

MIL-STD-31000A

Putting The Pieces Together

**Prepared By: Mitzi Whittenburg, CPCM
&
Roy Whittenburg**

For The Picatinny Chapter of NCMA

Agenda

Introduction to MIL-STD-31000A

- Background
- Better Buying Power 2.0 Tie In
- Benefits

Core Standard

- Defining a TDP
- Levels of a TDP
- 2D & 3D TDPs
- Option Selection Worksheet

Appendices B & C

- Appendix B
 - Purpose
 - Use
- Appendix C
 - Purpose
 - Use

Closing

- Conclusions
- Open Discussion

Putting the Pieces

Together

Introduction

Background: Who we are and what are we talking about

Benefits

BBP 2.0 Tie In

Background

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Bio

- **Mitzi Whittenburg, CPCM**
 - Project Manager, UTRS
 - Government Support Contractor
- **Experience:**
 - 30 years of procurement experience at the corporate headquarters of American Airlines, Northwest Airlines, GE and Cargill; most recently working at a large prime defense contractor – BAE Systems
- **Education:**
 - Holds a MBA in Acquisition & Government Contracts and a master's degree in Financial Planning from the University of Dallas and an undergraduate degree from Texas Christian University
- **Accomplishments:**
 - Recipient of a 2010 DoD Nunn-Perry award for managing an excellent Mentor-Protégé agreement with a small disadvantaged Native American 8(a) woman-owned business
 - Specializes in small business mentoring, procurement analysis and supply chain best practices including leading strategic sourcing teams
 - Member of the NCMA Picatinny Chapter Executive Committee and recently published a research paper in the NCMA *Journal of Contract Management* entitled Model-Based Enterprise: An Innovative Technology-Enabled Contract Management Approach



Bio

- **Roy Whittenburg**
 - Project Manager, UTRS
 - Government Support Contractor
- **Experience:**
 - 25 years experience in multiple defense and commercial industries in roles ranging from design engineer to MCAD Architect
- **Recent projects:**
 - OSD DMS&T 3D TDP and Certification Program (2012 DMT Achievement Award Winner, Project Manager and Data Deliver Subcommittee Co-Chair)
 - Net Centric Model Based Engineering (Army ManTech, Development Technical Lead)
 - NIST 3D Validation (Project Manager)
 - OSD Industrial Based Innovation Fund Integration and Validation of Next Gen 3D TDP (Technical Lead)



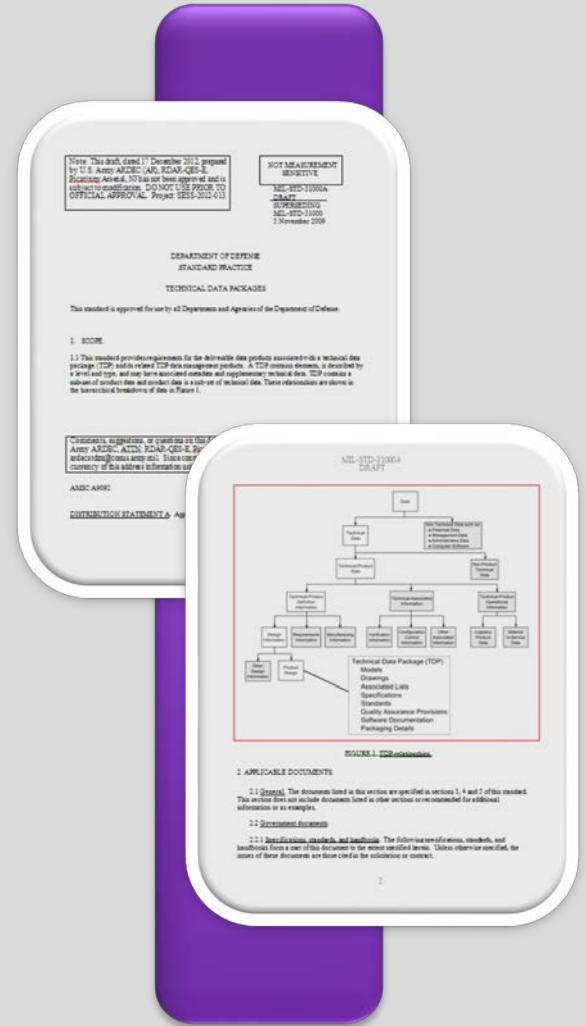
What are we talking about today?

- The DoD is modernizing how it receives technical data for weapons systems
- MIL-STD-31000A defines a Technical Data Package (TDP) and has been modified to support this modernization
- The effort is the cornerstone of moving the DoD to a Model Based Enterprise that can enable substantial efficiency gains, thus cost reductions in this fiscally challenging environment



MIL-STD-31000A

- The Military Standard defining Technical Data Packages
- Previously known as MIL-DTL-31000C
- Defines both Drawing Based and 3D TDPs
- Used to provide requirements for placing TDPs under contract



Team Members

BAE SYSTEMS



GENERAL DYNAMICS
Land Systems

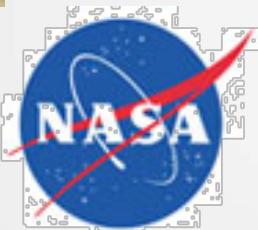
Gulfstream®



Raytheon



Honeywell



Team Members (Continued)



PTC®

SIEMENS

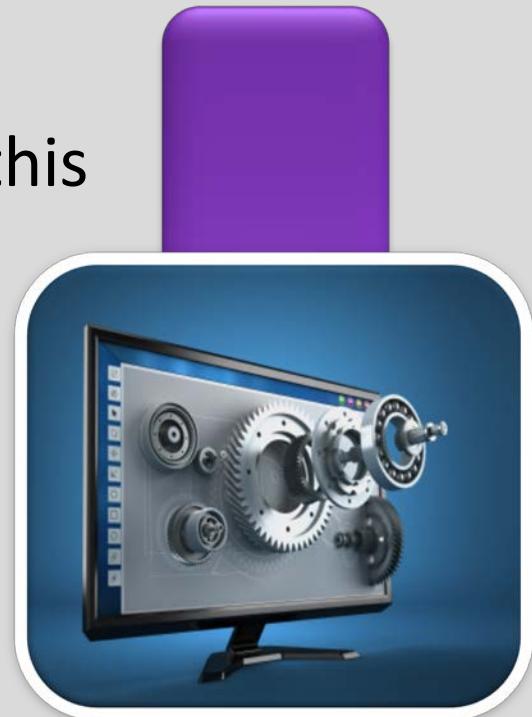


Tech Soft 3D



Bottom Line

- The DoD needs to acquire 3D TDPs
- It is up to Contracting Officers to insure this
- Training must be developed for the workforce
- The data acquired must be in a form that insures it can be reused
- The data must meet quality guidelines
- The consequences of not doing this is loss of data rights, increased cost and increased time to mission



Transforming the DoD



From This



To This

Introduction

Better Buying Power 2.0 Tie In:
How MIL-STD-31000A supports this
key DoD initiative

Benefits

BBP 2.0 Tie In

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MIL-STD-31000A From a Procurement/Contracting Perspective

MIL-STD-31000A was released on 26 February 2013. This standard supersedes MIL-STD-31000 which was issued on 05 November 2009. Requirements for the deliverable data products associated with a technical data package (TDP) and its related TDP data management products have been revised by this standard.

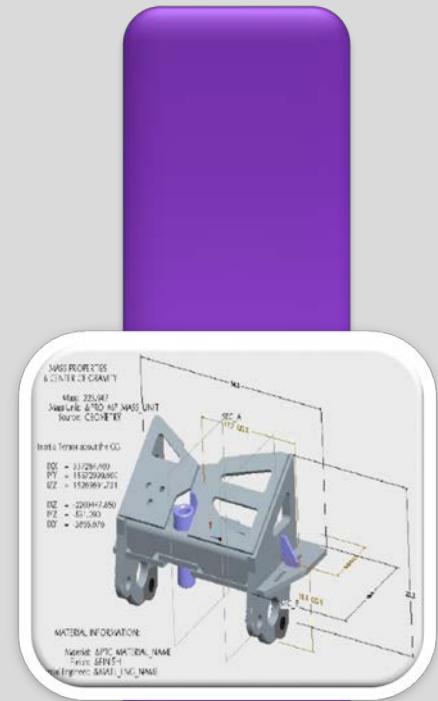
From a Procurement perspective this is important because contracting personnel will play a pivotal role in delivering government provided TDPs to the industrial supply base and retrieving contractor generated TDPs as contract deliverables. To accomplish this task, MIL-STD-31000A must be included by reference in future procurement contracts.

How is this different from the past standard – it's all about improvements in technology. Previously the standard communication tool was the 2D drawing which years ago was generated by hand on a drawing board. This process has been upgraded to a Computer Assisted Design (CAD) program; however, the issue remains with the visual being in a 2D format. MIL-STD-31000A helps eliminate this by using 3D Solid Model Data.

What is MIL-STD-31000A?

A 3D technical data package is a fully defined 3D version of the part, subassembly, assembly or full weapons system which contains annotations, geometry and various meta data. It should be noted that it can also contain associated 2D drawings during the transition phase.

This level of detail will allow the industrial supply base to quote from, as well as manufacture from, a single source of data without re-mastering it. This effort should result in reduced lead times because of data re-use, cost savings through better information provided upfront and improved quality due to less ambiguity around engineering intent.



Better Buying Power 2.0 Implementation Directive



THE UNDER SECRETARY OF DEFENSE
3010 DEFENSE PENTAGON
WASHINGTON, DC 20301-3010

APR 24 2013

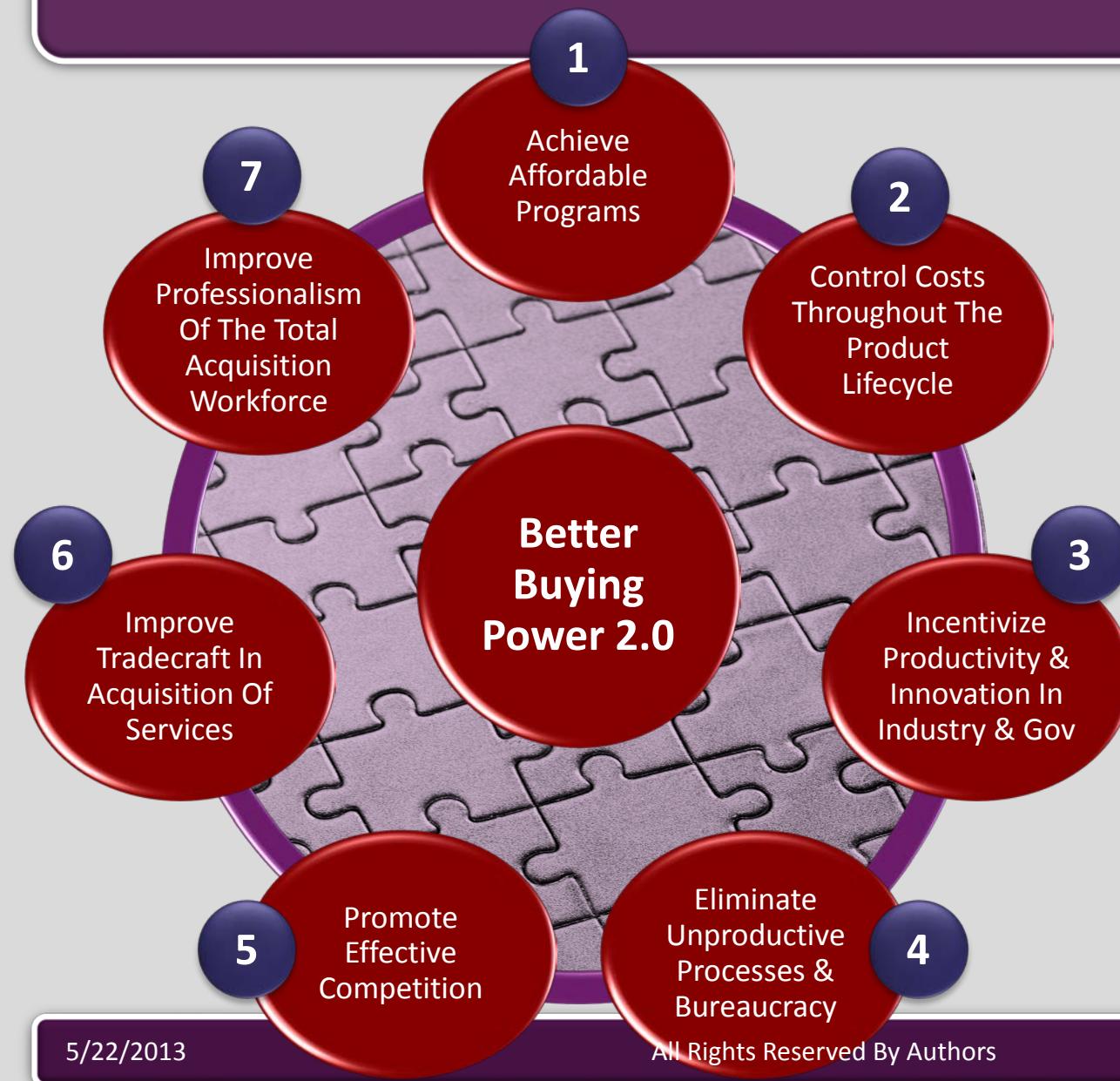
MEMORANDUM FOR SECRETARIES OF THE MILITARY DEPARTMENTS
DEPUTY CHIEF MANAGEMENT OFFICER
DEPARTMENT OF DEFENSE CHIEF INFORMATION OFFICER
DIRECTORS OF THE DEFENSE AGENCIES
AT&L DIRECT REPORTS

SUBJECT: Implementation Directive for Better Buying Power 2.0 – Achieving Greater Efficiency and Productivity in Defense Spending

As detailed in my November 13, 2012, memorandum to acquisition professionals introducing Better Buying Power (BBP) 2.0, and as listed in Attachment 1, we are continuing our efforts in the following seven areas to achieve greater efficiency and productivity in defense spending:

1. Achieve affordable programs;
2. Control costs throughout the product lifecycle;
3. Incentivize productivity and innovation in industry and Government;
4. Eliminate unproductive processes and bureaucracy;
5. Promote effective competition;
6. Improve tradecraft in acquisition of services; and
7. Improve the professionalism of the total acquisition workforce.

Elements of BBP 2.0



There are seven major elements to Better Buying Power 2.0.

MIL-STD-31000A can strategically support each of these elements.

BBP2.0 Achieve Affordable Programs And MIL-STD-31000A

Better
Buying
Power 2.0:
Element 1

MIL-STD-31000A can achieve affordable programs by enabling a program to acquire a modern TDP which can then be re-used throughout the acquisition cycle by the extended enterprise.

Suppliers will have full access to the product definition (ITAR restrictions still apply)

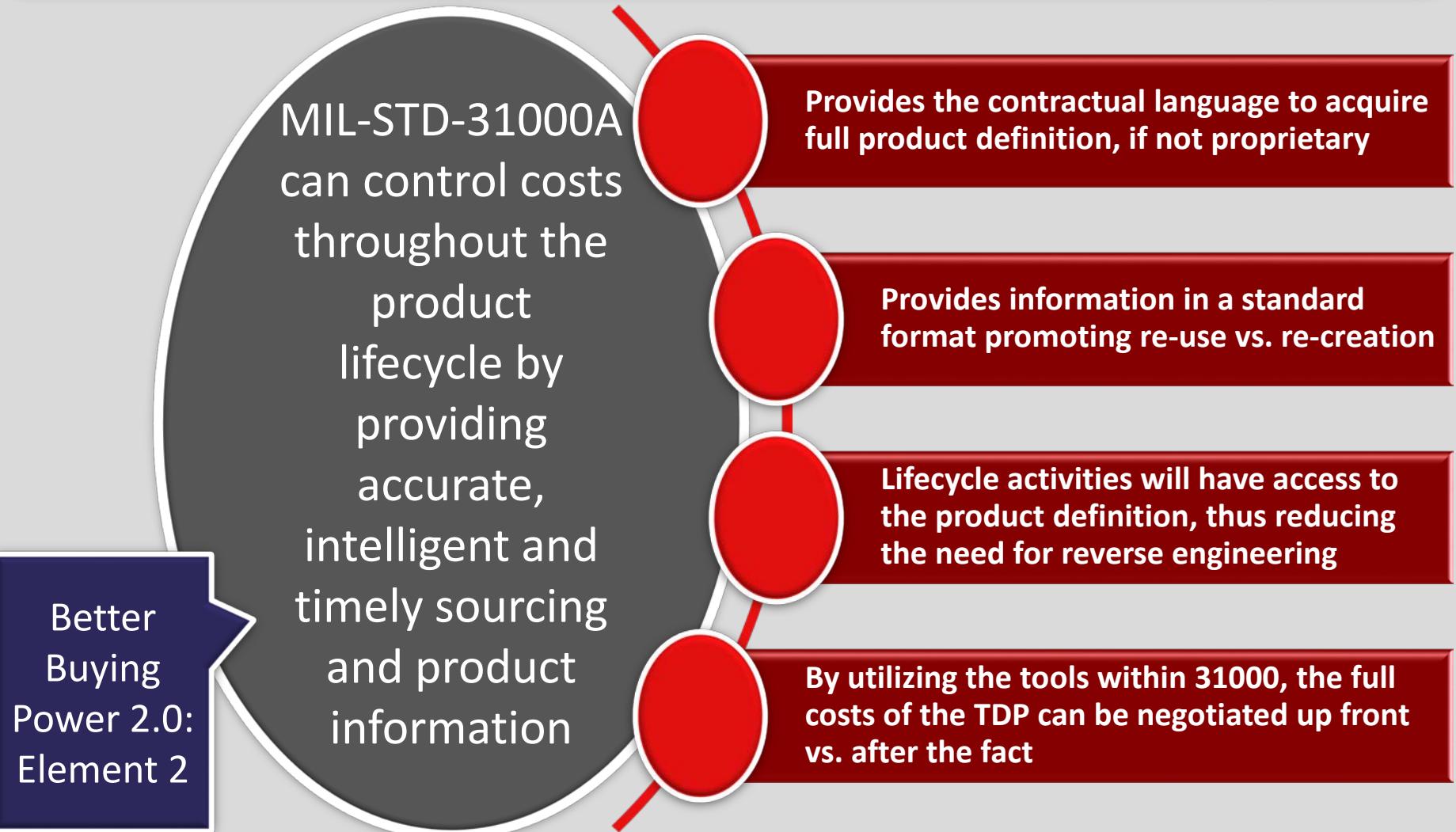
Reduces lead times by providing accurate data that can be reused

Other documents like technical manuals can be made quicker

Allows sustainment activities to be planned earlier

Improves the overall efficiency of the lifecycle by reducing labor & time to mission

BBP2.0 Control Costs And MIL-STD-31000A



BBP2.0 Incentivize Productivity & Innovation And MIL-STD-31000A

Better
Buying
Power 2.0:
Element 3

MIL-STD-31000A can incentivize productivity & innovation in Industry and government by collaborating during the design and manufacturing process to insure both parties' needs are met.

