

ATA Spec2000 Reliability Interest Group (RIG)



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Seattle, WA - May 19, 2010

ATA Reliability Interest Group (RIG) Charter

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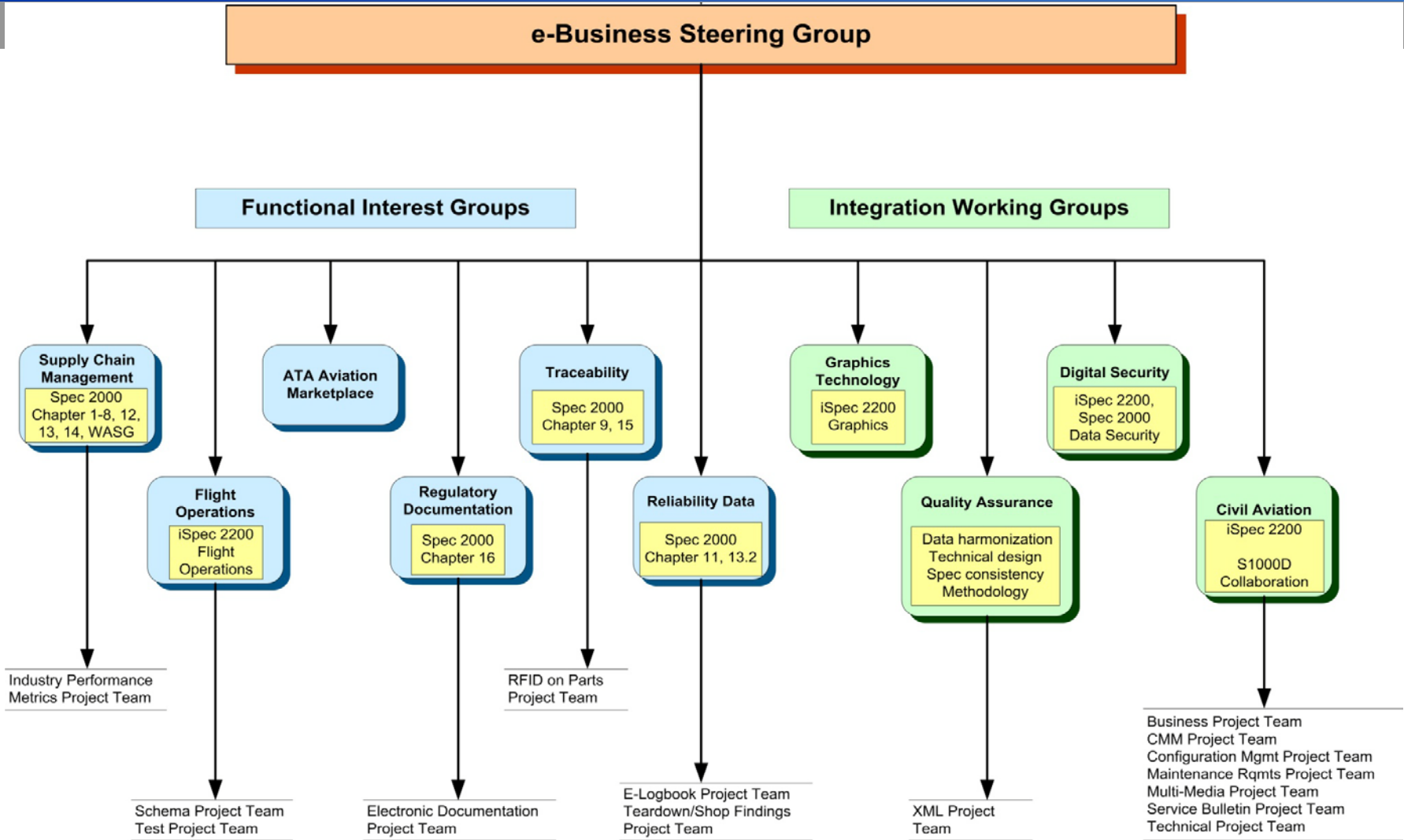
■ Purpose

- To provide an industry forum for developing electronic data exchange standards related to aircraft reliability, maintenance and repair data

■ Responsibilities

- Responsible for maintaining Spec2000 Chapter 11's, Reliability data collection/exchange records
- Spec2000 Chapter 13-2's Reliability metrics
- Recently the RIG has begun updating Spec2000 Chapter 15's, aircraft delivery record using data elements from Spec2000 Chapter 11
- The RIG has the following Project Teams as well
 - E-Logbook Project Team
 - Electronic Teardown Project Team

