

The Open Group Guide

**FACE™ Contract Guide:
Guidance in Writing Solicitations and Proposals with FACE
Requirements, Version 3.0**



Prepared by The Open Group FACE™ Consortium Business Working Group.



CCDC AvMC Public Release #20200153
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FACE™ Contract Guide: Guidance in Writing Solicitations and Proposals with FACE Requirements, Version 3.0

ISBN: 1-947754-59-1

Document Number: G20A

Published by The Open Group, June 2020.

Comments relating to the material contained in this document may be submitted to:

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Preface

The Open Group

The Open Group is a global consortium that enables the achievement of business objectives through technology standards. Our diverse membership of more than 750 organizations includes customers, systems and solutions suppliers, tools vendors, integrators, academics, and consultants across multiple industries.

The mission of The Open Group is to drive the creation of Boundaryless Information Flow™ achieved by:

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- Working with suppliers, consortia, and standards bodies to develop consensus and facilitate interoperability, to evolve and integrate specifications and Open Source technologies
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This Document

This document is the Future Airborne Capability Environment (FACE) Contract Guide, Version 3.0. It serves as a reference for including FACE requirements into a solicitation or proposal. This Guide is developed and maintained by The Open Group FACE Consortium.

Background

Today's military aviation airborne systems typically entail a unique set of requirements and a single vendor. This form of development has served the military aviation community well; however, this stovepipe development process has had some undesired side-effects including long lead times, cumbersome improvement processes, and lack of hardware and software reuse between various aircraft platforms resulting in platform-unique designs.

The advent of complex mission equipment and electronics systems has caused an increase in the cost and schedule to integrate new hardware and software into aircraft systems. This – combined with the extensive testing and airworthiness qualification requirements – has begun to affect the

ability of the military aviation community to deploy new capabilities across the military aviation fleet.

The current military aviation community procurement system does not promote the processes of hardware and software reuse across different programs. In addition, the current aviation development community has not created sufficient standards to facilitate the reuse of software components across the military aviation fleet. Part of the reason for this is the small military aviation market. Another part is the difficulty in developing qualified software for aviation. An additional problem is the inability to adopt current commercial software Common Operating Environment (COE) standards because they do not adhere to the stringent safety requirements developed to reduce risk and likelihood of loss of aircraft, reduced mission capability, and ultimately loss of life.

To counter these trends, the U.S. Naval Aviation Air Combat Electronics program office (PMA-209), U.S. Army Program Executive Office (PEO) Aviation, the U.S. Army Combat Capabilities Development Command Aviation & Missile Center (CCDC AvMC), and U.S. Air Force Research Laboratory (AFRL), enabled by the expertise and experience of the military aviation community's industrial base, are adopting a new approach.

Approach

The FACE Approach addresses the affordability initiatives of today's military aviation domain. The FACE Approach is to develop a Technical Standard for a software COE designed to promote portability and create software product lines across the military aviation domain. Several components comprise the FACE Approach to software portability and reuse:

- Business processes to adjust procurement and incentivize industry
- Technical practices to promote development of reusable software components
- A software standard to promote the development of portable components between differing avionics architectures

The FACE Approach allows software-based "capabilities" to be developed as software components that are exposed to other software components through defined interfaces. These "capabilities" are composed of one or more software units referred to as a FACE Unit of Conformance (UoC). A FACE UoC is a software component or Domain-Specific Data Model (DSDM) designed to meet the requirements within an individual FACE Segment. A DSDM is a data model designed to the FACE Data Architecture Requirements that captures domain-specific semantics. UoCs must be verified as conformant to the FACE Technical Standard to be certified.

The key business goals of the FACE Approach are to:

- Improve the affordability of capabilities
- Improve time-to-field, delivering new capabilities to the warfighter faster

To address the goals listed above and to help ensure competition of the capability throughout the lifecycle of the gaining platform, acquisitions specifying FACE requirements need to meet the following three key tenets:

- Conformance to the FACE Technical Standard
- Delivery of appropriate deliverables and artifacts

- Acquisition of appropriate rights in deliverables and artifacts

To promote adoption, the FACE Technical Standard is an open, non-proprietary technical specification that is publicly available without restrictive contracts, licensing terms, or royalties.

FACE Artifacts

The following documents provide definition and support of the FACE technical and business practices:

- FACE Technical Standard
- FACE Reference Implementation Guide
- FACE Software Supplier Getting Started Guide
- Open Universal Domain Description Language (Open UDDL)
- FACE Shared Data Model Governance Plan
- FACE Shared Data Model
- FACE Conformance Verification Matrix
- FACE Business Guide
- FACE Contract Guide
- FACE Conformance Policy
- FACE Library Policy
- FACE Problem Report (PR)/Change Request (CR) Process
- FACE AV-2: Glossary of Terms and Definitions

Additional information can be found at www.opengroup.org/face/information.

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Referenced Documents

The following referenced documents are included for the application of this Guide. For dated references, only the edition cited applies.

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

- AV-2: FACET™ Glossary of Terms and Definitions, Edition 3.0.1, The Open Group Guide (G194), published by The Open Group, August 2019; refer to: www.opengroup.org/library/g194
- ISO 10303: Industrial Automation Systems and Integration – Product Data Representation and Exchange
- ISO/IEC 12207:2008: Systems and Software Engineering – Software Life Cycle Processes; refer to: <https://www.iso.org/standard/43447.html>
- ISO/IEC/IEEE 24765:2017: Systems and Software Engineering — Vocabulary; refer to: <https://www.iso.org/standard/71952.html>
- ISO/IEC/IEEE 42010:2011: Systems and Software Engineering – Architecture Description; refer to: <https://www.iso.org/standard/50508.html>
- Open Universal Domain Description Language (Open UDDL), Edition 1.0, The Open Group Standard (C198), published by The Open Group, July 2019; refer to: www.opengroup.org/library/c198

1 Introduction

1.1 Document Scope

This FACE Contract Guide serves as a reference for including FACE requirements into a solicitation or proposal. The goal is twofold:

- To enable a Department of Defense (DoD) Contracting Officer or Program Manager (PM) to include FACE requirements in a solicitation
- To assist Offerors, Government Contractors, and Subcontractors in understanding the FACE requirements in a solicitation and appropriately addressing them in a proposal

Recommended language is included for SECTION C: Statement of Work (SOW), along with SECTION L: Instructions, Conditions, and Notices to Offerors and SECTION M: Evaluation Factors for Award. There are also clause recommendations that can be incorporated in SECTION H: Special Contract Requirements, including language regarding rights in Technical Data (TD) and Computer Software (CS) as well as warranty clauses. This Guide places an emphasis on acquiring the appropriate artifacts and rights in TD and CS to support reuse of FACE Units of Conformance (UoCs).

This Version 3.0 updates the FACE Contract Guide to:

- Include recommended language for Broad Agency Announcement (BAA) or Other Transaction Authority (OTA) topics
- Align the Glossary with FACE AV-2, Edition 3.0.1
- Remove the Software Architecture Description (SWARD) template *in lieu* of reference to SWARD DID (DI-SESS-82176)
- Update Recommended Standard Deliverables for Acquisitions with FACE requirements
- Enhance the Guide by incorporating user feedback from FACE Contract Guide, Version 2.0

The FACE Contract Guide serves to supplement the DoD Open Systems Architecture (OSA) Contract Guidebook for Program Managers (DoD OSA Guidebook) and, as such, only addresses FACE requirements for an acquisition. PMs are encouraged to reference the DoD OSA Guidebook and include additional OSA language as appropriate.

This FACE Contract Guide is a product of the FACE Consortium Business Working Group and has been approved by The Open Group FACE Consortium.

1.2 FACE Conformance

Conformance to the FACE Technical Standard helps ensure FACE UoCs are open, modular, and reusable to the maximum extent possible. There are no varying levels of compliance with the

FACE Technical Standard; a FACE UoC is either conformant or not. The PM should note that FACE Conformance Certification is only available through the FACE Conformance Program. (See the FACE Conformance Policy.)

Conformance to the FACE Technical Standard is based on the proper adherence to the FACE Reference Architecture. FACE Conformance and conformance testing are at the FACE UoC level, as opposed to the system level. The FACE Conformance Program utilizes test tools and verification processes to ensure conformance. The program uses the FACE Conformance Verification Matrix (CVM), which assigns verification methods, describes conformance artifacts for each requirement, and provides interpretation of the requirements for FACE UoCs in specific FACE Segments. Verification includes a FACE Conformance Test Suite (CTS) to check FACE UoCs for proper use of the FACE Interfaces.

FACE Conformance Certification occurs at the end of the software development process. Therefore, FACE Conformance Certification does not have to be complete to bid unless otherwise specified in the solicitation. If the PM desires a warranty from the Contractor to correct any conformance-related deficiencies at the Contractor's cost, the language suggested in the H2 clause in SECTION H (Chapter 5) provides guidance.

FACE Conformance Certification provides formal recognition of certified conformance to the FACE Technical Standard, which allows:

- Buyers to specify and procure products from vendors providing solutions that are conformant to the FACE Technical Standard
- The FACE Certification Authority (CA) to issue a Conformance Certificate to the Software Supplier
- Suppliers and practitioners to make and substantiate clear claims of conformance to the FACE Technical Standard, evidenced by possession of a FACE Conformance Certificate

1.3 Rights in Technical Data (TD) and Computer Software (CS)

1. **Technical Data (TD) and Computer Software (CS) Rights Strategy:** It is important for PMs to assess the requirements of their program and create a TD and CS rights strategy for each procurement (as required by Defense Federal Acquisition Regulations Supplement (DFARS) 207.106). The Government should clearly communicate its intended use of the specified TD and CS deliverables and the associated need for rights in the resulting deliverables (commercial and non-commercial) in the solicitation. The Government should allow bidders to offer creative and cost-efficient solutions to meet the Government's needs.
2. **Legal Counsel:** PMs are encouraged to coordinate with their Legal Counsel to ensure that the Government obtains appropriate rights in TD and CS. The Legal Counsel should also advise and review any special provisions in SECTION H (Chapter 5).
3. **Rights in Technical Data (TD) and Computer Software (CS):** The FACE Technical Standard is an open, non-proprietary technical specification that is publicly available without restrictive contracts, licensing terms, or royalties.¹ The open standards specified within the FACE Technical Standard allow use without payment, remuneration, or other

¹ Copyright and usage guidelines may be found at www.opengroup.org/face/legal.

obligation to the standards owner. Additionally, neither the FACE Technical Standard nor the FACE Conformance Certification Process require or prohibit a Software Supplier to relinquish rights to Technical Data (TD) or Computer Software (CS)² within the software, the business logic, the presentation logic, or any other logic whether in the application or the software computing environment. The PM should follow applicable laws and regulations to obtain the appropriate rights. Additionally, the PM should consider the goals set out in the TD and CS rights strategy.

4. **Reuse and Portability:** It is important for the PM to consider obtaining the appropriate rights in TD and CS to support software reuse and portability, two key Open Architecture (OA) tenets that a FACE Computing Environment enables. Ensuring the interchangeability/replaceability of software in the procured system, including commercial software and proprietary software, is an important part of a TD and CS rights strategy. The Government can enable the option of future competition by setting interchangeability/replaceability goals and requiring the delivery of, and appropriate rights in, the deliverables and artifacts required to identify physically and functionally interchangeable/replaceable items.

In determining which deliverables, artifacts, and associated rights are sufficient to support reuse, portability, interchangeability/replaceability, and open competition throughout the lifecycle of the product in a FACE Computing Environment, the Government should consider the following:

- The type of data (TD, software code, Interface Control Documents (ICDs), other documents, etc.) to be delivered
- The appropriate license rights in TD, such as interface data/documentation, required for future changes, including replacement, upgrades, and integration of FACE UoCs and software units
Refer to DFARS and Legal Counsel with regard to obtaining these appropriate license rights.
- The development and delivery of ICDs necessary to integrate software internally and externally to the FACE Computing Environment and to identify physically and functionally interchangeable items

1.4 Applicability

This Contract Guide is applicable to procurements specifying FACE requirements. The procurement scenarios will likely fit into one of the following acquisition circumstances:

- The FACE Computing Environment and accompanying FACE UoCs will be a portion of a larger acquisition program (i.e., the system being procured will have a portion with FACE requirements, and a portion without FACE requirements)
It will be important to identify the portions of the overall system that are desired to be certified FACE Conformant.
- The PM is acquiring a FACE Conformant capability or capabilities consisting of a FACE UoC or UoCs that also require the supporting FACE Computing Environment

² Refer to the definitions of TD and CS in the DFARS: 252.227-7013(a), 252.227-7014(a).

- The PM is solely procuring a FACE Conformant capability consisting of a FACE UoC or UoCs
- A capability or set of capabilities that are being procured for a legacy system
FACE certified conformant software can potentially be deployed without the full instantiation of the FACE Computing Environment. For legacy platforms, desired certified FACE Conformant software can be incrementally added as the legacy computing environment can support them.

2 Recommended Language for SECTION C: STATEMENT OF WORK (SOW)

Commentary

This section adheres to MIL-HDBK-245D Handbook for Preparation of Statement of Work and contains recommended SOW language for FACE requirements. PMs can tailor the language to meet the needs of a Statement of Objectives (SOO) if desired.

1. SCOPE

<No specific language.>

2. APPLICABLE DOCUMENTS

Commentary

This section contains an extended list of documents for consideration to be included. The scope of the SOW should help determine which of these should remain.

2.1 Mandatory Reference Documents

2.1.1 The FACE Technical Standard, Edition X.X

FACE™ is a trademark of The Open Group in the United States and other countries.