If used correctly, 31000A establishes a requirements framework that can be used up front to insure both sides get what they need

If done properly in the contracting phase, the government can request the same data that the contractor would normally create reducing cost by the contractor

More contractors will be interested in working with the government sustainment activities since better information is available

BBP2.0 Eliminate Unproductive Processes and Bureaucracy And MIL-STD-31000A

Better
Buying
Power
2.0:
Element 4

MIL-STD-31000A can eliminate unproductive processes and bureaucracy by creating a detailed TDP that utilizes modern tools and processes resulting in greater overall efficiency.

As stated in previous bullets, the 3D TDP can be used to streamline many sustainment, tech pubs and other downstream processes by reusing the data vs. recreating it

By utilizing the modern TDPs defined in 31000 along with modern tools to receive and manage the data, many old processes can be updated making more efficient use of technology

Used properly at the beginning of a program, 31000 defines the requirements reducing the need to go back to the contractor at a later date for more information or compromising data rights

BBP2.0 Promote Effective Competition And MIL-STD-31000A

Better
Buying
Power 2.0:
Element 5

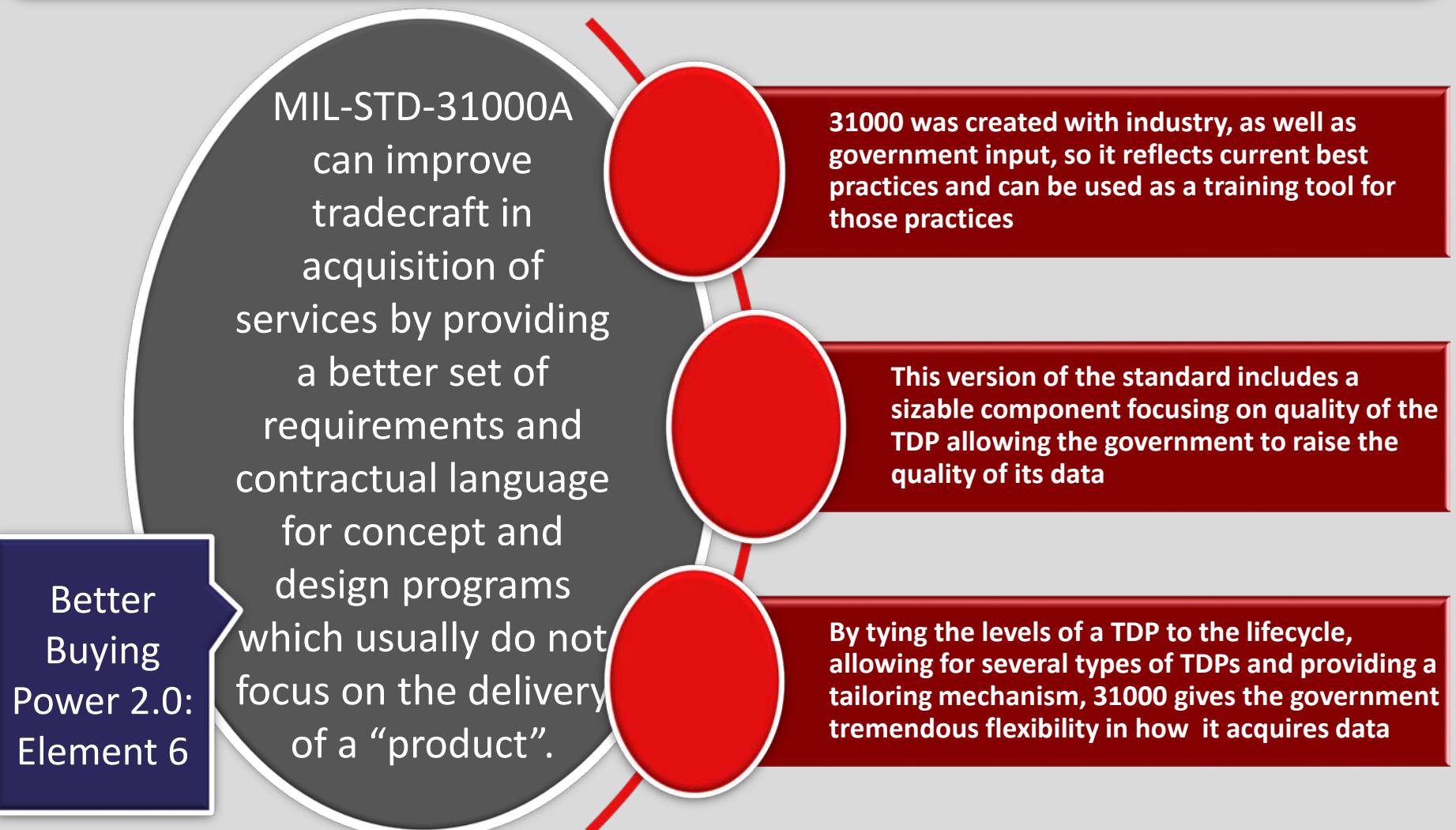
MIL-STD-31000A promotes effective competition by providing the government the tools to acquire a complete TDP that can then be used to provide a level playing field for the supply chain.

By providing a complete and reusable definition of a product (the TDP) the government can openly compete it resulting in fewer sole source contracts

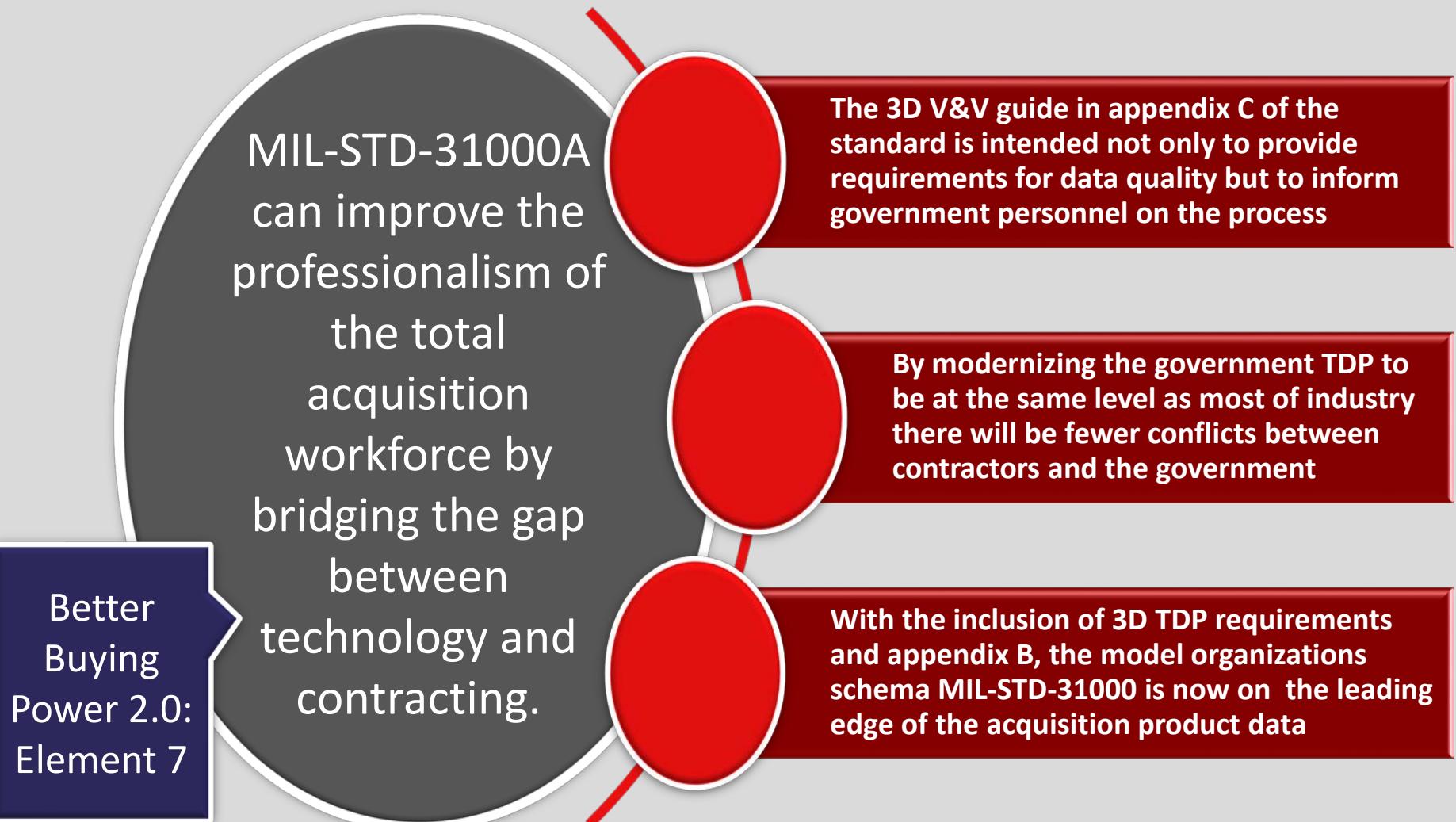
The TDP levels described in 31000 can be used to acquire TDPs at various points in the development lifecycle thus allowing the next milestone to be openly competed

Utilizing the data quality guides described in 31000 will insure that the acquired TDP is complete and easy to reuse promoting more manufacturers who use the data to respond to more RFQs

BBP2.0 Improve Tradecraft In Acquisition Of Services And MIL-STD-31000A



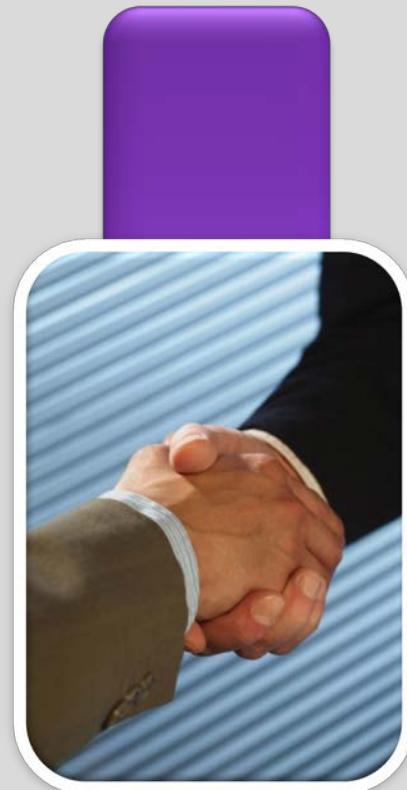
BBP2.0 Improve the Professionalism Of The Total Acquisition Workforce And MIL-STD-31000A



Summary

MIL-STD-31000A achieves Better Buying Power 2.0

- By utilizing technology to increase competition, reduce sourcing costs, shorten lead time and improve quality throughout the product lifecycle
- By modernizing the TDP process to be equivalent to industry and raising the bar on how the government acquires TDPs



Introduction

Benefits: Why do we want to use this standard?

Benefits

BBP 2.0 Tie In

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The Problem...

There are many problems centered around the TDP, here are some examples:



Legacy Systems

- 2D TDP, if any
- Outdated
- Hard to manufacture from

No TDP

- Never Purchased
- Deemed too expensive
- Resides at the OEM

No Current OEM

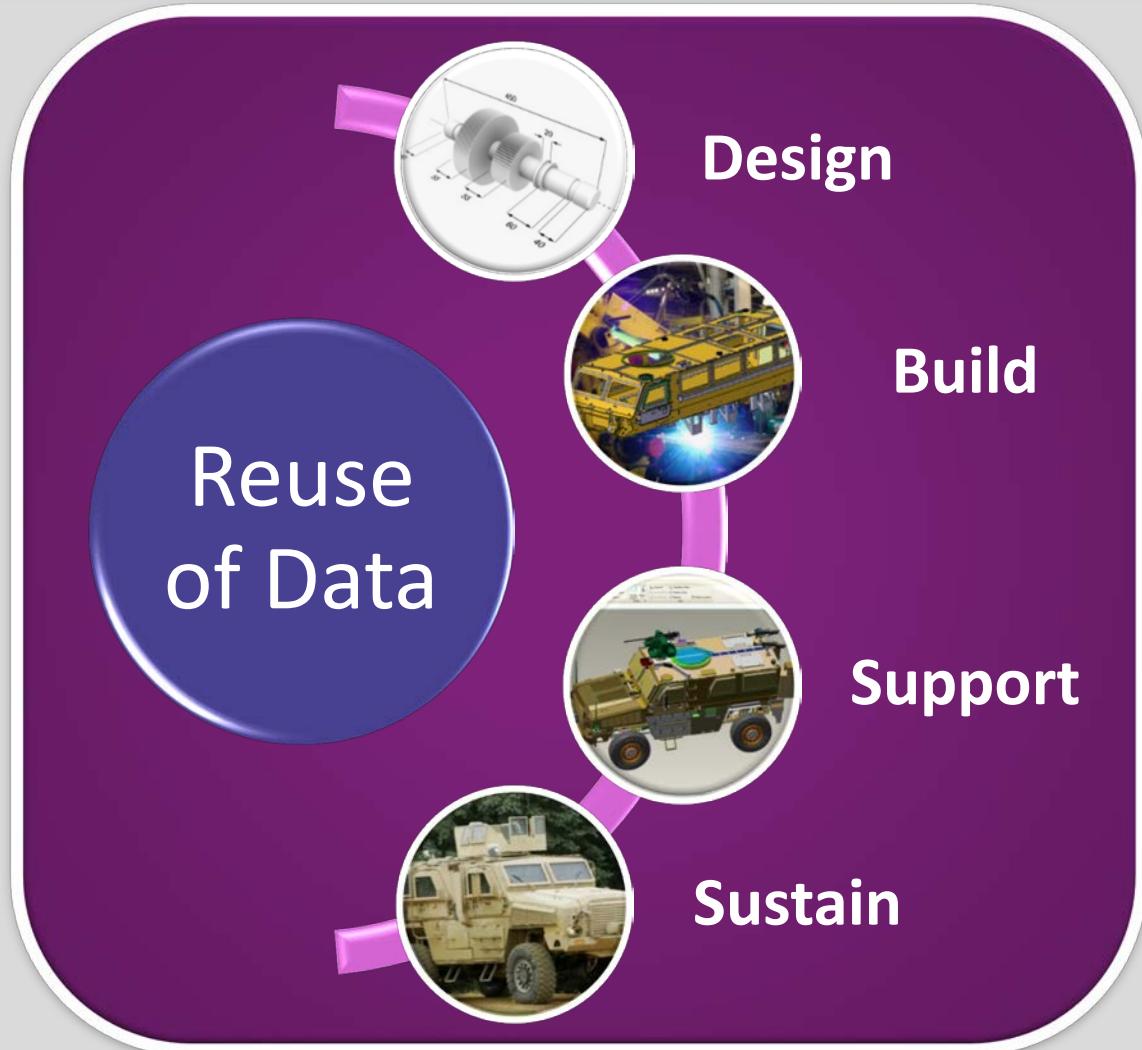
- Original OEM out of business
- TDPs, if available are incomplete

