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ATA e-Business forum Montreal 2011:

"A Use Case For Spec 2000 Reliability Data Exchange"

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AIR TRANSPORT ASSOCIATION

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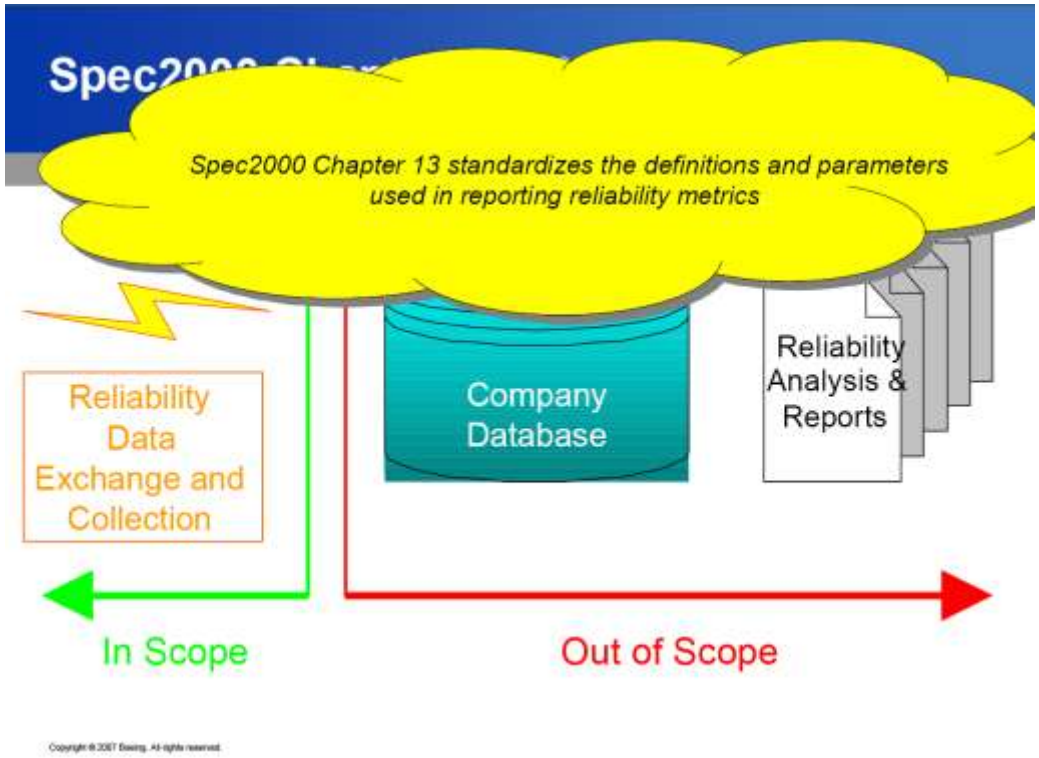
Abstract