- An open, royalty-free standard that addresses the software technical requirements of the FACE Infrastructure, FACE Interfaces, and FACE UoCs
- www.opengroup.org/face

Commentary

The edition of the FACE Technical Standard, including corrigenda if applicable, must be identified. This is the edition to which conformance will be certified.

2.1.2 FACE Conformance Verification Matrix (CVM), Edition [X]

Identifies the verification approach and provides examples for Verification Evidence for each of the individual Conformance Requirements per each FACE Reference Architecture segment.

2.1.3 Service-Specific Documents

<None identified.>

2.2 Guidance Reference Documents

2.2.1 The Reference Implementation Guide (RIG) for the FACE Technical Standard, Edition X.X

- Guides the developer through the necessary thought process in determining how FACE Conformant products may be instantiated into the FACE Reference Architecture

- Discusses the variability of software within the FACE Reference Architecture segments
- Presents best practices for FACE Segment composition
- Supplies further information on FACE Profiles, FACE UoCs, data model(s), and how safety, security, Health Monitoring/Fault Management (HMFM), and configuration services may be dispersed throughout the FACE Common Operating Environment (COE)
- Provides example implementation scenarios for typical DoD aviation capabilities and how they are distributed and interfaced within the FACE Reference Architecture

2.2.2 The FACE Shared Data Model Governance Plan, Edition X.X

Outlines the location of the FACE Shared Data Model and access methods as well as the responsibilities of the FACE Shared Data Model Configuration Control Board (CCB), the types of change requests that can be submitted, and the process for submitting and adjudicating those requests.

2.2.3 The FACE Conformance Certification Guide

Provides detailed instructions and steps required to achieve FACE Conformance Certification for a product.

2.2.4 The FACE Conformance Policy

Details the processes and policies governing the FACE Conformance Program.

2.2.5 The FACE Library User's Guide

A reference for the FACE Library user addressing the overall organization, operation, and use of the FACE Library, including the FACE Registry and FACE Repositories.

2.2.6 The FACE Business Guide

Addresses the business case for specifying FACE requirements, including business practices, scenarios, and acquisition options.

2.2.7 Service-Specific Related Guidance Documents

Commentary

While the major objective of the FACE Approach is portability, the Army has an additional objective of achieving airworthy certifiable reusable software components. Advisory Circular (AC) 20-148, published December 2004, highlights the cost benefits of reusable software components for achieving airworthiness certification on subsequent projects. The U.S. Army Combat Capabilities Development Command Aviation & Missile Center (CCDC AvMC) has developed the following:

“Developer's Requirements Guide for Airworthy, Reusable FACE Units of Conformance” which identifies the requirements for a developer producing software that is intended for operational use on multiple dissimilar Army aviation aircraft that maximizes reuse within the boundaries of Army certification and procurement practices/policies.

A PM can instruct the Software Supplier to reference this document for Army airworthiness requirements and include other service-specific reference documents as required.

3. REQUIREMENTS

3.1 Modular Open Systems Approach

Commentary

The Government intends to procure a capability and corresponding software having a software architecture based upon the FACE Technical Standard. Selected acquisition language may require Contractors to develop and maintain an Open Systems Management Plan (OSMP). However, for some acquisitions it may be sufficient to incorporate the content into a Software Development Plan (SDP). The PM's decision on whether to require an OSMP or SDP will depend on the complexity, nature, and size of the system or software capability being acquired. These provisions can be enforced under suitable Data Item Descriptions (DIDs) and deliverables.

3.1.1 Modular Open Design

The Contractor SHALL develop a software architecture that implements the FACE Reference Architecture defined in the FACE Technical Standard, Edition X.X.

3.1.2 The Contractor SHALL develop and maintain an OSMP.

Commentary

Tailoring of the OSMP to address the FACE requirements is in Appendix A.

3.2 FACE Technical Standard

Commentary

For the PM, it is important to specify the edition of the FACE Technical Standard, including corrigenda if applicable, to which the acquisition must conform. The edition should be listed in the APPLICABLE DOCUMENTS section. Since the FACE Technical Standard only pertains to the Software Computing Environment and associated FACE UoCs, the PM must specify or call for the use of other open standards outside the FACE Computing Environment. If the FACE Computing Environment and accompanying FACE UoCs are part of a larger system being procured, it is important to designate exactly which software or capabilities of the system must be FACE Conformant.

3.2.1 The Contractor SHALL develop the <insert capability(s), function(s), or software> in such a manner that the software capability conforms to the FACE Technical Standard. (Specific edition listed in the APPLICABLE DOCUMENTS section.)

3.2.2 The Contractor SHALL present periodic status updates describing how the system/subsystem and/or software with FACE requirements satisfies the applicable FACE Technical Standard requirements as identified within the FACE CVM at <insert specific program design reviews>. The intent is to report the progress towards conforming to the FACE Technical Standard at the FACE UoC level.

3.2.3 FACE Data Models

Commentary

The purpose of the FACE Data Models section is to provide an interoperable means of data exchange among FACE UoCs. To achieve this purpose, the data model defines data types used to create messages exchanged between the FACE UoCs. Each FACE UoC supplier should identify and deliver any utilized DSDM(s). Each FACE UoC supplier must provide a data model when the FACE UoC is submitted for FACE Conformance Verification. This data model is called the FACE UoP Supplied Model (USM). Data model requirements are described in detail in the FACE Technical Standard.

- 3.2.3.1 The Contractor SHALL submit changes to the FACE Shared Data Model according to the procedures in the FACE Shared Data Model Governance Plan.
- 3.2.3.2 The Contractor SHALL identify and deliver all utilized DSDMs.
- 3.2.3.3 The Contractor SHALL deliver the FACE USM for all FACE UoCs in either the Portable Components Segment (PCS) or Platform-Specific Services Segment (PSSS) according to the FACE Data Architecture defined in the FACE Technical Standard.

3.2.4 Software Development Tools

Commentary

PMs should include testing materials (software, tools, instructions, testing results, design artifacts, etc.) in the contract deliverables as required to support the system lifecycle, especially for those items developed with Government funding. The Government should ensure that it has appropriate rights to these items, and the Contractor marks them correctly.

Integrated Development Environment (IDE) tools and plug-ins to Commercial Off-the-Shelf (COTS) development tools in accordance with FACE design constraints have been developed under Government contract. They are available at no charge to all users. The development tools are optional, but the PM should consider recommending utilization by the Offeror and providing them as Government Furnished Information (GFI).

- 3.2.4.1 The Contractor SHALL document the system or subsystem (e.g., software, hardware, middleware) design information using industry standard formats (e.g., Unified Modeling Language® (UML®)).
- 3.2.4.2 The Contractor SHALL also document how they will use tools that are capable of exporting model information in a standard format (e.g., XMI and AP233/ISO 10303), as required for FACE Conformance Verification.
- 3.2.4.3 The Contractor SHALL identify the proposed standards and formats to be used. The Contractor SHALL maintain the design information, including any models used, so that the design information and models reflect the as-built system.

Commentary

The PM should require the delivery, as necessary, of any tools generated in performance of the contract required to meet the program's portability needs.

- 3.2.4.4 The Contractor SHALL identify to the Government any proprietary tools used for Government funded software development, load set, or Operational Flight Plan (OFP)

generation, data modeling, simulation modeling, and testing to meet the program's portability needs.

3.3 Modularity of Software

Commentary

The FACE Technical Standard describes an overall architecture that incorporates modular design tenets and is segmented to maximize the stated gains associated with FACE Conformance that should result in a design that exhibits low coupling and high cohesion of software. The FACE Technical Standard describes five segments and the potential FACE UoCs that reside within each segment.

The Contractor is permitted to offer a capability set as a bundled group of FACE UoCs known as a FACE UoC Package. Allowable FACE UoC packaging is discussed in more detail in the FACE Technical Standard.

The DoD OSA Guidebook contains additional information and recommended SOW language regarding modularity that may be included, as needed, as additional requirements the PM can evaluate in the Contractor's offer. In particular, the PM is encouraged to pull the following language from the DoD OSA Guidebook to establish the requirement for low coupling and high cohesion:

Module Coupling: The Contractor's design approach SHALL result in modules that have minimal dependencies on other modules (low coupling), as evidenced by simple, well-defined interfaces and by the absence of implicit data sharing. The purpose is to ensure that any changes to one module will not necessitate extensive changes to other modules, and hence facilitate module replacement and system enhancement.

Module Cohesion: The Contractor's design approach SHALL result in modules that are characterized by the singular assignment of identifiable, discrete functionality (high cohesion). The purpose is to ensure that any changes to system behavioral requirements can be accomplished by changing a minimum number of modules within the system.

3.3.1 The Contractor, as part of the OSMP or SDP, SHALL describe how software will be modularized within the FACE Reference Architecture to facilitate reusability and portability.

3.3.2 When a Computer Software Configuration Item (CSCI) is composed of more than one FACE UoC or a combination of FACE UoC(s) and other software, the contractor SHALL deliver each FACE UoC separately with the appropriate artifacts.

3.4 Reuse of Existing Software and Code

Commentary

The reuse goals are defined at two distinct levels:

1. Reuse of previously developed FACE UoCs and compatible Off-the-Shelf (OTS) software.
2. Reuse of code previously developed by the Contractor. It is important to encourage the reuse of code and to track the Software Lines of Code (SLOC) that are reused or modified. PMs should ask for an estimate of SLOC reuse and require tracking metrics on actual SLOC reused or modified.

PMs should require the Contractor to review the FACE Registry for FACE Certified Products and require justification for the Contractor's make/buy/reuse decisions. The PM should specify any particular items that are required to be used in the Contractor's design (Government directed reuse). In either case, the PM should consider the following:

- Costs associated with reuse (e.g., licenses needed, qualification challenges)
- TD and CS rights the Government may already have with existing FACE Conformant products
- Costs incurred to modify the software to be FACE Conformant and to re-certify it, and the Government's resulting TD and CS rights to any such modified software
- Risks associated with code reuse

The PM should track the actual reuse of software and source code as the program develops and analyze actual *versus* projected reuse.

The PM should also consider including the following language from the DoD OSA Guidebook:

As-Built Configuration List (ABCL) – Modified Item and Funding Source – The Contractor SHALL prepare and deliver a comprehensive list of items (to include parts, software, sub-assemblies, assemblies, Software Replaceable Units (SRUs), and Line Replaceable Units (LRUs)) that during or in connection with the performance of the contract are new or have been redesigned, modified, or otherwise changed. Such list may be specific as to description, nomenclature, part number, higher order subassembly or assembly, the nature of the redesign, modification, or other change. In addition, and as specific and discrete task requirements of this contract, the Contractor may further identify in the ABCL, with respect to each such listed new, redesigned, modified, or changed item, the purpose of the redesign, modification, or other change and the source of both the requirement and the funding for such redesign, modification, or other change. In identifying the funding source, the Contractor SHALL, in the case of each redesign modification, or other change funded in whole or in part with Government funding, specifically identify the contract, line item, and Accounting Classification Reference Number (ACRN) that funded or partially funded the redesign, modification, or other change.

3.4.1 Software Reuse

The Contractor SHALL reuse existing or common software to the maximum extent practicable.

The Contractor SHALL review the FACE Registry (<https://facesoftware.org>) as part of any make/buy/reuse decisions to identify certified FACE UoCs that meet the design requirements to avoid the need to redevelop products that already exist and that can be reused.

If reusing a FACE UoC, the Contractor SHALL provide copies of any license agreements.

The Contractor SHALL describe how the design approach meets the goal of reuse, including the steps taken to use existing FACE UoCs.

The Contractor SHALL include make/buy/reuse justifications as part of the OSMP. Exceptions to reusing existing software must be accompanied by justification, such as cost (of both adoption and lifecycle support), schedule, functional and non-functional performance, etc.

3.4.2 Government Directed Reuse

Commentary

In the case of Government directed reuse of a specific item(s), the PM should include the following language.

The Contractor SHALL incorporate the following FACE Conformant Government furnished or commercial items in the system/subsystem/software design: [Item 1], [Item 2], [Item 3]. Request(s) for exception to the reuse of these specific items must be accompanied by

justification, such as cost (of both adoption and lifecycle support), schedule, functional and non-functional performance, etc.

3.4.3 SLOC Count and Reuse Metrics

Commentary

Below is optional language to enable the PM to have metrics in regards to FACE UoC development.

At the agreed upon design reviews or other predetermined contractual event(s), the Contractor SHALL deliver estimates of its own:

- a. Total SLOC
- b. Percentage of total SLOC that are FACE Conformant or intended to be FACE Conformant
- c. Percentage of newly developed SLOC
- d. Percentage of SLOC modified
- e. Percentage of SLOC reused from other Non-Development Item (NDI) or previously developed CSCIs, FACE UoCs, or software units
- f. Percentage of auto-generated SLOC

3.5 Interface Design and Management

Commentary

The general objective of these efforts SHALL be the development of a common system, common elements, common software, or product line that meets the performance requirements of various platform missions. To ensure portability and reusability, FACE UoCs must be designed to use the applicable defined FACE Interfaces described in the FACE Technical Standard. These FACE Interfaces are open, standard interfaces and, therefore, the design documents associated with their implementations should be delivered with a minimum of Government Purpose Rights (GPR).

The Government should consider including requirements for the Offeror to implement applicable FACE Interfaces described within the FACE Technical Standard and to clearly define and describe all of them used in the design.

3.6 Conformance

Commentary

The PM should note that certification of FACE Conformance can only come from the FACE Conformance Program. For an explanation of the conformance process, see the FACE Conformance Policy.