Sustainment

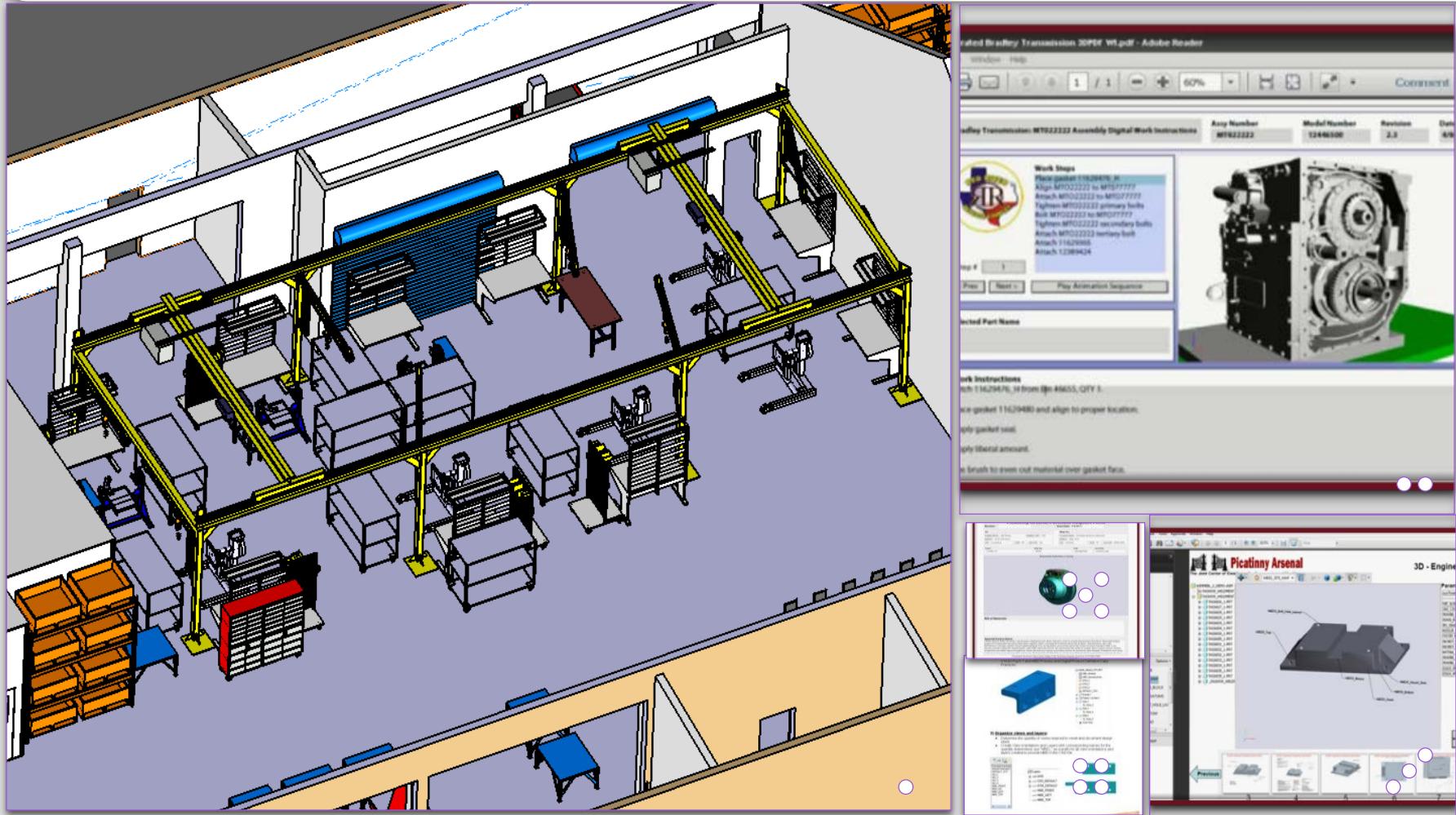
- TDP may, or may not, exist
- Must reverse engineer
- Late in the lifecycle

3D TDP Reuse

A 3D TDP enables the reuse of data throughout the lifecycle, without it the data must be reverse engineered or re-mastered



Examples Of Data Reuse



○ Virtual
Manufacturing



Digital Work
Instructions



3D PDF Micro
TDP



Tech Pubs



E Sourcing

The Cost Of A Drawing Based TDP

Acquisition

- Inability to source
- Increased cost of changes
- Data re-mastered for MFG
- Increased ambiguity
- Schedule delays

Sustainment

- Reverse engineered TDP
- Depot start up delays
- Tech pubs delayed
- Decreased readiness
- Increase rework

Studies show that 50% of an engineer's time is lost due to dealing with "bad" data

Cost

Time

The Core Standard

Defining a TDP: What is it? What is it made of?

- Worksheets
- 2D & 3D TDPs
- TDP Levels
- Defining a TDP

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TDP – The Heart Of The Standard

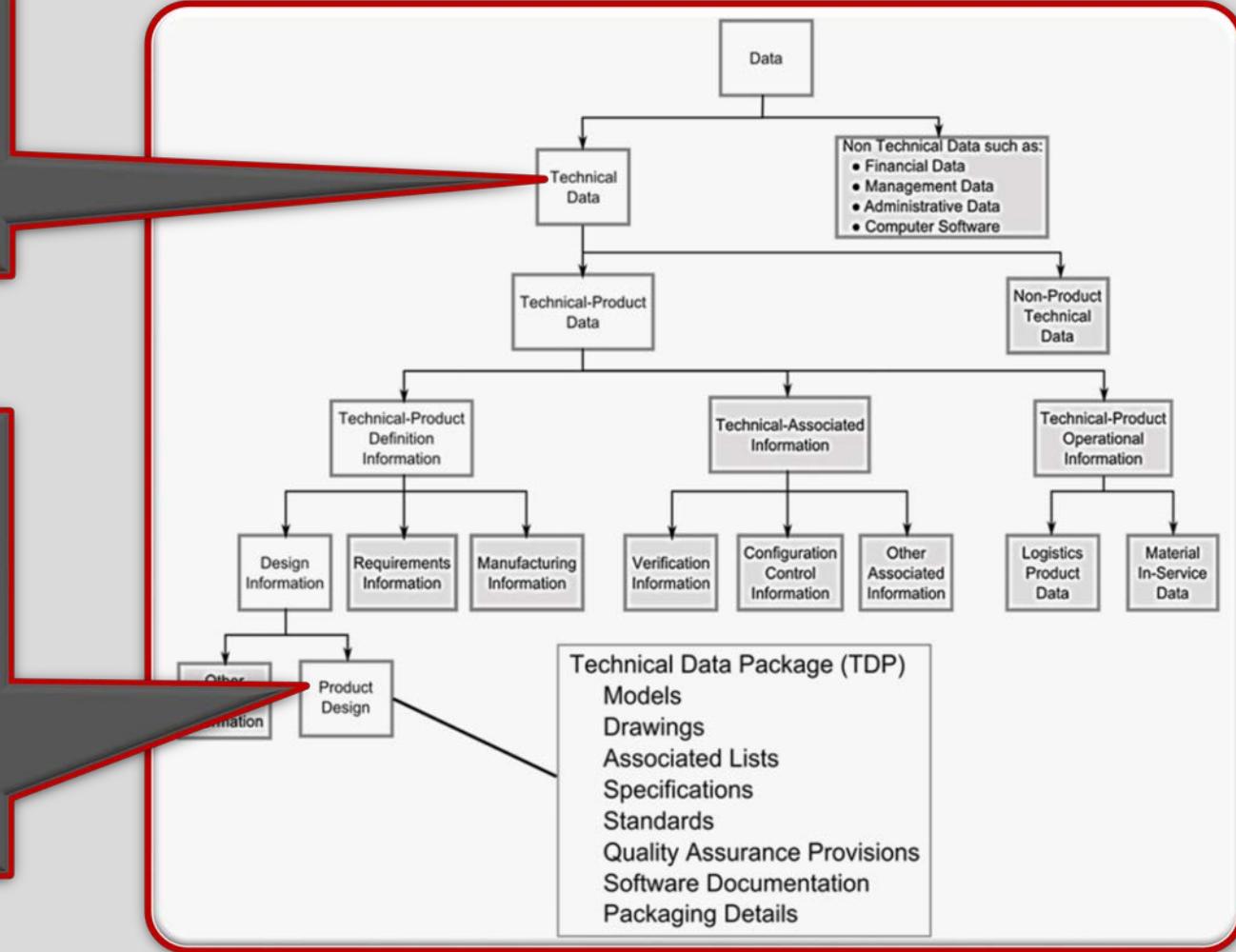
MIL-STD-31000A defines a TDP as:

“A technical description of an item adequate for supporting an acquisition, production, engineering, and logistics support (e.g. Engineering Data for Provisioning, Training, and Technical Manuals). The description defines the required design configuration or performance requirements, and procedures required to ensure adequacy of item performance. It consists of applicable technical data such as models, drawings, associated lists, specifications, standards, performance requirements, QAP, software documentation and packaging details.”

TDP In The Hierarchy Of Data

Technical
Data Includes
Many Types
of Data

The TDP is a
subset of
Product
Design Data
which is on
the bottom
tier of data



What A TDP Is Not

The TDP does not include:

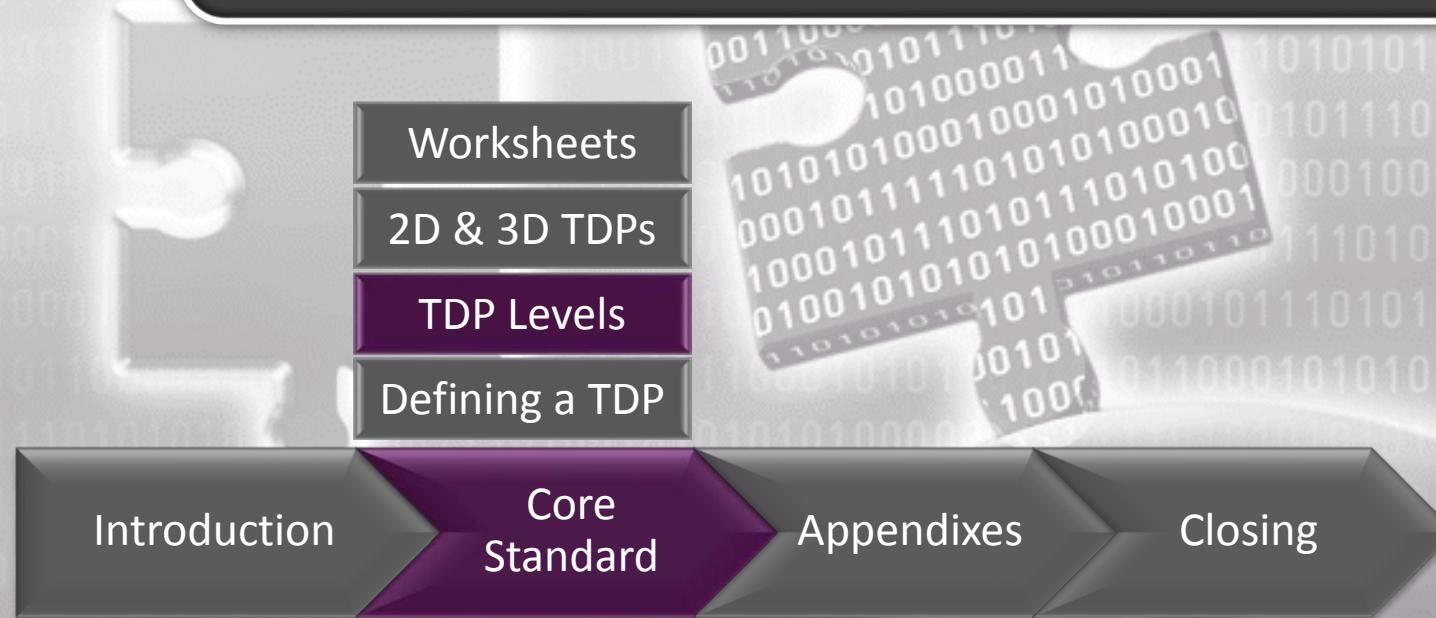
- Manufacturing information
- Requirements information
- Test information
- Logistics product information



**The TDP is basically about the product definition
not how the product is made or supported**

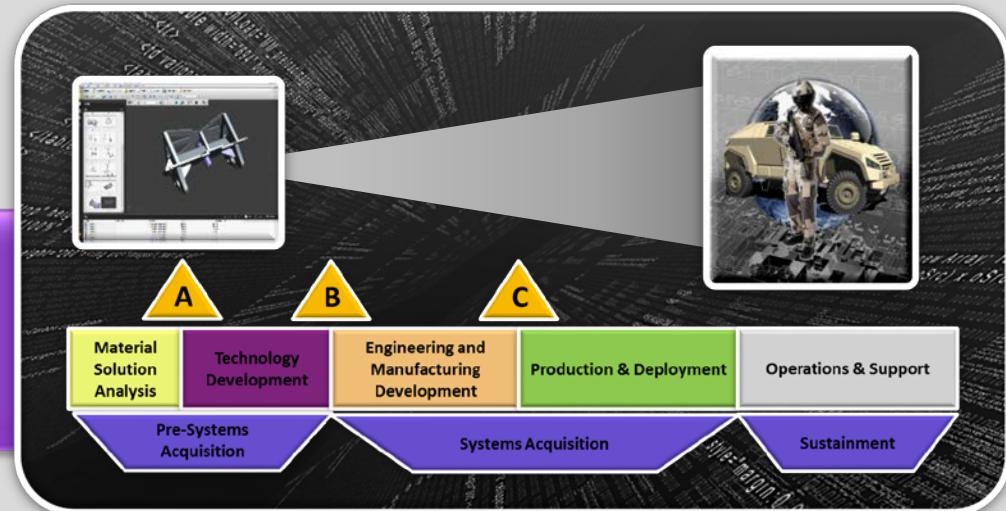
The Core Standard

Levels of a TDP: The different types of TDPs



The New Levels

- The old MIL-DTL-31000 used numeric levels (1, 2, and 3) to describe ascending levels of detail, where a level 3 would fully define a product
- MIL-STD-31000 ties this concept to the lifecycle
 - Conceptual Level
 - Developmental Level
 - Production Level



Definition: Conceptual Level

Conceptual Level. - A conceptual design TDP shall consist of those TDP elements necessary to define design concepts in graphic form, and include appropriate textual information required for analysis and evaluation of those concepts. The data will generally consist of simple sketches/models, artist renderings and/or basic textual data. The data may consist of the system performance specification and can be supported by Conceptual design drawings and/or models as specified by the contract.

Definition: Developmental Level

Developmental Level. - A developmental prototype TDP shall consist of those TDP elements necessary to provide sufficient data to support the analysis of a specific design approach, the fabrication of prototype materiel for test or experimentation, and limited production by the original design organization or with assistance from the original design organization. The data may consist of the unique item specifications for all system component Configuration Items (CIs) and can be supported by developmental design drawings and/or models along with any required associated lists as specified by the contract.

Definition: Production Level

Production Level. - A production level TDP shall consist of those TDP elements necessary to provide the design, engineering, manufacturing, inspection, packaging and quality assurance provisions information necessary to enable the procurement or manufacture of an item. The product shall be defined to the extent necessary for a competent manufacturer to produce an item, which duplicates the physical, interface, and functional characteristics of the original product, without additional design engineering effort or recourse to the current design activity. Production data shall reflect the approved, tested, and accepted configuration of the defined delivered item. The data may consist of product drawings and/or models along with all required associated lists; SIE drawings and/or models along with all required associated lists; ST drawings and/or models along with all required associated lists; specifications; software documentation; SPI drawings and/or models along with all required associated lists; and QAP as specified by the contract.