Remember last year… John Yakubowsky's presentation…



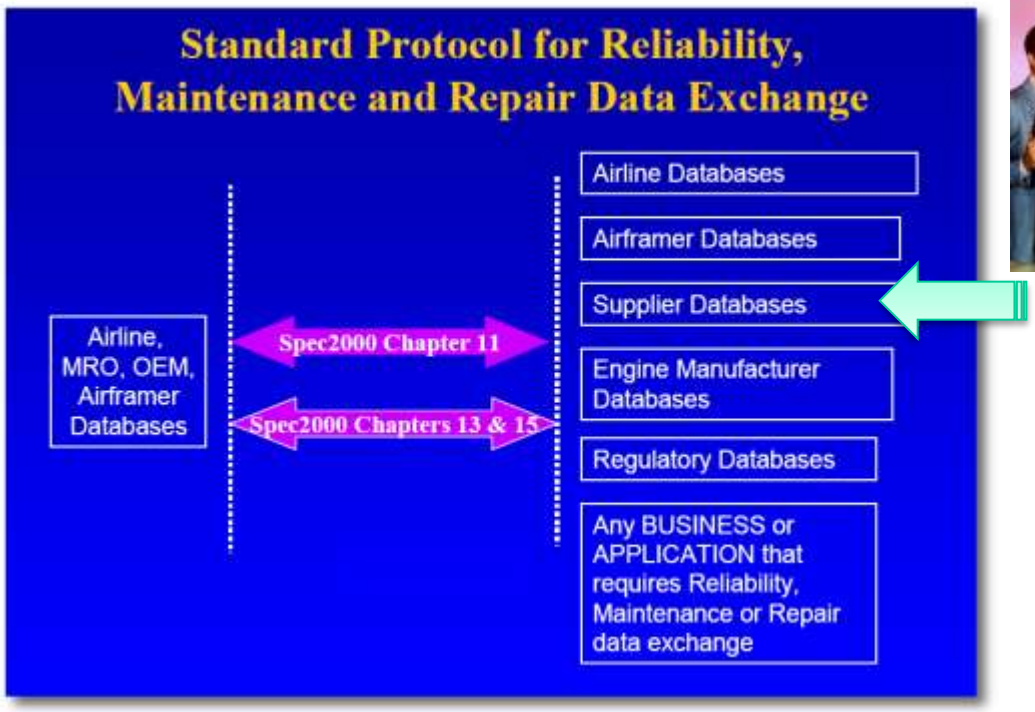
- **A concrete use case of ATA Spec2000 standards**
  - Database
  - Processing data
  - Coding
  - Calculations
  - Analysis
  - Organization

Let's GO !

The Context

A supplier in avionics world…

- Need to calculate and report reliability figures
- Need to make technical analysis



A TEAM

- Dedicated to reliability Calculations
- Part of Customer Support
- Located in Châtellerault (France)

MISSIONS

- Data Collection
- Integrity of Data
- Data Validation with Product support
- Reliability Calculations
- Tools Specifications / Development

Calculate reliability figures : A Team, A Standard

WHAT IS COMPONENT RELIABILITY ?

$$MTBUR = \frac{\text{Flight Hours}}{\text{Unscheduled Removals}}$$

Raw Data

Panel of Aircraft

Processing

Tools

SPEC2000

Simple Formula…Not so simple

DATA Processing problematic

- **Raw Data**
  - Removal and Shop Findings
    - Thales own repair shop
    - Airlines, MRO
    - Avionics Supplier
  - Fleet, Flight Hours
    - Airframer
    - Airlines
    - ACAS

Various data formats…

Risk of inconsistent data …

- **Data Processing**
  - Link data and clean up
    - Remove all multiple entries, erroneous data (Automatic tool)
    - Link data from multiple origin
    - Attach SRU shop Finding to LRU removals

Energy spent to convert, check, consolidate data !

- **Data Coding rules**
  - Harmonization of coding rules
    - Unschduled or Scheduled removals ?
    - Confirmed failure ? Justified removal ? Customer missuse ?

