



U.S. AIR FORCE



F-15 STRUCTURAL DISASSEMBLY AND ANALYSIS SUPPORT PROJECT

**2009 Air Force Corrosion Conference
Perry, GA**

2Lt Amanda Alpaugh

830th ACSG/GFEAB

Presentation Outline

- Background And Purpose
- Project Phases
 - Phase I: Planning
 - Phase II: Disassembly
 - Phase III: Detailed Inspection and Analysis
- Summary



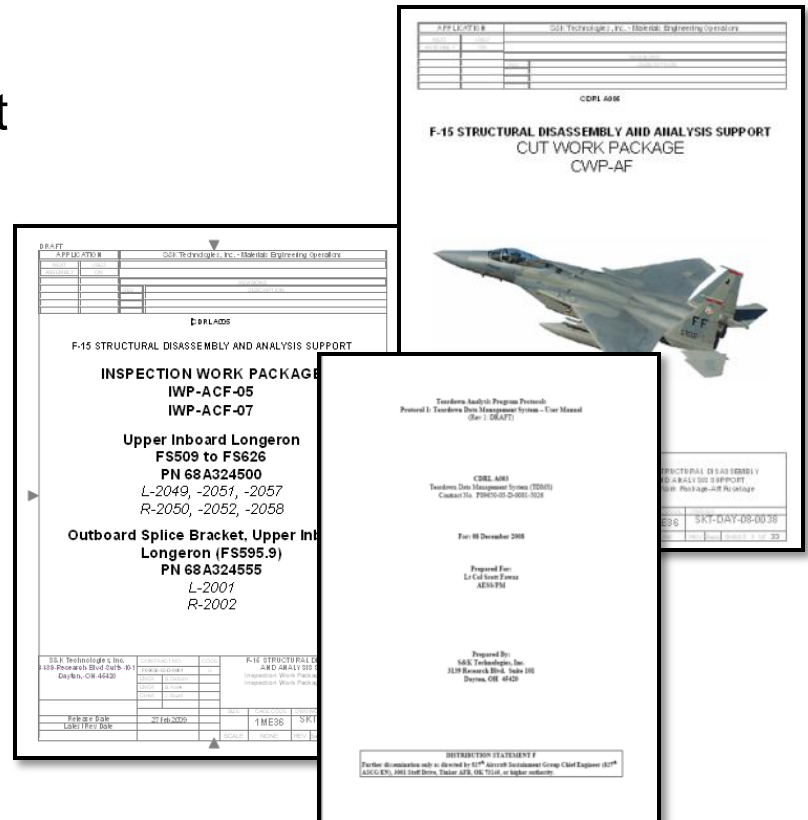
F-15 Teardown

Background and Purpose

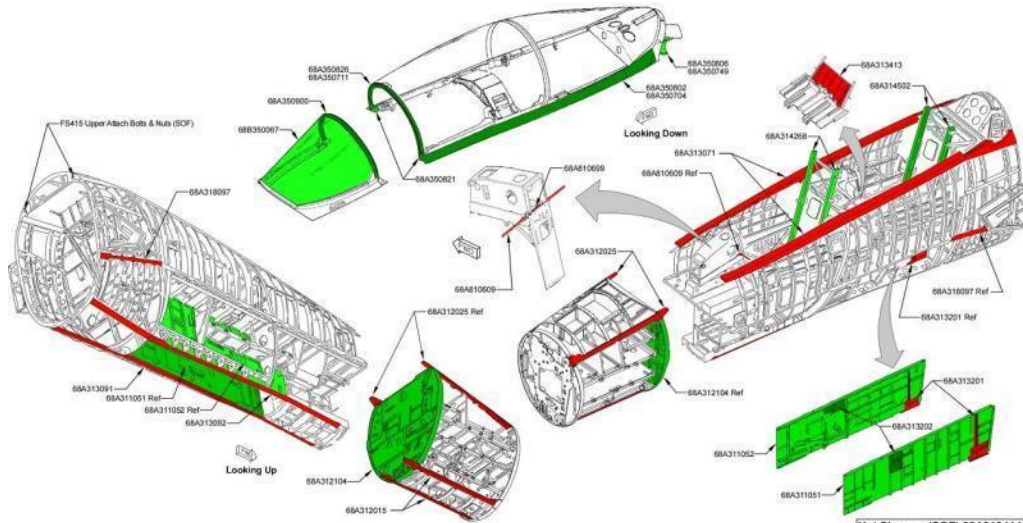
- Maintaining structural integrity becomes more challenging as aircraft systems age
- Structural Teardowns
 - Examine deeply embedded structural joints
 - Cracks
 - Corrosion
 - Enable the application of high-resolution inspection techniques to critical components which are not possible with an intact aircraft
- Purpose: Update the current Force Structural Maintenance Plan (FSMP) and Damage Tolerance Analysis

