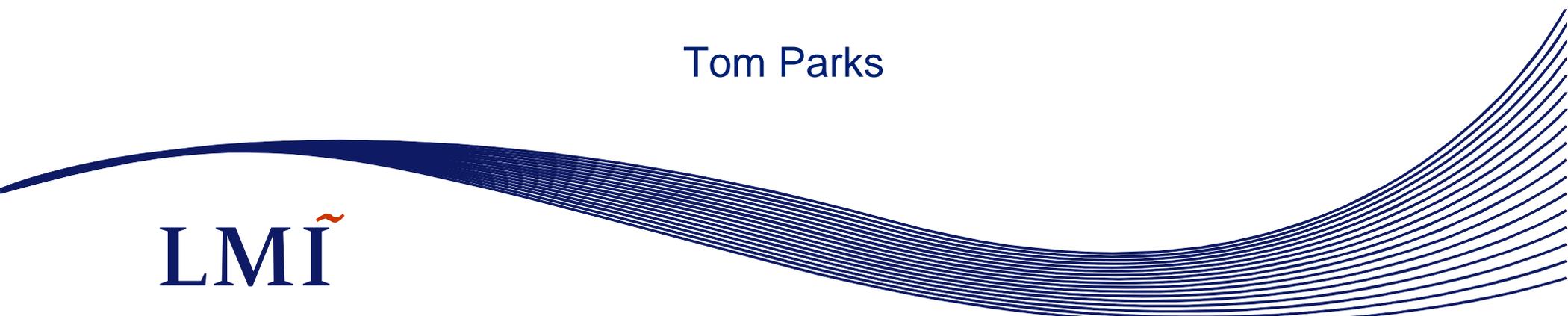


Testing the Use of 3D Technical Data to Buy Legacy Parts at the Defense Logistics Agency*

MBE Summit
April 14, 2016

Tom Parks



LMI

* DLA Weapon System Sustainment Program R&D Project

Issue

- DLA's current procurement processes are built to use 2D technical data
- Industry and Services have transitioned to CAD and CAM, which produce and use 3D technical data
- DLA does not have, but needs, capability to routinely procure parts using 3D technical data

Background: DLA's Capability Gap

- DLA can't access and display full product definition contained in 3D files
 - Precludes required completeness and consistency checks before solicitation release
- Root cause: 3D technical data recorded in multiple proprietary CAD formats (native file format)
 - SolidWorks, CREO 2 (Pro-E), NX, CATIA
 - DLA doesn't have appropriate software and training
 - Imagenation Viewer does not provide access to all data in a native CAD file
 - PDS/PSs* lack CAD literacy to locate data within native file

Background: DLA Must Solve 3 Challenges to Effectively Use 3D Technical Data

- To successfully fill DLA capability gap, solution must solve three major challenges
 - Provide PDS/PS* ability to fully access and view technical data (full data access)
 - Ensure PDS/PS* can easily locate and confirm inclusion of requisite information for procurement and manufacturing (easily locate data)
 - Ensure solicitation package technical data is accessible and useable by a majority of potential suppliers (supplier accessibility to data)

Background: Options to Solve Capability Gap

- **Option 1:** purchase software packages for each unique proprietary CAD software platform
- **Option 2:** require technical data be recorded in a single proprietary CAD format*
- **Option 3:** require technical data be recorded in 'neutral file format'*

Background: Comparison of Options

Options	Challenges		
	Full Data Access	Easily Locate Data	Supplier Accessibility to Data
<i>(1) Purchase S/W for each CAD Platform</i>	●	●	●
<i>(2) Require TDPs in One CAD Format</i>	●	●	●
<i>(3) Require TDPs in Neutral Format</i>	●	●	●



Low cost solution



High cost solution



Does not solve challenge

Only Option 3 can solve all 3 challenges!

Preferred Neutral File Format*

- 3D PDF (PRC** format) + STEP file (AP203 format)
- 3D PDF document can be read using Adobe Reader or Adobe Acrobat software
 - Widely available (installed on all DoD computers and ~90% of commercial computers)
 - Software is available via free web download
 - PDF format is intuitive to navigate
- 3D PDF + STEP is a neutral file combination that provides full product definition, includes geometry to create machine code for CNC manufacturing, meets TDP 'publishing' requirements, and is a stand-alone product

Desired End-state

- DLA uses 3D PDF (PRC) and STEP (AP203) files to build solicitation TDPs for weapon system parts procurement
- Services provide DLA with complete and validated 3D technical data in 3D PDF (PRC) and STEP (AP203) file formats
 - ARDEC (Rock Island and Picatinny Arsenals) has developed 3D PDF Template
 - NAWC Lakehurst has developed 3D PDF Template
 - Warner Robins has developed 3D PDF Template

