82FB_FC6266B893DD"
measurementSystemAxis="EAID_13D5B7DF_48FF_4ad4_B66E_AA8AD7621A42"
realizes="EAID_4E729952_4D4F_46f9_B372_04489372E9D4"/>
        <element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_9850C6AD_C2FE_44b1_B2E2_D25EE8E548B5"
name="Time_Duration_IntegerNanoseconds_MeasAxis" description="Measurement axis for time

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duration in integer nanoseconds."
valueTypeUnit="EAID_8FAB4588_E952_4394_AA69_083EAF893AF4"
measurementSystemAxis="EAID_13D5B7DF_48FF_4ad4_B66E_AA8AD7621A42"
realizes="EAID_4E729952_4D4F_46f9_B372_04489372E9D4"/>
<element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_C60479DC_124E_4445_82B5_55F128A30016"
name="Time_Duration_RealSeconds_MeasAxis" description="Time duration measurement axis for
measure in real seconds." valueTypeUnit="EAID_A558BC68_B8EF_43d8_8889_65E126114613"
measurementSystemAxis="EAID_13D5B7DF_48FF_4ad4_B66E_AA8AD7621A42"
realizes="EAID_4E729952_4D4F_46f9_B372_04489372E9D4"/>
</ldm>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_59C3F54_23B6_4bf8_A0F8_107DDD00657E" name="ViscosityMeasures">
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_057CBEFA_AE56_4c92_9C84_8EC23BBF9DDA" name="DynamicViscosityMeasures">
<element xmi:type="logical:Measurement"
xmi:id="EAID_0C15A43D_D229_46d4_A5A7_D1A5F3B8D746" name="Dynamic_Viscosity_Meas"
description="Measurement for dynamic (shear) viscosity"
measurementAxis="EAID_E327EB0_C09F_4407_AA4D_FC87B9365598"
measurementSystem="EAID_ABE06F26_4180_4736_BB0D_CF8FE9B05010"
realizes="EAID_C58154E2_40C4_466f_AAF2_CF0751E434A6"/>
<element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_E327EB0_C09F_4407_AA4D_FC87B9365598" name="Dynamic_Viscosity_MeasAxis"
description="Measurement axis for dynamic (shear) viscosity in "
measurementSystemAxis="EAID_2CA8F2E2_0148_48c7_BA65_555A7CEED7EF"
realizes="EAID_C58154E2_40C4_466f_AAF2_CF0751E434A6"/>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_B7D3BF1B_779E_4a9d_A41D_532267932C39" name="KinematicViscosityMeasures">
<element xmi:type="logical:Measurement"
xmi:id="EAID_F4954C31_9D48_4d0e_977D_C0B54AE0B5B6" name="Kinematic_Viscosity_Meas"
description="Measurement for kinematic viscosity"
measurementAxis="EAID_0B64D617_7FAB_4939_97C0_3998C5D76296"
measurementSystem="EAID_426F4C83_FAFB_42ae_BA99_51EF798EA3CD"
realizes="EAID_9894902C_4D24_43b6_9EA0_3FC535B15003"/>
<element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_0B64D617_7FAB_4939_97C0_3998C5D76296" name="Kinematic_Viscosity_MeasAxis"
description="Measurement axis for kinematic viscosity in square meters per second"
measurementSystemAxis="EAID_3D69C939_50F0_4bf9_8699_8CCB6784F721"
realizes="EAID_9894902C_4D24_43b6_9EA0_3FC535B15003">
<constraint xmi:type="logical:MeasurementConstraint"
xmi:id="EAID_30AC859B_0BDF_414e_8667_BCB31F729535" constraintText="Always >= 0"/>
</element>
</ldm>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_25F84E64_2935_4cd9_88C8_D0D1B91FBBB1" name="VolumeMeasures">
<element xmi:type="logical:Measurement"
xmi:id="EAID_CD94D57B_BFAF_4f19_8129_43362BD5FC10" name="Volume_Meas"
description="Measurement to hold values of volume."
measurementAxis="EAID_BF654B2D_5864_49de_879B_96C9BDD7684A"
measurementSystem="EAID_A1ED4E98_B10D_4e7f_BFAD_86BA34D7C3DB"
realizes="EAID_363355FA_D46C_4c74_BF38_B9466951F1A0"/>
<element xmi:type="logical:MeasurementAxis"
xmi:id="EAID_BF654B2D_5864_49de_879B_96C9BDD7684A" name="Volume_MeasAxis"
description="Measurement taxis to hold values of volume."