Level Comparison

Conceptual

Designed for the end of the pre-acquisition phase

Lowest amount of detail

Concepts only, not able to build to

Developmental

Represents the midpoint of the systems acquisition phase

Good level of detail

May or may not be able to build to

Production

Represents the entry into the production

Highest level of detail with full product definition

Can support product build

The Core Standard

2D and 3D TDPs: Supporting both old
and new styles of TDPs

- Worksheets
- 2D & 3D TDPs
- TDP Levels
- Defining a TDP

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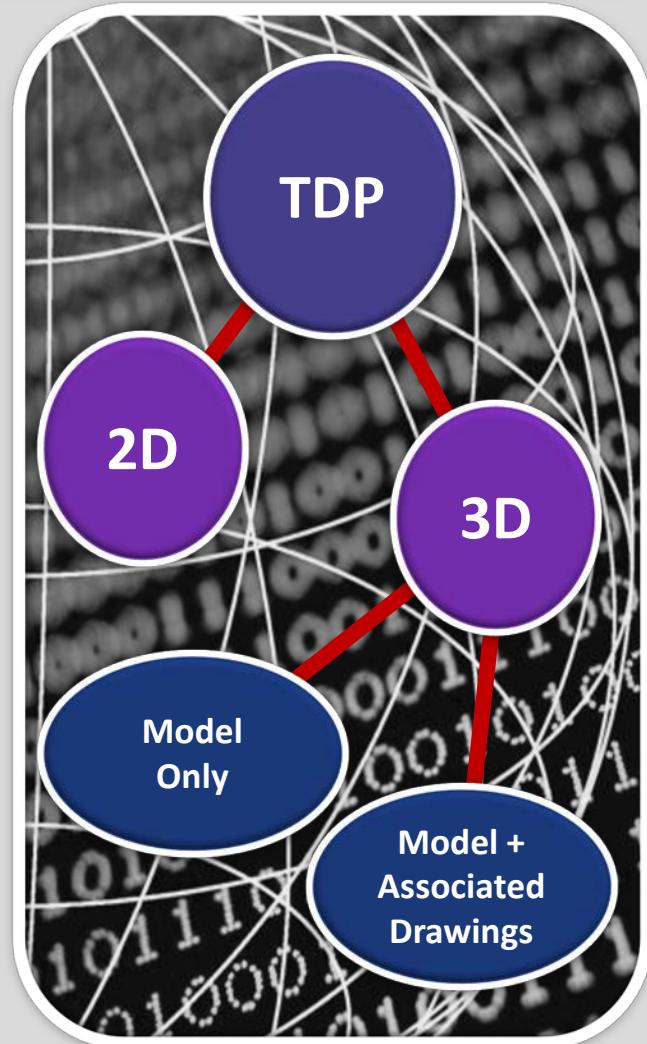
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Types Of A TDP

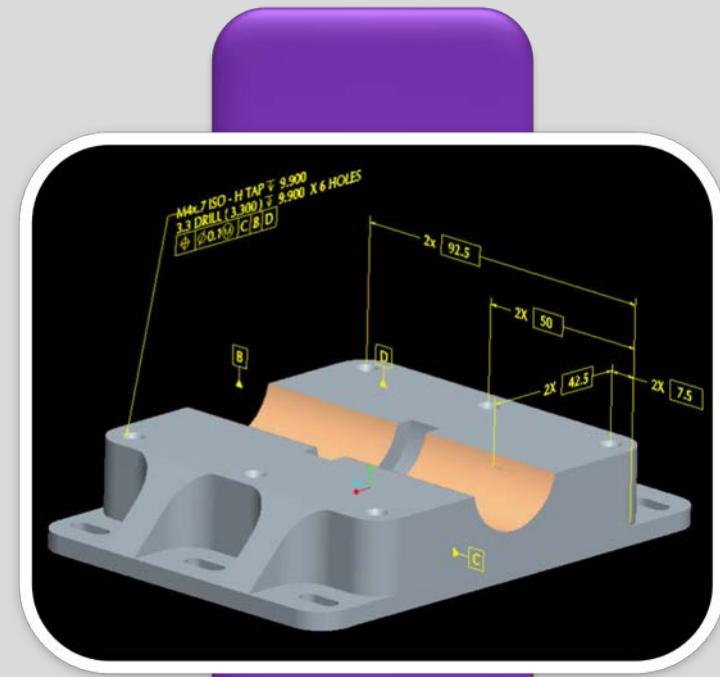
MIL-STD-31000A supports two basic types of TDPS:

- 2-Dimensional (2D)
 - Traditional drawings and document based
- 3-Dimensional (3D)
 - There are two subsets of 3D TDPS
 - Model Only
 - Models With Associated 2D drawings



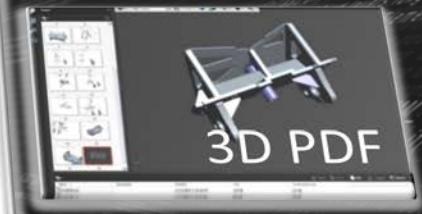
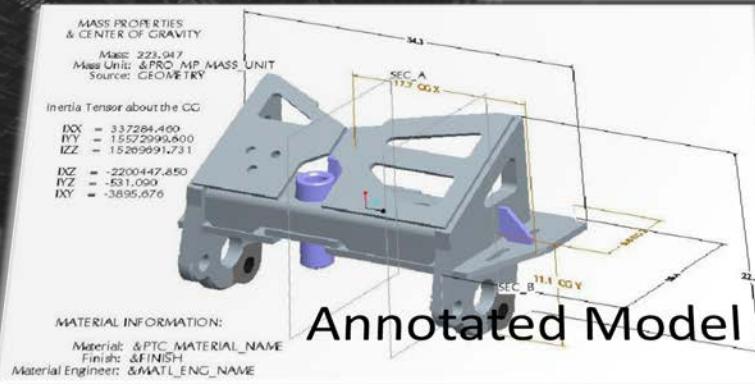
What is a 3D TDP?

- A set of technical data based upon a 3D Solid Model (aka an Annotated Model) that provides the product definition of an item
- It replaces a traditional drawing based TDP
- Can contain many types of related data



Provides a foundation for reuse downstream

3D Foundation



Comparison Of TDP Types

2D TDP

Consists of traditional 2D drawings for the product definition

Also has other document based TDP elements

Traditionally has no “intelligence” or data relationships

3D TDP

Model Only

Uses only the 3D CAD model for product definition

Can contain supplemental document based TDP elements

Contains many relationships and intelligent data

Model Plus Associated Drawings

Uses the 3D model as the master but also has linked drawings

Can contain supplemental document based TDP elements

Same intelligence as model only and the drawings are driven by the model

The Core Standard

The Option Selection Worksheets:
The primary way to use the standard

Worksheets

2D & 3D TDPs

TDP Levels

Defining a TDP

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Option Selection Worksheets

- Understanding that each contract/program has different needs MIL-STD-31000A has incorporated the Option Selection Worksheets
- These Worksheets allows the user to select which TDP elements are needed for their effort
- The worksheets should be included as part of the SOW or CDRL
- Appendix A provides detailed explanations of each block contained with in the worksheet

The image displays three overlapping windows of the TDP Option Selection Worksheets. The top window is titled 'TOP OPTION SELECTION WORKSHEET' and includes sections for 'OPTION', 'DATA REQUIREMENTS', 'DELIVERABLE DATA PRODUCTS', and 'APPLICABILITY'. The middle window is titled 'TDP Option Selection Worksheet' and focuses on 'COMMERCIAL DRAWING MODELS & ASSOCIATED LISTS'. The bottom window is also titled 'TDP Option Selection Worksheet' and is specifically for 'COMMERCIAL DRAWING MODELS & ASSOCIATED LISTS'. All windows contain various checkboxes and dropdown menus for selecting options.

The Option Selection Worksheet

- There are two worksheets the first of which covers the primary TDP Elements
- It contains 9 sections spread over 2 pages
- These sections focus on what elements are needed and there corresponding formats

FIGURE 2: TDP Option Selection Worksheet

FIGURE 2: TDP Option Selection Worksheet (cont.)

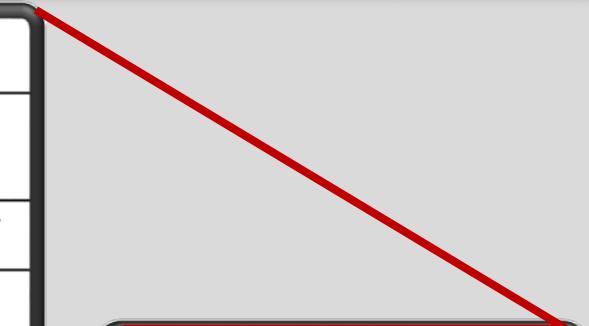
The forms contain the following sections:

- SYSTEM**: Includes fields for SYSTEM, CONTRACT ID, EXHIBIT ATTACHMENT ID, C.G.P., and D.G.D./DATA SUBMISSION.
- 1. TOP LEVEL/LEVEL: CHOOSE ONLY ONE FOR YOURNALIZE**: Options include CONCEPTUAL LEVEL, DEVELOPMENT LEVEL, and PRODUCTION LEVEL.
- 2. DELIVERABLES & PROJECTS**: Options include YIAVITE CAD, ISO 10000 PDF, and CAD/COPY.
- 3. 3D MODELS**: Options include YIAVITE 3D Model (level of assembly), MODELS (YIAVITE 3D Model) (specify Appendix B or other), FURNITURE FORMAT (SPECIFY, e.g., ISO 10000 Annex A), and OTHER FORMAT (SPECIFY, e.g., PDF, RTF).
- 4. DATA FORMATS**: Options include ARCS TEXT/FIRE DELETED, ISO 10000 (SPECIFY, e.g., Annex A or D), REVISION (PDF), and OTHER FORMAT (SPECIFY).
- 5. 2D DRAWINGS**: Options include YIAVITE 2D Drawing (level of assembly), FURNITURE FORMAT (SPECIFY, e.g., ISO 10000 Annex A or D), and OTHER FORMAT (SPECIFY).
- 6. CASE CODE & DOCUMENTATION REQUIREMENTS**: Options include CONTRACTOR CASE & DOCUMENT NUMBER, CONTRACTOR CASE & DOCUMENT NUMBER (CONTINUE), and CASE CODE.
- 7. 3D CAD CODE**: Options include YIAVITE 3D CAD CODE (level of assembly) and OTHER DOCUMENT NUMBER.
- 8. DRAWING FORMATS TO USE AND COMPLETE AS APPLICABLE**: Options include CONTRACTOR FORMAT and OTHER DRAWING FORMATS.
- 9. ASSOCIATED DATA**: Options include ASSOCIATED DATA REQUIRED (YIAVITE 3D Model, PRODUCT DRAWINGS, MODELS AND APPENDICES, SPECIAL INSTRUCTIONS (SP), DRANT/DRANT, SPECIFICATIONS FOR STANDARD (SPECIFY), SPECIAL INSTRUCTIONS (SP), DRANT/DRANT, SPECIFICATIONS FOR STANDARD (SPECIFY), SPECIAL INSTRUCTIONS (SP), DRANT/DRANT, SPECIFICATIONS FOR STANDARD (SPECIFY), METAL/PLATE (SPECIFY), and EQUIPMENT/TECHNICAL DATA (SPECIFY)).
- 10. TOP ELEMENTS AND ASSOCIATED DATA REQUIRED (YIAVITE 3D Model, PRODUCT DRAWINGS, MODELS AND APPENDICES, SPECIAL INSTRUCTIONS (SP), DRANT/DRANT, SPECIFICATIONS FOR STANDARD (SPECIFY), SPECIAL INSTRUCTIONS (SP), DRANT/DRANT, SPECIFICATIONS FOR STANDARD (SPECIFY), SPECIAL INSTRUCTIONS (SP), DRANT/DRANT, SPECIFICATIONS FOR STANDARD (SPECIFY), METAL/PLATE (SPECIFY), and EQUIPMENT/TECHNICAL DATA (SPECIFY)).**
- 11. TOP DATA MANAGEMENT PRODUCTS**: Options include SOURCE CONTROL, DRAWING RECORD APPROVAL REQUEST, DRAWING NUMBER ASSIGNMENT REPORT, and PROPOSED CRITICAL MANUFACTURING PROCESS DESCRIPTION.
- 12. ASSOCIATED LISTS (IF AND COMPLETE AS APPLICABLE)**: Options include PARTS LIST (IF ONE), DATA LIST, DESIGNER LIST, and OTHER.
- 13. APPLICATION LISTS**: Options include INTEGRAL, SEPARATE, and CONTRACTOR SELECT.
- 14. APPLICABILITY OF STANDARDS**: Options include ASME Y14.3M-2009 AND APPLICATIONS OF ENGINEERING DRAWINGS WITH APPENDICES (IF APPLICABLE), ASME Y14.3M ASSOCIATED LIST, ASME Y14.3M REVISION OF ENGINEERING DRAWINGS AND ASSOCIATED LIST, ASME Y14.4M DIGITAL PRODUCT DEFINITION DATA, ASME Y14.5M DIMENSIONING AND TOLERANCING, and OTHER STANDARDS APPLIED AS DESCRIBED.
- 15. OTHER TAILORING**: Options include ATTACH ADDITIONAL SHEETS IF NECESSARY, COMPANY STANDARDS DEFINED, and YES/NO.

Section 1

TDP OPTION SELECTION WORKSHEET			
SYSTEM:		DATE PREPARED:	
A. CONTRACT NO.	B. EXHIBIT / ATTACHMENT NO.	C. CLIN	D. CDRL DATA ITEM NO(s)
1. TDP LIFECYCLE LEVEL (CHOOSE ONLY ONE PER WORKSHEET) Note: The level selected must coincide with the requirements of the elements selected in Block 5.			
A. <input type="checkbox"/> CONCEPTUAL LEVEL <input type="checkbox"/> DEVELOPMENTAL LEVEL <input type="checkbox"/> PRODUCTION LEVEL	B. REMARKS:		

• This section covers the high-level contract information
 • Most importantly it defines what level of TDP is being acquired:
 • Conceptual
 • Developmental
 • Production



TOP OPTION SELECTION WORKSHEET			
SYSTEM:		DATE PREPARED:	
A. CONTRACT NO.	B. EXHIBIT / ATTACHMENT NO.	C. CLIN	D. CDRL DATA ITEM NO(s)
1. TDP LIFECYCLE LEVEL (CHOOSE ONLY ONE PER WORKSHEET) Note: The level selected must coincide with the requirements of the elements selected in Block 5.			
A. <input type="checkbox"/> CONCEPTUAL LEVEL <input type="checkbox"/> DEVELOPMENTAL LEVEL <input type="checkbox"/> PRODUCTION LEVEL	B. REMARKS:		
2. DELIVERABLE DATA PRODUCTS (X ALL THAT APPLY AND COMPLETE AS APPLICABLE)			
A. DRAWINGS: <input type="checkbox"/> PAPER COPY <input type="checkbox"/> CD/DVD COPY <input type="checkbox"/> OTHER FORMAT (SPECIFY) _____			
B. MODELS: <input type="checkbox"/> 3D Digital MODELS ONLY <input type="checkbox"/> 3D Digital MODELS w/o ASSOCIATED ID ASSOCIATED ID: _____ DRAWINGS: _____ (Specify in Section 2)			
C. METADATA: <input type="checkbox"/> ASCII TEXT-PIPE DELIMITED <input type="checkbox"/> ISO 10303 (SPECIFY, e.g., AP-203 & DE0) _____ <input type="checkbox"/> REMARKS (GML) <input type="checkbox"/> OTHER FORMAT (SPECIFY) _____			
D. ASSOCIATED LISTS (See Item 7) <input type="checkbox"/> NATIVE FORMAT <input type="checkbox"/> ISO 12000 PDF <input type="checkbox"/> IMAGECOPY (Specify in Section 2)			
E. SUPPLEMENTAL: <input type="checkbox"/> NATIVE <input type="checkbox"/> ISO 12000 PDF <input type="checkbox"/> IMAGECOPY (Specify in Section 2) <input type="checkbox"/> OTHER (SPECIFY, e.g., PDF) _____			
F. CAGE CODE & DOCUMENT NUMBERS: <input type="checkbox"/> CONTRACTOR CAGE & DOCUMENT NUMBERS GOVERNMENT CAGE (COMPLETE JN, JC and JD) G. USE CAGE CODE <input type="checkbox"/> USE DOCUMENT NUMBERS <input type="checkbox"/> TO BE ASSIGNED BY			
H. DRAWING FORMATS (X ONE AND COMPLETE AS APPLICABLE) CONTRACTOR FORMAT <input type="checkbox"/> GOVERNMENT FORMAT REMARKS			
I. TDP ELEMENTS AND ASSOCIATED DATA REQUIRED (X ALL THAT APPLY) <input type="checkbox"/> CONCEPTUAL DESIGN DRAWINGS & MODELS <input type="checkbox"/> DEVELOPMENTAL DESIGN DRAWINGS & MODELS AND ASSOCIATED LISTS <input type="checkbox"/> PRODUCT DRAWINGS & MODELS AND ASSOCIATED LISTS <input type="checkbox"/> SPECIAL INSPECTION EQUIPMENT (SIE) DRAWINGS & MODELS AND ASSOCIATED LISTS <input type="checkbox"/> SPECIAL TOOLING (ST) DRAWINGS & MODELS AND ASSOCIATED LISTS <input type="checkbox"/> SPECIAL PACKAGING & RESTRICTIONS (SPR) DRAWINGS & MODELS AND ASSOCIATED LISTS <input type="checkbox"/> SPECIFICATIONS AND STANDARDS (SPECIFY) _____ <input type="checkbox"/> QUALITY ASSURANCE PROVISIONS (QAP) (SPECIFY) _____ <input type="checkbox"/> METADATA (SPECIFY) _____ <input type="checkbox"/> SUPPLIED-READY TECHNICAL DATA (SPECIFY) _____			

Section 2

2. DELIVERABLE DATA PRODUCTS (X ALL THAT APPLY AND COMPLETE AS APPLICABLE)

TYPE	FORMAT
A. <input type="checkbox"/> 2D DRAWINGS	<input type="checkbox"/> NATIVE CAD <input type="checkbox"/> ISO 32000 PDF <input type="checkbox"/> HARD COPY <input type="checkbox"/> OTHER FORMAT (SPECIFY) _____
B. 3D MODELS:	<input type="checkbox"/> 3D Digital MODELS ONLY _____ <input type="checkbox"/> 3D Digital MODELS W/ ASSOCIATED 2D DRAWINGS _____ <input type="checkbox"/> NEUTRAL FORMAT (SPECIFY, e.g., ISO 10303 APxxx) _____ <input type="checkbox"/> OTHER FORMAT (SPECIFY, E.G., 3D PDF, JT) _____
C. <input type="checkbox"/> METADATA (Specify in Section 9)	<input type="checkbox"/> ASCII TEXT- PIPE DELIMITED <input type="checkbox"/> ISO 10303 (SPECIFY, e.g., APxxx& DEX) _____ <input type="checkbox"/> JEDMICS (DLF) <input type="checkbox"/> OTHER FORMAT (SPECIFY) _____
D. <input type="checkbox"/> ASSOCIATED LISTS (See Sect 7)	<input type="checkbox"/> NATIVE FORMAT <input type="checkbox"/> ISO 32000 PDF <input type="checkbox"/> HARDCOPY <input type="checkbox"/> OTHER FORMAT (SPECIFY) _____
E. SUPPLEMENTAL <input type="checkbox"/> TECHNICAL DATA (Specify in Section 9)	NATIVE _____ NEUTRAL (SPECIFY e.g., STEP AP238, 240, DEX, Other) _____ OTHER (SPECIFY e.g., PDF) _____

- This section begins the selection of what TDP elements are required
- It also shows in what format the information should be delivered