PMs need to determine how and at which milestones they will require Contractors to perform conformance testing, verify conformance, and report conformance. Conformance testing could be included as entry/exit criteria at specified milestone reviews. It is recommended that PMs encourage Software Suppliers to plan for FACE Conformance early in the software development lifecycle such as incorporating testing with the FACE CTS and identifying and engaging with a FACE Verification Authority (VA). This approach can avoid expensive and time-consuming re-work later in the lifecycle.

If the PM desires a warranty from the Contractor to correct any conformance-related deficiencies at the Contractor's cost, the language suggested in the H2 clause in SECTION H (Chapter 5) provides guidance.

The FACE CTS is subject to ongoing revisions and enhancements. The PM must decide how and when to specify the version of the FACE CTS which will be used to verify the FACE UoCs. The version could be specified in the Request for Proposal (RFP) or during contract negotiations with the Offeror.

The PM may require the Contractor to utilize the CVM in the SDP, Software Test Plan (STP), and Software Test Report (STR).

PMs should use the language included in the following paragraphs to ensure they are getting products certified as FACE Conformant.

3.6.1 FACE Conformance Verification Test Results

Commentary

The Contractor can include conformance verification test results in the STR.

3.6.2 FACE Conformance Verification Processes

Commentary

The Contractor can identify their internal processes for verification of the FACE Conformance Requirements in their SDP and STP. The Contractor can detail how and when conformance to the FACE Technical Standard will be verified and explain the use of specific modeling tools, test suites, and/or development practices. The Contractor can include their Contractor conformance verification test results in the STR.

3.7 FACE Documentation

Commentary

The PM must ensure that the appropriate documents and artifacts are delivered with the developed FACE UoCs to support replaceability, reuse, and technology refresh. Therefore, each individual FACE UoC should be delivered separately with its own appropriate artifacts, deliverables, or evidence pointers into other delivered CSCIs or system-level deliverables. For Government funded FACE UoCs, artifacts should be delivered with appropriate rights as defined by the DFARS. The list of deliverables in Appendix A contains the common software deliverables, pertinent to programs with FACE requirements, and indicates the ones considered most important for reuse, replacement, or refresh.

PMs should include testing materials (software, tools, instructions, testing results, design artifacts, etc.) in the deliverables as required for software sustainment and to support the system lifecycle, especially for those items developed with Government funding. The Government should ensure that it has appropriate rights and that these items are marked correctly by the Contractor. For testing materials provided by third-party vendors or Subcontractors, the Contractor should identify those materials and provide points of contact for that vendor.

The Contractor can identify in their SDP and STP any tools used to develop certified FACE Conformant software (i.e., commercial or proprietary tool suites, versions of the optional FACE IDE, the edition of the FACE Technical Standard to which the software will conform, the version of the FACE CTS that will be used to test conformance, and the inch stones or milestones for FACE Conformance.

The PM should establish separate Contract Line Item Numbers (CLINs) for TD and CS to be delivered under a contract as required by DFARS 227.7103-1(b)(3) and 227.7203-1(b)(3). In certain limited circumstances, it may be appropriate to consider the merits of priced contract option CLINs for future delivery of TD and CS that were not acquired upon initial contract award. Keep in mind, however, that these options should not be used to require delivery of TD relating to items, processes, or CS being developed with Government funding under a current contract, since those items should already be delivered under the current contract. The PM should ensure that the Deferred Ordering clause found at DFARS 252.227-7027 is included in the contract. This clause allows the Government to require the delivery of any TD or CS generated in the performance of a contract even if the Government does not require the delivery of this TD and CS at initial contract award.

In addition to unlimited rights in Form, Fit, and Function (FFF) data per the DFARS, the Government is also entitled to unlimited rights in any interface data developed exclusively with Government funding. As a result, PMs are encouraged to coordinate with their Legal Counsel to ensure that the Government obtains appropriate license rights in ICDs pertaining to the integration of commercial or vendor-unique software into the FACE Computing Environment. ICDs will be required for FACE UoCs and external interfaces connecting to FACE UoCs within the FACE Computing Environment.

Data rights for models generated by proprietary software development tools may require negotiation with the Contractor. Some tools and models may have been privately developed by the Contractor or a third-party vendor.

For the official source of DoD standards and specifications, please refer to the ASSIST online database (<https://assist.dla.mil>).

- 3.7.1 The Contractor SHALL complete FACE Conformance in accordance with the FACE Conformance Policy.
- 3.7.2 The Contractor SHALL deliver a copy of the FACE Conformance Certificate, once attained, for each FACE UoC or FACE UoC Package.

Commentary

The PM can make the FACE Conformance Certificate a deliverable if desired. Consider that the conformance certificate will lag a few months after completion of the software development. Consider timing of payment milestones, especially if it will be tied to delivery of the FACE Conformance Certificate.

3.8 Other Documentation

Commentary

The PM should ensure any additional documents requested in SECTION L (Chapter 3) are included in the SOW and on the Contract Data Requirements List (CDRL) (DD 1423) if they are to be maintained and updated throughout the acquisition lifecycle. Examples include the Integrated Master Schedule (IMS) or Integrated Program Management Report (IPMR), Risk Management Plan (RMP), Software Quality Assurance Plan (SQAP), and Software Configuration Management Plan (SCMP), and documentation related to Information Assurance (IA). Where applicable, these and other potential deliverables are listed in Appendix A with guidance on how to tailor to incorporate FACE specific information.

3.9 Cost Reports

Commentary

The following language is only applicable for cost type contracts.

For all software developed and funded by the Government under this [cost type] contract, the Contractor SHALL provide a Work Breakdown Structure (WBS) that provides detail for each FACE UoC so costs can be adequately estimated and tracked. This includes, but is not limited to, the costs to design, verify/test, and integrate the FACE UoCs. The Contractor SHALL systematically collect and report actual contract costs to provide DoD cost analysts with needed data to estimate future costs.

3.10 Lifecycle Management

- 3.10.1 The Contractor SHALL utilize the FACE Library throughout the lifecycle of the product, including ensuring that applicable publicly releasable metadata for each FACE UoC is listed in the FACE Registry and the software is stored in an applicable FACE Product Repository with the appropriate artifacts.

Commentary

As part of the OSMP, supportability and sustainment costs should be addressed.

The Contractor should describe and demonstrate the selected strategy for reducing product, system, and associated supportability costs through insertion of FACE Conformant software, Government Off-the-Shelf (GOTS), and commercial software including COTS software in the OSMP.

3.11 SOW FACE Technical Approach Content

Commentary

The following optional language describes deliverables that are part of the DIDs listed.

3.11.1 Software Engineering

- a. The Contractor SHALL define all software development processes, activities, and tasks related to the system/subsystem portion with FACE requirements. Information provided must include, at minimum, specific standards, methods, tools, actions, strategies, and responsibilities associated with development and certification of FACE UoCs.

- b. The Contractor SHALL document the FACE Computing Environment, FACE UoC design, and identify the proposed standards and formats to be used.
- c. The Contractor SHALL maintain the design information, including any models used, so that the design information and models are current with the as-built system.
- d. The Contractor's design approach SHALL result in a layered system design, maximizing software independence from the hardware, thereby facilitating technology refresh.
- e. The Contractor's system architecture SHALL minimize inter-software dependencies to allow FACE UoCs and other software to be decoupled and reused, where appropriate, across various DoD or service programs, or to be replaced by competitive alternatives.

3.11.2 Technology Insertion

Commentary

The following optional language describes deliverables that are part of the DIDs listed.

By using the FACE Approach, the software architectural approach would use open standards and open interfaces as defined by the specified edition of the FACE Technical Standard. This supports the rapid and affordable insertion and refreshment of technology through modular design. Software should be designed to avoid inadvertent interference with other software that uses the same computing hardware.

- a. The Contractor's architectural approach SHALL use open standards and open interfaces defined by the specified edition of the FACE Technical Standard. This supports the rapid and affordable insertion and refreshment of technology through modular design. Software should be designed to avoid inadvertent interference with other software that uses the same computing hardware.
- b. The Contractor SHALL describe how the product will respond to changes driven by mission requirements and new technologies, facilitate future upgrades, and permit incremental technology insertion with minimal impact on the existing systems.

3.11.3 Technical Design Reviews

Commentary

In some cases, the Government may want to require the Contractor to perform Technical Design Reviews. The purpose of these reviews includes observing that the design and documentation is complete, conforms to the established design approach, is technically sound, and will satisfy the functional requirements. For FACE requirements, the PM should be aware of including the items listed below in the Technical Design Reviews.

In addition to the requirements below, the PM may optionally require the following:

- Demonstrations of modularity, openness, and ease of technology insertion and refresh, with an emphasis on the use of third-party software

As part of the design review plan for the conduct of formal reviews, the Contractor SHALL include the following as part of Technical Design Reviews:

- Description or functional break down of capability for each FACE UoC
- Development progress related to the conformance of FACE UoCs

- SLOC Quantity, Percentages, and Reuse Metrics – at the agreed design reviews, or other predetermined contractual event(s)

3 Recommended Language for SECTION L: INSTRUCTIONS, CONDITIONS, AND NOTICES TO OFFERORS

This section contains commentary and recommended language as guidance to include in SECTION L: Instructions, Conditions, and Notices to Offerors for solicitations with FACE requirements. The structure of SECTION L and SECTION M parallel the DoD OSA Guidebook with some adjustments. This section contains guidance only, and is offered with the understanding that individual PMs can remain flexible in selecting and determining the relative importance of those items needed to meet their needs. PMs are not obligated to address all of the items contained in these recommendations.

Commentary

The PM will determine the required volumes of the proposal. A typical proposal might consist of an executive summary, a Technical Volume, a Data Rights Volume, a Cost Volume, a Management Volume, a Past Performance Volume, or any additional volumes required by the PM. Data rights assertions and data rights strategy description may be appended to the cost or technical volume instead of being in a separate volume. Proposal material addressing FACE requirements is most prevalent in the Technical Volume. For ease-of-use, the creators of this Guide have divided SECTION L into volumes, chapters, and subchapters, which can be tailored, omitted, and/or merged to suit specific acquisition needs.

For clarity, it is recommended that the PM's choices for volume, chapter, and subchapter terminology in SECTION L correspond with the factor, sub-factor, and element terminology in SECTION M:

SECTION L: Volume, Chapter, Subchapter

SECTION M: Factor, Sub-Factor, Element

The text below is recommended language to address FACE requirements for inclusion in the following volumes, chapters, and subchapters. A few topics such as modularity, portability, and reuse are intentionally discussed in multiple sections to ensure adequate coverage of the topic. The PM has the flexibility to require these topics be addressed in these multiple sections or just request the topic be addressed in the most applicable section.

1. Technical Volume

Commentary

It is recommended that the specific FACE language for the Technical Volume be addressed in the following structure of chapters and subchapters.

Open System Chapter:

- Open System Management Process Subchapter
- Software Reuse Subchapter
- Lifecycle Management Subchapter

Software Engineering Chapter:

- Software Development Process Subchapter

- Software Design Subchapter
- Interface Design Subchapter
- Verification and Certification Subchapter

Depending on the type of acquisition, these chapters and subchapters can be tailored, omitted, and/or merged to suit specific acquisition needs.

This volume describes the Offeror's understanding and technical approach to meet the total requirements as described in the RFP and attachments. The Offeror's technical proposal SHALL include details to demonstrate the Offeror's understanding of the requirements and allow for a thorough evaluation of the approach to meet all FACE requirements.

1.1 Open System Chapter

The Offeror SHALL prepare and submit a draft OSMP describing the aspects of developing an open system, including their open system management approach, software reuse, and lifecycle management, focused on achieving the FACE requirements.

Commentary

The PM's decision on whether to require a draft OSMP will depend on the complexity, nature, and size of the system or software capability being contracted. The information in an OSMP is critical for developing and managing an open system that supports FACE requirements. Should the PM decide not to require an OSMP deliverable, it is recommended to tailor Section 5.19.8 of the SDP deliverable to require the appropriate content described in Section 3.3 of the OSMP DID. This is likely if the RFP is only for one or more FACE UoCs or FACE UoC Packages.

The following language is applicable should the PM decide to require a draft OSMP.

1.1.1 Open System Management Process Subchapter

The Offeror SHALL describe their approach and processes for using the FACE Technical Standard to address the following:

1.1.1.1 Approach to Address FACE Requirements

The Offeror SHALL provide a detailed description of their approach for incorporating the FACE Technical Standard into their overall system design. The description should specify the portions of the system that will be FACE Conformant and how the overall system architecture incorporates appropriate considerations for portability, re-configurability, maintainability, vendor-independence, reusability, scalability, interoperability, upgradeability, and long-term supportability.

1.1.1.2 Design Disclosure

The Offeror SHALL identify and describe the proposed tools, standards, and formats to be used to develop and document the software, software architecture, and data model.

Commentary

The FACE CTS is available through The Open Group FACE website (<http://opengroup.org/FACE>).

1.1.1.3 Technology Insertion and Refresh

The Offeror SHALL provide a detailed description of how their proposed system allows for rapid and affordable technology insertion and refresh, to include identifying the processes for integrating new and existing FACE Conformant capabilities. The description should define how the proposed system facilitates technology refresh and allows incremental systems improvement through upgrades of individual software units with newer software units, including software from third-party providers and reuse sources.

1.1.1.4 Asset Reuse

The Offeror SHALL provide a detailed description of the steps taken to reduce acquisition of duplicative software or hardware where possible. The description should include what capabilities will be fulfilled through the use of FACE UoCs and artifacts listed in the FACE Registry.

1.1.1.5 Rationale for Modularization Choices

The Offeror SHALL describe the rationale for the modularization and FACE UoC choices made to generate the design of the system, to include size and capability set.

The Offeror's rationale SHALL explicitly address any trade-offs performed, particularly those that compromise the modular and open nature of the system.