measurementSystemAxis="EAID_F7F3A12A_7530_4370_9235_928317E0BC98"
realizes="EAID_363355FA_D46C_4c74_BF38_B9466951F1A0"/>
</ldm>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel"
xmi:id="EAID_92A25A5B_0CF9_42d2_89F0_937FCFCF5B76" name="Enumerations">
<element xmi:type="logical:Enumerated"
xmi:id="EAID_87E593E9_A387_4059_89D3_2186644F837E" name="AbstractDiscreteSet"
description="Set of discrete states for the AbstractDiscreteSetMeasurementSystemAxis that
has one "dummy" state for metamodel conformance. This set must be overridden on
real Measurement's MeasurementAxis with the actual set of states used by the
measurement."/>
<label xmi:type="logical:EnumerationLabel"
xmi:id="EAID_4517C956_4977_4893_BD7F_DAAAD28718AA" name="AbstractState"/>

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        </element>
    </ldm>
</ldm>
<ldm xmi:type="datamodel:LogicalDataModel" name="RIG_LogicalDataModelPackage">
    <ldm xmi:type="datamodel:LogicalDataModel" name="RIG_SpeedRealization_LDM_Package">
        <element xmi:type="logical:Measurement" name="AirspeedMeasurement"
measurementAxis="EAID_FA94A385_E790_4ab7_965F_D81D542D69F9"
measurementSystem="EAID_CA7165EF_5605_49ab_8B6F_24B78C4842AF"
realizes="EAID_06B460A8_5CEC_4e63_9607_4413DB527E37"/>
        <element xmi:type="logical:MeasurementAxis" name="AirspeedMeasurementAxis"
valueTypeUnit="EAID_A3E35DAE_F099_4f94_814A_3CCBD68FD08E"
measurementSystemAxis="EAID_34208C77_1C32_4838_89B7_FC6777140322"
realizes="EAID_06B460A8_5CEC_4e63_9607_4413DB527E37"/>
        <element xmi:type="logical:Measurement" name="GroundSpeedMeasurement"
measurementAxis="EAID_FA94A385_E790_4ab7_965F_D81D542D69F9"
measurementSystem="EAID_CA7165EF_5605_49ab_8B6F_24B78C4842AF"
realizes="EAID_06B460A8_5CEC_4e63_9607_4413DB527E37"/>
    </ldm>
    <ldm xmi:type="datamodel:LogicalDataModel" name="RIG_ImageRealization_LDM_Package">
        <element xmi:type="logical:StandardMeasurementSystem"
name="JPEGMeasurementSystem" referenceStandard="ISO/IEC 10918"/>
        <element xmi:type="logical:Measurement" name="JPEGMeasurement"
measurementSystem="//@dm.0/@ldm.1/@ldm.1/@element.0"
realizes="SDM_27B8B1EB_F1D3_43A4_9884_5C744FD0AB7D"/>
    </ldm>
    <ldm xmi:type="datamodel:LogicalDataModel"
name="RIG_ModeledDomainConcepts_LDM_Package" description="Subset of model elements from
RIG section 4.1.1 to support platform modeling for Figure 80.">
        <element xmi:type="logical:Entity" name="Area"
realizes="//@dm.0/@cdm.1/@cdm.2/@element.0">
            <composition xmi:type="logical:Composition" rolename="ID"
type="EAID_EB46C80F_53C9_4d1f_A356_5808475F4992"
realizes="//@dm.0/@cdm.1/@cdm.2/@element.0/@composition.0"/>
            <composition xmi:type="logical:Composition" rolename="position"
type="HIqhDQEExEeSj3_IywtjKpA"
realizes="//@dm.0/@cdm.1/@cdm.2/@element.0/@composition.1"/>
            <composition xmi:type="logical:Composition" rolename="extents"
type="EAID_9F6CBA03_9585_4e44_A3F2_4AB40FE76C7D"
realizes="//@dm.0/@cdm.1/@cdm.2/@element.0/@composition.2"/>
        </element>
        <element xmi:type="logical:Entity" name="Mission"
realizes="//@dm.0/@cdm.1/@cdm.2/@element.1">
            <composition xmi:type="logical:Composition" rolename="ID"
type="EAID_EB46C80F_53C9_4d1f_A356_5808475F4992"
realizes="//@dm.0/@cdm.1/@cdm.2/@element.1/@composition.0"/>
        </element>
        <element xmi:type="logical:Association" name="MissionRelevantArea"
realizes="//@dm.0/@cdm.1/@cdm.2/@element.2">
            <composition xmi:type="logical:Composition" rolename="ID"