Problematic of Panel

Panel Criteria

- Panel of Aircraft
- Panel of Removals
- Must be statistically Valid

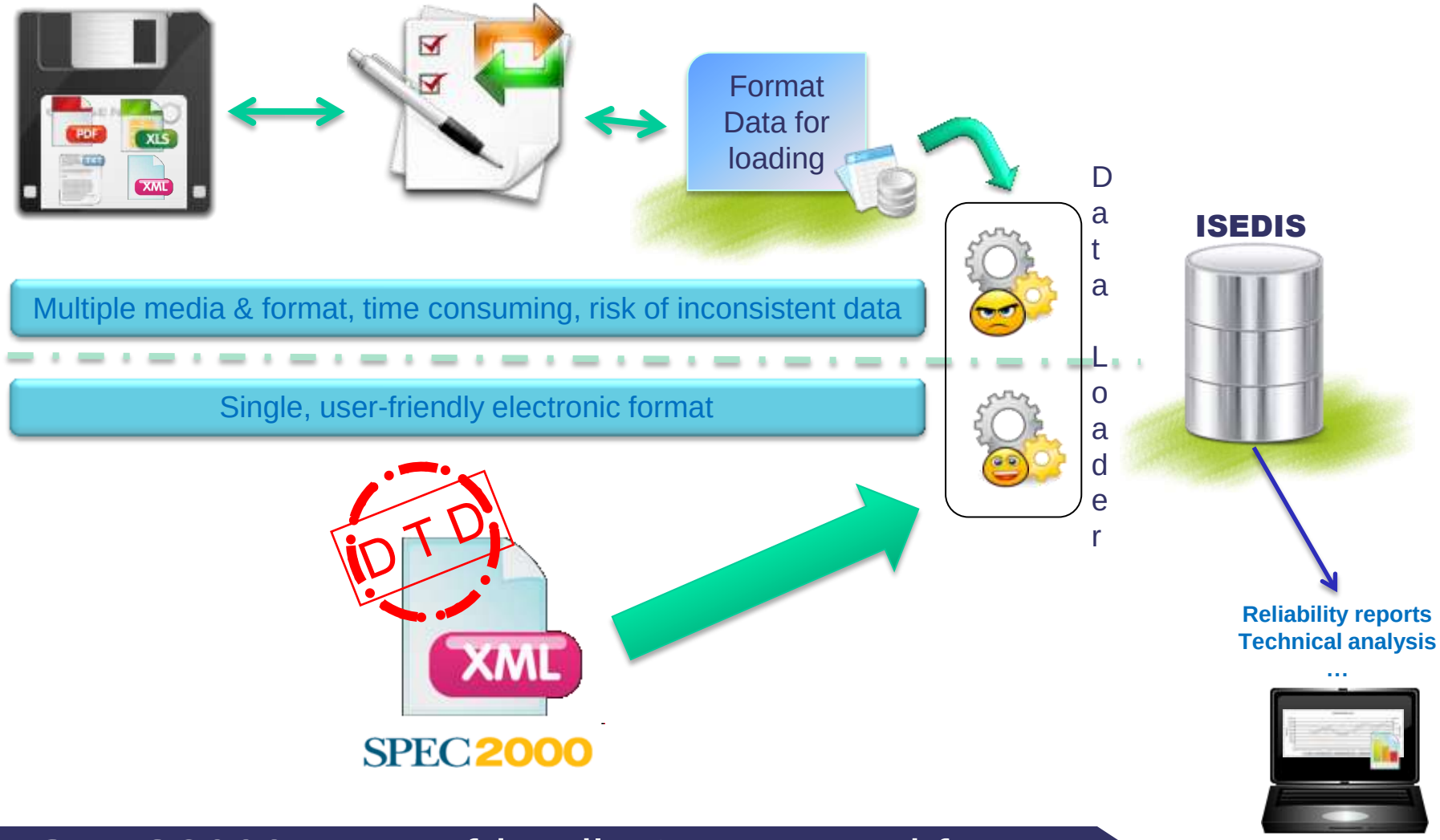
→ Matched for coherent results

From Raw to Processed Data

Raw data versus SPEC2000 data

(FH, Removals, Shop report…)