Organizational Structure



RIG Activities

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- **Reliability Data Collection/Exchange (Spec2000 Chapter 11)**
- **Reliability Metrics (Spec2000 Chapter 13.2)**
- **Delivery Configuration Data (Spec2000 Chapter 15)**
- **Electronic Teardown Project Team (Spec2000 Chapter 7 and 16)**
- **Electronic Logbook Project Team (Spec2000 Chapter 17)**

Status - RIG Activities

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- **Reliability Data Collection/Exchange (Spec2000 Chapter 11)**
 - On-going maintenance. Supporting implementation by airlines, parts suppliers and maintenance information software providers
- **Reliability Metrics (Spec2000 Chapter 13.2)**
 - Finalized metrics on Delays & Cancellations, Time Since, Pilot Reports, etc. Sent out a ballot to RIG members for an acceptance vote. Questions will be answered during next RIG meeting (Apr 13 – 15)
- **Delivery Configuration Data (Spec2000 Chapter 15)**
 - Finalized the record. Sent out a ballot to RIG members for an acceptance vote. Questions will be answered during next RIG meeting (Apr 13 – 15)
- **Electronic Teardown Project Team (Spec2000 Chapter 7 and 16)**
 - Harmonizing the old Chp 7 teardown record with Chp 11 Shop Findings Record that can be harmonized with the new electronic airworthiness documents (Chp 16)
- **Electronic Logbook Project Team (Spec2000 Chapter 17)**
 - Team is developing data model for exchanging information from e-logbook to ground maintenance systems including an interoperability document

Recent RIG Developments

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- The RIG has grown, with increased participants and issues
- To be able to address the large number of action items in a timely manner we have developed Sub Teams:
 - Major / Minor Change assessment sub team led by Kevin Stoltzfus, EmpowerMx
 - Reliability Metrics Development sub team led by John Nazareth, Bombardier
 - Delivery Configuration Record sub team led by Audrey Fauconnier, Airbus
 - Data Definitions sub team lead by Sebastien Touzot, Airbus

Recent RIG Developments

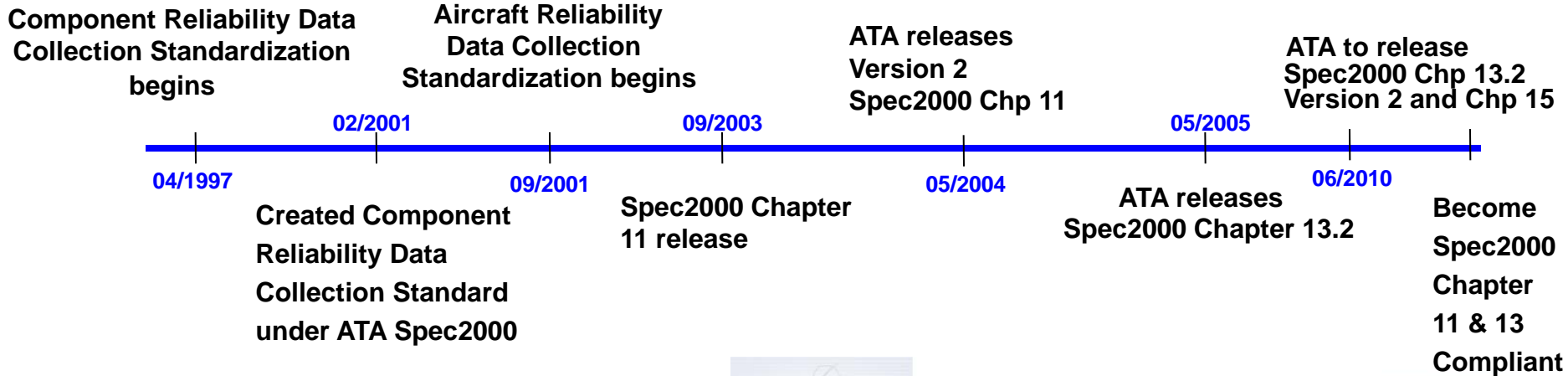
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- **Major / Minor Change Assessment Sub Team (Chapter 11)**
 - The team reviews change requests to determine if they will result in a major or minor change to Chapter 11
- **Aircraft Reliability Metrics Sub Team (Chapter 13.2)**
 - They are developing Reliability metrics based on the input data contained within Chapter 11
- **Aircraft Delivery Configuration Record Sub Team (Chapter 15)**
 - They have developed an XML format airplane delivery record based on data elements contained within Chapter 11
- **Data Definitions sub team (CSDD)**
 - This team will be addressing ATA Common Support Data Dictionary definitions pertaining to Reliability topics