The proposal SHALL include:

- A description of each proposed FACE UoC as defined by the specified edition of the FACE Technical Standard and the software units that reside within them
- A description of the proposed functionality of each FACE UoC and which FACE Segment of the FACE Reference Architecture the FACE UoC resides within
- A description of each proposed FACE UoC Package as permitted by the FACE Technical Standard and the FACE UoCs that reside within them

1.1.2 Software Reuse Subchapter

Commentary

The FACE Technical Standard promotes cost-effective reuse of products that have already been developed and are available for reuse. Identification of FACE Certified Products may be found in the FACE Registry. Other candidates for reuse include commercially available software or software developed exclusively at private expense that offer proven system performance, reduced technical risk, or cost advantages over potential newly developed products. These other candidates can be made certified FACE Conformant by wrapping them and completing the FACE Conformance Program.

The PM should note that software reuse requirements with respect to airworthiness certification are not addressed here. Each service is responsible for satisfying their software reuse requirements for airworthiness certification. The U.S. Army Combat Capabilities Development Command Aviation & Missile Center (CCDC AvMC) has developed the following document available for reference:

“Developer's Requirements Guide for Airworthy, Reusable FACE Units of Conformance”
(April 25, 2014)

The Offeror SHALL describe their software reuse approach and provide a detailed description of the steps taken to reduce development of duplicative software where possible.

At a minimum, the Offeror SHALL describe what artifacts listed in the FACE Registry and any common software specified by the PM it intends to use within its proposed solution.

If reusing certified FACE Conformant software listed in the FACE Registry, the Offeror SHALL identify the software, associated artifacts, and the intended use in their approach.

The Offeror SHALL identify those existing items (i.e., FACE UoCs) they will evaluate for reuse and how they will be used within its proposed solution, including FACE UoCs and artifacts listed in the FACE Registry.

The Offeror SHALL identify whether the reuse items will be “as-is” or “modified” and the extent of modification.

The Offeror SHALL describe their rationale for developing new, improved, and innovative FACE Conformant software *in lieu* of reusing existing software.

The Offeror SHALL identify existing software and/or portions thereof that are Open Source.

The Offeror SHALL provide additional information on the evaluation of prospective software, including where existing software information was found (i.e., FACE Registry and/or Government libraries/sites such as DISA’s Forge.mil, Navy’s SHARE, Navy PEO C4I’s NESI, etc.).

1.1.3 Lifecycle Management Subchapter

The Offeror SHALL describe their lifecycle management approach of the proposed FACE UoCs.

1.2 Software Engineering Chapter

The Offeror SHALL prepare and submit a draft SDP describing the aspects of software engineering, including software development process, software design, interface design, and verification, focused on achieving the FACE requirements.

1.2.1 Software Development Process Subchapter

Commentary

The PM should require at a minimum a draft or initial release of the SDP and could require draft versions of other plans, including the RMP, the SQAP, and the SCMP. Instead of requesting separate deliverables, the PM has the option to request the appropriate content of the plans as part of the SDP.

The Offeror SHALL describe their software development approach for satisfying the FACE requirements for the proposed FACE UoCs.

a. Risk Management Plan (RMP)

Commentary

If the PM requests the draft content of the RMP instead of a separate RMP deliverable, the SDP deliverable can be tailored to require the appropriate content for the RMP. The PM can tailor this section or omit it if it does not apply at the time of solicitation.

The Offeror SHALL prepare and submit an initial release or draft of the RMP describing the Offeror's risk management approach to any risks related to conforming to the FACE requirements, their likelihood, their impact, and mitigation steps.

b. Software Quality Assurance Plan (SQAP)

Commentary

If the PM requests the draft content of the SQAP instead of a separate SQAP deliverable, the SDP deliverable can be tailored to require the appropriate content for the SQAP. The PM can tailor this section or omit it if it does not apply at the time of solicitation.

The Offeror SHALL prepare and submit an initial release or draft of their SQAP for FACE UoCs.

c. Software Configuration Management Plan (SCMP)

Commentary

If the PM requests the draft content of the SCMP instead of a separate SCMP deliverable, the SDP deliverable can be tailored to require the appropriate content for the SCMP. The PM can tailor this section or omit it if it does not apply at the time of solicitation.

The Offeror SHALL prepare and submit an initial release or draft of their SCMP for FACE UoCs.

1.2.2 Software Design Subchapter

Commentary

It is recommended that the PM ask the Offeror to submit their software designs. It is understood that complete software design may not be available at the time of proposal, but it can be a vital evaluation factor. The PM can tailor this section or omit it if it does not apply at the time of solicitation.

The Offeror SHALL describe the proposed software design, including how the software architecture design and interface design address FACE requirements.

The proposal SHALL describe the software and data architecture, including where they reside in the FACE Reference Architecture.

Commentary

It is important that the PM ensure the following architecture and interface information is submitted by the Offeror in a proposal as part of the SWARD.

The PM can tailor this section or omit it if it does not apply at the time of solicitation. Sometimes the SWARD is designed on contract following the proposal.

The content of the SWARD could be addressed in sections of the Interface Design Description (IDD) and Software Design Description (SDD) deliverables.

The Offeror SHALL describe their software architecture including how it implements the FACE Reference Architecture.

This description should include the following:

- a. A description of the proposed software design, including the software architecture design, interface design, and supportability design, focused on achieving the FACE requirements.
- b. A description of the proposed software and data architecture including where they reside in the FACE Reference Architecture.
- c. A description of how the proposed solution meets the requirements of the FACE Technical Standard.
- d. A description of the proposed use of the defined FACE Interfaces and which FACE UoCs utilize these specific interfaces.
- e. A description of the proposed FACE Operating System Segment (OSS), to include language run-time and OS Profile.

1.2.3 Interface Design Subchapter

Commentary

This section is applicable should the PM choose to require the Offeror's proposed interface designs prior to award of contract. The PM can tailor this section or omit if it does not apply at the time of solicitation. Typically, interface design is not available at the time of solicitation. The intent is to get a pre-award idea of the Offeror's proposed solution and expected use of the defined FACE Interfaces, the internal interfaces within FACE UoCs, and the external interfaces between the FACE Computing Environment and other external systems/subsystems.

The Offeror SHALL describe how they will implement interfaces both internal and external to the FACE Computing Environment and FACE UoCs.

At a minimum, the Offeror SHALL address the following:

- a. The Offeror SHALL describe how they will define and document all internal and external interfaces to the FACE Computing Environment and FACE UoCs.
- b. The Offeror SHALL describe how they have implemented the defined FACE Interfaces.
- c. The Offeror SHALL address the interface and data exchange standards between the software unit, FACE UoC, CSCI, subsystem, or system and the interconnecting or underlying information exchange medium.
- d. The Offeror SHALL identify any planned interfaces implemented by proprietary, vendor-unique standards, as well as the impact of those standards upon the proposed modularity and logistics approach.

1.2.4 Verification and Certification Subchapter

The Offeror SHALL describe the proposed approach to implementing FACE UoCs developed by the Offeror and any Subcontractor.

The proposal SHALL address the Offeror's internal verification processes, verification by a FACE VA, and certification by the FACE CA.

2. Technical Data (TD) and Computer Software (CS) Rights Volume

Commentary

The PM should clearly communicate the desired rights in TD, CS, and Intellectual Property (IP) strategy consistent with applicable law and regulation. PMs are encouraged to coordinate with their Legal Counsel to ensure that the Government obtains at least GPR in interface data pertaining to the integration of commercial or proprietary software into the FACE Computing Environment if such interface data was developed at least partially at Government expense.

It is incumbent upon the PM and Contracting Officer to fully understand the terms of each TD rights license, including the specific rights and limitations, if any, proposed by the Offeror. License agreements should be made a part of and attached to the Contract.

- 2.1 The Offeror SHALL describe the rights in TD and CS for each proposed FACE UoC. The rights described SHALL be consistent with the assertions in the 7017 List.
- 2.2 The Offeror SHALL explain the extent to which the rights in TD, CS, and Computer Software Documentation (CSD) offered to the Government promote the following:
 - a. Promote innovative and cost-effective production, operation, maintenance, sustainment, and upgrade of FACE UoCs throughout its lifecycle.
 - b. Allow for open and competitive procurement of enhancements.
 - c. Permit the transfer of the FACE product's non-proprietary object code and non-proprietary source code to other Contractors for use on other systems or platforms.
- 2.3 The Offeror SHALL describe their plan for making design and interface information available to the Government and third-party Contractors.
- 2.4 The Offeror SHALL describe how the proposed Intellectual Property Rights (IPR) meet the program needs.
- 2.5 The Offeror SHALL provide the following information as attachments to their offer:
 - 2.5.1 Pre-Award Identification and Assertion of Restrictions on the Government's Use, Release, or Disclosure of TD and CS:
 - a. Rights in Non-commercial TD, Non-commercial CS, and Non-commercial CSD.

The Offeror (including their Subcontractors at all tiers) SHALL identify and list all non-commercial TD, CS, and CSD that they propose to deliver with less than unlimited rights pursuant to the procedures and requirements of the DFARS 252.227-7017 Identification and Assertion of Use, Release, or Disclosure Restrictions (the 7017 List) provision incorporated in SECTION K of this solicitation.

- b. Supplemental Non-commercial License Information

The Offeror (including their Subcontractors at all tiers) SHALL include copies of, or provide in their proposal website links to, any proposed specifically negotiated license(s) associated with deliverable non-commercial items on the 7017 List.

- c. Rights in Commercial TD, Commercial CS, and Commercial CSD

The Offeror (including their Subcontractors at all tiers) SHALL attach to its proposal a list, entitled “Commercial Technical Data, Commercial Computer Software, and Commercial Computer Software Documentation-Government Use Restrictions” – the Commercial Restrictions List (CRL) – that provides the following information regarding all commercial TD, CS, and CSD that the Offeror (or their Subcontractors) proposes to deliver:

- i. Identification of the commercial TD, CS, or CSD
- ii. Name of the person/entity licensing the TD, CS, or CSD
- iii. Identification of the commercial license that will apply
- iv. Identification of the deliverable requirements to which the TD, CS, or CSD pertain. The Government’s rights with respect to certain types of commercial TD are set out in DFARS Clause 252.227-7015. Any proposal submitted by the Offeror should be consistent with this clause.

An example CRL format is provided below. The Offeror SHALL submit the CRL as an attachment to their proposal, dated and signed by an official authorized to contractually obligate the Offeror.

If there is no information to be included in the CRL, the Offeror SHALL submit the list and enter “None” as the body of the list. If the Offeror is awarded a contract, the CRL SHALL be attached to the contract.

COMMERCIAL TECHNICAL DATA, COMMERCIAL COMPUTER SOFTWARE, AND COMMERCIAL COMPUTER SOFTWARE DOCUMENTATION

Commercial Technical Data or Computer Software to be Furnished with Restrictions	Name of Person (or Entity) Assertion Restrictions	Asserted Rights Category (e.g., Commercial License Rights, Specifically Negotiated License Rights)	Associated Delivery Requirement(s) (Identify CLIN(s), CDRL(s), or SOW Paragraph(s))

GOVERNMENT USE RESTRICTIONS

2.5.2 Rationale and Proposed Use of Proprietary or Vendor-Unique Software

The Offeror SHALL provide a description of the proposed use and functionality of commercial, proprietary, or vendor-unique FACE UoCs or software units identified in the 7017 List and the CRL in the system.

Commentary

In addition, the acquiring PM could request a mapping of each TD and CS rights assertion to the corresponding CLIN(s), CDRL(s), or SOW paragraph(s) pertaining to the deliverables that may be subject to each assertion. The Offeror may include a copy of the 7017 List and add a column with the heading “Associated Delivery Requirement(s) (Identify CLIN(s), CDRL(s), or SOW Paragraph(s))” to fulfill this requirement, as shown in the CRL. However, this request could be cost prohibitive for Offerors.

3. Cost Volume

Commentary

PMs should consult the DoD OSA Guidebook for information regarding the Cost Volume.

It is recommended that the Government ask the Offeror to include the following specific chapters in the Cost Volume to address FACE requirements:

- Cost Proposal Chapter related to FACE UoC costs (note that requiring WBS cost information at the FACE UoC level would only apply to cost type contracts)
- Cost Proposal Chapter related to FACE UoCs metrics tracking costs

In addition, the PM is strongly encouraged to include cost proposal language from the DoD OSA Guidebook pertaining to:

- Supplemental information concerning cost/price of non-commercial TD, non-commercial CS, and non-commercial CSD
- Supplemental information concerning cost/price of commercial TD, commercial CS, and commercial CSD
- Supplemental information concerning cost/price of background inventions
- License option pricing

Ultimately, the PM should insert specific cost language that supports the acquisition strategy for the system specifying FACE requirements.

The Cost Volume describes the Offeror’s cost approach and understanding of the requirements in the RFP. The Offeror’s cost proposal SHALL include specific details that demonstrate the Offeror understands the costs related to FACE requirements and allows for a comprehensive evaluation of their approach toward meeting FACE requirements.

The proposal SHALL be sufficiently detailed to demonstrate their cost reasonableness and realism. The burden of proof rests with the Offeror for credibility of proposed costs.

The Offeror SHALL provide any information required to explain estimating processes, methods, factors, or any assumptions or contingencies used in the proposed cost estimates addressing FACE requirements. The following chapters and subchapters are recommended to address FACE requirements in the Cost Volume:

3.1 Cost Proposal Chapter: FACE UoC Costs

3.1.1 Work Breakdown Structure (WBS) for Cost Type Contracts

Commentary

The following requirement should be considered for cost type contracts.