Phase I: Planning

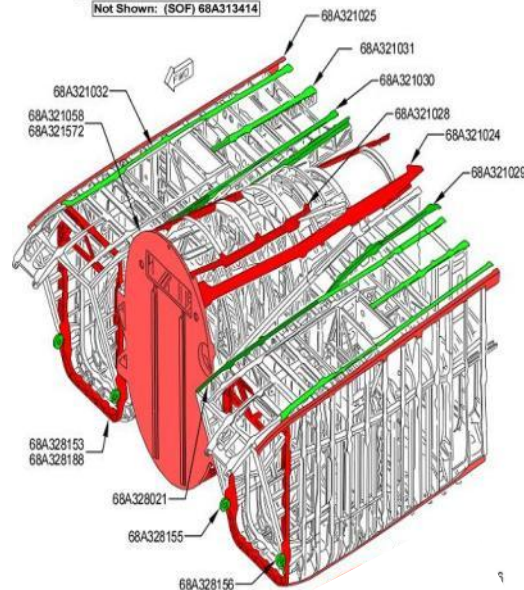
- Parts List Development
- Data Gathering
- Technical Data Package Development
- TMDS Development
- Task Protocols



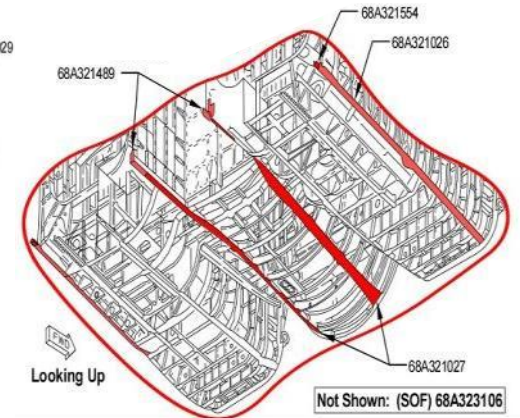
Parts List Development



Forward Fuselage



Forward Center Fuselage

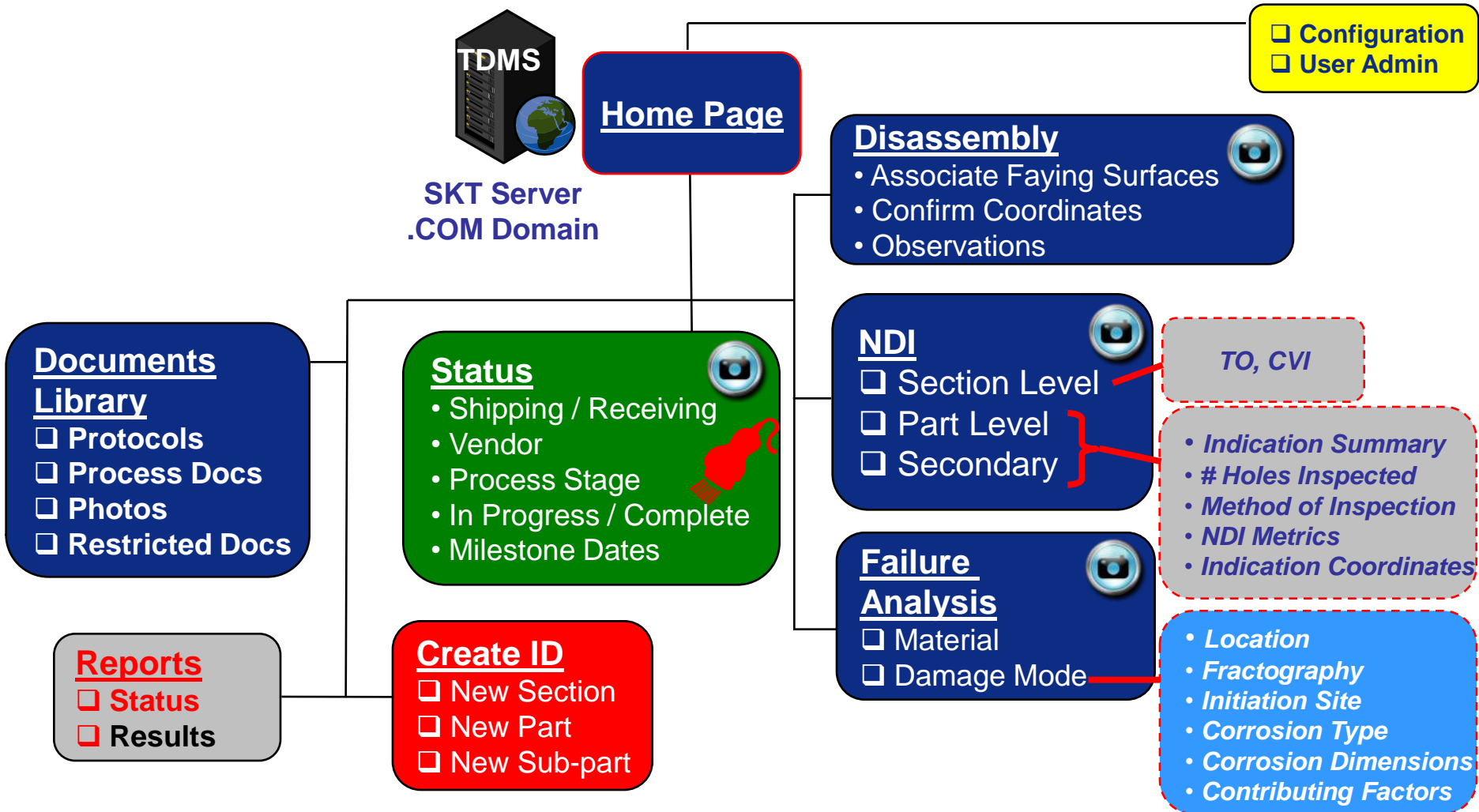


Teardown Data Management System

Teardown Data Management System (TDMS) Objective

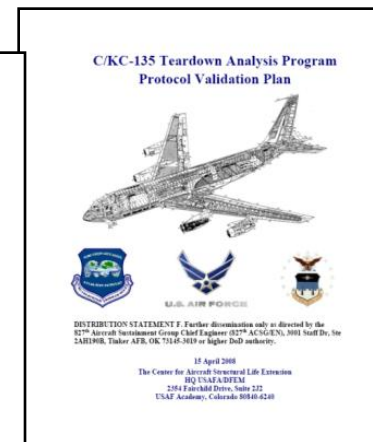
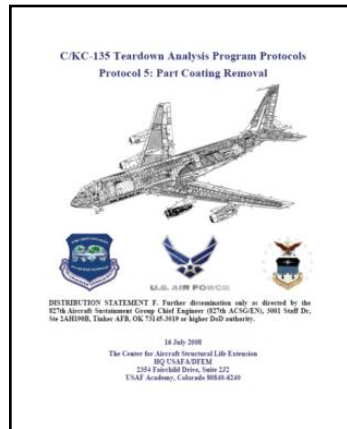
- Provide a web-based, structured data management system to support AF aircraft teardown program
 - Secure
 - Error-free
 - User friendly
 - Support multiple users / functions