type="EAID_EB46C80F_53C9_4d1f_A356_5808475F4992"
realizes="//@dm.0/@cdm.1/@cdm.2/@element.2/@composition.0"/>
            <participant xmi:type="logical:Participant" rolename="area"
type="//@dm.0/@ldm.1/@ldm.2/@element.0"
realizes="//@dm.0/@cdm.1/@cdm.2/@element.2/@participant.0"/>
            <participant xmi:type="logical:Participant" rolename="mission"
type="//@dm.0/@ldm.1/@ldm.2/@element.1"
realizes="//@dm.0/@cdm.1/@cdm.2/@element.2/@participant.1" sourceLowerBound="1"
sourceUpperBound="1"/>
        </element>
    </ldm>
    <ldm xmi:type="datamodel:LogicalDataModel"
name="RIG_AircraftAirportArrival_LDM_Package" description="Subset of model elements from
RIG section 3.3.4.2.1.4 to support platform modeling for Figure 81.">
        <element xmi:type="logical:Entity" name="Airport"
realizes="//@dm.0/@cdm.1/@cdm.1/@element.1">
            <composition xmi:type="logical:Composition" rolename="airportID"
type="EAID_EB46C80F_53C9_4d1f_A356_5808475F4992"
realizes="//@dm.0/@cdm.1/@cdm.1/@element.1/@composition.0"/>
            <composition xmi:type="logical:Composition" rolename="airportName"
type="EAID_37987436_DB8D_4c30_B508_C84431136B28"
realizes="//@dm.0/@cdm.1/@cdm.1/@element.1/@composition.0"/>

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        <composition xmi:type="logical:Composition" rolename="code"
type="EAID_37987436_DB8D_4c30_B508_C84431136B28"
realizes="//@dm.0/@cdm.1/@cdm.1/@element.1/@composition.0"/>
        <composition xmi:type="logical:Composition" rolename="gates" upperBound="-1"
type="//@dm.0/@ldm.1/@ldm.3/@element.1"
realizes="//@dm.0/@cdm.1/@cdm.1/@element.1/@composition.2"/>
        <composition xmi:type="logical:Composition" rolename="kind"
type="//@dm.0/@ldm.1/@ldm.3/@element.5"
realizes="//@dm.0/@cdm.1/@cdm.1/@element.1/@composition.1"/>
    </element>
    <element xmi:type="logical:Entity" name="Gate"
realizes="//@dm.0/@cdm.1/@cdm.1/@element.3">
        <composition xmi:type="logical:Composition" rolename="gateID"
type="EAID_EB46C80F_53C9_4d1f_A356_5808475F4992"
realizes="//@dm.0/@cdm.1/@cdm.1/@element.3/@composition.0"/>
        <composition xmi:type="logical:Composition" rolename="capacity"
type="EAID_EB46C80F_53C9_4d1f_A356_5808475F4992"
realizes="//@dm.0/@cdm.1/@cdm.1/@element.3/@composition.2"/>
    </element>
    <element xmi:type="logical:Measurement" name="PosixTimeMeasurement"
measurementAxis="EAID_101C0D13_D395_47fb_8885_743191537CB9"
measurementSystem="EAID_3E078B08_3024_4dfc_B01E_74929C579251"
realizes="EAID_4E729952_4D4F_46f9_B372_04489372E9D4"/>
        <element xmi:type="logical:Measurement" name="NameMeasurement"
measurementAxis="EAID_C1593D3F_5E10_4f8e_8DB3_E6D374FA42E3"
measurementSystem="EAID_3328F5AF_7CAE_4149_A03E_EB78F6653396"
realizes="EAID_B14C698C_13F8_434c_9D67_54CF514CA74E"/>
        <element xmi:type="logical:Measurement" name="CalendarTimeMeasurement"
measurementAxis="EAID_A742838B_04C5_4ac6_BE93_23DFB19E071D"
measurementSystem="EAID_C5B2FCE6_50D5_49bd_B283_E3C5F1C922CC"
realizes="EAID_6F2C6003_64FF_42a1_B4D1_00E34745B793"/>
        <element xmi:type="logical:Measurement" name="ArrivalTypeMeasurement"
measurementAxis="EAID_B2D8EA0F_F077_4946_985D_3FC15360B8EA"
measurementSystem="EAID_3328F5AF_7CAE_4149_A03E_EB78F6653396"
realizes="EAID_83B70E53_9E0D_4223_8D53_C07C30BD5CB3"/>
        <element xmi:type="logical:Measurement" name="AirportTypeMeasurement"
measurementAxis="EAID_B2D8EA0F_F077_4946_985D_3FC15360B8EA"
measurementSystem="EAID_3328F5AF_7CAE_4149_A03E_EB78F6653396"