ATA Spec2000 Chapter 11

“Reliability Data Collection / Exchange”

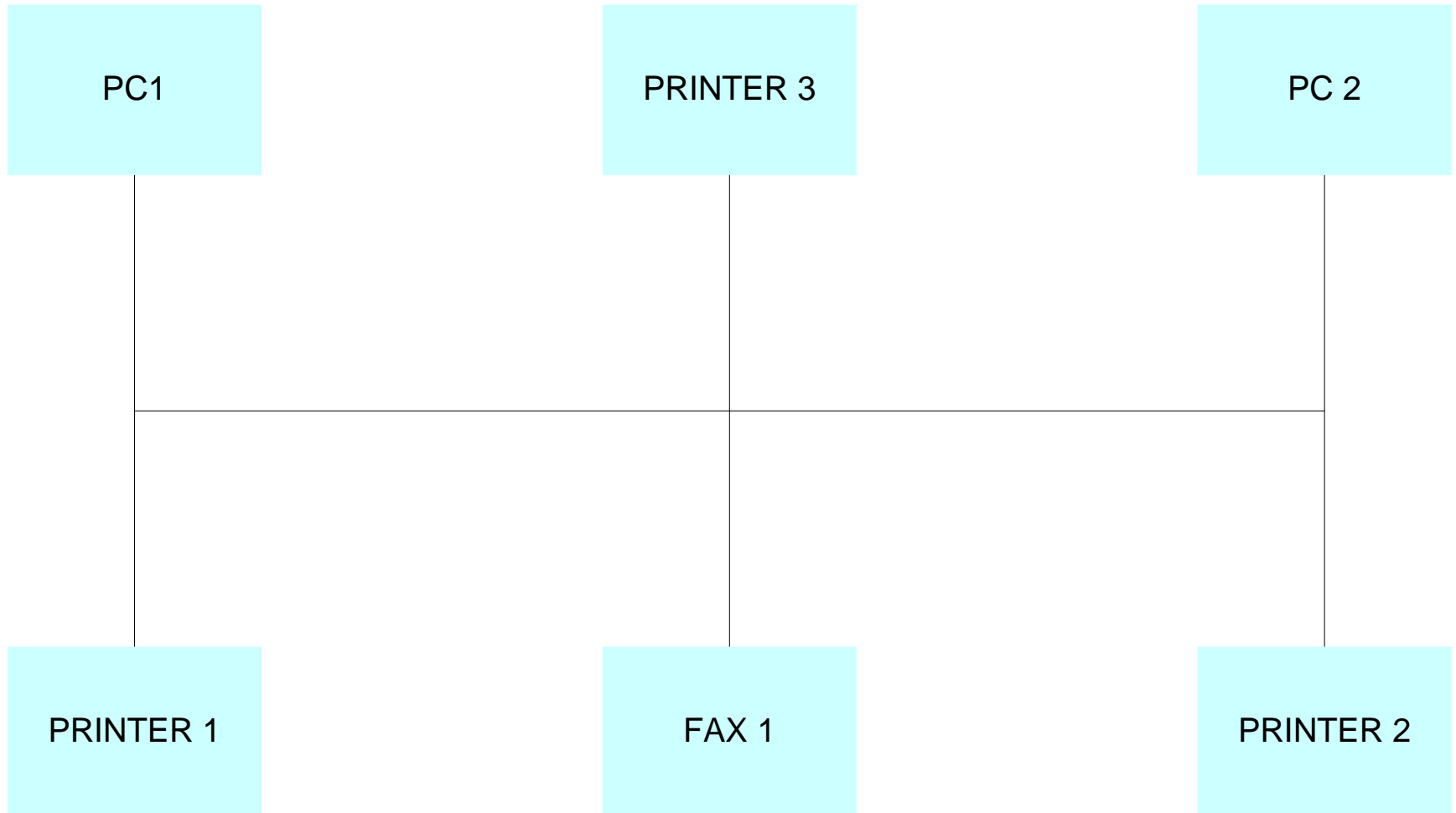
ATA Spec2000 Chapter 11 Background



Reliability Interest Group is the largest ATA Spec2000 interest group!