Data path schema



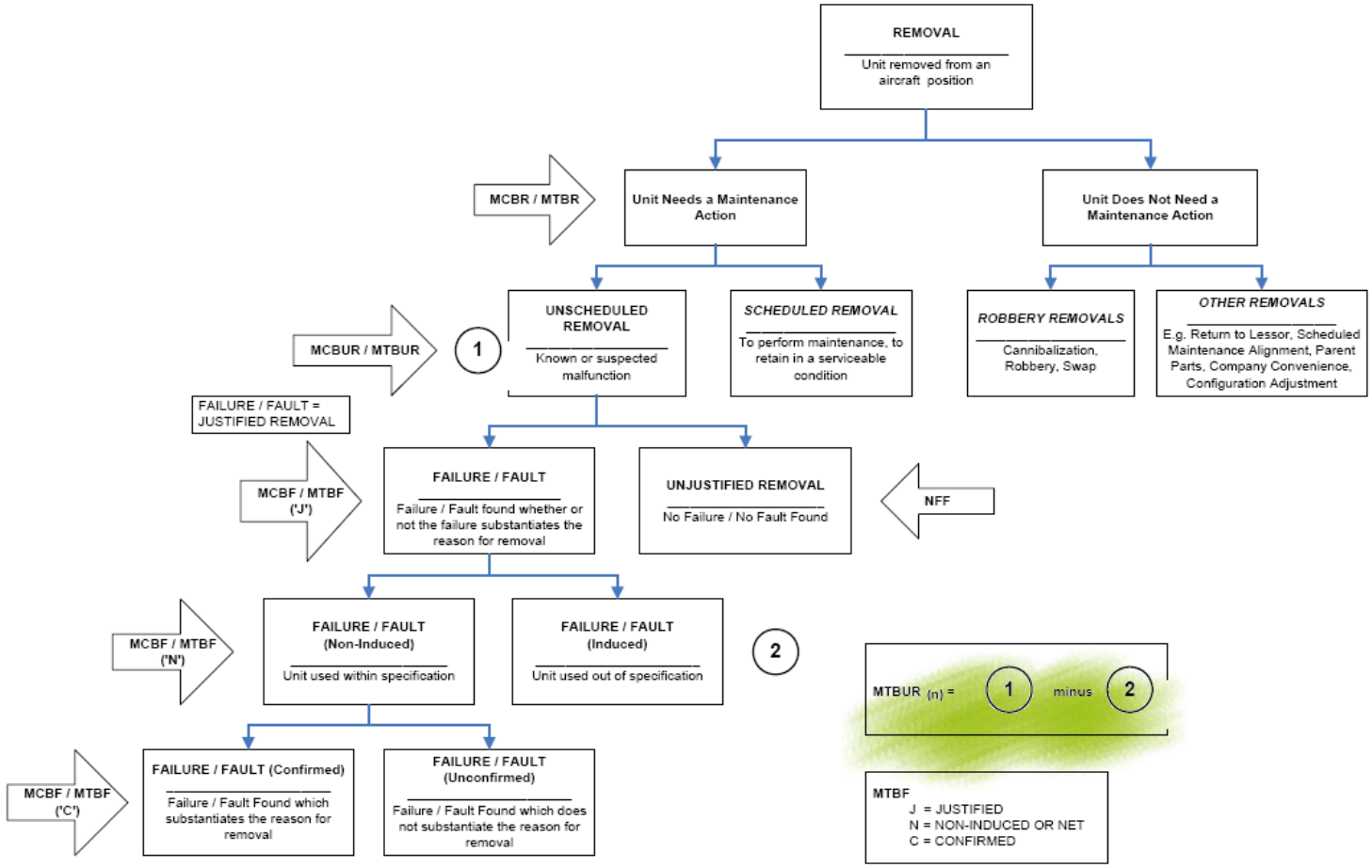
SPEC2000 a user-friendly & structured format

Implementation of coding rules

SPEC2000 Flowchart

ATA SPEC2000 E-Business Specification for Materiels Management

Figure 13-2.2. Removal Findings Decision Tree



SPEC2000 use = TALKING THE SAME LANGAGE

Which Tool ?

- No tool in the “COTS” market
- In house developed tool: **ISEDIS Web**
  - Centralised Database
  - Web based interface
  - Compatible as well with SPEC2000 and non-SPEC2000 data format
    - Tool to process, clean and cross-check all data
  - Removals and shop finding analysis
  - Capitalisation
  - Automated reports and calculations