TOP OPTION SELECTION WORKSHEET

SYSTEM	DATE PREPARED												
A. CONTRACT NO.	B. EXHIBIT / ATTACHMENT NO.												
C. CLIN (CONTRACT LINE ITEM NUMBER)													
1. STEP LIFE CYCLE LEVEL (CHOOSE ONLY ONE PER WORKSHEET) <small>Note: The level selected must coincide with the requirements of the documents entered in Block A</small>													
A. CONCEPTUAL LEVEL B. REGARDS <input type="checkbox"/> DEVELOPMENTAL LEVEL													
2. DELIVERABLE DATA PRODUCTS (X ALL THAT APPLY AND COMPLETE AS APPLICABLE)													
<table border="1"> <thead> <tr> <th>TYPE</th> <th>FORMAT</th> </tr> </thead> <tbody> <tr> <td>A. 2D DRAWINGS</td> <td><input type="checkbox"/> NATIVE CAD <input type="checkbox"/> ISO 32000 PDF <input type="checkbox"/> HARD COPY <input type="checkbox"/> OTHER FORMAT (SPECIFY) _____</td> </tr> <tr> <td>B. 3D MODELS</td> <td><input type="checkbox"/> 3D Digital MODELS ONLY _____ <input type="checkbox"/> 3D Digital MODELS W/ ASSOCIATED 2D DRAWINGS _____ <input type="checkbox"/> NEUTRAL FORMAT (SPECIFY, e.g., ISO 10303 APxxx) _____ <input type="checkbox"/> OTHER FORMAT (SPECIFY, E.G., 3D PDF, JT) _____</td> </tr> <tr> <td>C. METADATA</td> <td><input type="checkbox"/> ASCII TEXT- PIPE DELIMITED <input type="checkbox"/> ISO 10303 (SPECIFY, e.g., APxxx& DEX) _____ <input type="checkbox"/> JEDMICS (DLF) <input type="checkbox"/> OTHER FORMAT (SPECIFY) _____</td> </tr> <tr> <td>D. ASSOCIATED LISTS (See Sect 7)</td> <td><input type="checkbox"/> NATIVE FORMAT <input type="checkbox"/> ISO 32000 PDF <input type="checkbox"/> HARDCOPY <input type="checkbox"/> OTHER FORMAT (SPECIFY) _____</td> </tr> <tr> <td>E. SUPPLEMENTAL</td> <td>NATIVE _____</td> </tr> </tbody> </table>		TYPE	FORMAT	A. 2D DRAWINGS	<input type="checkbox"/> NATIVE CAD <input type="checkbox"/> ISO 32000 PDF <input type="checkbox"/> HARD COPY <input type="checkbox"/> OTHER FORMAT (SPECIFY) _____	B. 3D MODELS	<input type="checkbox"/> 3D Digital MODELS ONLY _____ <input type="checkbox"/> 3D Digital MODELS W/ ASSOCIATED 2D DRAWINGS _____ <input type="checkbox"/> NEUTRAL FORMAT (SPECIFY, e.g., ISO 10303 APxxx) _____ <input type="checkbox"/> OTHER FORMAT (SPECIFY, E.G., 3D PDF, JT) _____	C. METADATA	<input type="checkbox"/> ASCII TEXT- PIPE DELIMITED <input type="checkbox"/> ISO 10303 (SPECIFY, e.g., APxxx& DEX) _____ <input type="checkbox"/> JEDMICS (DLF) <input type="checkbox"/> OTHER FORMAT (SPECIFY) _____	D. ASSOCIATED LISTS (See Sect 7)	<input type="checkbox"/> NATIVE FORMAT <input type="checkbox"/> ISO 32000 PDF <input type="checkbox"/> HARDCOPY <input type="checkbox"/> OTHER FORMAT (SPECIFY) _____	E. SUPPLEMENTAL	NATIVE _____
TYPE	FORMAT												
A. 2D DRAWINGS	<input type="checkbox"/> NATIVE CAD <input type="checkbox"/> ISO 32000 PDF <input type="checkbox"/> HARD COPY <input type="checkbox"/> OTHER FORMAT (SPECIFY) _____												
B. 3D MODELS	<input type="checkbox"/> 3D Digital MODELS ONLY _____ <input type="checkbox"/> 3D Digital MODELS W/ ASSOCIATED 2D DRAWINGS _____ <input type="checkbox"/> NEUTRAL FORMAT (SPECIFY, e.g., ISO 10303 APxxx) _____ <input type="checkbox"/> OTHER FORMAT (SPECIFY, E.G., 3D PDF, JT) _____												
C. METADATA	<input type="checkbox"/> ASCII TEXT- PIPE DELIMITED <input type="checkbox"/> ISO 10303 (SPECIFY, e.g., APxxx& DEX) _____ <input type="checkbox"/> JEDMICS (DLF) <input type="checkbox"/> OTHER FORMAT (SPECIFY) _____												
D. ASSOCIATED LISTS (See Sect 7)	<input type="checkbox"/> NATIVE FORMAT <input type="checkbox"/> ISO 32000 PDF <input type="checkbox"/> HARDCOPY <input type="checkbox"/> OTHER FORMAT (SPECIFY) _____												
E. SUPPLEMENTAL	NATIVE _____												
3. CAGE CODE & DOCUMENT NUMBERS													
A. CONTRACTOR CAGE & DOCUMENT NUMBERS													
B. USE CAGE CODE													
C. USE DOCUMENT NUMBERS													
D. TO BE ASSIGNED BY													
4. DRAWING FORMATS (X ONE AND COMPLETE AS APPLICABLE)													
<input type="checkbox"/> CONTRACTOR FORMAT <input type="checkbox"/> GOVERNMENT FORMAT REMARKS _____													
5. TDP ELEMENTS AND ASSOCIATED DATA REQUIRED (X ALL THAT APPLY)													
<input type="checkbox"/> CONCEPTUAL DESIGN DRAWINGS MODELS <input type="checkbox"/> DEVELOPMENTAL DESIGN DRAWINGS MODELS AND ASSOCIATED LISTS <input type="checkbox"/> PRODUCT DRAWINGS MODELS AND ASSOCIATED LISTS <input type="checkbox"/> SPECIAL INSPECTION EQUIPMENT (SIE) DRAWINGS MODELS AND ASSOCIATED LISTS <input type="checkbox"/> SPECIAL TOOLING (ST) DRAWINGS MODELS AND ASSOCIATED LISTS <input type="checkbox"/> SPECIAL PACKAGE AND RESTRICTIONS (SPR) DRAWINGS MODELS AND ASSOCIATED LISTS <input type="checkbox"/> SPECIFICATIONS AND STANDARDS (SPS) (SPECIFY) <input type="checkbox"/> QUALITY ASSURANCE PROVISIONS (QAP) (SPECIFY) <input type="checkbox"/> METADATA (SPECIFY) <input type="checkbox"/> SUPPLIED-READY TECHNICAL DATA (SPECIFY)													

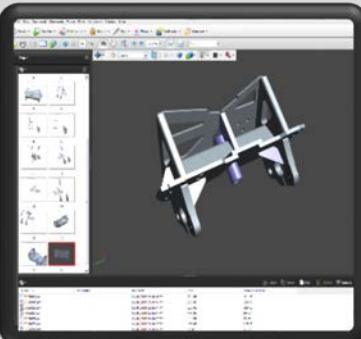
FIGURE 2: TDP Option Selection Worksheet

Section 2 Continued

- There are 5 element types described
 - Drawings
 - Models
 - Metadata
 - Associated Lists
 - Supplemental Technical Data
- Each element has an associated format selection area as well



OR



General Recommendations Are:

- If Drawings are required they should be associated to the model
- Require models whenever possible
- Try to obtain the Native, Neutral, and Lightweight File
- Whenever possible deliverables should be in a standard based format

Section 3

3. CAGE CODE & DOCUMENT NUMBERS	A. <input type="checkbox"/> CONTRACTOR CAGE & DOCUMENT NUMBERS GOVERNMENT CAGE (COMPLETE 3B, 3C and 3D)		
B. USE CAGE CODE:	C. USE DOCUMENT NUMBERS:	D. TO BE ASSIGNED BY:	

- This section defines what CAGE code should be used by the TDP
- It also defines what document numbers should be used by the TDP and who is responsible for assigning them (contractor or government)

TOP OPTION SELECTION WORKSHEET		
SYSTEM		DATE PREPARED
A. CONTRACT NO.	B. EXHIBIT / ATTACHMENT NO.	C. CLIN
D. CORR DATA ITEM(S)		
1. STEP LIFE CYCLE LEVEL (CHOOSE ONLY ONE PER WORKSHEET) <i>(Note: Step Level selected must coincide with the requirements of the elements selected in Section 3)</i>		
A. <input type="checkbox"/> CONCEPTUAL LEVEL <input type="checkbox"/> DEVELOPMENTAL LEVEL <input type="checkbox"/> PRODUCTION LEVEL		B. REGARDS:
2. DELIVERABLE DATA PRODUCTS (X ALL THAT APPLY AND COMPLETE AS APPLICABLE)		
TYPE FORMAT		
A. 3D DRAWINGS	<input type="checkbox"/> NATIVE CAD <input type="checkbox"/> ISO 2000 PDF <input type="checkbox"/> MBD/COPY <input type="checkbox"/> OTHER FORMAT (SPECIFY) _____	
B. 3D MODELS	<input type="checkbox"/> ID Digital Models ONLY <input type="checkbox"/> ID Digital Models w/ ASSOCIATED ID <input type="checkbox"/> DRWINGS	<input type="checkbox"/> NATIVE CAD (Specify level of association) <input type="checkbox"/> MODEL ORGANIZATION SCHEMA (Specify Appendix B or other) <input type="checkbox"/> NEUTRAL FORMAT (SPECIFY, e.g. ISO 10303 AP203) <input type="checkbox"/> OTHER FORMAT (SPECIFY, e.g. IFC, PDF, JT)
C. METADATA	<input type="checkbox"/> ASCII TEXT-PIPE DELIMITED <input type="checkbox"/> REMARKS (CFD) <input type="checkbox"/> SPECIFICATIONS (SPECIFY)	<input type="checkbox"/> ISO 10003 (SPECIFY, e.g. AP-003 & DRAFT) <input type="checkbox"/> OTHER FORMAT (SPECIFY)
D. ASSOCIATED	<input type="checkbox"/> NATIVE FORMAT <input type="checkbox"/> ISO 10000 PDF	<input type="checkbox"/> MBD/COPY
E. SUPPLEMENTAL		
<input type="checkbox"/> TECHNICAL DATA (SPECIFY e.g., STEP AP214, 141, DEX, Other) (Specify in Section 3) <input type="checkbox"/> OTHER (SPECIFY, e.g., PDF)		
F. 3. CAGE CODE & DOCUMENT NUMBERS		
A. CONTRACTOR CAGE & DOCUMENT NUMBERS GOVERNMENT CAGE (COMPLETE 3B, 3C and 3D)		B. USE CAGE CODE C. USE DOCUMENT NUMBERS
D. TO BE ASSIGNED BY		
3. DRAWING FORMATS (X ONE AND COMPLETE AS APPLICABLE)		
<input type="checkbox"/> CONTRACTOR FORMAT <input type="checkbox"/> GOVERNMENT FORMAT REMARKS:		
4. STEP ELEMENTS AND ASSOCIATED DATA REQUIRED (X ALL THAT APPLY)		
<input type="checkbox"/> CONCEPTUAL DESIGN DRAWINGS MODELS <input type="checkbox"/> DEVELOPMENTAL DESIGN DRAWINGS MODELS AND ASSOCIATED LISTS <input type="checkbox"/> PRODUCT DRAWINGS MODELS AND ASSOCIATED LISTS <input type="checkbox"/> SPECIAL INSPECTION EQUIPMENT (SIE) DRAWINGS MODELS AND ASSOCIATED LISTS <input type="checkbox"/> SPECIAL TOOLING (ST) DRAWINGS MODELS AND ASSOCIATED LISTS <input type="checkbox"/> SPECIAL PACKAGE/STRUCTURE (SP) DRAWINGS MODELS AND ASSOCIATED LISTS <input type="checkbox"/> SPECIFICATIONS AND STANDARDS (SPECIFY) <input type="checkbox"/> DESIGN DOCUMENTATION (SPECIFY) <input type="checkbox"/> QUALITY ASSURANCE PROVISIONS (QAP) (SPECIFY) <input type="checkbox"/> METADATA (SPECIFY) <input type="checkbox"/> SUPPLIED-READY TECHNICAL DATA (SPECIFY)		

FIGURE 2: TDP Option Selection Worksheet

Section 4

4. DRAWING FORMATS (X ONE AND COMPLETE AS APPLICABLE)

CONTRACTOR FORMAT

GOVERNMENT FORMAT

REMARKS: _____

- If either associative or stand-a-lone drawings are required this section defines who's drawing format should be used
- The choices here are the contractors or the government
- Additional remarks can be added to provide more requirements
- Format refers to the basic template use on a drawing as place holders for general information and layout

TOP OPTION SELECTION WORKSHEET

SYSTEM				DATE PREPARED	
A. CONTRACT NO.	B. EXHIBIT / ATTACHMENT NO.	C. CLIN	D. CORR. DATA ITEM NO.		
1. STEP LIFE CYCLE LEVEL (CHOOSE ONLY ONE PER WORKSHEET). The level selected must coincide with the requirements of the document selected in Section 3.					
A. <input type="checkbox"/> CONCEPTUAL LEVEL		B. REGARDS:			
<input type="checkbox"/> DEVELOPMENTAL LEVEL		<input type="checkbox"/> PRODUCTION LEVEL			
2. DELIVERABLE DATA PRODUCTS (X ALL THAT APPLY AND COMPLETE AS APPLICABLE)					
TYPE FORMAT					
A. 3D DRAWINGS <input type="checkbox"/> NATIVE CAD (<i>Specify level of association</i>) <input type="checkbox"/> ISO 10303 PDF <input type="checkbox"/> HARD COPY <input type="checkbox"/> OTHER FORMAT (<i>SPECIFY</i>) _____					
B. 3D MODELS <input type="checkbox"/> 3D Digital MODELS ONLY <input type="checkbox"/> 3D Digital MODELS w/ ASSOCIATED ID <i>(Specify in Section 3)</i> <input type="checkbox"/> NATIVE CAD (<i>Specify level of association</i>) <input type="checkbox"/> MODEL ORGANIZATION SCHEMA (<i>Specify Applicable or other</i>) <input type="checkbox"/> ASSOCIATED ID <input type="checkbox"/> NEUTRAL FORMAT (<i>SPECIFY</i> , e.g. ISO 10303 APN) <input type="checkbox"/> OTHER FORMAT (<i>SPECIFY</i>) <input type="checkbox"/> 3D PDF <input type="checkbox"/> STEP					
C. METADATA <input type="checkbox"/> ASCII TEXT-PIPE DELIMITED <input type="checkbox"/> ISO 10303 (<i>SPECIFY</i> , e.g. XML & DEX) <input type="checkbox"/> REMARKS (DF) <input type="checkbox"/> OTHER FORMAT (<i>SPECIFY</i>)					
D. ASSOCIATED LISTS (<i>See Item 7</i>) <input type="checkbox"/> NATIVE FORMAT <input type="checkbox"/> ISO 10303 PDF <input type="checkbox"/> HARD COPY <input type="checkbox"/> OTHER FORMAT (<i>SPECIFY</i>)					
E. SUPPLEMENTAL <input type="checkbox"/> NATIVE <input type="checkbox"/> NEUTRAL (<i>SPECIFY</i> , e.g. STEP APN18, 140, DEX, Other) <i>(Specify in Section 3)</i> <input type="checkbox"/> OTHER (<i>SPECIFY</i> , e.g. PDF)					
F. CAGE CODE & DOCUMENT NUMBERS					
A. CONTRACTOR CAGE & DOCUMENT NUMBERS		B. GOVERNMENT CAGE (COMPLETE J8, JC and JD)			
C. USE CAGE CODE		D. TO BE ASSIGNED BY			
4. DRAWING FORMATS (X ONE AND COMPLETE AS APPLICABLE)					
<input type="checkbox"/> CONTRACTOR FORMAT <input type="checkbox"/> GOVERNMENT FORMAT					
REMARKS: _____					
<input type="checkbox"/> CONCEPTUAL DESIGN DRAWINGS MODELS <input type="checkbox"/> DEVELOPMENTAL DESIGN DRAWINGS MODELS AND ASSOCIATED LISTS <input type="checkbox"/> PRODUCT DRAWINGS MODELS AND ASSOCIATED LISTS <input type="checkbox"/> SPECIAL INSPECTION EQUIPMENT (SIE) DRAWINGS MODELS AND ASSOCIATED LISTS <input type="checkbox"/> SPECIAL TOOLING (ST) DRAWINGS MODELS AND ASSOCIATED LISTS <input type="checkbox"/> SPECIAL PACKAGING/STRUCTURES (SP) DRAWINGS MODELS AND ASSOCIATED LISTS <input type="checkbox"/> SPECIFICATIONS AND STANDARDS (<i>SPECIFY</i>) <input type="checkbox"/> DESIGN DOCUMENTATION (<i>SPECIFY</i>) <input type="checkbox"/> QUALITY ASSURANCE PROVISIONS (QAP) (<i>SPECIFY</i>) <input type="checkbox"/> METADATA (<i>SPECIFY</i>) <input type="checkbox"/> SUPPLIED-READY TECHNICAL DATA (<i>SPECIFY</i>)					

