TOWARDS A BETTER (MODERN) TDP with 3DPDF

A New Way of Communication
Agenda

- TDP overview
- TDP evolution
- Modern TDP
- Construction of a modern TDP
- Demo
- Q&A
What is a Technical Data Package?

- Geometric description (form)
- Product Manufacturing Information (fit)
- QA requirements
- Material specifications
- Reliability data
- Maintenance specifications
- Manufacturing process and tooling data
- Packaging
- Performance requirements
- Certifications
- Other product definition data
Why are TDP’s important?

- Second source manufacture
- Operate, train, maintain, repair
- Spares provisioning
- Overhaul / upgrade / refit
- Replacement manufacturing
Once upon a time (Phase 1 TDP’s)
Issues with TDP’s technical documentation

**Engineering Documentation: Issues and Problems**

- Suppliers or downstream consumers request additional clarifications of engineering documentation: 58%
- Suppliers or downstream consumers recreate 3D model: 51%
- Suppliers or downstream consumers do not have access to the necessary CAD application: 41%
- Scrap and rework resulting from incorrect or misinterpretations of engineering documentation: 40%
- Suppliers or downstream consumers do not have the latest revision of the 3D models or 2D drawing: 39%

**On average, per week, engineers spend...**
- 21.3 hours creating drawings
- 6.4 hours answering questions or clarifying drawings
- 5.5 hours generating additional drawing documentation

**On average, per week, machinists spend...**
- 8.3 hours creating manufacturing or quality documentation
- 4.7 hours answering questions or clarifying documentation
- 4.1 hours generating additional documentation

Electronic delivery! (Phase 2 TDP’s)
What did we gain?

• More efficient information exchange
• Better management of documentation
• Traceability
  • Clearer, more concise communication
PDF – One “container” ubiquitously accessible

- TDP form itself
- 2D Drawings
- 3D Models of any type
- Metadata
- Associated documents
- Supplemental data
PDF Portfolio with 3D Model (Phase 3)

- PDF “portfolio” allows inclusion of attachments
- Container provides seamless transmittal
- Consumption of model not provided within PDF
- External app may or may not be available!
Model-Based Definition (MBD) and TDP’s

- MBD users
  - Build ½ the number of prototypes
  - Shorten development cycle by 30% - 50%
  - Reduce non-conformance issues by 30%-40%

(40% of non-conformance issues are due to 2D drawing inaccuracies and ambiguities)

Source: Aberdeen Group study
Publish MBD to PDF with 3D (Phase 4)
Fully leverage the capabilities of the PDF platform

- Templates ensure consistent presentation
- Portfolios enable “collections” of information
- Interactivity connects relevant, disparate data
- Relationships improve navigation
Publish “interactive 3DPDF” with MBD (Phase 5)
Moving towards the “modern” TDP

Phase 1: Paper-based
Phase 2: Electronic Delivery
Phase 3: PDF w/ included 3D model
Phase 4: PDF with MBD 3D
Phase 5: Interactive 3DPDF with MBD

Effectiveness vs. Maturity
Ubiquitous Consumption

• Adobe Reader omnipresent
• Mobile consumption
• Web consumption
• Snaps into existing document management processes
• Archivable
Value of a modern TDP

- 27% reduction in procurement cost
- Reduction in quoting (accounts for 8% of cost)
- 19% of supplier scrap and rework due to poor TDP quality

Source: Defense Logistics Agency (DLA) survey
Benefits summary

• For customer
  • Reduced procurement costs
  • Lower overall lifecycle costs
  • Frictionless consumption
  • Shorter time to service

• For supplier
  • Reduced risk
  • Faster time to award
  • Increased profit margins
  • Competitive advantage
Resources

- 3DPDF Consortium – www.3dpdfconsortium.org
- Modeling Based Enterprise – www.modelbasedenterprise.org
- Tech Soft 3D – www.techsoft3d.com
- Tetra4D products – www.tetra4d.com
- Email: Jordan Opsahl – jordan@tetra4d.com
  Dave Opsahl – dave@techsoft3d.com