realizes="EAID_83B70E53_9E0D_4223_8D53_C07C30BD5CB3"/>
        <element xmi:type="logical:Entity" name="Aircraft"
realizes="//@dm.0/@cdm.1/@cdm.1/@element.0">
            <composition xmi:type="logical:Composition" rolename="ID"
type="EAID_EB46C80F_53C9_4d1f_A356_5808475F4992"
realizes="//@dm.0/@cdm.1/@cdm.1/@element.0/@composition.0"/>
            <composition xmi:type="logical:Composition" rolename="duration"
type="//@dm.0/@ldm.1/@ldm.3/@element.4"
realizes="//@dm.0/@cdm.1/@cdm.1/@element.0/@composition.1"/>
            <composition xmi:type="logical:Composition" rolename="name"
type="//@dm.0/@ldm.1/@ldm.3/@element.3"
realizes="//@dm.0/@cdm.1/@cdm.0/@element.0/@composition.0"/>
            <composition xmi:type="logical:Composition" rolename="speed"
type="//@dm.0/@ldm.1/@ldm.0/@element.2"
realizes="//@dm.0/@cdm.1/@cdm.0/@element.0/@composition.2"/>
            <composition xmi:type="logical:Composition" rolename="speedInAir"
type="//@dm.0/@ldm.1/@ldm.0/@element.0"
realizes="//@dm.0/@cdm.1/@cdm.1/@element.0/@composition.2"/>
        </element>
    </ldm>
</ldm>
<pdm xmi:type="datamodel:PlatformDataModel" name="RIG_PlatformDataModelPackage">
    <pdm xmi:type="datamodel:PlatformDataModel"
name="RIG_SpeedRealization_PDM_Package">
        <element xmi:type="platform:Double" name="Airspeed_Double" description=" "
realizes="//@dm.0/@ldm.1/@ldm.0/@element.0"/>
    </pdm>
    <pdm xmi:type="datamodel:PlatformDataModel"
name="RIG_ImageRealization_PDM_Package">
        <element xmi:type="platform:IDLArray" name="JPEGImage"
realizes="//@dm.0/@ldm.1/@ldm.1/@element.1"/>
    </pdm>

```

```

<pdm xmi:type="datamodel:PlatformDataModel"
name="RIG_ModeledDomainConcepts_PDM_Package" description="Subset of model elements from
RIG section 4.1.1 to support platform modeling for Figure 80.">
    <element xmi:type="platform:Long" name="UniqueIdentifierType"
realizes="EAID_EB46C80F_53C9_4d1f_A356_5808475F4992"/>
        <element xmi:type="platform:IDLStruct" name="PositionType"
realizes="_HIqhDQExEeSj3_IywtjKpA">
            <composition xmi:type="platform:IDLComposition"
type="//@dm.0/@pdm.0/@pdm.2/@element.3" rolename="X"/>
                <composition xmi:type="platform:IDLComposition"
type="//@dm.0/@pdm.0/@pdm.2/@element.4" rolename="Y"/>
                    <composition xmi:type="platform:IDLComposition"
type="//@dm.0/@pdm.0/@pdm.2/@element.5" rolename="Z"/>
                </element>
            <element xmi:type="platform:IDLStruct" name="ExtentsType"
realizes="EAID_9F6CBA03_9585_4e44_A3F2_4AB40FE76C7D">
                <composition xmi:type="platform:IDLComposition"
type="//@dm.0/@pdm.0/@pdm.2/@element.6" rolename="Length"/>
                    <composition xmi:type="platform:IDLComposition"
type="//@dm.0/@pdm.0/@pdm.2/@element.7" rolename="Width"/>
                </element>
            <element xmi:type="platform:Long" name="PositionX"
realizes="_HIqhDwExEeSj3_IywtjKpA"/>
                <element xmi:type="platform:Long" name="PositionY"
realizes="_HIqhEQExEeSj3_IywtjKpA"/>
                    <element xmi:type="platform:Long" name="PositionZ"
realizes="_HIqhEwExEeSj3_IywtjKpA"/>
                <element xmi:type="platform:Long" name="ExtentLength"
realizes="EAID_025B2FE1_E76C_4b77_ABF9_8475DD97BCE5"/>
                    <element xmi:type="platform:Long" name="ExtentWidth"
realizes="EAID_E145CFA5_FCBB_4d8e_B452_DA9F6D17F2CF"/>
                <element xmi:type="platform:Entity" name="Area"
realizes="//@dm.0/@ldm.1/@ldm.2/@element.0">