Tool in-house Developed

ISEDIS Reliability & Analysis tool overview

LRU Removal

A/L or MRO Shop

Repair Shops

Removal data
Or Shop report

Shop report

Airframer
Airlines

Fleet
Flight Hours

ISEDIS WEB

ORACLE
DATABASE

Airframer Reliability

On-Demand Results

Reliability Analysis

Data entry for others
support tools

SPEC2000
Chapter 13.2 : reliability metrics

Chapter 11 :
reliability data collection / exchange records

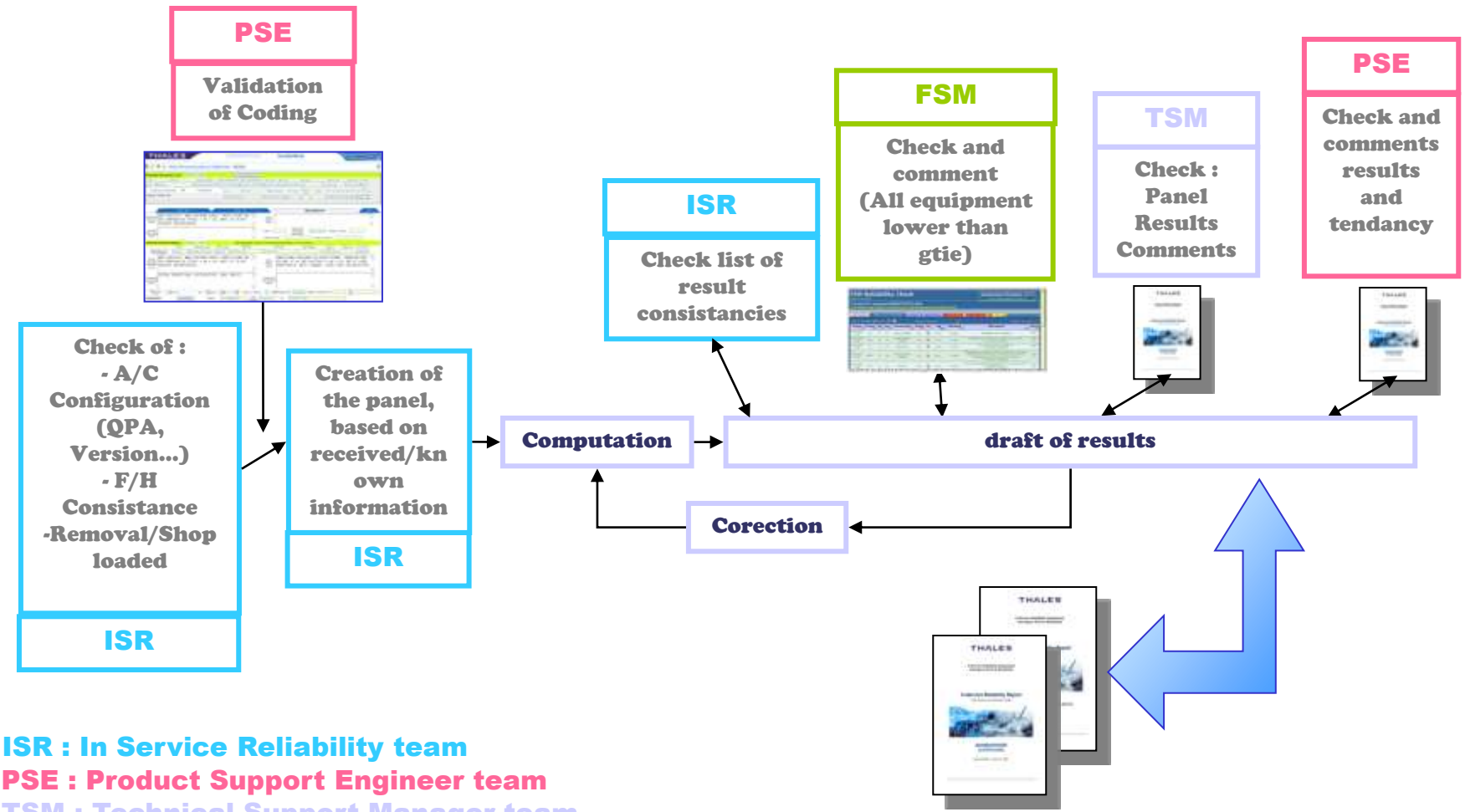
SPEC2000

LRU Configuration
Failure Analysis / Codification

Product Support Engineer

Basis for all Action Plan

Related organization & database information check



ISR : In Service Reliability team
PSE : Product Support Engineer team
TSM : Technical Support Manager team
FSM : Field Service Managers

Good level of confidence in computed MTBUR/MTBF : A great Teamwork !

ATA SPEC 2000

ATA SPEC 2000

- Cornerstone of calculation and data exchange
  - Chapter 11: Data Collection
  - Chapter 13: Metrics
- THE Industry Standard
- Common Language, between Airlines, Airframer, Supplier
- User Friendly structured XML data format
- ATA Spec2000 chapter 13.2 outlines a method to compute Reliability metrics using Spec2000 chapter 11's data elements

USE IT !