TDMS Modules & Data Collection Parameters



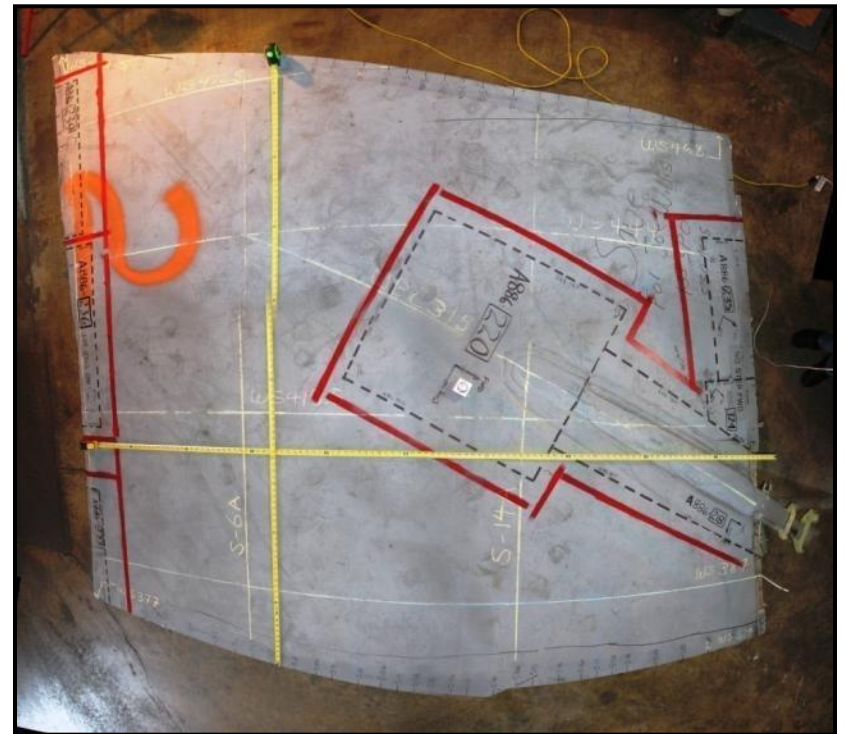
Protocols

- Utilizing modified protocols from KC-135 teardown program
- Developers:
 - The 827th Aircraft Sustainment Group Chief Engineer (827th ASCG/EN), Tinker AFB, Mr. Gaddis Gann
 - The Center for Aircraft Structural Life Extension (CAStLE), USAF/DFEM, USAF Academy, Dr. Scott Fawaz



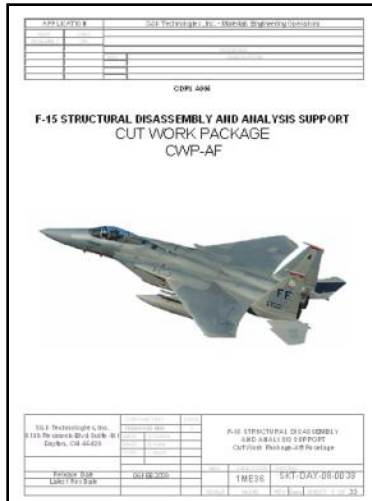
Phases II - Disassembly

- Aircraft Preparation
- Section Extraction
- Section Disassembly
- Part Marking
- Paint Stripping
- Visual Inspection



Cut Work Package (CWP)

- Maps the parts or structural joints to be removed
- References protocols and documents that guide the procedures