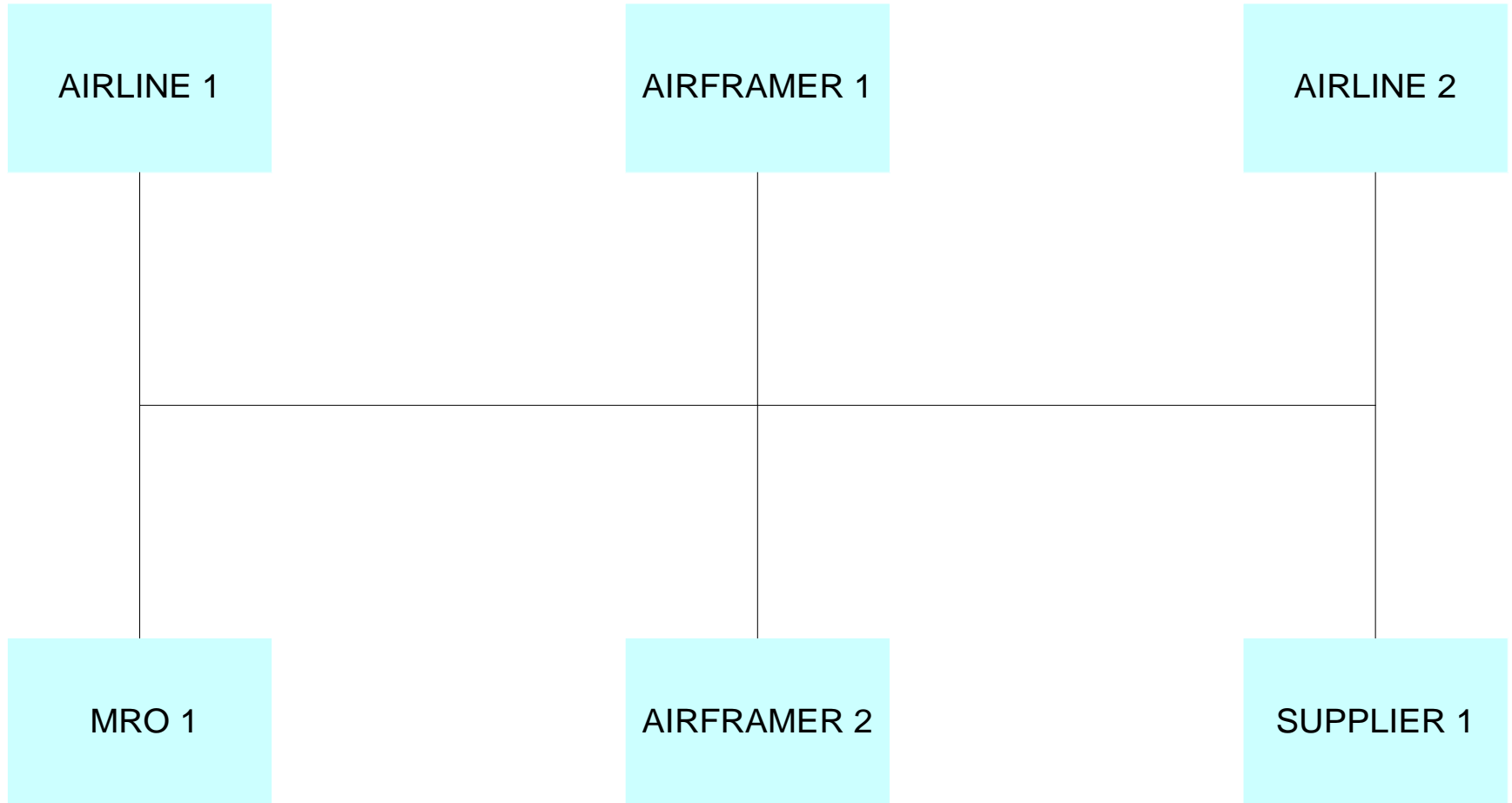
Standard Protocol (Local Area Network)