The Offeror SHALL provide a WBS with the Cost Volume that provides detail at the FACE UoC level, so costs for FACE UoCs can be adequately estimated and tracked. This includes, but is not limited to, the costs to design, verify/test, integrate, and maintain/sustain the FACE UoCs.

3.1.2 License Option Price Information

For each proposed/expected FACE UoC that the Offeror asserts with less than GPR and for which the Offeror is willing to sell to the Government greater rights than those identified in the 7017 List, the Offeror SHALL identify those greater rights, provide an option price at which the Government may purchase such greater rights, and identify the period of time during which the option is available for the Government to exercise.

3.1.2.1 Government Preferences

Commentary

The Offeror may state any license option price as a firm fixed price, a percentage royalty rate (or use fee), or any other comparable compensation scheme, provided that the Government can reasonably calculate a sum-certain price for the license option using the price information and terms and conditions information the Offeror provided.

4. Management Volume

4.1 Risk Chapter

Commentary

Business Risk:

It is important for the PM to consider appropriate measures to mitigate business risks associated with assuring continuous access, operation, and maintenance of the FACE Computing Environment, FACE UoCs, and related artifacts.

One optional measure the PM can consider to mitigate a business risk is using a software escrow service with a contingent license agreement. This would entail having the software source code and/or artifacts held in escrow. In the event the licensor (Offeror or Subcontractor) files for bankruptcy or otherwise fails to maintain and update the software and artifacts as agreed to in the software license agreement, the software source code and/or artifacts are released to the licensee (i.e., the Government).

Measures to mitigate business risks are optional and should be considered and negotiated on a case-by-case basis.

Reuse Risk:

As with any product within a system, there is an inherent integration risk in using existing items (i.e., software) for reuse within a proposed solution. It is pertinent for the Offeror to:

- Identify the existing items in consideration for reuse
- Identify whether they will be modified

– Submit a draft plan that further identifies and mitigates the risks associated with the integration of the reused items

The Offeror's plan should consider mitigation derived from trade-off studies, requirements analysis, design synthesis, verification, and other systems engineering processes and program milestones. Additionally, the plan should also address IA risk, particularly those associated with using Open Source software.

The PM should be aware that, in the event the Offeror proposes to modify a certified FACE UoC, the resultant modified FACE UoC must be re-certified through the FACE Conformance Program.

The PM should consider the arrangement of appropriate license agreements associated with reused software and how they address potential integration or product problems. The PM must be assured of continuous operation, maintenance, and recourse for resolving integration problems of the reused software. License agreements are discussed in SECTION H (Chapter 5). See the Software Reuse Subchapter.

4.2 Integrated Master Schedule (IMS) Chapter

Commentary

The Offeror should include, identify, and integrate tasks in the submitted schedule (IMS) to demonstrate their understanding of FACE Conformance and the required deliverables.

The Offeror SHALL submit a draft IMS that includes tasks such as:

- FACE UoC(s) make, buy, or reuse decision milestones
- FACE Reference Architecture design and development
- Offeror conducted verification of candidate FACE UoCs
- FACE Conformance Verification and Certification of FACE UoCs
- FACE UoC integration into the FACE Computing Environment

4.3 Metrics Chapter: FACE UoCs Metrics Tracking Costs

Commentary

Particularly during the first instantiations of systems conforming to the FACE Technical Standard, it will be important to capture and track certain cost data and metrics to evaluate the true costs and savings related to OA and the FACE Approach. Actual metric requirements would be included in the SOW, but the Offeror should be asked to include the additional costs (if any) of tracking and reporting this data.

The Offeror SHALL quantify the costs associated with tracking and reporting the FACE UoC cost metrics specified in the SOW.

5. Past Performance Volume

Commentary

The DoD OSA Guidebook provides a detailed list of past performance material the Offeror should include within a proposal. This section includes recommended language for requesting the Offeror to provide relevant experience in Modular Open System Approach (MOSA) and/or the FACE Reference Architecture. The objective is for the Offeror to demonstrate their capabilities to perform work of a similar nature and magnitude to the current program and conform to the FACE Technical Standard.

The Offeror SHALL identify relevant past performance example(s) (e.g., experiences, contracts, and subcontracts) which demonstrate previous experience with OA, Integrated Modular Avionics (IMA), MOSA, or the FACE Reference Architecture within the last five (5) years. For FACE experience, the Offeror may include:

- i. Previous experience in successfully gaining a FACE Conformance Certification for a product
- ii. Brief descriptions of FACE UoCs, associated artifacts, and development and integration approaches
- iii. Previous experience of software reuse and reusing FACE UoCs listed in the FACE Registry
- iv. Previous experience using development and verification tools for FACE UoCs (IDE, CTS, etc.).

4 Recommended Language for SECTION M: EVALUATION FACTORS FOR AWARD

This section contains commentary and recommended evaluation criteria to include in SECTION M: Evaluation Factors for Award for solicitations with FACE requirements. The structure of SECTION L and SECTION M parallel the DoD OSA Guidebook with some adjustments. This section contains only recommended guidance, and is offered with the understanding that individual PMs can be flexible in selecting and determining the relative importance of those items needed to meet their needs. PMs should not feel that they need to address all of the items contained in these recommendations.

Commentary

The PM will determine the evaluation factors which might consist of a technical factor, a data rights factor, a cost factor, a management factor, a past performance factor, or any additional factors deemed necessary.

For ease-of-use, the creators of this Contract Guide have divided SECTION M into factors, sub-factors, and elements, which can be tailored, omitted, and/or merged to suit specific acquisition needs.

The PM may decompose each factor into sub-factors, and sub-factors into elements. The PM will determine the relative importance or weighting of these factors, sub-factors, and elements.

Below are recommended evaluation criteria pertaining to solicitations with FACE requirements. A few topics such as modularity, portability, and reuse are intentionally discussed in multiple sections to ensure adequate inclusion as an evaluation factor.

1. Technical Factor

Commentary

Depending on the type of acquisition, the factors, sub-factors, and elements below can be tailored, omitted, and/or merged to suit specific acquisition needs.

The Government will evaluate the Offeror's ability to demonstrate a thorough understanding of the complete range of tasks in the RFP and implementation of the FACE Technical Standard. The Government will evaluate the Offeror's:

- a. Approach for accomplishing the tasks and requirements set forth in the SOW
- b. Ability to deliver FACE UoCs, DSDMs, supporting products, and services that meet or exceed requirements
- c. Ability to overcome the technical challenges that must be addressed to fulfill the FACE requirements
- d. Solutions for clarity, completeness, and feasibility
- e. Approach to provide the services and capabilities described in accordance with the FACE Technical Standard

1.1 Open System Sub-Factor

1.1.1 Open System Management Process Element

The Government will evaluate the extent to which the Offeror's approach incorporates the FACE requirements, design disclosure, technology insertion and refresh, asset reuse, and modularization choices and is thorough, complete, adequate, feasible, and flexible.

1.1.2 Software Reuse Element

Commentary

The FACE Technical Standard promotes software reuse, but does not address software reuse requirements with respect to airworthiness certification. Each service is responsible for satisfying their software reuse requirements for airworthiness certification.

The Government must also evaluate the benefits Offerors may propose of cost-efficient new development of improved and innovative software *versus* reuse of existing software that may be old, inefficient, obsolete, outdated, or innovatively stale. A rationale for developing new software *in lieu* of reusing existing software should suffice.

The Government will evaluate the extent to which the Offeror's software reuse approach describes the following factors and is thorough, complete, adequate, feasible, flexible, and represents understanding of the requirements:

- Evaluation approach of prospective software items to reuse
- Rationale for developing new, improved, and innovative software conformant to the FACE Technical Standard *in lieu* of reusing existing software
- Reuse of pre-existing items including artifacts from the FACE Registry
- Reuse items "as-is" or "modified" including the extent of modification
- Reuse of Open Source or partial Open Source software

Proposals demonstrating cost-effective reuse of products that have already been developed by the Government, or cost-attractive commercial products that have been certified as FACE Conformant or verified to meet applicable requirements defined in the FACE Technical Standard will receive a more favorable rating.

1.1.3 Lifecycle Management Element

The Government will evaluate the extent to which the Offeror's lifecycle management approach to the proposed FACE UoCs is thorough, complete, adequate, feasible, flexible, and represents understanding of the requirements.

1.2 Software Engineering Sub-Factor

The Government will evaluate the technical feasibility of the Offeror's software development process, software design, interface design, and verification approaches to the proposed FACE UoCs in terms of portability, re-configurability, maintainability, vendor-independence, reusability, scalability, interoperability, upgradeability, and long-term supportability.

1.2.1 Software Development Process Element

The Government will evaluate the extent to which the Offeror describes the software development approach for satisfying the FACE requirements, including approaches for risk management, software quality assurance, and software configuration management, is thorough, complete, adequate, feasible, flexible, and represents understanding of the requirements.

1.2.2 Software Design Element

Commentary

This section is applicable when the PM requires proposed software designs. Complete software design may not be available at the time of proposal, but it can be a vital evaluation factor. The PM can tailor this element or omit it if it does not apply at the time of solicitation.

The evaluation should consider the following:

- The Offeror’s design thoroughly describes the software and data architectures, including where they reside in the FACE Reference Architecture
- The Offeror’s design demonstrates an understanding of the FACE requirements and promotes the FACE quality attributes of portability and extensibility
- The Offeror adequately specifies how the FACE Technical Standard and FACE Shared Data Model are incorporated into their design
- The Offeror’s design adequately describes the partitioning scheme and the targeted FACE Operating System Profile(s) proposed in the solution
- The Offeror’s design adequately describes the rationale for the modularization and FACE UoC choices made to generate the design of the system or FACE Computing Environment

The PM should evaluate the modularization and FACE UoC choices based on appropriate functionality, size, coupling, cohesion, and location in the architecture. The intent is to make sure disparate capabilities are not bundled into a single FACE UoC or valid FACE UoC Package.

The Government will evaluate the extent to which the Offeror’s software design is thorough, complete, adequate, feasible, flexible, and represents understanding of the requirements.

1.2.3 Interface Design Element

Commentary

This section is applicable should the PM decide to require proposed interface designs. The PM can tailor this element or omit it if it does not apply at the time of solicitation. Typically, interface design is not available at the time of solicitation.

The Government will evaluate, based on the Government’s preference for open interfaces and conformance to the FACE Technical Standard, the extent to which the Offeror:

- Clearly defines and describes all interfaces (internal and external) to the FACE Computing Environment and FACE UoCs, including the defined FACE Interfaces
- Defines and documents all subsystem and software-level interfaces to provide full functional, logical, and physical specifications
- Identifies any planned interfaces implemented by proprietary, vendor-unique standards, as well as the impact of those standards on the proposed modularity and logistics approach

- Identifies the interface and data exchange standards between the software unit, FACE UoC, CSCI or system, and the interconnectivity or underlying information exchange medium
- Identifies any planned use of proprietary or closed interfaces which impact portability

1.2.4 Verification and Certification Element

The Government will evaluate the extent to which the Offeror's FACE Conformance Verification approach is thorough, complete, adequate, feasible, flexible, and represents understanding of the FACE Conformance Verification requirements.

2. Technical Data (TD) and Computer Software (CS) Rights Factor

Commentary

PMs should consider evaluation of the data rights packages offered as part of best value determinations. An Offeror who proposes only those rights required by statute and states their intention to provide TD developed exclusively at private expense with limited rights cannot be rated "Unacceptable". Those who offer more favorable data rights packages can be positively rewarded by being graded with adjectival ratings such as "Good", "Excellent", and "Superior". Offering the rights to which the Government is statutorily entitled should result in an "Acceptable" TD rights evaluation score – offering less than the rights statutorily entitled would result in an "Unacceptable" rating.

Conformant FACE UoCs can be acquired using the existing DFARS data rights clauses. The defined FACE Interfaces are open (non-proprietary) interface standards. Offerors may propose to use and deliver commercial or proprietary solutions within a FACE UoC in performance of the resultant contract and be FACE Conformant, so long as the interface usage is permitted by the FACE Technical Standard, maintains FACE UoC portability, and the defined FACE Interfaces remain open (see the FACE Technical Standard for permitted interface use). However, the Government should also require the delivery of sufficient FFF, and interface data and associated rights thereto, as necessary to understand the physical and functional attributes of commercial and proprietary software within the system and ensure the interchangeability and replaceability of commercial, proprietary, or vendor-unique software.

The Government will use information in the proposal to evaluate the extent to which:

- The Offeror has adequately described the rights in TD and CS for each proposed FACE UoC consistent with the assertions in the 7017 List
- The rights in TD, CS, and CSD offered to the Government promote innovative and cost-effective production, operation, maintenance, sustainment, and upgrade of the FACE UoC throughout its lifecycle, allow for open and competitive procurement of future enhancements, and permit the transfer of the FACE UoC's non-proprietary object code and non-proprietary source code to other Contractors for use on other systems or platforms
- The rights in TD, CS, and CSD offered to the Government promote innovative and cost-effective production, operation, maintenance, and upgrade of the FACE UoC throughout its lifecycle, allow for open and competitive procurement of future enhancements, and permit the transfer of the FACE UoC's TD, CS, and CSD to other systems or platforms

Proposals will not be rated less than "Acceptable" on this factor solely because an Offeror does not offer a price for the GPR option CLIN. However, ratings on this factor for proposals to

deliver TD, CSD, or Software (SW) with less than the minimum rights specified for the Government by applicable statute (10 USC 2320) and regulation (DFARS 252.227-7013, 252.227-7014, and 252.227-7015) may be negatively impacted. For non-commercial acquisitions, these rights include: unlimited rights in TD (as specified in DFARS 252.227-7013(b)(1)) and CS and CSD (as specified in DFARS 252.227-7014(b)(1)); limited rights in TD (as specified in DFARS 252.227-7013(b)(3)); and restricted rights in CS (as specified in DFARS 252.227-7014(b)(3)). The minimum rights considered for TD associated with commercial item acquisitions are specified in DFARS 252.227-7015(b). For commercial FACE UoC acquisitions, evaluation of the offered rights will assess their consistency with Federal procurement law and satisfaction of Government user needs in accordance with the policy in DFARS 227.7202-1(a).