5.13 CWP-AF-12 – Figure 13, Table 13 – Stringer #10 (FS712 to FS785)
PN 68A332052 (L-2005 & R-2006)

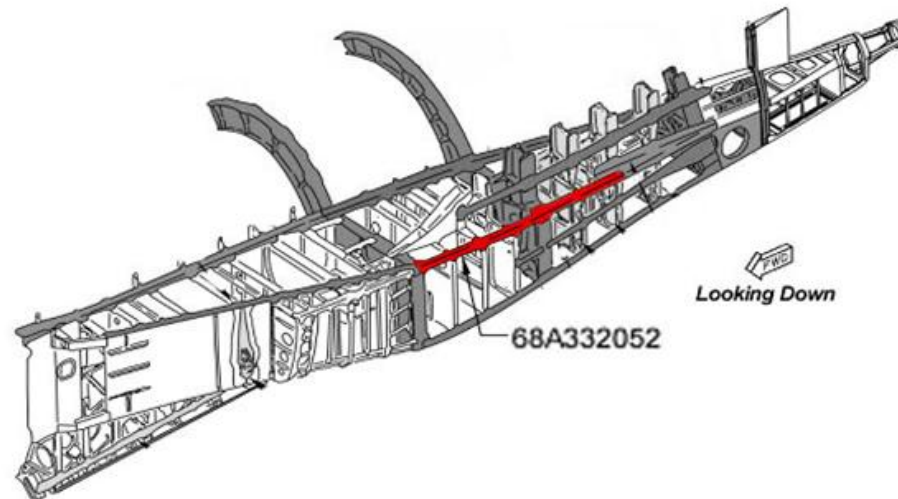


Figure 13: CWP-AF-12

Table 13: CWP-AF-12 Task Completion Check Sheet

TDMS Disassembly Data Entry Page

Part Information

Part Information

Part ID:

Faying Surfaces:
 324-007_-000, 324-009_-000, 324-010_-000

Confirm Coordinates

LH Side RH Side Spans Center Line

Distance AFT of Forward Spar: Fwd to Aft
 Inbd to Outbd
 WS: to
 Bottom to Top
 Distance Below Upper Wing Skin: to

Faying Surface Association

Part Coordinate Boundaries

Observations

Observations

Coatings

- Sealant Missing [Ref.](#)
- Sealant Damage [Ref.](#)
- Coating Missing [Ref.](#)
- Coating Damage [Ref.](#)

Fasteners

- Missing Fastener [Ref.](#)
- Damaged Fastener [Ref.](#)
- Loose Fastener [Ref.](#)
- Corroded Fastener [Ref.](#)
- Atypical Fastener [Ref.](#)

Corrosion

- Pilling [Ref.](#)
- Corrosion Product [Ref.](#)
- Exfoliation [Ref.](#)
- Pitting [Ref.](#)
- Surface Corrosion [Ref.](#)

Repairs

- Patch [Ref.](#)
- Bonded Patch [Ref.](#)
- Grind Out [Ref.](#)
- Bushing [Ref.](#)

Physical Damage

- Crack [Ref.](#)
- Severed Part [Ref.](#)
- Broken Spotweld [Ref.](#)
- Multiple Drilled Holes [Ref.](#)
- Out of Round Hole [Ref.](#)
- Dent [Ref.](#)
- Disbond [Ref.](#)
- Gouge [Ref.](#)
- Puncture [Ref.](#)
- Bend [Ref.](#)
- Drill Start [Ref.](#)
- Short Edge Distance [Ref.](#)
- Accidental Damage [Ref.](#)