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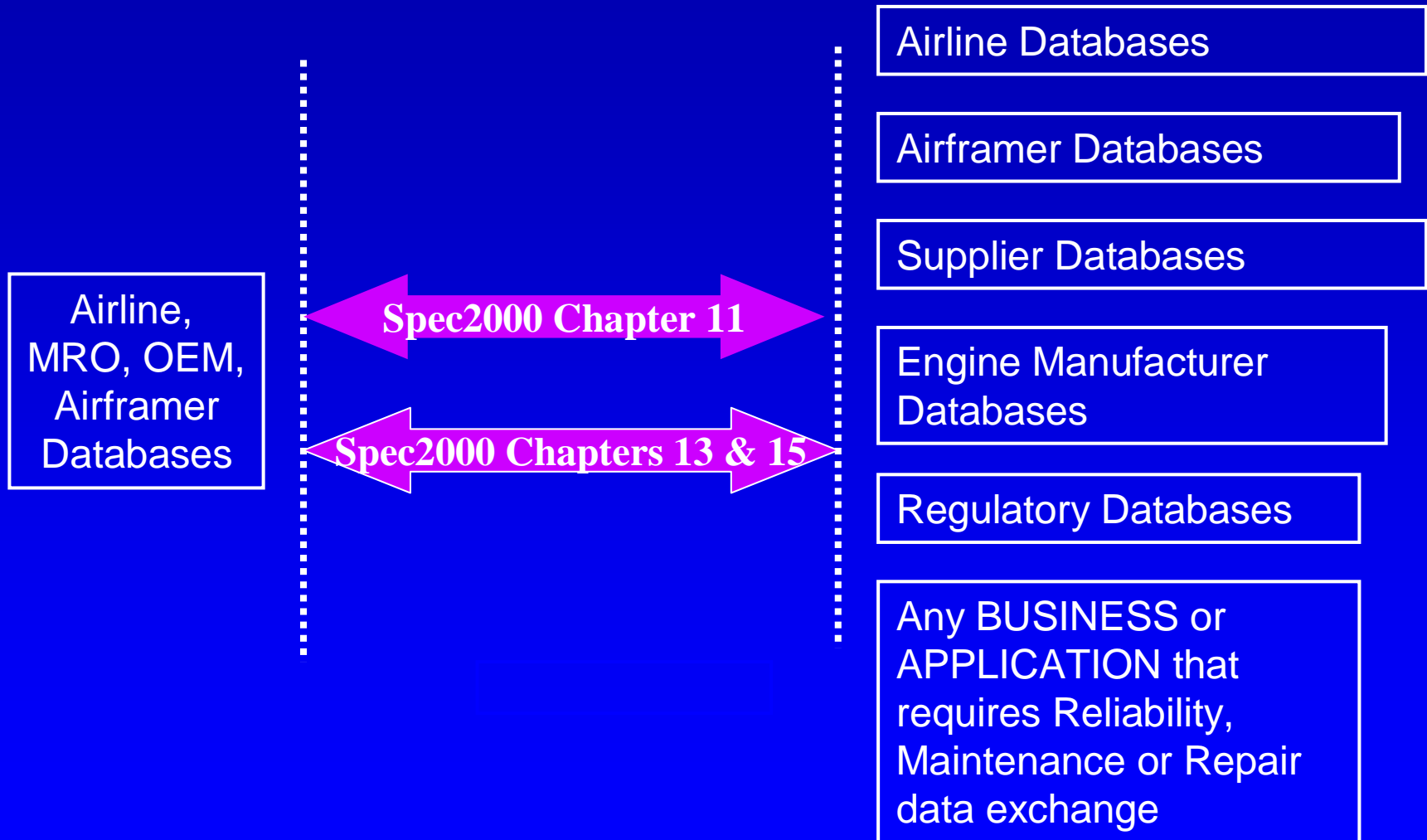


Need a Standard Protocol for Reliability & Maintenance Data Exchange

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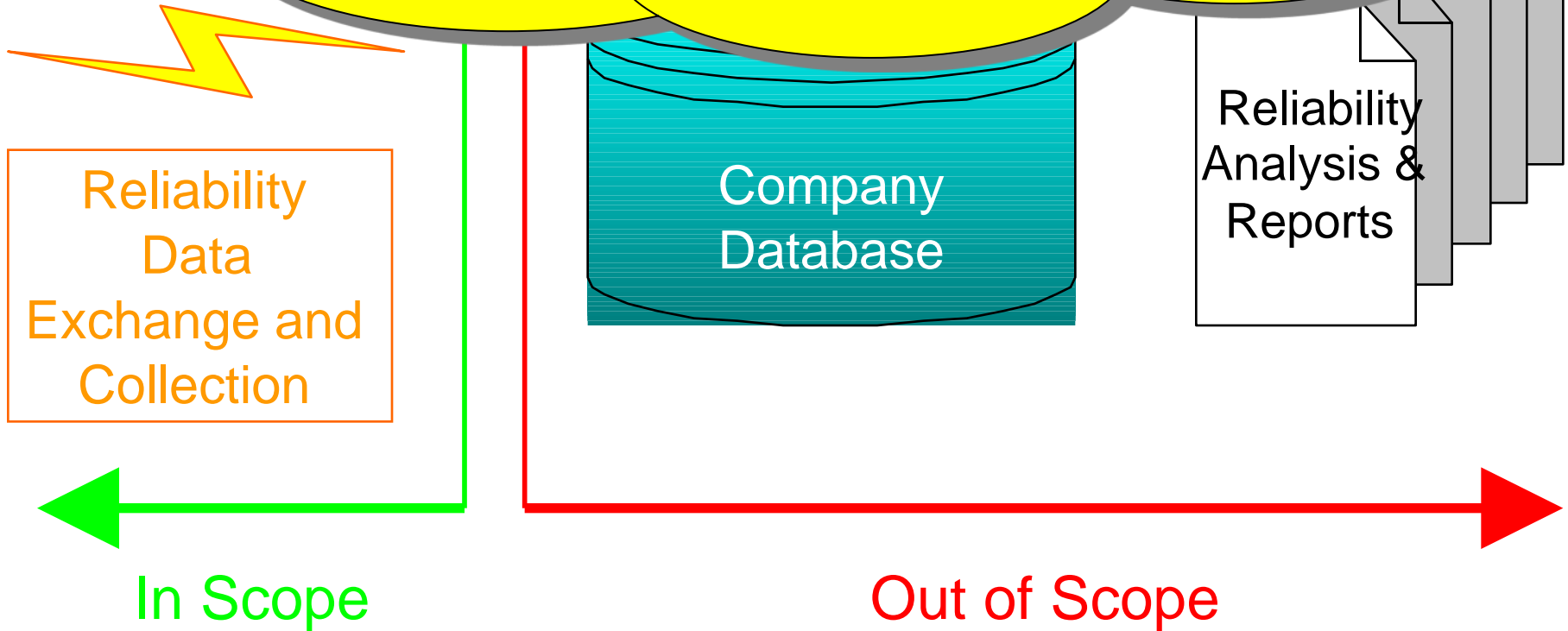