Ratings on this factor for proposals to deliver TD, CSD, or SW with more than the minimum rights specified for the Government by applicable statute and regulation may be positively impacted.

3. Cost Factor

Commentary

PMs should consult the DoD OSA Guidebook for information regarding the cost factor.

PMs should assess the long-term data needs of FACE products and establish corresponding acquisition strategies that provide for data rights needed to sustain the products over their lifecycle. Such strategies may include the development of maintenance capabilities within the DoD or conducting competitions for contracts for sustainment.

For cost type contracts, it is recommended that the Government evaluate the following in the cost factor to address FACE requirements:

- FACE UoC costs
- FACE UoC metrics tracking costs

In addition, the PM is encouraged to consider the following from the DoD OSA Guidebook if it was included in the cost proposal language in SECTION L (Chapter 3):

- Supplemental information concerning cost/price of non-commercial TD, non-commercial CS, and non-commercial CSD
- Supplemental information concerning cost/price of commercial TD, commercial CS, and commercial CSD
- Supplemental information other than cost or pricing data
- License option pricing

Ultimately, the PM should insert specific cost language that supports the acquisition strategy for the system specifying FACE requirements.

The Government will evaluate the following costs with respect to the extent that they are reasonable for cost type contracts:

- FACE UoC costs
- FACE UoC metrics tracking costs

4. Management Factor

4.1 Risk Sub-Factor

Commentary

Business Risk:

No specific SECTION M language regarding business risk is recommended at this time.

Reuse Risk:

As with any product within a system, there is an inherent integration risk in reusing existing software items (e.g., FACE UoCs) within a proposed solution.

The objective is to evaluate the Offeror on:

- The degree and quality of the Offeror’s plan to identify and mitigate risks associated with the integration of reused items

The Offeror’s plan should consider mitigation derived from trade-off studies, requirements analysis, design synthesis, verification, and other systems engineering processes and program milestones. Additionally, the plan should address IA risk, particularly those associated with using Open Source software.

The Government will evaluate the quality of the Offeror’s plan to identify and mitigate risks associated with the integration of reused software, and the degree to which risk is addressed. The Government will consider whether the Offeror’s plan adequately considers mitigation determined by trade-off studies (mitigations are not derived from studies, but from implementing mitigations based on the results of studies), requirements analysis, design synthesis, verification, and other systems engineering processes.

4.2 Integrated Master Schedule (IMS) Sub-Factor

Commentary

Upon evaluating the Offeror’s proposed schedule or draft IMS, the Government needs to consider tasks and how well the Offeror understands the scope of FACE Conformance and required deliverables.

The objective is to evaluate the Offeror on the adequacy of identifying and integrating the appropriate tasks into the schedule and how well they meet the overall program schedule needs as determined by the PM.

The Government will evaluate the degree to which the Offeror adequately identifies tasks in the draft IMS to demonstrate understanding of FACE requirements.

5. Past Performance Factor

Commentary

The DoD OSA Guidebook provides a detailed list of past performance evaluation criteria. This section includes recommended past performance evaluation criteria specific to a program with FACE requirements. The objective is to evaluate the Offeror on previous performed work and experiences of a similar nature to the current program, which demonstrates their capability to adhere to the FACE Technical Standard (in areas including process, design, requirements, and conformance). It is understood that Offerors may have no previous FACE experience in the early stages of adoption of the FACE Approach. This sample language may be included when the PM determines that FACE experience exists and chooses to use it as a relevant past performance factor.

In assessing the Offeror's past performance, the Government will consider how well the Offeror has implemented a MOSA, and how well the Offeror has implemented a Software Computing Environment with conformance to the FACE Technical Standard. The Government will consider the following experience:

- i. The Offeror's previous experience in successfully gaining a FACE Conformance Certification for a product
- ii. The Offeror's previous experience in developing and integrating FACE UoCs of the same nature as that being acquired with this solicitation
- iii. The degree to which the Offeror demonstrated reuse of general software, FACE UoCs, and artifacts listed in the FACE Registry
- iv. The Offeror's previous experience using development and verification tools for FACE UoCs (CTS, etc.).

5 Recommended Language for SECTION H: SPECIAL CONTRACT REQUIREMENTS

This section contains commentary and recommended language to include in SECTION H: Special Contract Requirements for solicitations with FACE requirements.

Commentary

Although systems specifying FACE UoCs can be acquired using the existing DFARS data rights clauses, the Government should consider whether any SECTION H special provisions are required, on a case-by-case basis. For example, the Government may desire greater rights in TD or CS than the rights normally granted in accordance with the DFARS. The Government will also need the delivery of, and appropriate rights in: (1) ICDs at a level sufficient to address the integration of a Contractor's commercial or proprietary software into the procured system; and (2) deliverables and artifacts required to identify physically and functionally interchangeable/replaceable items. In such cases, consider a SECTION H special provision to negotiate special license rights or GPR in deliverable ICDs, deliverables, or artifacts that may otherwise be deliverable with restrictions.

The DoD OSA Guidebook includes an extensive collection of potential SECTION H clauses the PM may wish to include in the solicitation and contract.

To facilitate the reuse of FACE Conformant proprietary software listed in the FACE Registry, consider adding the following H1 Clause below. If the contract is going to require the Contractor to provide a warranty of FACE Conformance, consider adding the H2 clause provided below.

H1

For all Contractor Technical Data (TD) and Computer Software (CS) to be delivered in performance of the contract with less than GPR, for retention in a FACE Product Repository, the Contractor agrees to enter into good faith negotiations to license such TD and CS under reasonable and non-discriminatory terms to third parties requesting such data or software for purposes of performance under a U.S. Government contract. The Contractor SHALL utilize industry-standard or company best practice IP valuation methodologies.

H2

For all FACE UoCs delivered in performance of the contract that are required to be FACE Conformant, the Contractor warrants that such FACE UoCs SHALL, at the time of delivery, conform with the FACE Technical Standard <insert edition>. The warranty period SHALL extend for <insert time period> after delivery of such CS. For as long as the deliverable is under the Contractor's warranty, the Contractor SHALL be responsible for correcting:

- a. Any failures within control of the Contractor to meet the requirements of the FACE Technical Standard
- b. Any material errors in the Contractor delivered artifacts supporting FACE Conformance

6 Recommended Language for REQUEST FOR INFORMATION (RFI)

This section contains recommended language and commentary to include in Request for Information (RFI) and market research type solicitations that include FACE requirements. This section contains guidance only, and is provided with the understanding that individual PMs can remain flexible in determining the relevance, selecting and tailoring the clauses needed to meet their needs. PMs are not obligated to include or address all of the items contained in these recommendations.

Commentary

1. Specify the edition of the FACE Technical Standard: This clause can be used to specify which capabilities are expected to adhere to the FACE Technical Standard. The edition number should also be specified [2.0, 2.1, 3.0, 3.1, etc.]. A PM will likely want to specify the edition of the FACE Technical Standard of interest for the opportunity addressed by the RFI/solicitation.

2. Provide ability, experience, and innovative approaches: These clauses are meant to ask Offerors for their general ability and experience with the FACE Approach. This can include FACE UoCs, FACE Computing Environments, FACE Certification, development of FACE Verification artifacts, related development tools, relevant programs, and other relevant activities.

3 and 4. These clauses are meant to ask Offerors to describe their open systems management approach as an integrator and/or Software Supplier. This is relevant to prevent vendor lock and promote competition among Software Suppliers. As an integrator, the Offeror will discuss the ability of their system to host/integrate third-party apps. As a Software Supplier, the Offeror will describe the ability and constraints of their FACE UoCs to integrate into a system, including what their dependencies are. This clause is relevant to understanding how an Offeror's software-enabled capabilities can be integrated into a system. This includes understanding the system dependences such as minimum system resources needed, inputs needed, artifacts needed for integration, and other needed constraints.

1. Specify the edition of the FACE Technical Standard.
2. Identify your experience in development or integration of capabilities enabled by software conformant to the FACE Technical Standard.
3. Provide insight into the open systems management approach as an integrator.
 - a. Describe how the software architecture design approach implements the FACE Reference Architecture. This may include a description of a full or partial approach identifying the FACE Segments supported, FACE UoCs supported, and FACE Computing Environment provided.
 - b. Describe the ability of the system to host/integrate third-party capabilities enabled by software conformant to the FACE Technical Standard.
 - c. Identify the system dependencies for the capabilities enabled by software conformant to the FACE Technical Standard.

4. Provide insight into the open systems management approach as a Software Supplier.
 - a. Identify and describe your capabilities enabled by software conformant to the FACE Technical Standard.
 - b. Describe your modularization choices.
 - c. Identify and describe your software's dependencies and required resources.

7 Recommended Language for BROAD AGENCY ANNOUNCEMENT (BAA) or OTHER TRANSACTION AUTHORITY (OTA) TOPICS

This section contains recommended language and commentary to include for a topic in a Broad Agency Announcement (BAA) or Other Transaction Authority (OTA) solicitation with FACE requirements. Procedures for the use of a BAA is described by the Federal Acquisition Regulation (FAR) 35.016 for the acquisition of basic and applied research and that part of development not related to the development of a specific system or hardware procurement. OTAs, covered in 10 U.S.C. 2371b (Authority of the Department of Defense to Carry Out Certain Prototype Projects), describe streamlined procedures, not subject to the FARs, that the Government can utilize to acquire innovative research and prototypes from industry and academia.

Both a BAA and an OTA solicitation can issue a topic detailing the Government's interest to initiate a two-step, White Paper/Proposal Submission Process for streamlined procurement. This section contains guidance only, and is provided with the understanding that individual PMs can remain flexible in determining relevance, selecting and tailoring the clauses needed to meet their needs. PMs are not obligated to include or address all of the items contained in these recommendations.

Commentary

Some identified topics can cover a wide variety of areas related to the FACE Approach, including: capability or capabilities enabled by FACE Conformant software (PCS, PSSS), FACE Infrastructure (OSS, IOSS, TSS), utilization of the FACE Approach, migration to FACE Conformant software, or a Software Product Line using the FACE Approach.

Information that should be considered when developing the topic:

1. Specify the FACE Technical Standard edition [2.0, 2.1, 3.0, 3.1, etc.]
2. Identify the scope and the needed capability/capabilities enabled by FACE Conformant software or FACE Infrastructure to host FACE Conformant capabilities
3. Plan for migrating to FACE Conformant software

BAA Solicitation Call

Call number <Call Number> solicits white papers to perform trade studies for capabilities enabled by FACE Conformant software. Additional instruction and information can be found under the Broad Agency Announcement (BAA) <Identifier> which is posted to Contract Opportunities at <https://beta.sam.gov/>.

OTA Solicitation Call

Call number <Call Number> solicits white papers to perform trade studies for capabilities enabled by FACE Conformant software. Additional instruction and information can be found

under the <Name of OTA> Other Transaction Authority (OTA) which is posted to < OTA website >.

Potential Topics

Capability Enabled by FACE Conformant Software Topic

<Name of Program> has identified a need for a <Name of Capability> capability enabled by FACE Conformant software. A white paper on this topic should discuss modularization choices and potential functional decomposition of the capability to FACE UoCs and their identified FACE Architectural Segments.

Migration to FACE Conformant Software Topic

<Name of Program> has identified a need for migration of the existing <Name of Capability> capability to a portable software solution enabled by FACE Conformant software. A white paper on this topic should discuss the migration strategy to include modularization choices and data architecture approach.

FACE Infrastructure Topic

<Name of Program> has identified a need for a FACE Infrastructure to host capabilities enabled by FACE UoCs. A white paper on this topic should discuss establishment and utilization of a FACE Infrastructure. The Offeror is encouraged to identify capabilities covering multiple domains and the relationships between them for hosting within the FACE Infrastructure.

FACE Data Architecture Topic

<Name of Program> has identified a need for applying the FACE Data Architecture to support an open systems management approach. A white paper on this topic should discuss utilization of the FACE Shared Data Model and any existing FACE Domain-Specific Data Models (DSDMs), extension of DSDMs, as well as the development of any new DSDMs or FACE USMs.

A Recommended Standard Deliverables for Acquisitions with FACE Requirements

It is recommended that solicitations and contracts for software acquisitions require delivery of typical documentation, known as Contract Data Requirements List (CDRL) items, in accordance with Data Item Descriptions (DIDs). The list and deliverables content should be tailored to meet the needs of a specific acquisition.

Table 1 lists deliverables important for acquisitions with FACE requirements by identifying an applicable DID, any tailoring, and key areas of interest to consider when reviewing the deliverable with respect to the FACE Approach. The table identifies deliverables that are recommended for evaluation during source selection, as limited by their availability at this stage of an acquisition. The table also identifies the deliverables particularly significant for reuse, replacement, and refresh.

Table 1 is not inclusive of all deliverables related to software or Open Architecture (OA). If a deliverable is not listed, it is unlikely to have content that would vary between acquisitions with or without FACE requirements.

The “Reuse, Replace, Refresh” column identifies the deliverables particularly significant for enabling software portability, reuse of FACE UoCs across different hardware computing environments, and the replaceability/interchangeability of FACE UoCs with physically and functionally equivalent FACE UoCs through technology insertion and upgrades. As such, it is important for the Government to consider which of these deliverables, artifacts, and their associated rights are required to support reuse, portability, interchangeability/replaceability, and open competition throughout the lifecycle of the product in a FACE Computing Environment.