FIGURE 2: TDP Option Selection Worksheet

Section 5

5. TDP ELEMENTS AND ASSOCIATED DATA REQUIRED (X ALL THAT APPLY)

- CONCEPTUAL DESIGN DRAWINGS / MODELS
- DEVELOPMENTAL DESIGN DRAWINGS / MODELS AND ASSOCIATED LISTS
- PRODUCT DRAWINGS / MODELS AND ASSOCIATED LISTS
- SPECIAL INSPECTION EQUIPMENT (SIE) DRAWINGS, MODELS AND ASSOCIATED LISTS
- SPECIAL TOOLING (ST) DRAWINGS, MODELS AND ASSOCIATED LISTS
- SPECIAL PACKAGING INSTRUCTIONS (SPI) DRAWINGS, MODELS AND ASSOCIATED LISTS
- SPECIFICATIONS AND/OR STANDARDS (SPECIFY) _____
- SOFTWARE DOCUMENTATION (SPECIFY) _____
- QUALITY ASSURANCE PROVISIONS (QAP) (SPECIFY) _____
- METADATA (SPECIFY) _____
- SUPPLEMENTARY TECHNICAL DATA (SPECIFY) _____

TOP OPTION SELECTION WORK SHEET			
DATE PREPARED:			
ACT NO.	B EXHIBIT / ATTACHMENT NO.	C CLN	D CORR DATA ITEM NO.
EQUIPMENT LEVEL (CHOOSE ONLY ONE PER WORKSHEET): <small>(The level selected must coincide with the requirements indicated in Section 2)</small>			
CENTRAL LEVEL		B REGARDS:	
ELEMENTAL LEVEL			
SECTION LEVEL			
TABLE DATA PRODUCTS (X ALL THAT APPLY AND COMPLETE AS APPLICABLE)			
TYPE		FORMAT	
A. DRAWINGS		<input type="checkbox"/> NATIVE CAD <input type="checkbox"/> ISO 10303 PDF <input type="checkbox"/> HARD COPY <input type="checkbox"/> OTHER FORMAT (SPECIFY) _____	
B. MODELS		<input type="checkbox"/> NATIVE CAD (Specify level of association) <input type="checkbox"/> MODEL ORGANIZATION SCHEMA (Specify Appendix B or other) <input type="checkbox"/> ASSOCIATED ID <input type="checkbox"/> DRIVETOOLS <input type="checkbox"/> NEUTRAL FORMAT (SPECIFY, e.g. ISO 10303 AP203) <input type="checkbox"/> OTHER FORMAT (SPECIFY, e.g. IFC PDF, JT)	
C. METADATA		<input type="checkbox"/> ASCII TEXT-PIPE DELIMITED <input type="checkbox"/> ISO 10303 (SPECIFY, e.g. AP203 & DEX) <input type="checkbox"/> RDBMS (SQL) <input type="checkbox"/> OTHER FORMAT (SPECIFY)	
D. ASSOCIATED LISTS (See Item 7)		<input type="checkbox"/> NATIVE FORMAT <input type="checkbox"/> ISO 10303 PDF <input type="checkbox"/> HARD COPY <input type="checkbox"/> OTHER FORMAT (SPECIFY)	
E. SUPPLEMENTAL		<input type="checkbox"/> NATIVE <input type="checkbox"/> NEUTRAL (SPECIFY, e.g. STEP AP214, 140, DEX, Other) <input type="checkbox"/> OTHER (SPECIFY, e.g. PDF)	
F. CAGE CODE & DOCUMENT NUMBERS		A. CONTRACTOR CAGE & DOCUMENT NUMBERS <input type="checkbox"/> GOVERNMENT CAGE (COMPLETE JM, JC and JD)	
G. USE CAGE CODE		C. USE DOCUMENT NUMBERS <input type="checkbox"/> D. TO BE ASSIGNED	
H. DRAWING FORMATS (X ONE AND COMPLETE AS APPLICABLE)			
<input type="checkbox"/> CONTRACTOR FORMAT <input type="checkbox"/> GOVERNMENT FORMAT			
I. ADDRESSES			
J. TDP ELEMENTS AND ASSOCIATED DATA REQUIRED (X ALL THAT APPLY)			
<input type="checkbox"/> CONCEPTUAL DESIGN DRAWINGS / MODELS <input type="checkbox"/> DEVELOPMENTAL DESIGN DRAWINGS / MODELS AND ASSOCIATED LISTS <input type="checkbox"/> PRODUCT DRAWINGS / MODELS AND ASSOCIATED LISTS <input type="checkbox"/> SPECIAL INSPECTION EQUIPMENT (SIE) DRAWINGS, MODELS AND ASSOCIATED LISTS <input type="checkbox"/> SPECIAL TOOLING (ST) DRAWINGS, MODELS AND ASSOCIATED LISTS <input type="checkbox"/> SPECIAL PACKAGING INSTRUCTIONS (SPI) DRAWINGS, MODELS AND ASSOCIATED LISTS <input type="checkbox"/> SPECIFICATIONS AND STANDARDS (SPECIFY) <input type="checkbox"/> SOFTWARE DOCUMENTATION (SPECIFY) <input type="checkbox"/> QUALITY ASSURANCE PROVISIONS (QAP) (SPECIFY) <input type="checkbox"/> METADATA (SPECIFY) <input type="checkbox"/> SUPPLEMENTARY TECHNICAL DATA (SPECIFY)			

FIGURE 2: TDP Option Selection Worksheet

Section 5 Continued

The selections for this section are:

- Conceptual Design Drawings / Models
- Developmental Design Drawings / Models And Associated Lists
- Product Drawings / Models And Associated Lists
- Special Inspection Equipment (SIE) Drawings, Models And Associated Lists
- Special Tooling (ST) Drawings, Models And Associated Lists
- Special Packaging Instructions (SPI) Drawings, Models And Associated Lists
- Specifications And/Or Standards
- Software Documentation
- Quality Assurance Provisions (QAP)
- Metadata
- Supplementary Technical Data



Section 6

6. TDP DATA MANAGEMENT PRODUCTS

- SOURCE CONTROL DRAWING (SOCD) APPROVAL REQUEST
- DRAWING NUMBER ASSIGNMENT REPORT
- PROPOSED CRITICAL MANUFACTURING PROCESS DESCRIPTION

- This section defines elements that are used to manage other aspects of the TDP
- These are:
 - Source Control Drawing Approval
 - Deciding what is sources to use
 - Drawing Number Assignment Report
 - Only used when government CAGE code is used
 - Proposed Critical Manufacturing Process Description
 - Be very cautious, this can lead to sole source and or a very expensive TDP

6. TOP DATA MANAGEMENT PRODUCTS			
<input type="checkbox"/> SOURCE CONTROL DRAWING (SOCD) APPROVAL REQUEST <input type="checkbox"/> DRAWING NUMBER ASSIGNMENT REPORT <input type="checkbox"/> PROPOSED CRITICAL, MANUFACTURING PROCESS DESCRIPTION			
7. ASSOCIATED LISTS (X AND COMPLETE AS APPLICABLE)			
A. PARTS LISTS (X OR 1)	<input type="checkbox"/> (1) INTEGRAL	<input type="checkbox"/> (2) SEPARATE	<input type="checkbox"/> (3) CONTRACTOR SELECT
B. DATA LISTS	<input type="checkbox"/> REQUIRED (Specify Levels of Ass)		
C. INDEX LISTS	<input type="checkbox"/> REQUIRED (Specify Levels of Ass)		
D. WIRING LISTS	<input type="checkbox"/> REQUIRED (Specify Levels of Ass)		
E. APPLICATION LISTS	<input type="checkbox"/> (1) INTEGRAL	<input type="checkbox"/> (2) SEPARATE	<input type="checkbox"/> (3) CONTRACTOR SELECT
F. OTHER	<input type="checkbox"/> REQUIRED (Specify)		
8. APPLICABILITY OF STANDARDS. THE FOLLOWING STANDARDS APPLY: (X AS APPLICABLE)			
<input type="checkbox"/> ASME Y14.100 ENGINEERING DRAWING PRACTICES WITH APPENDICES		<input type="checkbox"/> ASME Y14.24 TYPES AND APPLICATIONS OF ENGINEERING DRAWINGS	<input type="checkbox"/> OTHER STANDARDS APPLY AS DESCRIBED
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		<input type="checkbox"/> ASME Y14.34 ASSOCIATED LIST <input type="checkbox"/> ASME Y14.35I REVISION OF ENGINEERING DRAWINGS AND ASSOCIATED LIST <input type="checkbox"/> ASME Y14.41 DIGITAL PRODUCT DEFINITION DATA PRACTICES <input type="checkbox"/> ASME Y14.8 DIMENSIONING AND TOLERANCING	<input type="checkbox"/> COMPANY STANDARDS PERMITTED <input type="checkbox"/> YES <input type="checkbox"/> NO
9. OTHER TAILORING (ATTACH ADDITIONAL SHEETS AS NECESSARY)			

FIGURE 2: TDP Option Selection Worksheet (cont.)

Section 7

7. ASSOCIATED LISTS (X AND COMPLETE AS APPLICABLE)

A. PARTS LISTS (X ONE)	<input type="checkbox"/> (1) INTEGRAL	<input type="checkbox"/> (2) SEPARATE	<input type="checkbox"/> (3) CONTRACTOR SELECT
B. DATA LISTS	<input type="checkbox"/> REQUIRED (Specify Levels of Assy)		
C. INDEX LISTS	<input type="checkbox"/> REQUIRED (Specify Levels of Assy)		
D. WIRING LISTS	<input type="checkbox"/> REQUIRED (Specify Levels of Assy)		
E. APPLICATION LISTS	<input type="checkbox"/> (1) INTEGRAL	<input type="checkbox"/> (2) SEPARATE	<input type="checkbox"/> (3) CONTRACTOR SELECT
F. OTHER	<input type="checkbox"/> REQUIRED (Specify)		

- If Associated Lists are called out in section 2, use this section to further define what lists are needed
- The terms integral or separate refer to where the list is located (either in the drawing/model) or as a separate document
- Required level refers to what level in the product structure the list is required

6. TOP DATA MANAGEMENT PRODUCTS

SOURCE CONTROL DRAWING (SCD) APPROVAL REQUEST
 DRAWING NUMBER ASSIGNMENT REPORT
 PROPOSED OPTICAL MANUFACTURING PROCESS DESCRIPTION

7. ASSOCIATED LISTS (X AND COMPLETE AS APPLICABLE)

A. PARTS LISTS (X ONE)	<input type="checkbox"/> (1) INTEGRAL	<input type="checkbox"/> (2) SEPARATE	<input type="checkbox"/> (3) CONTRACTOR SELECT
B. DATA LISTS	<input type="checkbox"/> REQUIRED (Specify Levels of Assy)		
C. INDEX LISTS	<input type="checkbox"/> REQUIRED (Specify Levels of Assy)		
D. WIRING LISTS	<input type="checkbox"/> REQUIRED (Specify Levels of Assy)		
E. APPLICATION LISTS	<input type="checkbox"/> (1) INTEGRAL	<input type="checkbox"/> (2) SEPARATE	<input type="checkbox"/> (3) CONTRACTOR SELECT
F. OTHER	<input type="checkbox"/> REQUIRED (Specify)		

8. APPLICABILITY OF STANDARDS. THE FOLLOWING STANDARDS APPLY: (X AS APPLICABLE)

<input type="checkbox"/> ASME Y14.100 ENGINEERING DRAWING PRACTICES WITH APPENDICES	<input type="checkbox"/> ASME Y14.24 TYPES AND APPLICATIONS OF ENGINEERING DRAWINGS	<input type="checkbox"/> OTHER STANDARDS APPLY AS DESCRIBED
<input type="checkbox"/> D	<input type="checkbox"/> ASME Y14.34 ASSOCIATED LIST	<input type="checkbox"/> COMPANY STANDARDS PERMITTED
<input type="checkbox"/> C	<input type="checkbox"/> ASME Y14.35 REVISION OF ENGINEERING DRAWINGS AND ASSOCIATED LIST	<input type="checkbox"/> YES <input type="checkbox"/> NO
<input type="checkbox"/> B	<input type="checkbox"/> ASME Y14.41 DIGITAL PRODUCT DEFINITION DATA PRACTICES	
<input type="checkbox"/> A	<input type="checkbox"/> ASME Y14.8 DIMENSIONING AND TOLERANCING	

8. OTHER TAILORING (ATTACH ADDITIONAL SHEETS AS NECESSARY)

FIGURE 2: TDP Option Selection Worksheet (cont.)

Section 8

8. APPLICABILITY OF STANDARDS. THE FOLLOWING STANDARDS APPLY: (X AS APPLICABLE)

ASME Y14.100
ENGINEERING DRAWING
PRACTICES

WITH APPENDICES:

B C D E

- ASME Y14.24 TYPES AND APPLICATIONS OF
ENGINEERING DRAWINGS
- ASME Y14.34 ASSOCIATED LIST
- ASME Y14.35M REVISION OF ENGINEERING
DRAWINGS AND ASSOCIATED LIST
- ASME Y14.41 DIGITAL PRODUCT DEFINITION DATA
PRACTICES
- ASME Y14.5 DIMENSIONING AND TOLERANCING

OTHER STANDARDS
APPLY AS DESCRIBED:

COMPANY STANDARDS
PERMITTED

YES NO

- This step is critical because not all of the element selections have a standard associated with them
- This section allows the user to select what standards should apply to the TDP as a whole
- It also decides if the contractor can use their company standards or not when preparing the TDP

TDP DATA MANAGEMENT PRODUCTS																										
<input type="checkbox"/> SOURCE CONTROL DRAWING (SCD) APPROVAL REQUEST	<input type="checkbox"/> DRAWING NUMBER ASSIGNMENT REPORT	<input type="checkbox"/> PROPOSED CRITICAL MANUFACTURING PROCESS DESCRIPTION																								
A1 ASSOCIATED LISTS (X AND COMPLETE AS APPLICABLE)																										
<table border="1"> <tr> <td>A. PARTS LISTS (X OR N/A):</td> <td><input type="checkbox"/> (1) INTEGRAL</td> <td><input type="checkbox"/> (2) SEPARATE</td> <td><input type="checkbox"/> CONTRACTOR SELECT</td> </tr> <tr> <td>B. DATA LISTS</td> <td colspan="3"><input type="checkbox"/> REQUIRED (Specify Levels of Assn)</td> </tr> <tr> <td>C. INDEX LISTS</td> <td colspan="3"><input type="checkbox"/> REQUIRED (Specify Levels of Assn)</td> </tr> <tr> <td>D. WIRING LISTS</td> <td colspan="3"><input type="checkbox"/> REQUIRED (Specify Levels of Assn)</td> </tr> <tr> <td>E. APPLICATION LISTS</td> <td><input type="checkbox"/> (1) INTEGRAL</td> <td><input type="checkbox"/> (2) SEPARATE</td> <td><input type="checkbox"/> CONTRACTOR SELECT</td> </tr> <tr> <td>F. OTHER</td> <td colspan="3"><input type="checkbox"/> REQUIRED (Specify)</td> </tr> </table>			A. PARTS LISTS (X OR N/A):	<input type="checkbox"/> (1) INTEGRAL	<input type="checkbox"/> (2) SEPARATE	<input type="checkbox"/> CONTRACTOR SELECT	B. DATA LISTS	<input type="checkbox"/> REQUIRED (Specify Levels of Assn)			C. INDEX LISTS	<input type="checkbox"/> REQUIRED (Specify Levels of Assn)			D. WIRING LISTS	<input type="checkbox"/> REQUIRED (Specify Levels of Assn)			E. APPLICATION LISTS	<input type="checkbox"/> (1) INTEGRAL	<input type="checkbox"/> (2) SEPARATE	<input type="checkbox"/> CONTRACTOR SELECT	F. OTHER	<input type="checkbox"/> REQUIRED (Specify)		
A. PARTS LISTS (X OR N/A):	<input type="checkbox"/> (1) INTEGRAL	<input type="checkbox"/> (2) SEPARATE	<input type="checkbox"/> CONTRACTOR SELECT																							
B. DATA LISTS	<input type="checkbox"/> REQUIRED (Specify Levels of Assn)																									
C. INDEX LISTS	<input type="checkbox"/> REQUIRED (Specify Levels of Assn)																									
D. WIRING LISTS	<input type="checkbox"/> REQUIRED (Specify Levels of Assn)																									
E. APPLICATION LISTS	<input type="checkbox"/> (1) INTEGRAL	<input type="checkbox"/> (2) SEPARATE	<input type="checkbox"/> CONTRACTOR SELECT																							
F. OTHER	<input type="checkbox"/> REQUIRED (Specify)																									
A2 APPLICABILITY OF STANDARDS. THE FOLLOWING STANDARDS APPLY: (X AS APPLICABLE)																										
<input type="checkbox"/> ASME Y14.100 ENGINEERING DRAWING PRACTICES WITH APPENDICES: <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E		<input type="checkbox"/> ASME Y14.24 TYPES AND APPLICATIONS OF ENGINEERING DRAWINGS <input type="checkbox"/> ASME Y14.34 ASSOCIATED LIST <input type="checkbox"/> ASME Y14.35M REVISION OF ENGINEERING DRAWINGS AND ASSOCIATED LIST <input type="checkbox"/> ASME Y14.41 DIGITAL PRODUCT DEFINITION DATA PRACTICES <input type="checkbox"/> ASME Y14.5 DIMENSIONING AND TOLERANCING																								
<input type="checkbox"/> OTHER STANDARDS APPLY AS DESCRIBED COMPANY STANDARDS PERMITTED <input type="checkbox"/> YES <input type="checkbox"/> NO																										

FIGURE 2: TDP Option Selection Worksheet (cont.)