Standard Protocol for Reliability, Maintenance and Repair Data Exchange



Spec2000 Chapter 13

Spec2000 Chapter 13 standardizes the definitions and parameters used in reporting reliability metrics.



ATA Spec2000 Chapter 11's Data Collection / Exchange Records

Spec2000 Chapter 11 Records

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Chapter 11 consists of 9 records:

- **LRU Removal record**
 - Purpose : Collect details of the components removed from an aircraft as well as reasons for removal and details of component being installed.
- **Shop Findings record**
 - Purpose: Collect detailed component tear down reports from an airline's shop or other repair facilities.
- **Aircraft Hours and Landings record**
 - Purpose: Collect detailed hours, cycles and utilization data from operators. This data can also be used as the basis for MTBUR calculations, etc.
- **Aircraft Event record**
 - Purpose : To capture aircraft event data such as delays, cancellations, technical incidents, etc.
- **Aircraft Logbook record**
 - Purpose : Collect technical/journey log entries such as pilot reports, maintenance corrective action, etc.

Spec2000 Chapter 11 Records

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Chapter 11 records (ctd)

- **Summary Counts record**
 - Purpose : Allow operators that are unable to capture data at the detailed level to provide summarized counts of delays, cancellations, pilot reports, etc.
- **Scheduled Maintenance record**
 - Purpose : Collect scheduled maintenance data, findings and corrective action, and provide reference ability back to the operator's maintenance program.
- **Service Bulletin/Modification record**
 - Purpose : Provide data on service bulletin/mod incorporation and unincorporation.
- **Aircraft Status Change record**
 - Purpose : Capture changes in aircraft ownership, operator, long term out-of-service, engine model changes, etc.

Spec2000 Chapter 11 Records

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Field Name Field Type (Mandatory vs Conditional)

Nbr	Information Level	Data to be Collected (Business Terms)	Data Element (CSDD)	TEI	Condition	Data Type	Size: min/max	Example	Business rules / comments
1	Segment Header "HDR"								The Header Segment is Mandatory. This segment is sent only once per transmission of Aircraft Hours and Landings record.
2		Record Status	Change Code	CHG	Mandatory	AN	1/1	N	The valid codes are N=New; D=Delete; T = Total Replacement
3		Reporting Organization Code	Reporting Organization Code	ROC	Mandatory	AN	3/5	UAL	Should be CAGE or NCAGE code. Use code ZZZZZ if no CAGE/NCAGE is available OR use ICAO code for operator.
4		Reporting Organization Name	Reporting Organization Name	RON	Conditional	AN	1/55	United Airlines	Required if the reporting organization has no CAGE/NCAGE Code.
5		Operator Code	Operator Code	OPR	Mandatory	AN	3/5	UAL	This code should support ICAO 3-digit airline designator for reliability applications. Use ZZZZZ if no ICAO code is available. This element is a KEY field in the record.
6		Operator Name	Company Name	WHO	Conditional	AN	1/55	United Airlines	Represents the name of operator in reliability applications. Mandatory, if operator of the aircraft has no ICAO operator code.