- Follow us, Use ATA spec2000, it is ready !
- For common language
- Easy exchange….no rework
- Once implemented, reduce cost and efforts

Spec2000 is ready : Adopt it !

Problematic of Panel

- **Airlines are Welcome in Thales Panel**
  - Help us to help you !
    - Component behaviour followed by our Support Engineers
    - Capability to provide tailored analysis very quickly
    - Detection of issues and quick responsiveness
    - Analysis of Issues and Action Plan definition
    - Commercial Proposal to implement the action plan
    - Data remains confidential

Join Thales Reliability Panel !

In Summary :

- **Component Reliability Data and Measure**
  - A Dedicated Reliability Team, managing database
  - An internal reliability Tool: ISEDIS
  - Spec2000 chpt 11 & 13 compliant to work on consistent data and compute normalized reliability results
  - A Teamwork to consolidate and analyse data
  - Produce Data used to define customer action plan

Thank You…

Any Question ?

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In-Service Reliability Department
Aerospace Service Worldwide

In-Service Reliability Department

Data Period: 1 st Semester 2010

Airbus Long Range

Issue: Rev 01. October 19th, 2010

3.1.24 Airbus Long Range - LCDU 725

a) Characteristics

Short Part Name Details	
Manufacturer:	Thales Avionics (CS)
Quantity Per Aircraft:	6
ATA code:	31-65-32
Part Number(s):	C10265AF05, C10366AF05
Guarantee	
Guarantee:	20 000 FH
Guarantee Type:	Guaranteed MTBUR(h) according to SSC (Supplier Support Condition)

b) Reliability Trend

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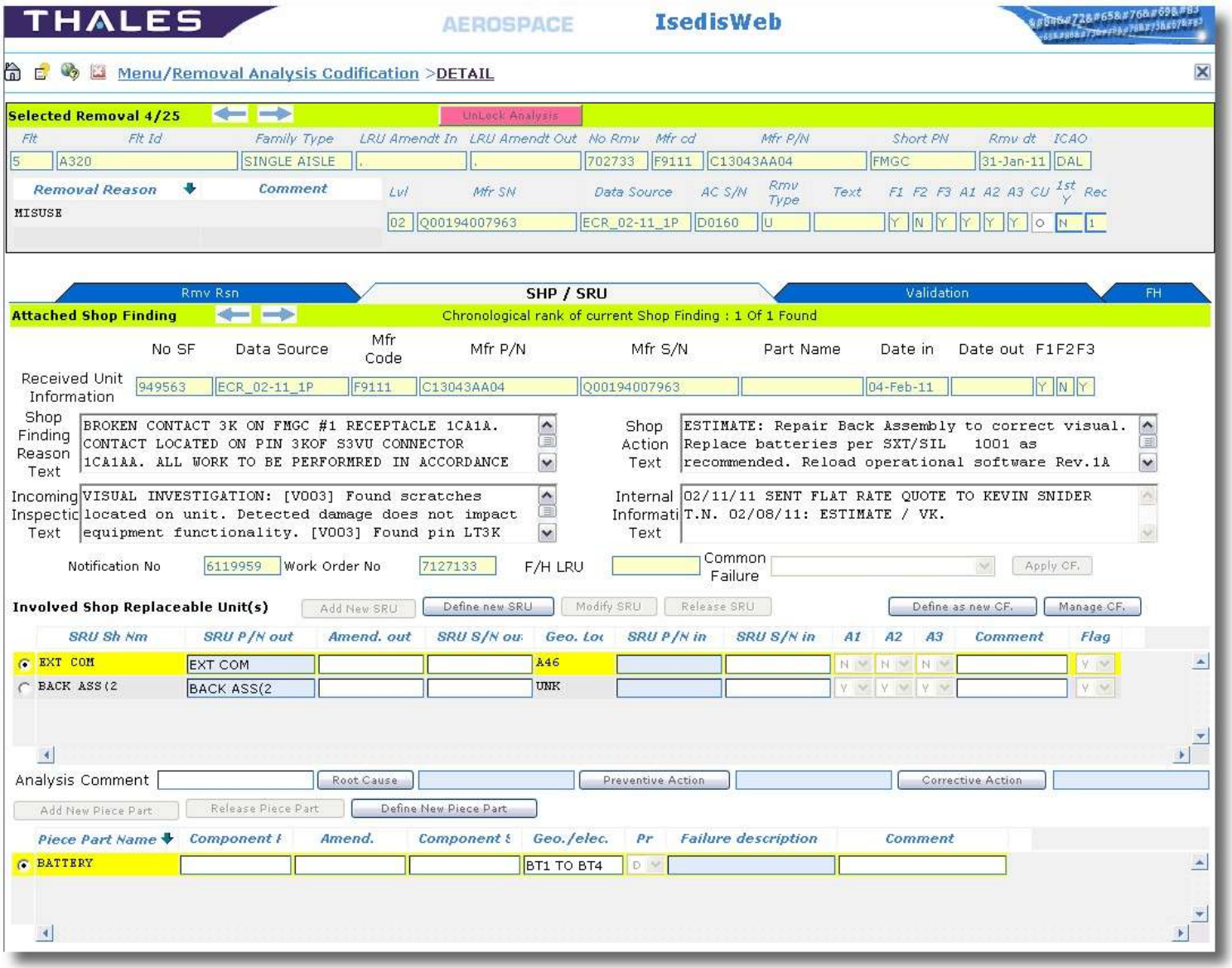
Removal Analysis by the Product Supporyt