Section 9

9. OTHER TAILORING (ATTACH ADDITIONAL SHEETS AS NECESSARY)

- This section is a freeform area that allows the user to add any additional tailoring information
- Additional documents and/or sheets can be called out to further tailor the TDP
- It is also used to clarify some selections made earlier in the worksheet

The figure shows a screenshot of the 'TDP Option Selection Worksheet (cont.)'. A red box highlights the '9. OTHER TAILORING (ATTACH ADDITIONAL SHEETS AS NECESSARY)' section. The worksheet contains several sections:

- 4. TOP DATA MANAGEMENT PRODUCTS:** Includes checkboxes for 'SOURCE CONTROL DRAWING (SCD) APPROVAL REQUEST', 'DRAWING NUMBER ASSIGNMENT REPORT', and 'PROPOSED CRITICAL MANUFACTURING PROCESS DESCRIPTION'.
- 7. ASSOCIATED LISTS (X AND COMPLETE AS APPLICABLE):** Sub-sections A through F, each with checkboxes for 'INTEGRAL', 'SEPARATE', and 'CONTRACTOR SELECT'. Sub-section E includes a note '(Specify Levels of Assembly)'.
- 8. APPLICABILITY OF STANDARDS: THE FOLLOWING STANDARDS APPLY: (X AS APPLICABLE)**:
 - ASME Y14.100 ENGINEERING DRAWING PRACTICES WITH APPENDICES: Options include 'ASME Y14.24 TYPES AND APPLICATIONS OF ENGINEERING DRAWINGS', 'ASME Y14.34 ASSOCIATED LIST', 'ASME Y14.35R REVISION OF ENGINEERING DRAWINGS AND ASSOCIATED LIST', and 'ASME Y14.41 DIGITAL PRODUCT DEFINITION DATA PRACTICES'.
 - ASME Y14.9 DIMENSIONING AND TOLERANCING: Options include 'ASME Y14.24 TYPES AND APPLICATIONS OF ENGINEERING DRAWINGS', 'ASME Y14.34 ASSOCIATED LIST', 'ASME Y14.35R REVISION OF ENGINEERING DRAWINGS AND ASSOCIATED LIST', and 'ASME Y14.41 DIGITAL PRODUCT DEFINITION DATA PRACTICES'.
- 9. COMPANY STANDARDS PERMITTED:** Options 'YES' and 'NO'.
- 10. OTHER TAILORING (ATTACH ADDITIONAL SHEETS AS NECESSARY):** A large red box surrounds this section.

FIGURE 2: TDP Option Selection Worksheet (cont.)

Commercial Drawings/Models and Associated Lists Worksheet

- This worksheet is similar to the previous one but only applies to Commercial Drawings/Models that may be included in the TDP to support COTS (Commercial Off The Shelf) items
- The selections are the same as the previous worksheet except fewer in number because not as much information is available when buying a commercial item

TDP OPTION SELECTION WORK SHEET COMMERCIAL DRAWING & MODEL S AND ASSOCIATED LISTS			
SYSTEM:		DATE PREPARED:	
A. CONTRACT NO.	B. EXHIBIT / ATTACHMENT NO.	C. CLIN	D. CDRL DATA ITEM NO(s)
1. DELIVERABLE DATA PRODUCTS (X ALL THAT APPLY AND COMPLETE AS APPLICABLE)			
TYPE		FORMAT	
A. <input type="checkbox"/> 2D DRAWINGS		<input type="checkbox"/> NATIVE CAD	<input type="checkbox"/> ISO 32000 PDF
		<input type="checkbox"/> OTHER FORMAT (SPECIFY) _____	<input type="checkbox"/> HARDCOPY
B. 3D DIGITAL MODELS:			
<input type="checkbox"/> 3D DIGITAL MODELS ONLY		<input type="checkbox"/> NATIVE CAD	<input type="checkbox"/>
<input type="checkbox"/> 3D DIGITAL MODELS W/ ASSOCIATED 2D DRAWINGS		<input type="checkbox"/> NEUTRAL FORMAT (SPECIFY, e.g., ISO10303, APxxx)	<input type="checkbox"/>
		<input type="checkbox"/> OTHER FORMAT (SPECIFY) _____	<input type="checkbox"/>
C. <input type="checkbox"/> METADATA (Specify in Section 2) <input type="checkbox"/> ASCII TEXT-PIPE DELIMITED <input type="checkbox"/> ISO 10303 STEP (SPECIFY, e.g., APxxx, DEX)			
		<input type="checkbox"/> JEDMIG2 (DLF)	<input type="checkbox"/> OTHER FORMAT (SPECIFY) _____
D. <input type="checkbox"/> ASSOCIATED LISTS <input type="checkbox"/> NATIVE FORMAT <input type="checkbox"/> ISO 32000 PDF <input type="checkbox"/> HARDCOPY			
		<input type="checkbox"/> OTHER FORMAT (SPECIFY) _____	<input type="checkbox"/>
2. OTHER TAILORING (ATTACH ADDITIONAL SHEETS AS NECESSARY)			

FIGURE 3: TDP Option Selection Worksheet – Commercial Drawing/Models and Associated Lists

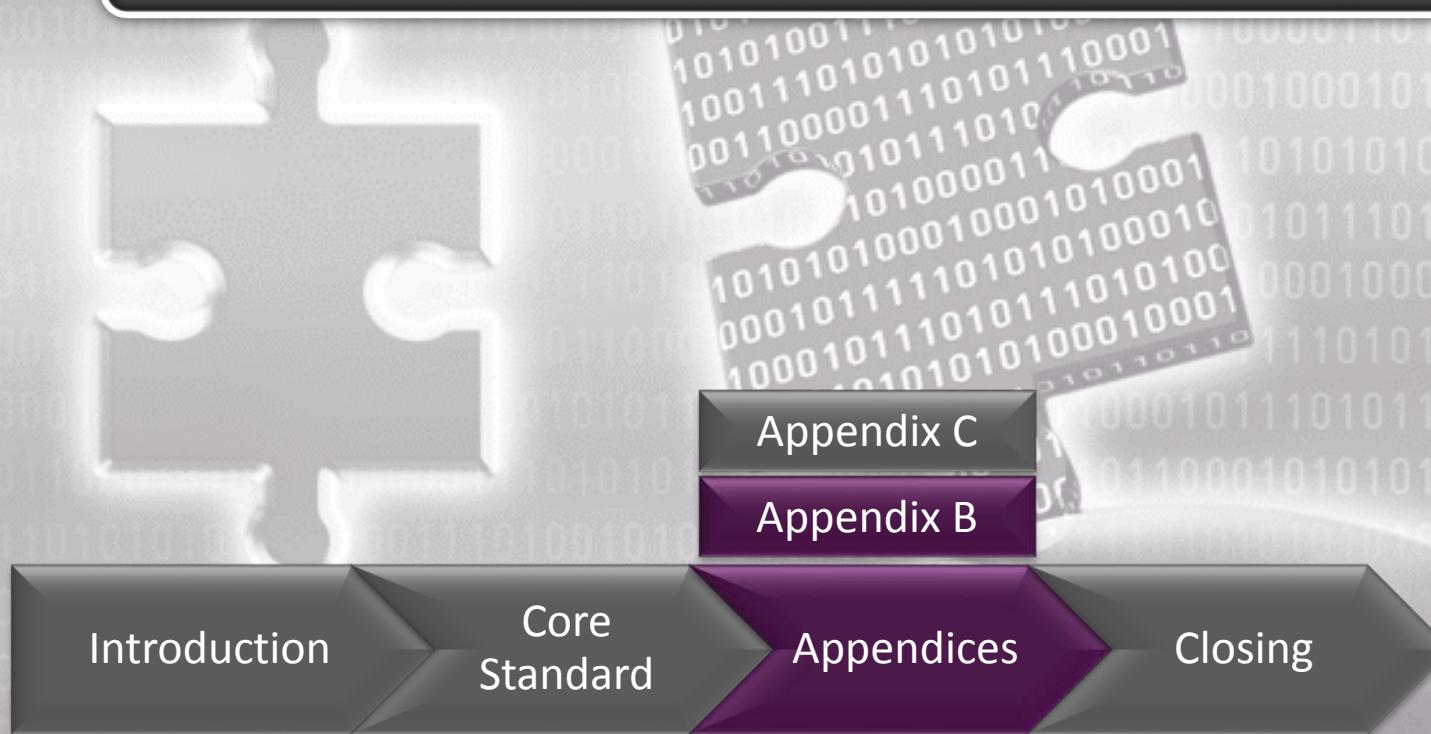
DIDs and MIL-STD-31000

The following Data Item Descriptions are used in conjunction with 31000A

DID Number	DID Title	Suggested Tailoring	Reference Paragraph
DI-SESS-81001E	Conceptual Design Drawings/Models	Appendix A	A.2.4.1
DI-SESS-81002F	Developmental Design Drawings/Models and Associated Lists	Appendix A	A.2.4.2
DI-SESS-81000E	Product Drawings/Models and Associated Lists	Appendix A	A.2.4.3
DI-SESS-81003E	Commercial Drawings/Models and Associated Lists	Appendix A	A.2.4.4
DI-SESS-81004E	Special Inspection Equipment Drawings/Models and Associated Lists	Appendix A	A.2.4.5
DI-SESS-81008E	Special Tooling Drawings/Models and Associated Lists	Appendix A	A.2.4.6
DI-SESS-81010E	Source Control Drawing Approval Request	Appendix A	A.2.5.1.b
DI-SESS-81011E	Drawing/Model Number Assignment Report	Appendix A	A.2.5.2.b
DI-SESS-81012E	Proposed Critical Manufacturing Process Description	Appendix A	A.2.5.3.b
DI-CMAN 80776A	Technical Data Package	Appendix A	A.2.4.3

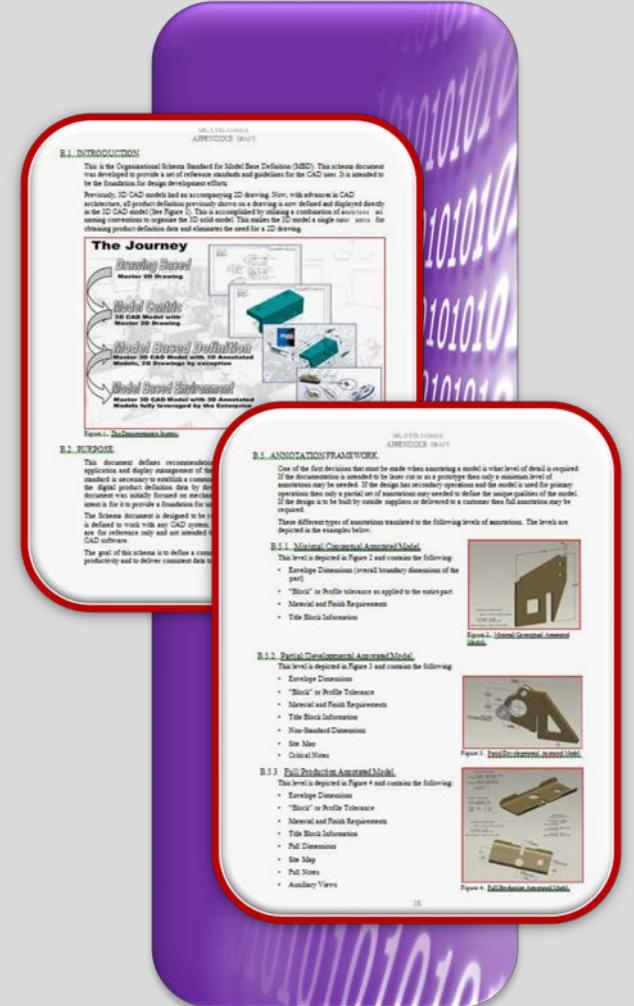
Appendices B and C

Appendix B: How to organize a model



Appendix B – Model Schema

- This appendix provides a baseline modeling organization schema to insure the model can be easily understood and reused
- If a contractor desires to use their own schema, they simply provide a document mapping it to this appendix
- Remember, like all appendices in MIL Standards it is reference only unless called out by the contract



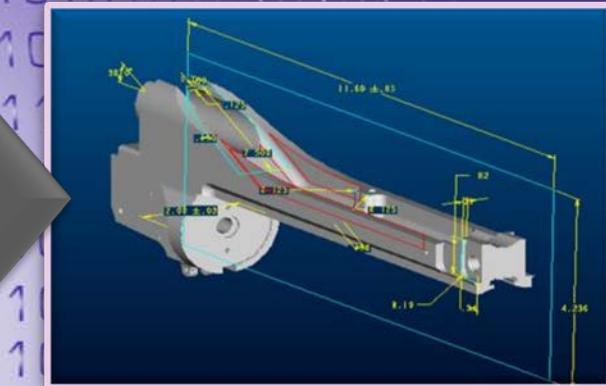
Why a Schema?

Enabling Reuse Through Organization

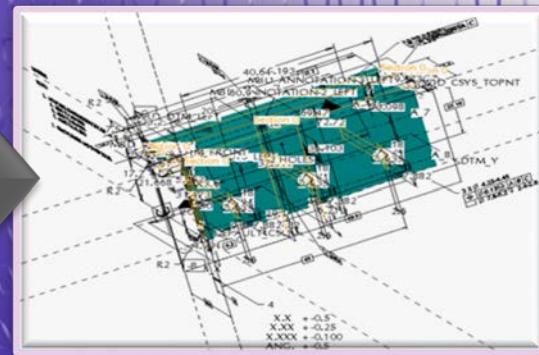
From
This



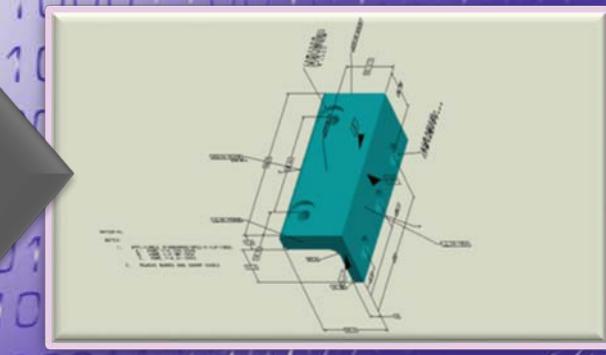
To
This



From
This



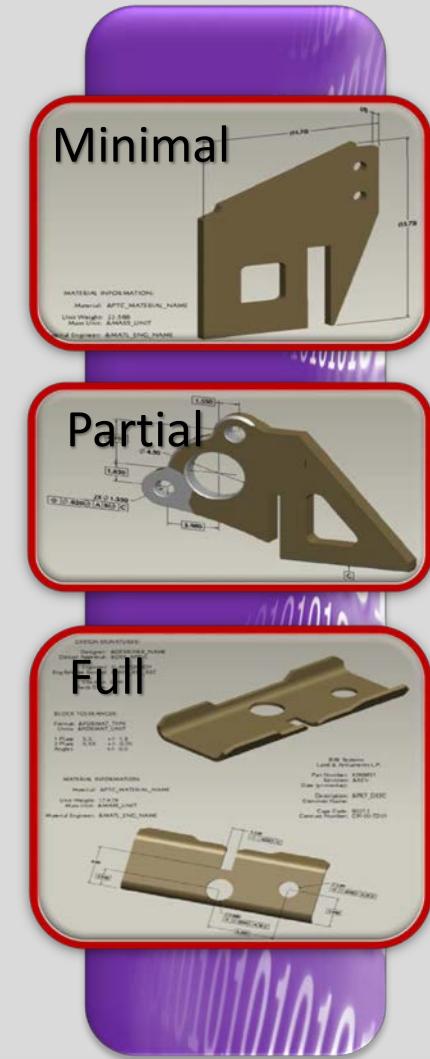
To
This



Levels Of Annotated Models

The Model Organization Schema also defines three basic levels of annotated models

- Conceptual/Minimal Annotation
 - Only contains general information
 - Examples are: Material, Finish, Envelope Dims
- Developmental/Partial Annotation
 - Only contains non standard or critical information
 - Adds to minimal definition
 - Examples are key and critical dimensions, interface notes
- Production/Full Annotation
 - Contains all information needed to clearly define a product
 - Adds to Partial
 - Examples are complete dimensions and notes



Appendices B and C

Appendix C: How to measure the quality of a model

Appendix C

Appendix B

Introduction

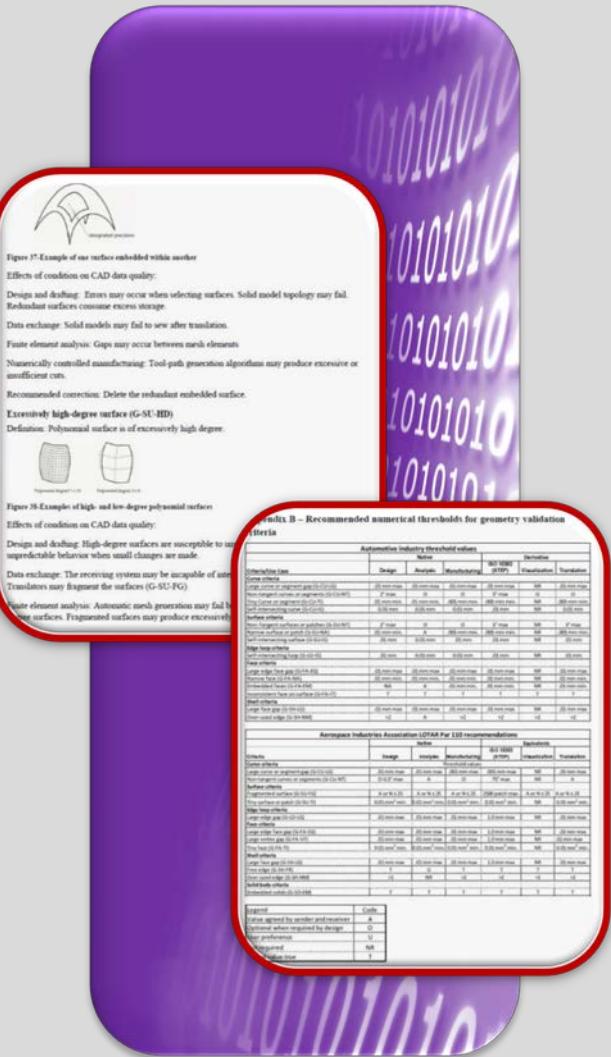
Core Standard

Appendices

Closing

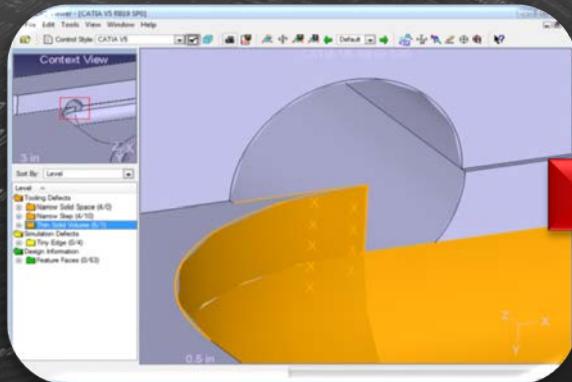
Appendix C – Model Validation

- The quality of a model determines how easily it can be reused
 - This appendix gives guidelines for defining that quality
 - Every program should have a model quality guideline
 - Guidance is under development to validate the conversion of a Drawing to a 3D Annotated Model
 - Again note that to be used this must be called out in the contract



Why Validate?