Field Size

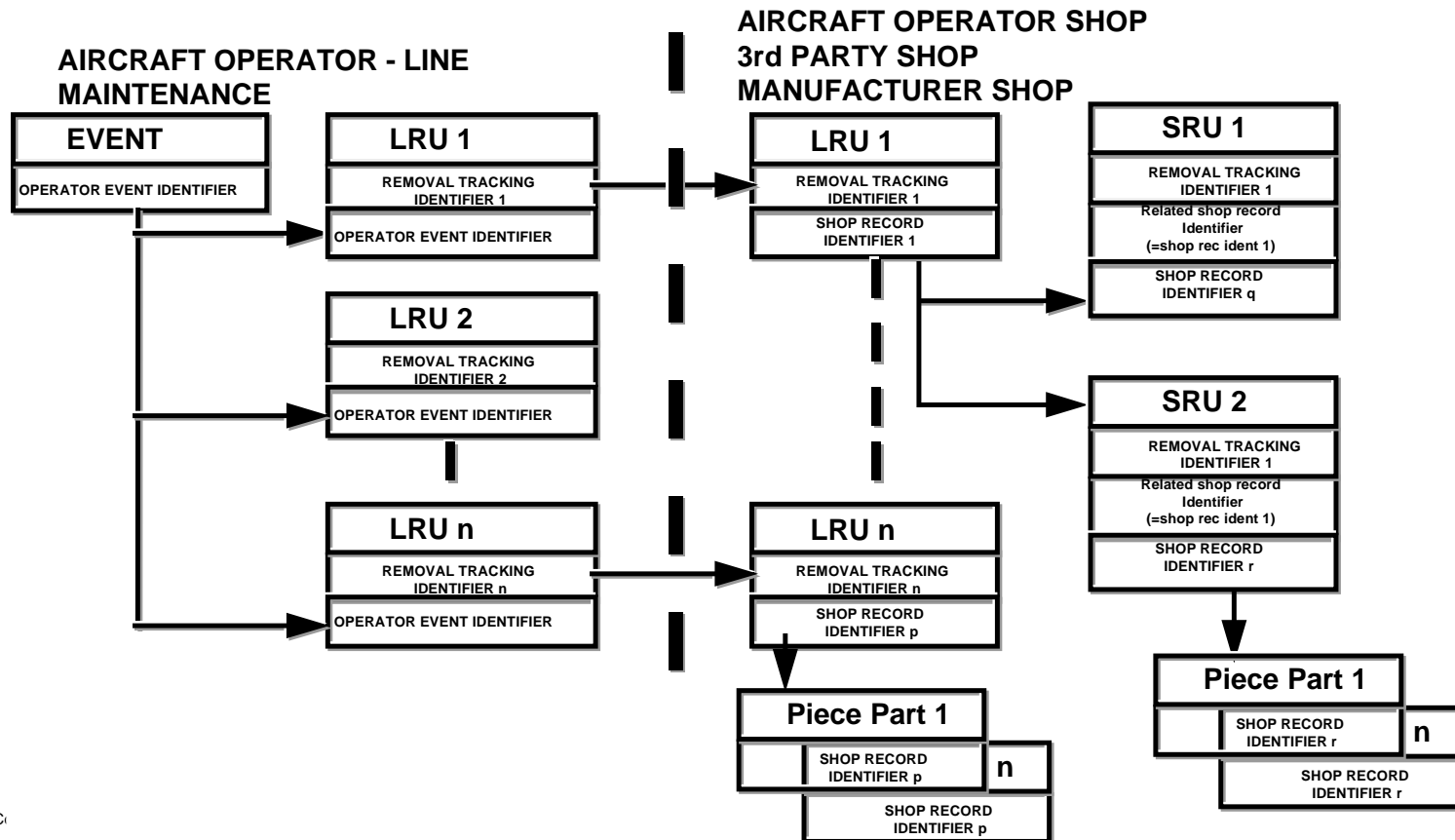
Field Definitions

Field Example

Spec2000 Chapter 11 - Links between Records

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- Fields have been added to facilitate linking related records
- Data is repeated in case of missing records or erroneous linking information



Linking the Event, Logbook, LRU Removal and Shop Finding Records

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EVENT

ERI	EV930630
OEI	LG41106
ROC	LTX
OPR	LTX
AMC	Q400
ICD	P
DTA	2311
ATA	231101
IOD	11-Aug-01
AIN	4232
DLY	1
TCI	3
DTM	0.53
DCT	#2 comm will not receive
MNT	Replaced transceiver.