3D PDF File Example

Sample 3D PDF File

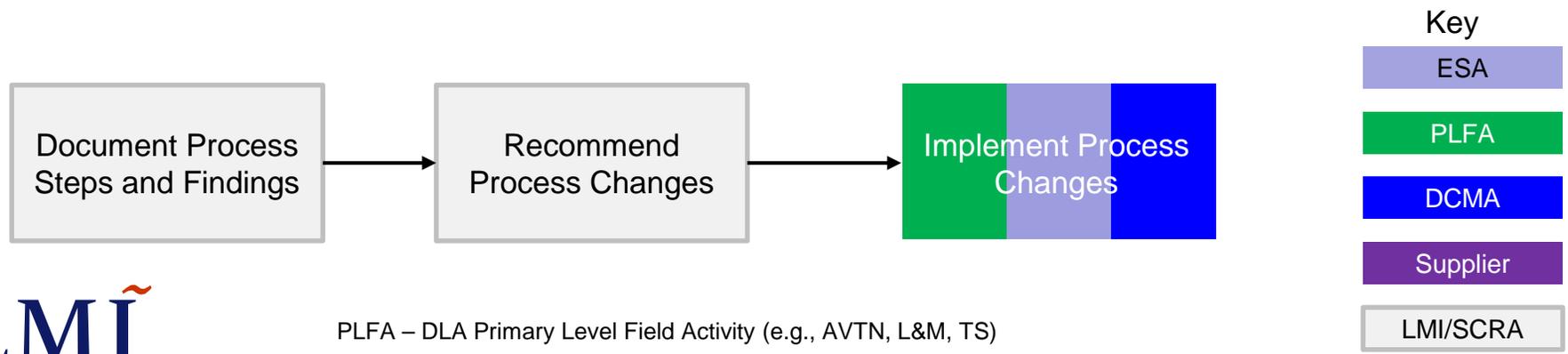
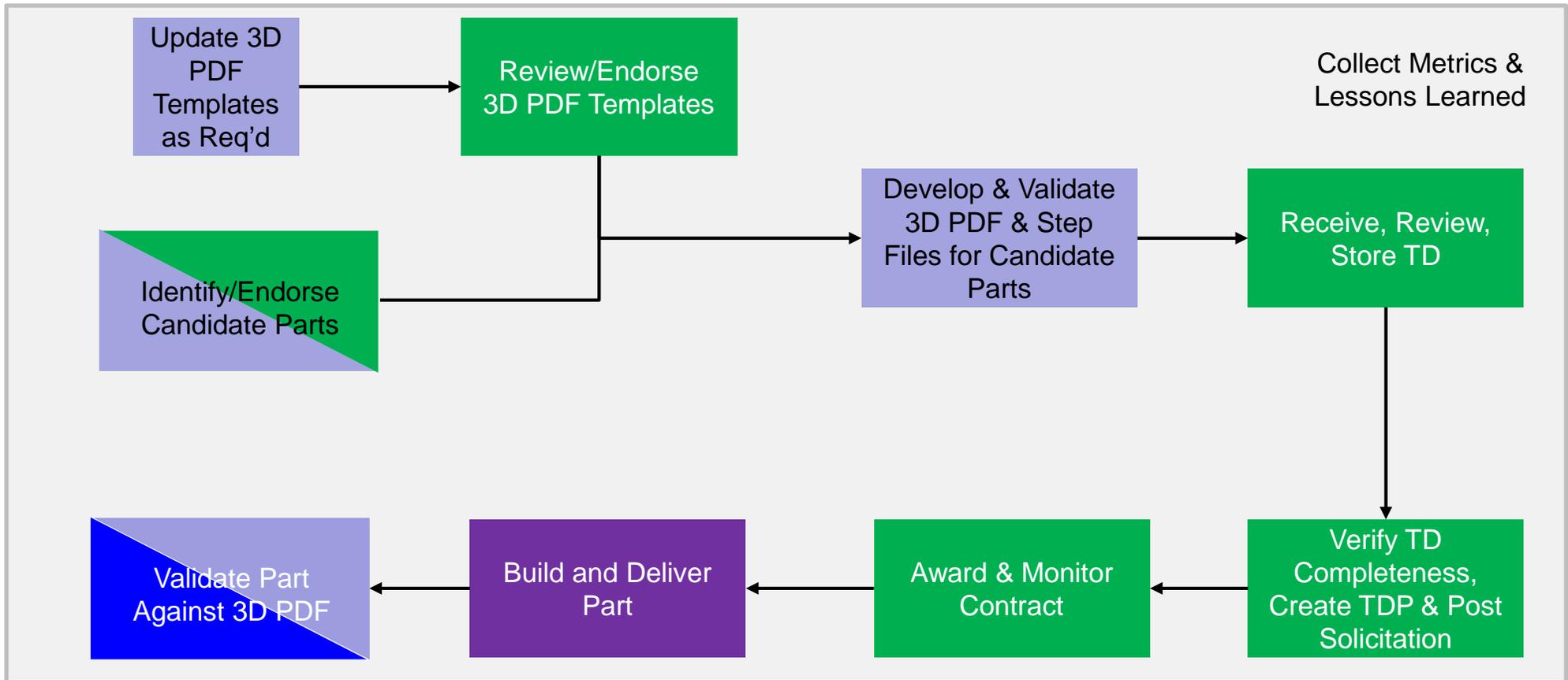
3D PDF Demo Objective