In order to facilitate the reusability, refresh, or replacement of FACE UoCs developed with Government funds under this contract, the PM should direct the Contractor to deliver each FACE UoC with the following artifacts to support the intended reuse:

Commentary

On typical acquisitions, at least a draft of the plans of the OSMP, RMP, SCMP, SDP, and a SQAP should be available during source selection and it is recommended that at a minimum a draft SDP and draft content of the OSMP be evaluated. However, even a draft of the SWARD will not typically be available at source selection, especially for phase 1 of a Major Defense Acquisition Program (MDAP).

Some of the deliverables in Table 1 can be combined into other deliverables such as the SDP or SDD.

Options for the OSMP:

- Require an OSMP deliverable in accordance with DI-MGMT-82099 tailoring the deliverable appropriately for the program
- Tailor the SDP deliverable to require the appropriate content described starting in Section 3.3 of the OSMP DID to be addressed in the SDP

Options for the RMP, SQAP, and SCMP:

- Require separate deliverables for each of the RMP, SQAP, and SCMP
- Tailor the SDP deliverable to require the appropriate content for these plans

Options for the SWARD:

- Require a SWARD deliverable tailoring appropriately for the program
- Tailor the IDD and SDD deliverables to require the appropriate content described starting in Section 3.3 of the SWARD DID

Plans such as the SDP, OSMP, RMP, SQAP, SCMP, etc. are living documents. Their frequency, either periodic or milestone-based, of update and delivery should be stated on the Contract CDRL (DD 1423).

For acquisitions of MDAPs, the DoD 5000 Instruction series requires a two-phase source selection. For the initial phase, the approach is evaluated and two Offerors are selected. During the initial phase, the Offerors refine their approach and develop their high-level design. The second phase of the source selection evaluates the refined approaches and designs and then down-selects to one Offeror to move into development. With this two-phased approach, some of the deliverables or draft deliverables not available for the Phase 1 source selection should be available during Phase 2 source selection.

Table 1: Recommended Deliverables for Acquisitions with FACE Requirements

Deliverable	Data Item Description (DID)	Tailoring, Key Areas of Interest, and Notes		Software Supplier Evaluated Deliverable	Reuse, Replace, Refresh
Software Development Plan (SDP)	DI-IPSC-81427B	Tailoring	See Note below.	D	NO
		Key Areas	The SDP SHALL contain information on how the developer will implement to the FACE Technical Standard and verify conformance. It should list what existing FACE Conformant UoCs will be used. It will describe what middleware, language run-time, and operating system will be used.		
		Note	The SDP can be tailored to address the contents of such plans as the OSMP, RMP, SCMP, SQAP, etc.		

Deliverable	Data Item Description (DID)	Tailoring, Key Areas of Interest, and Notes		Software Supplier Evaluated Deliverable	Reuse, Replace, Refresh
Open Systems Management Plan (OSMP)	DI-MGMT-82099	Tailoring	<p>All FACE Conformant software planned for use SHALL be identified and described. The description SHALL include scope, resident FACE architectural segments, FACE profiles, and key interfaces.</p> <p>Incorporation of the FACE Reference Architecture SHALL be addressed in the overall system design.</p> <p>Describe how the FACE Approach SHALL be considered in modularization choices.</p> <p>Identify how incorporation of the FACE Approach SHALL enhance lifecycle supportability.</p>	D	NO
		Key Areas	<p>The OSMP should describe how the FACE Approach affects and supports the Offeror's approach to OSA, modular, open design, inter-unit dependencies, technology insertion, lifecycle sustainability, interface design and management, treatment of proprietary or vendor-unique software, and reuse of existing FACE Conformant software, their functionality and proposed function in the system, and copies of license agreements related to the use of these software units for Government approval. The OSMP should also include a statement explaining why each FACE UoC was selected for use.</p>		

Deliverable	Data Item Description (DID)	Tailoring, Key Areas of Interest, and Notes		Software Supplier Evaluated Deliverable	Reuse, Replace, Refresh
		Note	<p>As an alternative to requiring an OSMP deliverable, selected content from the OSMP could be requested in the SDP.</p> <p>Additional elements of the OSMP that can be considered for tailoring for the FACE Approach include:</p> <ul style="list-style-type: none"> • Explain the selection of the programming languages for each FACE UoC • Explain the supported FACE OS Profiles and underlying standards (e.g., the POSIX[®] standard and/or ARINC 653) • Describe the use of language run-time and application frameworks • Describe an architecture to enhance portability and to facilitate rapid and affordable insertion and technology refresh • Describe the functional partitioning and the physical modularity of the system • Describe the design approach for producing a system that consists of hierarchical collections of software; this software must be modular in nature to support competitive acquisition and software reuse • Explain how and when they will exercise the FACE Conformance Certification process to the specified edition of the FACE Technical Standard • Explain how the Contractor will demonstrate compliance with the OSMP during all agreed upon design reviews 		
Risk Management Plan (RMP)	DI-MGMT-81808	Tailoring	See Note below.	D	NO
		Key Areas	The RMP should identify and discuss risks associated with the FACE Approach including obtaining a FACE Conformance Certificate.		

Deliverable	Data Item Description (DID)	Tailoring, Key Areas of Interest, and Notes		Software Supplier Evaluated Deliverable	Reuse, Replace, Refresh
		Note	As an alternative to requiring an RMP deliverable, selected content from the RMP could be requested in the SDP.		
Software Quality Assurance Plan (SQAP)	DI-IPSC-81427B	Tailoring	See Note below.	D	NO
		Key Areas	The SQAP should identify and discuss audits planned concerning FACE Conformance.		
		Note	The SQAP is documented as a section in the SDP.		
Software Configuration Management Plan (SCMP)	DI-SESS-80858D	Tailoring	See Note below.	D	NO
		Key Areas	The SCMP should address utilization of the FACE Library and other repositories.		
		Note	As an alternative to requiring an SCMP deliverable, selected content from the SCMP could be requested in the SDP.		
Software Architecture Description (SWARD)	DI-SESS-82176	Tailoring	<p>Implementation of the FACE Reference Architecture SHALL be addressed in the overall system design.</p> <p>Impact of the FACE Approach on modularization choices SHALL be described.</p> <p>FACE UoCs SHALL be identified in the architecture diagrams using consistent colors and shapes from the FACE Technical Standard.</p> <p>All FACE Conformant software SHALL be described to include scope, FACE Technical Standard edition, FACE Shared Data Model edition, resident FACE Architectural Segments, FACE OS Profiles, and key interfaces.</p> <p>Requirements traceability documentation SHALL include traceability from any software requirements derived from the FACE requirements into the software architecture.</p>	(D)	YES
		Key Areas	The SWARD should describe how the FACE Approach influences and is reflected in the software architectural design.		

Deliverable	Data Item Description (DID)	Tailoring, Key Areas of Interest, and Notes		Software Supplier Evaluated Deliverable	Reuse, Replace, Refresh
		Note	The content of the SWARD could be addressed in sections of the IDD and SDD deliverables.		
Interface Control Document (ICD)	DI-SESS-81248B	Tailoring	None.	NO	YES
		Key Areas	The ICD should address utilization of the FACE Interfaces.		
		Note	None.		
Software Requirements Specification (SRS)	DI-IPSC-81433A	Tailoring	The SRS SHALL identify the subset of requirements associated with conformance to the FACE Technical Standard.	NO	YES
		Key Areas	Conforming to the FACE Technical Standard will influence system design and the derived software requirements. The SRS would also address the functionality and performance of the FACE UoC.		
		Note	This may be needed only when upgrades/modifications are made to the FACE UoC to support reuse/replace/refresh.		
Interface Requirements Specification (IRS)	DI-IPSC-81434A	Tailoring	The IRS SHALL include interface specifications between each layer (FACE Segment) of the FACE Reference Architecture, and for each FACE UoC.	NO	YES
		Key Areas	The IRS should identify and describe utilization of the FACE Interfaces. It should include interface specifications between each layer (segment) of the system architecture and for each FACE UoC.		
		Note	None.		
Interface Design Description (IDD)	DI-IPSC-81436A	Tailoring	The IDD SHALL include interface specifications between each layer (FACE Segment) of the FACE Reference Architecture, and for each FACE UoC.	NO	YES

Deliverable	Data Item Description (DID)	Tailoring, Key Areas of Interest, and Notes		Software Supplier Evaluated Deliverable	Reuse, Replace, Refresh
		Key Areas	Conforming to the FACE Technical Standard will influence interface design. The IDD(s) should show conformance with FACE Interfaces. It should include interface descriptions between each layer (segment) of the FACE Reference Architecture and for each FACE UoC. It should cover each of the defined FACE Interfaces described in the FACE Technical Standard.		
		Note	None.		
Software Test Plan (STP)	DI-IPSC-81438A	Tailoring	The STP SHALL include utilization of the FACE CTS for new or modified software.	NO	YES
		Key Areas	None.		
		Reuse/ Replace/ Refresh	This may be needed when re-certifying the FACE UoC.		
		Note	None.		
Software Test Description (STD)	DI-IPSC-81439A	Tailoring	None.	NO	YES
		Key Areas	The STD SHALL address any FACE Verification test details. Specifically, who will perform the test, what version of the test will be used, what the test setup will be, etc.		
		Reuse/ Replace/ Refresh	This may be needed when re-certifying the FACE UoC.		
		Note	None.		
Software Test Report (STR)	DI-IPSC-81440A	Tailoring	The Contractor STR SHALL include FACE Verification results for new or modified FACE UoCs.	NO	YES
		Key Areas	The STR should include FACE UoC Conformance Certification for new or modified software.		
		Reuse/ Replace/ Refresh	This may be needed when re-certifying the FACE UoC.		

Deliverable	Data Item Description (DID)	Tailoring, Key Areas of Interest, and Notes		Software Supplier Evaluated Deliverable	Reuse, Replace, Refresh
		Note	None.		
Software Metrics Report (SMR)	DI-MISC-80711A	Tailoring	<p>The SMR SHALL be written in contractor preferred format and include:</p> <ul style="list-style-type: none"> • Total SLOC • Percentage of total SLOC that are FACE Conformant or intended to be FACE Conformant • Percentage of newly developed SLOC • Percentage of SLOC modified • Percentage of SLOC reused from other NDIs or previously developed CSCIs, FACE UoCs, or software units • Percentage of auto-generated SLOC 	NO	YES
		Key Areas	None.		
		Notes	This information may be available in an SPS.		
Software Product Specification (SPS)	DI-IPSC-81441A	Tailoring	None.	NO	YES
		Key Areas	<p>The SPS contains or references the executable software, source files, and software support information, including “as-built” design information and compilation, build, and modification procedures, for a CSCI.</p> <p>The SPS should contain “as-built” design information addressing the software design for the FACE UoCs.</p>		
		Note	May also be known as Software Configuration Index (SCI).		
Software Version Description (SVD)	DI-IPSC-81442A	Tailoring	The SVD SHALL identify FACE UoCs that were acquired and possibly modified.	NO	YES
		Key Areas	The SVD identifies and describes a software version consisting of one or more CSCIs. It is used to release, track, and control software version.		
		Note	None.		

Deliverable	Data Item Description (DID)	Tailoring, Key Areas of Interest, and Notes		Software Supplier Evaluated Deliverable	Reuse, Replace, Refresh
Computer Software Product End Items	DI-AVCS-80700A	Tailoring	Government funded Computer Software Product End Items SHALL include: <ul style="list-style-type: none"> • All configuration files for all the FACE Segments • System information/target information • Any models created in the development of the software by using tools such as MATLAB), SIMULINK, or other modeling tools in an industry standard format • OFP load set generation tools • Reusable verification component/reusable test harness • Build instructions and files 	NO	YES
		Key Areas	The Computer Software Product End Items provided configuration files meet the configuration service requirements defined in the FACE Technical Standard.		
		Note	None.		
FACE Conformance Report and Certificate	DI-MISC-80711A	Tailoring	Report SHALL be written in contractor format and include a copy of the FACE Conformance Certificate from the FACE CA.	NO	YES
		Key Areas	None.		
		Note	None.		
Integrated Support Plan (ISP)	DI-ILSS-80395	Tailoring	The ISP SHALL state the lifecycle support requirements for FACE Conformant software, including problem reporting process and update distribution plans.	NO	NO
		Key Areas	The ISP should address reuse, development, and maintenance of FACE UoCs.		
		Note	None.		
Integrated Program Management Report (IPMR)	DI-MGMT-81861	Tailoring	None.	NO	NO
		Key Areas	The IPMR should contain any required FACE Conformance Certification efforts.		

Deliverable	Data Item Description (DID)	Tailoring, Key Areas of Interest, and Notes		Software Supplier Evaluated Deliverable	Reuse, Replace, Refresh
		Note	The IPMR incorporates the IMS, whose DID has been retired.		
Software Installation Plan (SIP)	DI-IPSC-81428A	Tailoring	None.	NO	NO
		Key Areas	The SIP SHALL discuss and recommend a partitioning scheme and discuss the targeted FACE Operating System Profiles (i.e., General-Purpose, Safety, Security).		
		Note	None.		
Software Transition Plan (STrP)	DI-IPSC-81429A	Tailoring	The STrP SHALL describe license agreements or rights for FACE Conformant software.	NO	NO
		Key Areas	The STrP should include license agreements for any commercial (including Open Source) FACE Conformant software. It should describe TD and CS rights for Government purpose or public domain software.		
		Note	None.		
Software Design Description (SDD)	DI-IPSC-81435A	Tailoring	None.	NO	NO
		Key Areas	Use of a FACE Reference Architecture will affect system design. A design description should show the planned architecture and FACE conformant software to be used or created.		
		Note	None.		