                    <composition xmi:type="platform:Composition" rolename="ID"
type="//@dm.0/@pdm.0/@pdm.2/@element.0"
realizes="//@dm.0/@ldm.1/@ldm.2/@element.0/@composition.0"/>
                    <composition xmi:type="platform:Composition" rolename="position"
type="//@dm.0/@pdm.0/@pdm.2/@element.1"
realizes="//@dm.0/@ldm.1/@ldm.2/@element.0/@composition.1"/>
                    <composition xmi:type="platform:Composition" rolename="extents"
type="//@dm.0/@pdm.0/@pdm.2/@element.2"
realizes="//@dm.0/@ldm.1/@ldm.2/@element.0/@composition.2"/>
                </element>
            <element xmi:type="platform:Entity" name="Mission"
realizes="//@dm.0/@ldm.1/@ldm.2/@element.1">
                <composition xmi:type="platform:Composition" rolename="ID"
type="//@dm.0/@pdm.0/@pdm.2/@element.0"
realizes="//@dm.0/@ldm.1/@ldm.2/@element.1/@composition.0"/>
                </element>
            <element xmi:type="platform:Association" name="MissionRelevantArea"
realizes="//@dm.0/@ldm.1/@ldm.2/@element.2">
                <composition xmi:type="platform:Composition" rolename="ID"
type="//@dm.0/@pdm.0/@pdm.2/@element.0"
realizes="//@dm.0/@ldm.1/@ldm.2/@element.2/@composition.0"/>
                <participant xmi:type="platform:Participant" rolename="mission"
type="//@dm.0/@pdm.0/@pdm.2/@element.9"
realizes="//@dm.0/@ldm.1/@ldm.2/@element.2/@participant.1" sourceLowerBound="1"
sourceUpperBound="1"/>
                    <participant xmi:type="platform:Participant" rolename="area"
type="//@dm.0/@pdm.0/@pdm.2/@element.8"
realizes="//@dm.0/@ldm.1/@ldm.2/@element.2/@participant.0"/>
                </element>
            <element xmi:type="platform:Query" name="RIG_ModeledDomainConcepts_PDM_Query1"
specification="select position, extents as size from Area as aoi"/>
                <element xmi:type="platform:Template" name="AreaOfInterest" specification="main
(aoi) { position; size; }" boundQuery="//@dm.0/@pdm.0/@pdm.2/@element.11"/>
            </pdm>
        <pdm xmi:type="datamodel:PlatformDataModel"
name="RIG_AircraftAirportArrival_PDM_Package" description="Subset of model elements from
RIG section 3.3.4.2.1.4 to support platform modeling for Figure 81."/>

```

```

<element xmi:type="platform:Entity" name="Airport"
realizes="//@dm.0/@ldm.1/@ldm.3@element.0">
    <composition xmi:type="platform:Composition" rolename="ID"
type="//@dm.0/@pdm.0/@pdm.3@element.2"
realizes="//@dm.0/@ldm.1/@ldm.3@element.0@composition.0"/>
        <composition xmi:type="platform:Composition" rolename="name"
type="//@dm.0/@pdm.0/@pdm.3@element.3"
realizes="//@dm.0/@ldm.1/@ldm.3@element.0@composition.1"/>
            <composition xmi:type="platform:Composition" rolename="code"
type="//@dm.0/@pdm.0/@pdm.3@element.4"
realizes="//@dm.0/@ldm.1/@ldm.3@element.0@composition.2"/>
                <composition xmi:type="platform:Composition" rolename="gates" upperBound="-1"
type="//@dm.0/@pdm.0/@pdm.3@element.1"
realizes="//@dm.0/@ldm.1/@ldm.3@element.0@composition.3"/>
            </element>
        <element xmi:type="platform:Entity" name="Gate"
realizes="//@dm.0/@ldm.1/@ldm.3@element.1">
            <composition xmi:type="platform:Composition" rolename="ID"
type="//@dm.0/@pdm.0/@pdm.3@element.2"
realizes="//@dm.0/@ldm.1/@ldm.3@element.1@composition.0"/>
                <composition xmi:type="platform:Composition" rolename="capacity"
type="//@dm.0/@pdm.0/@pdm.3@element.5"
realizes="//@dm.0/@ldm.1/@ldm.3@element.1@composition.1"/>
            </element>
        <element xmi:type="platform:Long" name="UniqueIDType"