- Demonstrate/assess DLA's capability to acquire real parts (Class IX items)* using only 3D PDF technical data plus a STEP file (AP203)
 - Includes demonstrating/assessing ESA processes to deliver 3D technical data to DLA
 - Includes DLA ability to receive and use 3D technical data from ESAs
 - Includes assessing supplier's ability to use 3D PDF and STEP files
 - Includes DCMA's ability to use 3D PDF data for on-site inspection

Technical Approach - Overview

- Task 1: Limited Procurement
 - Conduct live acquisition of Class IX parts using DLA procurement process
 - Validate delivered parts against 3D TDP (data of record)
 - Document end-to-end process from technical data conversion to validation; identify responsible/performing activities
 - Collect/assess metrics and lessons learned
 - Summarize findings, recommend process changes
- Go/No-go Decision
- Task 2: Full and Open Procurement
 - Incorporate Task 1 lessons learned/recommended process changes
 - Repeat Task 1 steps using different set of Class IX parts
- Task 3: Final Report

Demo Process Flow and Division of Labor



Candidate Part List

<i>NSN</i>	<i>Nomenclature</i>	<i>ESA</i>	<i>Supply Chain</i>
1005-00-701-2757	Screw, Brake	ARDEC	L&M
1005-00-072-6112	Support, Deflector	ARDEC	L&M
1005-00-701-2756	Bracket, Brake	ARDEC	L&M
5340-00-701-2758	Bracket, Cam Brake	ARDEC	AVTN
3130-01-251-1742	Cap, Pillow Block	Warner Robins	AVTN
3110-01-003-1296	Plate, Retaining, Bearing	Warner Robins	AVTN
5340-01-608-4916	Cable Sheave Guide	Lakehurst	TS
5340-01-391-5405	Lever, Lock Release	Warner Robins	TS

Current Status

- Parts for Limited Procurement selected for AVTN, L&M, and TS Supply Chains
- Technical data for all L&M parts converted to 3D PDF and STEP files – available for DLA
- Technical data conversion for AVTN and TS parts in-process – expected availability by mid-April
- AVTN, L&M, and TS working procurement process details

Next Steps (next 90 days)

- AVTN, L&M, TS create purchase requisitions (PRs), review 3D technical data*, and create/distribute solicitations to potential suppliers (Apr - May)
- L&M contract with Rock Island Arsenal Joint Manufacturing and Technology Center for organic manufacture of 1 part (Apr)
- Suppliers respond to solicitations (Apr – May)
- AVTN, L&M, TS award contracts to commercial suppliers (Apr – May)
- Suppliers build and deliver parts (May – Jun); DCMA perform on-site inspections as required
- ESAs validate parts against 3D PDF technical data* (May – Jul)

Points of Contact

- Emily Baigis (R&D Sponsor)
 - 215-737-5781
 - Emily.Baigis@dla.mil
- Tom Parks (Project Leader)
 - 703-917-7223
 - tparks@lmi.org
- Dick Tiano
 - 843-760-3333
 - Dick.tiano@scra.org

Back-up Slides

Technical Data Elements and Attributes Required by DLA*

- Legibility
- Completeness
- Restrictions
- Document approval
- Document title
- Document number
- Revision and date
- Revision type
- Expiration date
- Document data code
- Size of drawing, number of sheets, frames
- Call outs
- Sources
- First Article Test requirements
- Inspection requirements
- Higher level contract quality requirements
- Part number
- NSN
- Export control
- Commercial and government entity (CAGE) code
- Specifications
- Dimensions
- Tolerances
- Welding requirements
- Materials (ballistics)
- Temper
- Heat treatments
- Finishes
- Rights in Data
- License Agreement
- Distribution Statement
- Document Type–Parts List, Detailed Drawing, Assembly List, Quality
- Assurance Provision, etc.
- Security code
- Tech data availability code
- Foreign secure
- Nuclear
- Subsafe
- Control code

Metrics

- Time to develop solicitation
- Time to get the item on contract (DLA)
- Time to develop bid (contractor)
- Cost to develop bid (contractor)
- Time to manufacture item (contractor)
- Cost to manufacture item (contractor)
- Easier/harder for contractor to use 3D PDF technical data?