Notes

D: A draft SHOULD be available during source selection.

(D): A draft MIGHT be available during source selection.

B Acronyms

Acronym	Definition
ABCL	As-Built Configuration List
AC	Advisory Circular
ACRN	Accounting Classification Reference Number
AFRL	Air Force Research Laboratory
API	Application Programming Interface
ARINC	Aeronautical Radio, Incorporated
BAA	Broad Agency Announcement
CA	Certification Authority
CCB	Configuration Control Board
CCDC	Combat Capabilities Development Command
CCDC AvMC	CCDC Aviation & Missile Center
CDRL	Contract Data Requirements List
CI	Configuration Item
CLIN	Contract Line Item Number
COE	Common Operating Environment
COTS	Commercial Off-the-Shelf
CRL	Commercial Restrictions List
CS	Computer Software
CSCI	Computer Software Configuration Item
CSD	Computer Software Documentation
CVM	Conformance Verification Matrix
DFARS	Defense Federal Acquisition Regulations Supplement
DID	Data Item Description

Acronym	Definition
DoD	Department of Defense
DoD OSA Guidebook	DoD Open Systems Architecture (OSA) Contract Guidebook for Program Managers
DSDM	Domain-Specific Data Model
FACE	Future Airborne Capability Environment
FAR	Federal Acquisition Regulation
FFF	Form, Fit, and Function
GFI	Government Furnished Information
GOTS	Government Off-the-Shelf
GPR	Government Purpose Rights
HMFM	Health Monitoring/Fault Management
I/O	Input/Output
IA	Information Assurance
ICD	Interface Control Document
IDD	Interface Design Description
IDE	Integrated Development Environment
IMA	Integrated Modular Avionics
IMS	Integrated Master Schedule
IOSS	I/O Services Segment
IP	Intellectual Property
IPMR	Integrated Program Management Report
IPR	Intellectual Property Rights
IRS	Interface Requirements Specification
ISO	International Organization for Standardization
ISP	Integrated Support Plan
LRU	Line Replaceable Unit
MDAP	Major Defense Acquisition Program

Acronym	Definition
MOSA	Modular Open Systems Approach
NDI	Non-Development Item
OA	Open Architecture
OFP	Operational Flight Plan
OS	Operating System
OSA	Open Systems Architecture
OSMP	Open Systems Management Plan
OSS	Operating System Segment
OTA	Other Transaction Authority
OTS	Off-the-Shelf
PCS	Portable Components Segment
PEO	Program Executive Office
PM	Program Manager
POSIX	Portable Operating System Interface
PSSS	Platform-Specific Services Segment
RFI	Request for Information
RFP	Request for Proposal
RIG	Reference Implementation Guide
RMP	Risk Management Plan
SCI	Software Configuration Index
SCMP	Software Configuration Management Plan
SDD	Software Design Description
SDP	Software Development Plan
SIP	Software Installation Plan
SLOC	Software Lines of Code
SMR	Software Metrics Report

Acronym	Definition
SOO	Statement of Objectives
SOW	Statement of Work
SPS	Software Product Specification
SQAP	Software Quality Assurance Plan
SRS	Software Requirements Specification
SRU	Software Replaceable Unit
STD	Software Test Description
STP	Software Test Plan
STrP	Software Transition Plan
STR	Software Test Report
SVD	Software Version Description
SW	Software
SWARD	Software Architecture Description
TD	Technical Data
TSS	Transport Services Segment
UDDL	Universal Domain Description Language
UML	Unified Modeling Language
UoC	Unit of Conformance
UoP	Unit of Portability
USM	UoP Supplied Model
VA	Verification Authority
WBS	Work Breakdown Structure
XMI	Extensible Markup Language (XML) Metadata Interchange

C Glossary

Aircraft Platform

Represents an airframe that hosts mechanical, computing, and other resources necessary to perform a particular mission within the aviation domain.

Application Programming Interface (API)

A particular set of rules and specifications a software program can follow to access and make use of the services and resources provided by another particular software component implementing that Application Programming Interface. It serves as an interface between different software components and facilitates their interaction, similar to the way the user interface facilitates interaction between humans and computers.

Architecture

Fundamental concepts or properties of a system in its environment embodied in its elements, relationships, and in the principles of its design and evolution. (ISO/IEC/IEEE 42010).

Certification Authority (CA)

The entity officially sanctioned to manage the day-to-day operations of the FACE Conformance Program in accordance with the policies defined in the FACE Conformance Policy.

Cohesion

A measure of the strength of association of elements within a software unit. It is a way of describing the degree to which a module achieves the objective of carrying out a single, well-defined purpose.

Commercial Software

Software developed or regularly used for non-Government purposes which has been or offered for sale, lease, or license to the public. See DFARS 252.227-7014(a)(1).

Computer Software Configuration Item (CSCI)

See Software Configuration Item.

Computing Platform

The combination of hardware and operating system, network, and device drivers supporting software components. Typically refers to a processing hardware within a Weapons Replaceable Assembly, or Line Replaceable Unit, along with its associated software infrastructure.

Configuration

The selection of values or features of a component or system such that the intended operational characteristics are achieved.

Configuration Item (CI)

An aggregation of hardware, software, or both that satisfies an end-use function and is designated for separate configuration management by the acquirer.

Conformant

See FACE Conformant.

Coupling

Coupling is a measure of the degree to which each module relies on each one of the other modules.

Data Architecture

A set of related models, specifications, and governance policies with the primary purpose of providing an unambiguous description of exchanged data and an interoperable means of data exchange.

Data Model

An abstraction that describes real-world elements, their properties, and their relationships in order to establish a common understanding for communication between components.

Domain-Specific Data Model (DSDM)

A data model designed to the FACE Data Architecture Requirements. It captures domain-specific semantics.

FACE Computing Environment

A generic concept instantiated for a particular system under development. It includes all elements of the FACE Reference Architecture necessary to deploy FACE Conformant components. The FACE Computing Environment is composed of the software infrastructure (Transport Services, Operating System, and I/O Services Segments), the Platform-Specific Services Segment required by the FACE components.

FACE Conformance Certificate

A document issued to a Software Supplier formally declaring that a Unit of Conformance, any associated conformant variants, and/or Unit of Conformance Package has successfully met the requirements for certification.

FACE Conformance Certification

Provides formal recognition of conformance to the FACE Technical Standard.

FACE Conformance Policy

The document that defines the processes and policies that govern the FACE Conformance Program including the conformance verification and certification processes.

FACE Conformance Test Suite (CTS)

A test suite that will accept the Unit of Conformance and produce a pass/fail with respect to all Conformance Requirements covered by the test suite plus a detailed report of the test results.

FACE Conformant

Unit(s) of Conformance that have been certified as adhering to the requirements of a specific edition of the FACE Technical Standard, for the applicable FACE Profile(s) and FACE Segment.

FACE Contract Guide

Serves as a reference guide for including FACE specific content into a solicitation or proposal.

FACE Infrastructure

An implementation of a FACE Operating System Segment, I/O Services Segment, and Transport Services Segment that is capable of hosting PCS and PSSS software components that are aligned to the FACE Technical Standard.

Note: PCS and PSSS components are not required to have a FACE Conformant “stamp” in order to be integrated.

FACE Interfaces

Standardized interfaces providing connections between software components of the FACE Segments.

FACE Library

The infrastructure developed to enable the discovery and acquisition of FACE Certified Units of Conformance.

FACE Reference Architecture

A reference architecture that guides and constrains the development of FACE UoCs based on the Architectural Segments, key interfaces between the Architectural Segments, Programming Language Mappings, and the Operating System Profiles as specified in the FACE Technical Standard.

FACE Registry

The single online reference point for listing and managing all FACE Certified Units of Conformance. As the gateway to discovering certified products, it will include descriptions and locations of available FACE Conformant products and the publishable standard licensing terms for each product.

FACE Repository

A storage component of the FACE Library for software, models, interfaces, documents, source code, and other artifacts associated with portable software that are certified to be FACE Conformant. The types of repositories include: FACE Reference Repository, FACE Product Repositories, FACE Certification Retention Repository and Verification Retention Repositories, and a FACE Shared Data Model Reference Repository.

FACE Technical Standard

An open, royalty-free standard that addresses the software technical requirements of the FACE Infrastructure, interfaces, and software.

I/O Service

A collection of software components that provides a unified view of an IO Interface to all Platform-Specific Services Segment software components using that interface.

License

The grant by the owner of intangible or intellectual property, such as a trademark or software program, of the rights to make certain uses of the property.

Mission-Level Capabilities

Software adding high-level discernible value to the user's mission. An example is "situational awareness" which adds value to some missions. However, a bubble-sort is a supporting algorithm and, while it may be part of a mission capability, it is not the mission capability itself.

Models

A description or specification of a system and its environment for some certain purpose is often presented as a combination of drawings and text using a modeling language or in a natural language.

Modularity

The degree to which a system or software is composed of discrete software such that a change to a software unit has minimal impact on other software.

Modularization

The breaking down of software into discrete modules such that changes to one module have minimal impact on other modules.

Non-Commercial Software

Software that does not qualify as commercial software (see Commercial Software). See DFARS 252.227-7014(a)(14).

Open Source

Pertaining to or denoting software whose source code is available free-of-charge to the public to use, copy, modify, sublicense, or distribute.

Open Standards

Widely accepted and supported standards set by recognized standards organizations. These standards support interoperability, portability, and scalability and are equally available to the public at no cost or with a moderate license fee, and are maintained by standards bodies that meet the requirements of OMB-A119.

Partition

An operating system allocation of computing platform and processor resources, including time and memory/address space, to a software component or portion of a software component.

Platform

Refers to one of three related things with respect to the FACE Technical Standard: Device (comprised of sensors, Weapon Replaceable Assembly, and Line Replaceable Unit), Aircraft (to include one or more computing platforms), and Computing (comprised of electronic circuitry and software).

Portable

The ability to move existing software elements from one environment (physical or computing) to another. More specifically, the ease with which Unit of Conformance source code can be transferred and reused from one instance of a Software Computing Environment to another.

Proprietary Software

Non-commercial software “developed exclusively at private expense” in accordance with DFARS 252.227-7014. Although commercial software and non-commercial software that was not developed exclusively at private expense may be proprietary, it is excluded from the definition of “Proprietary Software” as used herein.

Reusability

The ability for source code, components, or modules to be used again to add new functionalities with slight or no modification.

Reference Implementation Guide (RIG) for FACE Technical Standard

The FACE Reference Implementation Guide is to be used in conjunction with the FACE Technical Standard. The RIG guides the developer through the thought process in determining

how FACE Conformant products may be instantiated in a manner that is conformant to the FACE Technical Standard.

Reusable Test Harness

All test scripts and simulations utilized by test procedures in the Software Test Description. The scripts and simulations should be developed in a platform-independent means whenever possible.

Reuse

The ability for source code, components, or modules to be used again to add new functionalities with slight or no modification.

Segment

A logical grouping of components and/or services within a boundary whereby elements within are allowed to vary based on system needs and the interface to elements outside the segment boundary adheres to the FACE Reference Architecture.

Service

A software utility providing capability to software applications or other services.

Software Artifact

Any piece of software (i.e., models/descriptions) developed and used during software development and maintenance. Examples are requirements specifications, architecture and design models, source and executable code (programs), configuration directives, test data, test scripts, process models, project plans, various documentation, etc.

Software Capability

A set of software deliverables that provides one or more mission-level facilities to the existing functionality of the current software suite.

Software Computing Environment

From a deployment perspective, a layer above the computing and networking hardware that encompasses a collection of configured instances of Operating System Segment Units of Conformance, Transport Services Segment Units of Conformance, I/O Services Segment Units of Conformance, and Platform-Specific Services Segment Common Service Units of Conformance required to support a specific collection of configured instances of Portable Components Segment Units of Conformance and Platform-Specific Services Segment Units of Conformance in the layer above it.

Software Configuration Item

An aggregation of software designated for configuration management and treated as a single entity in the configuration management process (ISO/IEC/IEEE 24765). This entity satisfies an

end-use function and can be uniquely identified at a given reference point (ISO/IEC 12207:2008 §4.7).

Software Supplier

A vendor who is interested in, is applying for certification in, or has certified a Unit of Conformance in the FACE Conformance Program.

Software Unit

An element in the design of a Computer Software Configuration Item; for example, a major subdivision of a Computer Software Configuration Item, a component of that subdivision, a class, object, module, function, routine, or database. Software units may occur at different levels of a hierarchy and may consist of other software units (MIL-STD-498).

From a FACE standpoint, one or more Software Units can make up a FACE UoC, which can be combined with one or more FACE UoCs, and/or conventional (not adhering to the FACE Technical Standard) Software Units, to create a Computer Software Configuration Item.

Unit of Conformance (UoC)

A software component or Domain-Specific Data Model designed to meet the applicable requirements defined in the FACE Technical Standard. It is referenced as a FACE UoC at any point in its development, and becomes a Certified FACE UoC upon completion of the FACE Conformance Process.

Unit of Conformance Package

A collection of Units of Conformance combined to create a singular software logical entity, which may be placed in the Registry. The Units of Conformance that make up a Unit of Conformance Package may be from different FACE Segments.

Verification Authority

An entity officially sanctioned by the Steering Committee to conduct or witness For-the-Record Verification testing using an approved version of the Conformance Test Suite and assess the Verification Evidence provided by the Software Supplier in support of the FACE Conformance Program. The Verification Authority may be an independent third-party entity or a designated internal, independent entity of the Software Supplier.

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