Other Observations

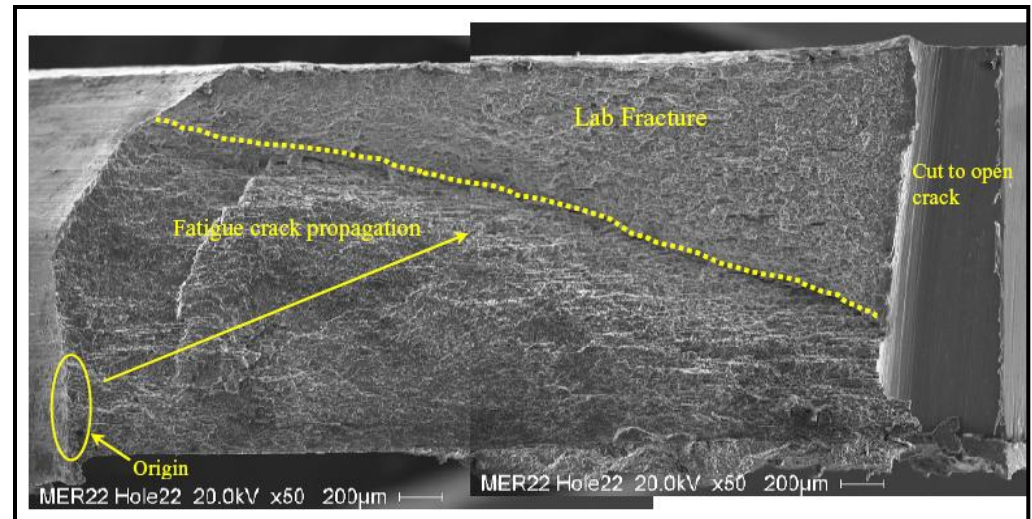
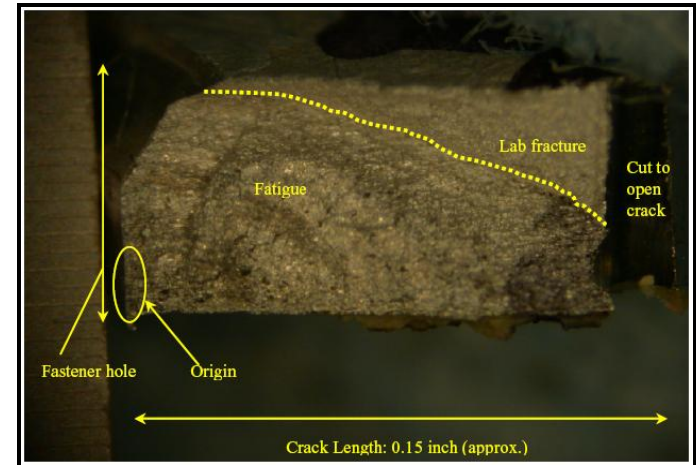
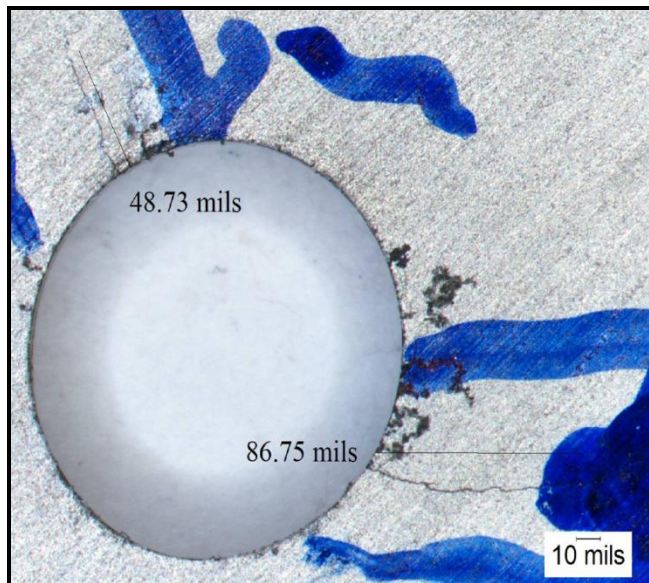
Attachments

Id	Typename	Description	Size Kb

Attachment Upload And Index

Phases III – Detailed Inspection and Analysis

- Phase III:
 - Detailed NDI
 - Metallography / Fractography
 - Data Collection And Entry



Inspection Work Package (IWP)

- Identifies the inspection requirements
- Provides engineering drawing excerpts for the all parts on the teardown inspection list

DRAFT

APPLICATION: S&T Technology, Inc. - Marine Engineering Operations

DESCRIPTION

F-15 STRUCTURAL DISASSEMBLY AND ANALYSIS SUPPORT

INSPECTION WORK PACKAGE
IWP-ACF-05
IWP-ACF-07

Upper Inboard Longeron
FS509 to FS626
PN 68A324500
 L-2049, -2051, -2057
 R-2050, -2052, -2058

Outboard Splice Bracket, Upper Inboard Longeron (FS595.9)
PN 68A324555
 L-2001
 R-2002

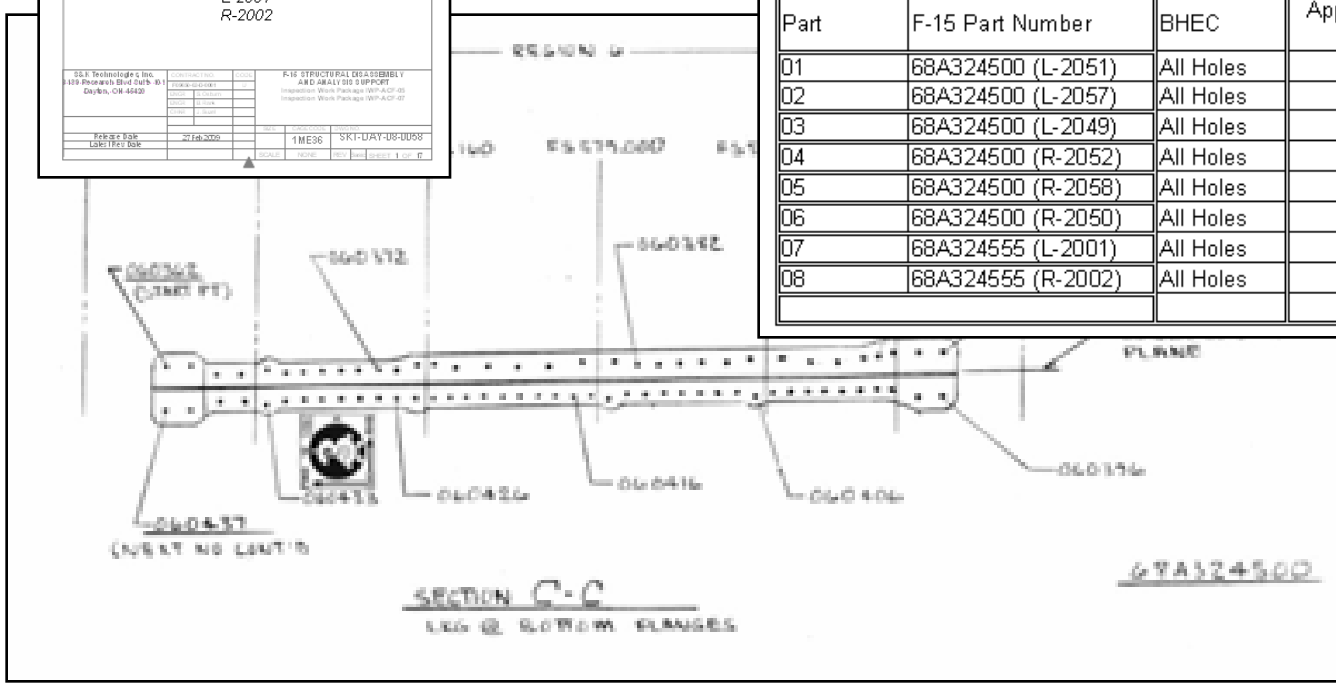
S&T Technology, Inc.
 319 Research Blvd, Suite 61
 Durham, NC 27702