realizes="EAID_EB46C80F_53C9_4d1f_A356_5808475F4992"/>
            <element xmi:type="platform:BoundedString" name="AirportNameType"
realizes="EAID_37987436_DB8D_4c30_B508_C84431136B28" maxLength="64"/>
                <element xmi:type="platform:BoundedString" name="AirportCodeType"
realizes="EAID_37987436_DB8D_4c30_B508_C84431136B28" maxLength="3"/>
                    <element xmi:type="platform:Short" name="CapacityType"
realizes="EAID_EB46C80F_53C9_4d1f_A356_5808475F4992"/>
                    <element xmi:type="platform:Query" name="RIG_AircraftAirportArrival_PDM_Query1"
specification="select Airport.ID, Airport.code, Gate.ID, Gate.capacity from Airport join
Gate on Airport.gates"/>
                <element xmi:type="platform:Template" name="AirportGateData"
specification="GateType (Gate) { Gate.ID; Gate.capacity; } main (Airport) { Airport.ID;
Airport.code; GateType(Gate) gates; }" boundQuery="//@dm.0/@pdm.0/@pdm.3@element.6"/>
            </pdm>
        <pdm xmi:type="datamodel:PlatformDataModel"
name="RIG_CompositeTemplateExample_Package" description="Figure 82 Composite Template
Example">
            <element xmi:type="platform:CompositeTemplate" name="AllData">
                <composition xmi:type="platform:TemplateComposition" rolename="TC1"
type="//@dm.0/@pdm.0/@pdm.3@element.7"/>
                <composition xmi:type="platform:TemplateComposition" rolename="TC2"
type="//@dm.0/@pdm.0/@pdm.2@element.12"/>
            </element>
        </pdm>
        <pdm xmi:type="datamodel:PlatformDataModel"
name="RIG_EquivalentEntityTemplate_Example" description="Figure 83 Equivalent Entity
Template Example">
            <element xmi:type="platform:Template" name="MyEquivT" specification="main &lt;x>
{x.id; x.desc} &lt;/x&gt;" boundQuery="//@dm.0/@pdm.0/@pdm.5@element.1"/>
                <element xmi:type="platform:Query" name="RIG_EquivalentEntity_Query1"
specification="select x.id, x.desc from X as x;"/>
                <element xmi:type="platform:Query" name="RIG_EquivalentEntity_Query2"
specification="select p.mass p.vol from P as p;"/>
                <element xmi:type="platform:Template" name="CargoPayload" specification="main (p)
{ @inline MyEquivT &lt; p > ;mass;vol; }" boundQuery="//@dm.0/@pdm.0/@pdm.5@element.2"/>
            </pdm>
        </pdm>
    </dm>
    <um xmi:type="uop:UoPModel" xmi:id="_YW0K0CqWEeelF6AY1Hf4Pg" name="UoP_Model"/>
    <im xmi:type="integration:IntegrationModel" xmi:id="_mizosCtyEeeQO9Gy9xFRJQ"
name="Integration_Model"/>
    <tm xmi:type="traceability:TraceabilityModel" xmi:id="_aF8MUCqWEeelF6AY1Hf4Pg"
name="Traceability_Model"/>
</face:ArchitectureModel>

```

C Frequently Asked Questions (FAQs)

This section provides frequently asked questions and answers in response to inquiries on techniques, rules, constraints, and metamodel requirements that may be of importance to the FACE Data Architecture consumer.

What tools do I use for FACE data modeling?

The Open Group FACE Consortium does not prescribe tools; however, the official FACE website does provide links for available third-party tools.

Why did the FACE Consortium create a new data model language when there is _____ (UML®, SysML, OWL, RDF, etc.) that already accomplish the same goals?

The FACE Data Architecture does not specifically follow many of the more traditional approaches in use today although it builds upon the concepts of message modeling, software modeling (e.g., UML), and ontology modeling languages (e.g., OWL, RDF).