Because...

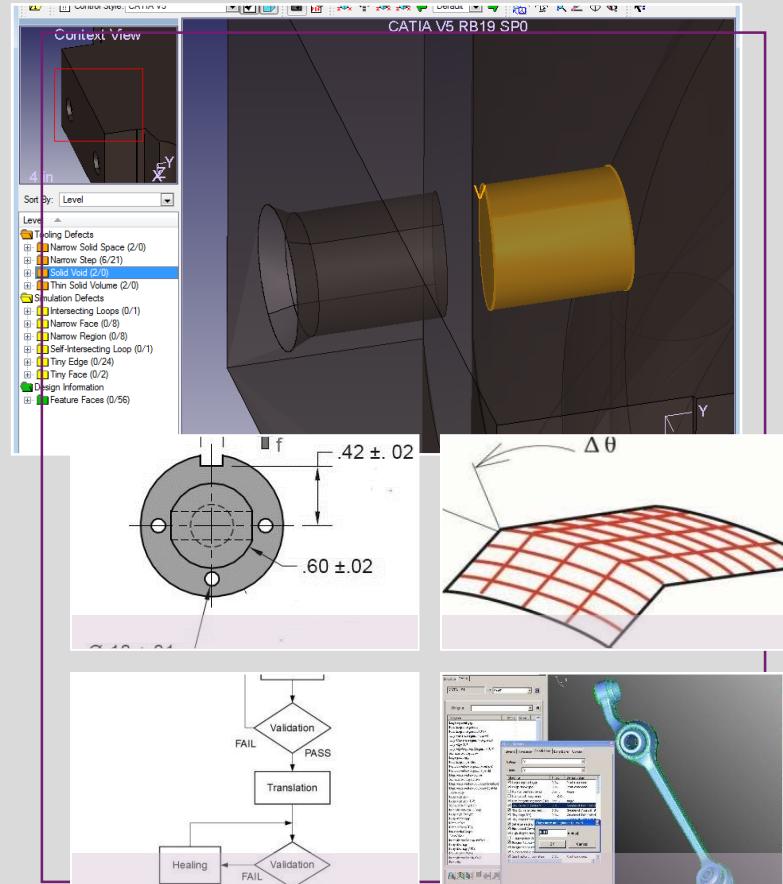


... If you don't

Contents

Appendix C contains the following:

- Technical Glossary
- Explanation of Checks
- High-Level Processes
- Examples
- Checks for Geometry, Visualization and PMI
- Checks for Derivative Models
- Tailoring Worksheet
- Recommended Values



Worksheet

- Similar to the main standard Appendix C has a worksheet to define what checks are needed
- Each program should review the checks and decide which are applicable (along with their associated tolerance)
- There are recommended values and checks if the program has no preference

C.8.1. Department of Defense Product Data Validation Criteria Worksheet

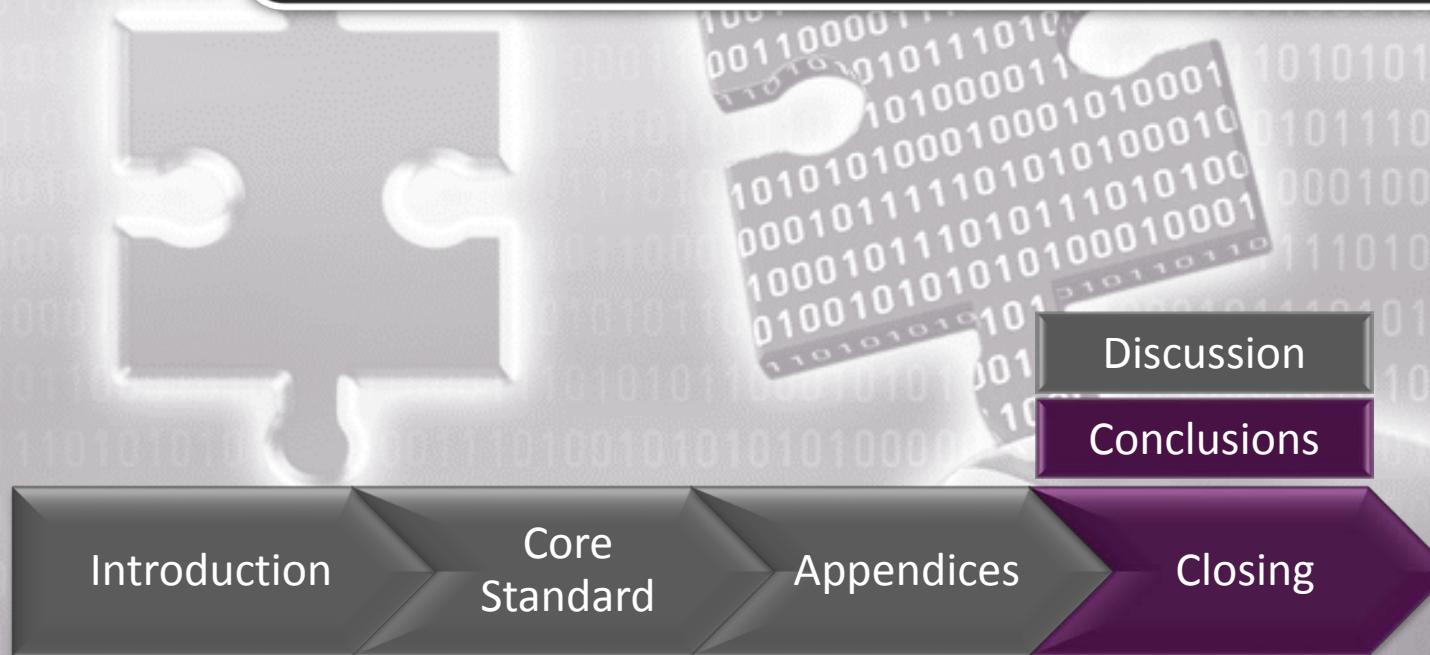
Supplier name	Contract number	Contact name	Contact phone
Source CAD system	Software release/build	Delivery format: <input type="checkbox"/> same as source <input type="checkbox"/> ISO 10303-203 (STEP) <input type="checkbox"/> JT <input type="checkbox"/> 3D PDF	
Commercial CAD software Software release/build		Intended use: <input type="checkbox"/> design changes <input type="checkbox"/> analysis <input type="checkbox"/> manufacturing <input type="checkbox"/> archival storage <input type="checkbox"/> design review <input type="checkbox"/> supplier distribution	
Conformance required	Validation Criteria	Validation code	Threshold value (mm)
Curve criteria			
<input type="checkbox"/> Large curve or segment gap (G-C-G)	<input type="checkbox"/> Wavy surface (G-SU-WV)	(G-SU-CR)	_____
<input type="checkbox"/> Non-tangent curves or segments (G-C-N)	<input type="checkbox"/> Small surface radius of curvature (G-SU-CR)	(G-ED-TI)	_____
<input type="checkbox"/> Non-smooth curves or segments (G-C-N)	<input type="checkbox"/> Edge criteria (G-ED-FG)	(G-ED-IO)	_____
<input type="checkbox"/> Tiny Curve or segment (G-C-T)	<input type="checkbox"/> Fragmented Edge (G-ED-FG)	(G-ED-IO)	_____
<input type="checkbox"/> Indistinct curve knots (G-C-I)	<input type="checkbox"/> Inconsistent edge on curve (G-ED-IO)	(G-LO-LG)	_____
<input type="checkbox"/> Self-Intersecting curve (G-C-S)	<input type="checkbox"/> Edge loop criteria (G-LO-LG)	(G-LO-NT)	_____
<input type="checkbox"/> Embedded curves (G-C-E)	<input type="checkbox"/> Large edge gap (G-LO-NT)	(G-LO-NS)	_____
<input type="checkbox"/> Excessively high-degree Curve (G-C-EH)	<input type="checkbox"/> Non-tangent edges (G-LO-NS)	(G-LO-IT)	_____
<input type="checkbox"/> Fragmented curve (G-C-F)	<input type="checkbox"/> Self-intersecting loop (G-LO-IT)	(G-LO-SA)	_____
<input type="checkbox"/> Wavy planar curve (G-C-W)	<input type="checkbox"/> Sharp Edge Angle (G-LO-SA)	(G-LO-IT)	_____
<input type="checkbox"/> Small radius of curvature (G-C-SR)	<input type="checkbox"/> Inconsistent edge in loop (G-LO-IT)	(G-FA-EG)	_____
Surface criteria			
<input type="checkbox"/> Large gap between surfaces (G-S-G)	<input type="checkbox"/> Face criteria (G-FA-EG)	(G-FA-VF)	_____
<input type="checkbox"/> Non-Tangent surfaces or patches (G-S-N)	<input type="checkbox"/> Large edge face gap (G-FA-VF)	(G-FA-TI)	_____
<input type="checkbox"/> Non-smooth surfaces or patches (G-S-N)	<input type="checkbox"/> Tiny face (G-FA-TI)	(G-FA-NA)	_____
<input type="checkbox"/> Tiny surface or patch (G-S-T)	<input type="checkbox"/> Narrow face (G-FA-NA)	(G-FA-RN)	_____
<input type="checkbox"/> Narrow surface or patch (G-S-N)	<input type="checkbox"/> Narrow region (G-FA-RN)	(G-FA-IS)	_____
<input type="checkbox"/> Relatively narrow neighboring (G-S-RN)	<input type="checkbox"/> Intersecting loops (G-FA-IS)	(G-FA-EM)	_____
<input type="checkbox"/> Degenerate surface boundary (G-S-D)	<input type="checkbox"/> Embedded faces (G-FA-EM)	(G-FA-IT)	_____
<input type="checkbox"/> Degenerate surface corner (G-S-DC)	<input type="checkbox"/> Inconsistent face on surface (G-FA-IT)	(G-FA-MU)	_____
<input type="checkbox"/> Indistinct surface knots (G-S-ID)	<input type="checkbox"/> Multi-region surface (G-FA-MU)	(G-SH-LG)	_____
<input type="checkbox"/> Self-intersecting surface (G-S-SI)	<input type="checkbox"/> Shell criteria (G-SH-LG)	(G-SH-NT)	_____
<input type="checkbox"/> Embedded surfaces (G-S-E)	<input type="checkbox"/> Large face gap (G-SH-NT)	(G-SH-NS)	_____
<input type="checkbox"/> Excessively high-degree surface (G-S-EH)	<input type="checkbox"/> Non-tangent faces (G-SH-NS)	(G-SH-IS)	_____
<input type="checkbox"/> Fragmented surface (G-S-F)	<input type="checkbox"/> Self-intersecting shell (G-SH-IS)	(G-SH-SA)	_____
<input type="checkbox"/> Unused patches (G-S-U)	<input type="checkbox"/> Sharp face angle (G-SH-SA)	(G-SH-IT)	_____
<input type="checkbox"/> Folded surface (G-S-F)	<input type="checkbox"/> Inconsistent face in shell (G-SH-IT)	(G-SH-FR)	_____
Solid body criteria			
<input type="checkbox"/> Large face gap (G-SH-LG)	<input type="checkbox"/> Free edge (G-SH-FR)	(G-SH-NM)	_____
<input type="checkbox"/> Non-tangent faces (G-SH-NT)	<input type="checkbox"/> Over-used edge (G-SH-NM)	(G-SH-OU)	_____
<input type="checkbox"/> Non-smooth faces (G-SH-NS)	<input type="checkbox"/> Over-used vertex (G-SH-OU)	(G-SH-OU)	_____
<input type="checkbox"/> Self-intersecting shell (G-SH-IS)	<input type="checkbox"/> Solid body criteria (G-SH-OU)	(G-SO-EM)	_____
<input type="checkbox"/> Sharp face angle (G-SH-SA)	<input type="checkbox"/> Embedded solids (G-SO-EM)	(G-SO-IS)	_____
<input type="checkbox"/> Inconsistent face in shell (G-SH-IT)	<input type="checkbox"/> Intersecting Shells (G-SO-IS)	(G-SO-MU)	_____
<input type="checkbox"/> Free edge (G-SH-FR)	<input type="checkbox"/> Multi-volume solid (G-SO-MU)	(G-SO-VO)	_____
<input type="checkbox"/> Over-used edge (G-SH-NM)	<input type="checkbox"/> Solid void (G-SO-VO)	(G-SO-TI)	_____
<input type="checkbox"/> Over-used vertex (G-SH-OU)	<input type="checkbox"/> Tiny solid (G-SO-TI)		
Signatures:		Date	Supplier Date
Contracting officer		Date	Supplier Date

Recommended Tolerance Values

Automotive industry threshold values						
Criteria/Use Case	Native			Derivative		
	Design	Analysis	Manufacturing	ISO 10303 (STEP)	Visualization	Translation
Curve criteria						
Large curve or segment gap (G-CU-LG)	.01 mm max	.01 mm max	.01 mm max	.01 mm max	NR	.01 mm max
Non-tangent curves or segments (G-CU-NT)	2° max	O	O	3° max	O	O
Tiny Curve or segment (G-CU-TI)	.01 mm min.	.01 mm min.	.005 mm min.	.005 mm min.	NR	.005 mm min.
Self-intersecting curve (G-CU-IS)	0.01	0.01	0.01	0.01	NR	0.01
Automotive industry threshold values						
Surface criteria						
Non-Tangent surfaces or patches (G-SU-NT)	2°					
Narrow surface or patch (G-SU-NA)	.01 mm					
Self-intersecting surface (G-SU-IS)	0.01					
Edge loop criteria						
Self-intersecting loop (G-LO-IS)	.01 mm					
Face criteria						
Large edge face gap (G-FA-EG)	.01 mm					
Narrow face (G-FA-NA)	.01 mm					
Embedded faces (G-FA-EM)						
Inconsistent face on surface (G-FA-IT)						
Shell criteria						
Large face gap (G-SH-LG)	.01 mm					
Over-used edge (G-SH-NM)						

Closing

Conclusions: Review of what we have learned



Summary – What It Provides

- Defines what makes up both 2D and 3D TDPs
- Better alignment between the TDP and the product lifecycle to ensure the right data is acquired at the right point in the lifecycle
- Defines a 3D TDP that uses modern data to provide a product definition foundation that can be reused throughout the lifecycle
- Defines a complete up to date TDP that can be used to competitively bid the product
- Provides a method for both structuring and verifying the quality of a 3D TDP

Summary - Benefits

- Fewer sole source because of the ability to increase competition by acquiring the complete product definition
- Higher quality data thus reducing the risk of errors during production and sustainment
- Reduces the time to mission on critical programs by providing reusable, quality, modern data
- Potentially reduces cost by using the same modern data as the contractor and reducing labor through reuse vs. recreation
- By defining the right TDP early in the lifecycle it helps to avoid costly renegotiations for missing data during the later part of the lifecycle
- Fully supports and enables the tenants of Better Buying Power 2.0

Summary – Key Take A Ways

- Whenever possible obtain the 3D model data as part of the TDP
- Always obtain the TDP in both its Native and a Standard Based format
- Use the option selection worksheets to define what TDP elements are needed
- Specifically specify all appendices and standards in the contract that are needed to support the complete TDP
- While it may incur substantial cost to acquire a complete TDP in the initial stages of a program, it will cost dramatically more to acquire it once the product is made

Closing

Discussions: What have we missed?



Discussion

Conclusions

Introduction

Core
Standard

Appendixes

Closing

Questions?



Thank You

Image by DoD Live



Thank you
for your time and
consideration