DATE: 27 Feb 2009

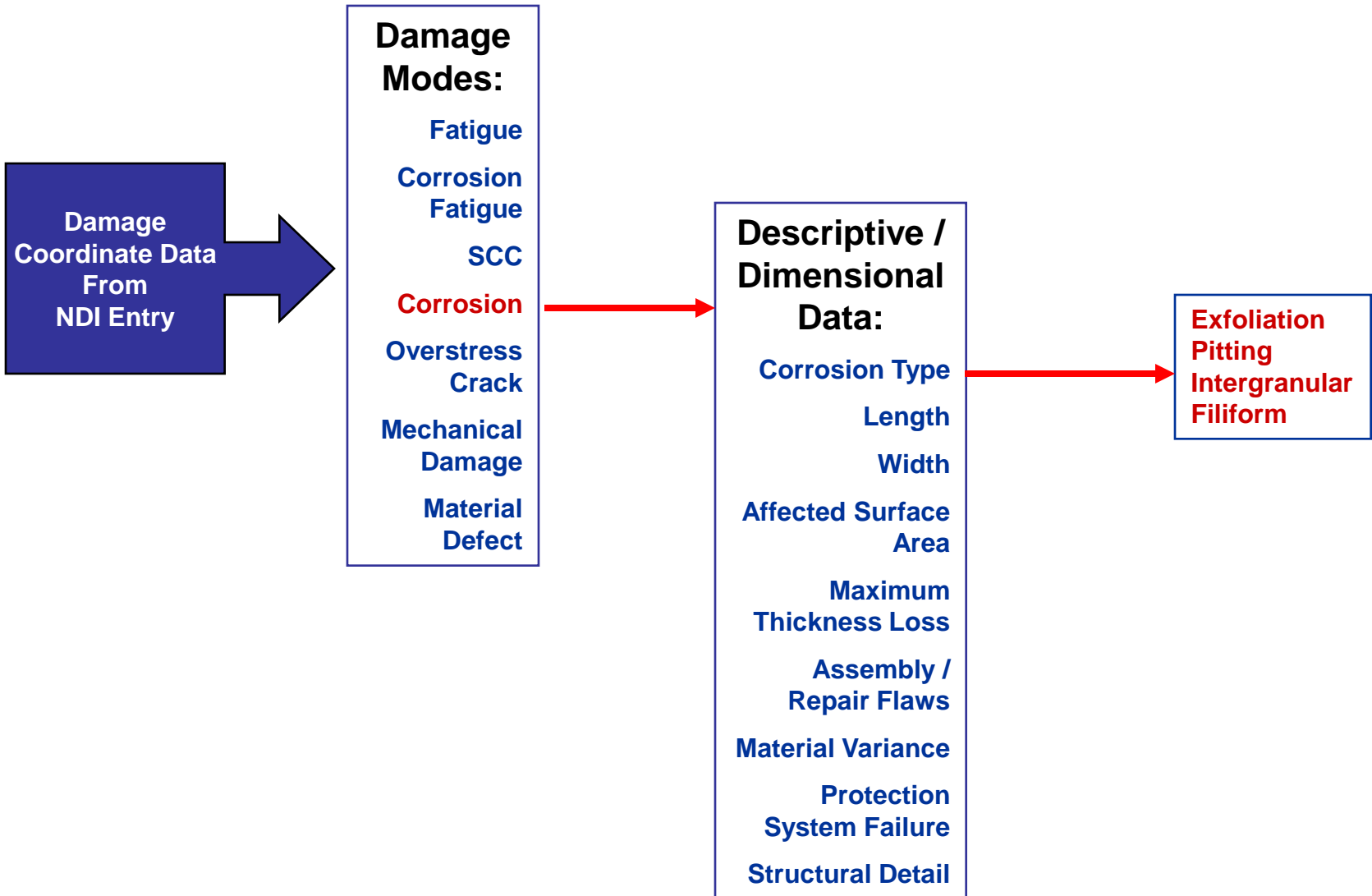
1ME36 SKI-DAY-US-0008

Table 2 - Summary of NDI Requirements

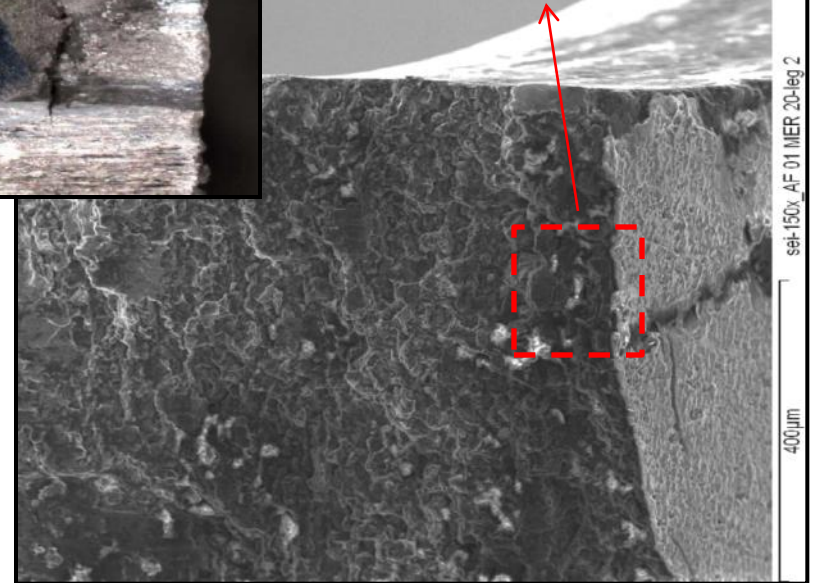
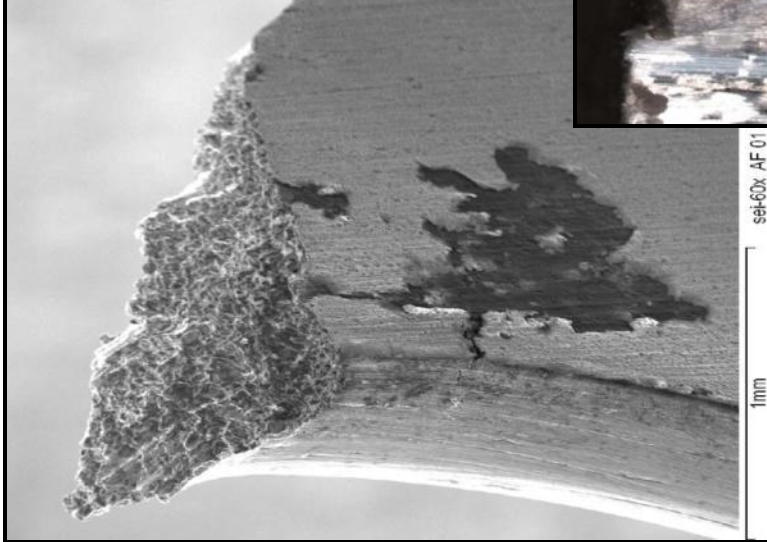
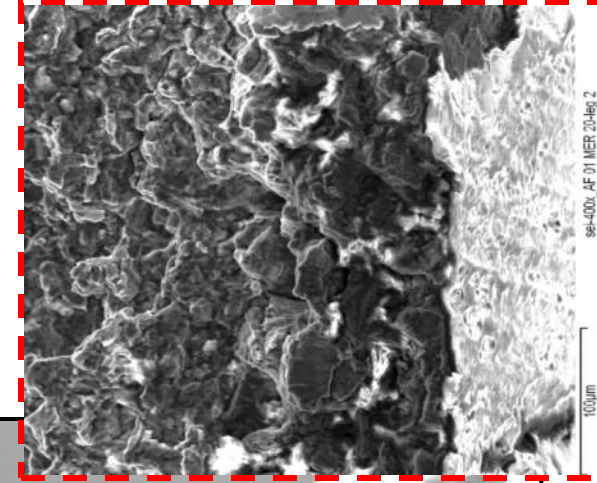
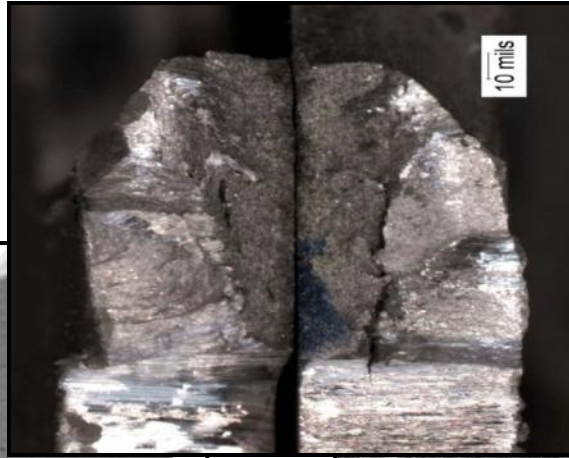
F-15 TEARDOWN PACKAGE ACF-05 NDI SUMMARY TABLE					
Part	F-15 Part Number	BHEC	Approximate Hole Count	ECSS	FPI
01	68A324500 (L-2051)	All Holes	160	As Required *	All Surfaces
02	68A324500 (L-2057)	All Holes	248	As Required *	All Surfaces
03	68A324500 (L-2049)	All Holes	132	As Required *	All Surfaces
04	68A324500 (R-2052)	All Holes	160	As Required *	All Surfaces
05	68A324500 (R-2058)	All Holes	242	As Required *	All Surfaces
06	68A324500 (R-2050)	All Holes	132	As Required *	All Surfaces
07	68A324555 (L-2001)	All Holes	20	As Required *	All Surfaces
08	68A324555 (R-2002)	All Holes	20	As Required *	All Surfaces
			Total: 1,114	-	-