The FACE Data Architecture is not a traditional message-based data model. Instead, it defines the foundation necessary for capturing semantic and syntactic data model information.

Why are there three Entity-Association models?

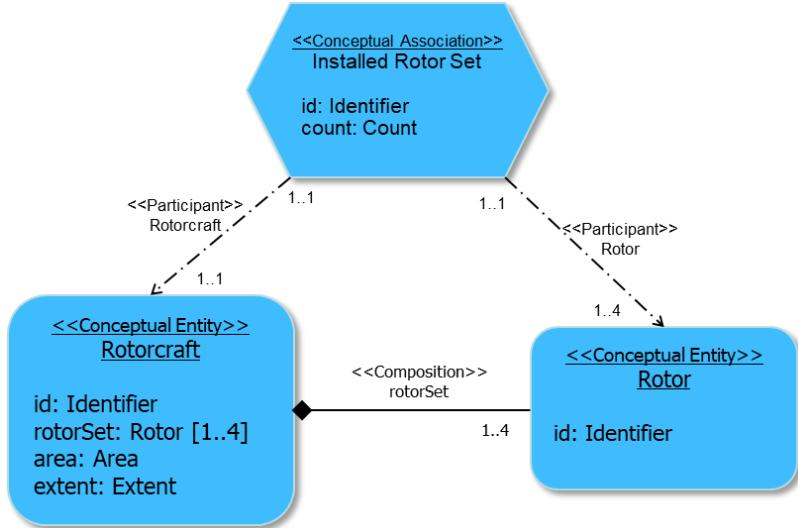
These three levels of model allow for the progression of the definition of data to maximize the reuse of the entities by many UoPs. Modeling activities focus first on developing data concepts, then on the elaboration on those ideas with additional detail until the UoP interfaces have been sufficiently defined.

Why is the Measurement System so complex? Can't we just use a text description to describe our "Frame of Reference"?

This was, in fact, the original approach that the FACE Consortium took when defining the FACE Technical Standard, Edition 2.0. We soon realized, while developing the criteria for the Frame of Reference description, that it was difficult to define and manage free-text descriptions. So, we developed a model for the frame of reference that allowed all measurements to be described in a consistent way. The result is the Measurement System first introduced in the FACE Technical Standard, Edition 2.1.

How do I use the Count Observable?

The *Count Observable* is somewhat different than other *Observables* in that it describes a set of things. Therefore, it should be composed in an *Association* or *Entity* that describes a set of things. To use the *Count Observable* you should compose it into a *Conceptual Association* or *Entity* when a tally of the number of items in a set is required. For example, in the figure below, the *count* composition of *Installed Rotor Set* is typed to the *Observable Count*. It corresponds to the actual number of *Rotors* in the *Installed Rotor Set*.



I know what my message is supposed to look like. How do I create a model to make it look like what I need?

The FACE Technical Standard allows a separation from the Entity-Association Perspective models and the Application Perspective models. The *Template Language*, in the Application Perspective, allows the creation of message structures called a *Template*. That said, it does not allow you to define the BIT-level formats (the FACE Data Architecture describes the data not the transport format, which is left up to the TSS implementation).

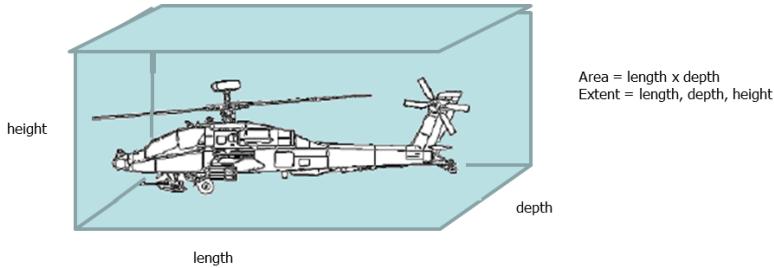
Assuming adequate Entity-Association models already exist, creating a structure very close to an existing message can be relatively straightforward.

What's the difference between Area, Count, Extent, Distance, and Size Observables?