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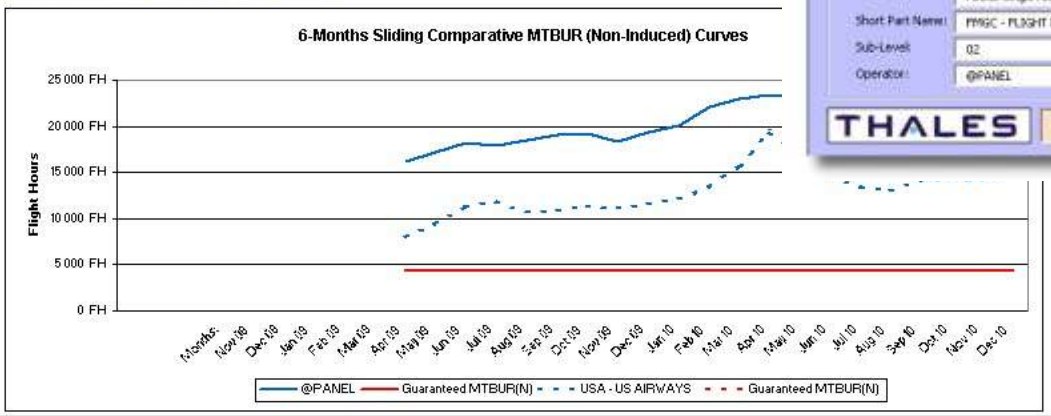
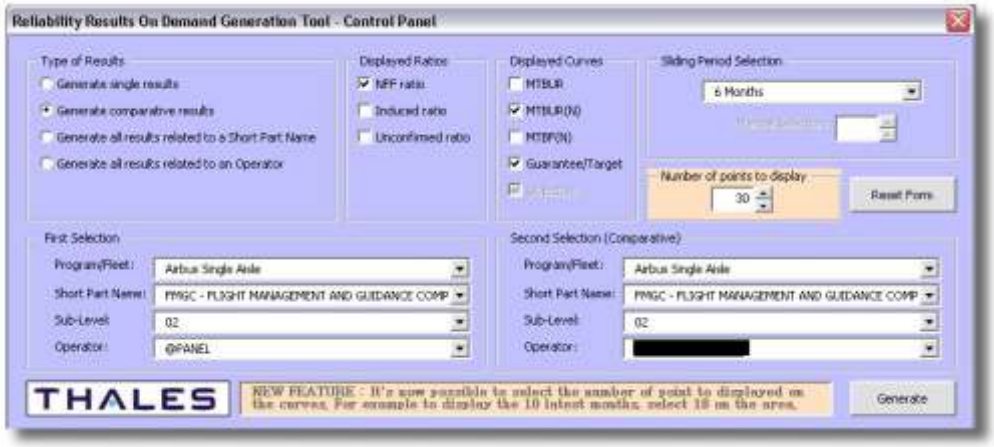
On Demand Reliability Results