Confirmed Failure Analysis Data Entry Parameters



Metallography/Fractography

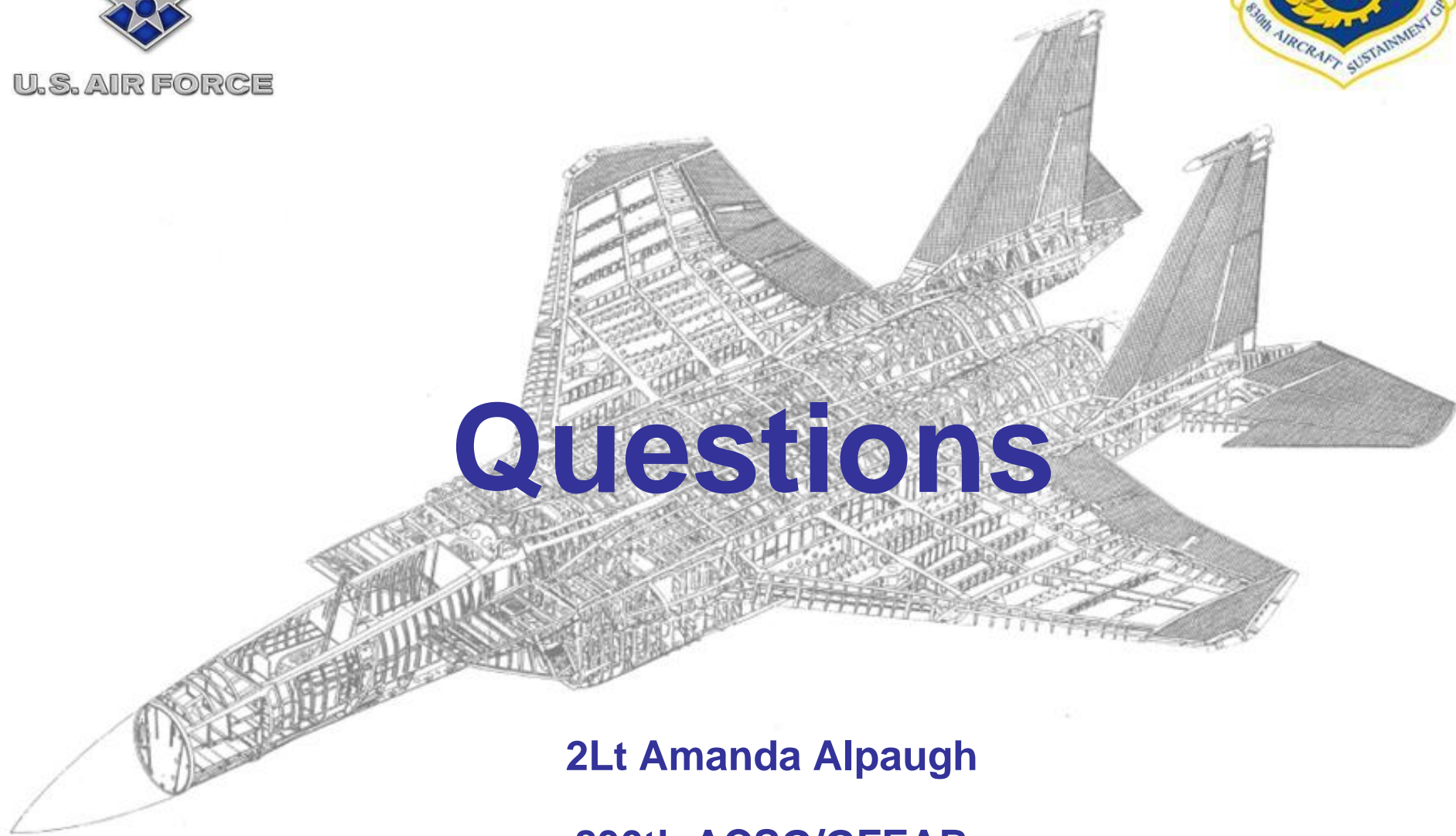


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Questions

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