Sometimes it is difficult to determine which *Observable* to use when typing the *compositions* at the Conceptual level. This is particularly true when making a decision between several similar *Observables* such as Area, Count, Extent, Distance, and Size. In general, use these guidelines:

- Use the Area *Observable* to describe the amount of surface space in two dimensions; for example, an Area *composition* of Airport indicates the amount of surface area taken up by the Airport
- Use the Count *Observable* to describe a number (or tally) of items in a set; for example, earlier we showed how the Count *Observable* could be used to count the number of installed Rotors on a Rotorcraft
- Use the Extent *Observable* to describe the bounding region encompassing an item in one or more dimensions

Extent is used when describing, for example, length, width, or height (or combinations of these) of an item. For example, the extent of a helicopter is the bounding region encompassed by it – the box defined by the length, width, and height that encompasses the helicopter.



- Use the Distance *Observable* to describe the amount of separation between two points (or positions)
Note that length is different than distance; length is an extent in one dimension or axis.
- Use the Size *Observable* only to describe a generic amount or magnitude as a last resort when the *composition* cannot be typed using other *Observables*

What does “context” mean?

Context can mean many things:

- As applied to data *Entities* and *Associations*, context is defined in Section 2.2.1.1.1
- As applied to data *Views*, context is defined in Section 2.2.1.1.2
- As applied to Traceability Model, context is defined in Section 2.2.1.4
- As applied to DSDM, context is defined in Section 2.2.3.2
- As applied to *Domains*, context is defined in Section 5.2.2.3.1
- As applied to *Measurement System* conversion, context is defined in Section 5.3.1.10.2
- As applied to *Association Participant* paths, context is defined in Section 4.5.3.5 and 7.2.2.2

What does it mean to specify a path through a *CharacteristicPathNode* or *ParticipantPathNode* that has an upper bound greater than 1?

This is currently undefined and will cause an OCL constraint violation.

What are source upper and lower bound?

The *Participant* meta-class meta-attributes *sourceLowerBound* and *sourceUpperBound* are used to describe *Participant* multiplicity from the perspective of the *Participant* with respect to the *Association*.

D Acronyms

The following acronyms are used within this Guide:

Acronym	Definition
API	Application Programming Interface
BIT	Built-In Test
CC	Common Criteria
CCA	Clinger-Cohen Act
CCB	Configuration Control Board
CCD	Component Configurability Definition
CDM	Conceptual Data Model
CNSS	Committee of National Security Systems
CR	Change Request
CTS	Conformance Test Suite
CVM	Conformance Verification Matrix
DO	Document
DoDAF	Department of Defense Architecture Framework
DoDI	Department of Defense Instruction
DQL	Data Query Language
DSDM	Domain-Specific Data Model
EBNF	Extended Backus-Naur
ECEF	Earth Centered Earth Fixed
EIA	Electronic Industries Alliance
EMOF	Essential Meta-Object Facility
FACE	Future Airborne Capability Environment
FISMA	Federal Information Security Management Act

Acronym	Definition
GPS	Global Positioning System
IA	Information Assurance
ICD	Interface Control Document
ID	Identification, Identifier
IDL	Interface Definition Language
IEEE	Institute of Electrical and Electronics Engineers
IETF	Internet Engineering Task Force
IOSS	Input/Output Services Segment
ISO/IEC	International Organization for Standardization/International Electrotechnical Commission
IT	Information Technology
LDM	Logical Data Model
MDA	Model-Driven Architecture
MGRS	Military Grid Reference System
MIL-STD	Military Standard
MOF	Meta-Object Facility
NSA	National Security Agency
NSTISSP	National Security Telecommunications and Information Systems Security Policy
OCL	Object Constraint Languag
OMG	Object Management Group
OSS	Operating System Segment
OWL	Web Ontology Language
PCS	Portable Components Segment
PDM	Platform Data Model
POSIX	Portable Operating System Interface
PR/CR	Problem Report/Change Request

Acronym	Definition
PSSS	Platform-Specific Services Segment
RDF	Resource Description Framework
RFC	Request for Comments
ROP	Relevant Operating Picture
RTCA	Radio Technical Commission for Aeronautics
RTOS	Real-Time Operating System
SAE	Society of Automotive Engineers
SDM	Shared Data Model
SQL	Structured Query Language
SSE	Systems Security Engineering
TS	Transport Service
TSS	Transport Services Segment
UAV	Unmanned Aerial Vehicle
UCS	Unmanned Control System
UML	Unified Modeling Language
UoC	Unit of Conformance
UoP	Unit of Portability
USM	UoP Supplied Model
VTU	Value Type Unit
XMI	XML Metadata Interchange
XML	eXtensible Markup Language

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