Reliability Data (Comparative)

Export to Powerpoint

	@PANEL	
Selection Performed		
Selected Sliding:	6 Months	6 Months
Program/Fleet:	Airbus Single Aisle	Airbus Single Aisle
Selected Short Part Name (SPN):	FMGC - FLIGHT MANAGEMENT AND GUIDANCE COMPUTER	FMGC - FLIGHT MANAGEMENT AND GUIDANCE COMPUTER
Selected Sub-Level:	02	02
Selected Operator:	@PANEL	USA - US AIRWAYS
Short Part Name Details		
Manufacturer:	Thales Avionics (CCC Mdn)	Thales Avionics (CCC Mdn)
Quantity Per Aircraft:	2	2
ATA code:	22-83-XX	22-83-XX
Part Number(s):	C13043AA01, C13043AA02, C13043AA03, C13043AA04, C13043BA01, C13043BA02, C13043BA03, C13043BA04	C13043AA01, C13043AA02, C13043AA03, C13043AA04, C13043BA01, C13043BA02, C13043BA03, C13043BA04
Reliability Data		
Date of extraction:	Feb 17, 2011	Feb 17, 2011
Month:	December 2010	December 2010
MTBUR:	21 841 FH	15 535 FH
MTBUR (Non-induced):	22 293 FH	15 535 FH
Corrected MTBF (Non-induced):	29 662 FH	18 124 FH
NFF ratio:	24,3%	14,3%
Induced ratio:	2,8%	0,0%
Unconfirmed ratio:	3,1%	0,0%
Characterization		
Representativeness:	68,3%	4,7%
Percentage of Aircraft equipped (Selected Operator):	48,6%	67,1%
% No report:	3,1%	0,0%
Guarantee & Objective		
Guarantee:	4 300 FH	4 300 FH
Guarantee Type:	Guaranteed MTBUR(N) according to SSC (Supplier Support Conditions Agreement)	Guaranteed MTB Conditions Agree
Objective:		
Objective Type:		
Daily Utilization & Flight Duration		
Average Daily Utilization (over the 6 last months):	7,50 FH	8,38 FH
Average Flight Duration (over the 6 last months):	1,80 FH	2,15 FH





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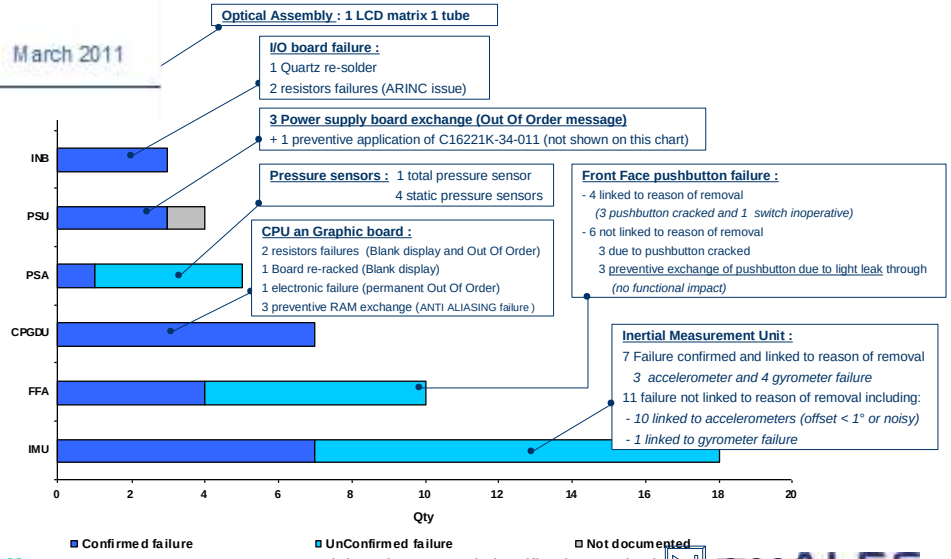
Reliability Analysis

ISFD in service removals – WJA 737NG

SRUs Failures (Period: from 01-janv-2009 to 31-mars-2011)



Link to the removal classification method