LOGBOOK

OEI	LG41106
ATA	2310
DOT	11-Aug-01
AMC	Q400
AIN	4232
ROC	LTX
OPR	LTX
LOC	
DOC	P
MCC	11-Aug-01
MAH	3.5
DCT	#2 VHF: TX-CARRIER ONLY RX-STATIC-UNREADABLE. NO VOICE AT ALL.
MNT	REMOVED & REPLACED VHF TRANSCEIVER. CONDUCTED TEST IAW TASK 23-11-00-710-801. TEST GOOD.

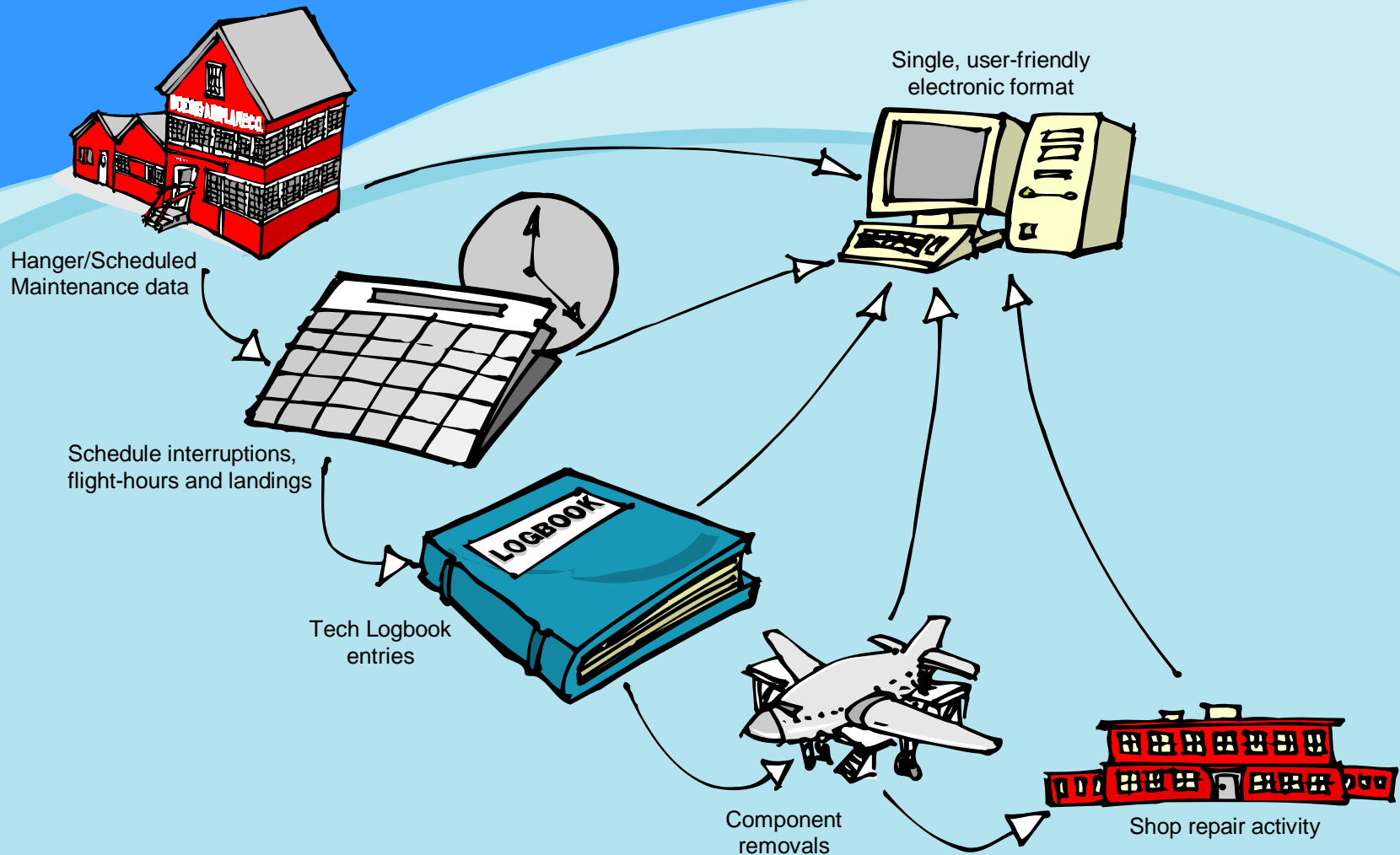
REMOVAL

RTI	RM10774
OEI	LG41106
OPR	LTX
AMC	Q400
AIN	4232
ASN	6-2311-3-0020
MFR	32AXV
MPN	EVR716-11-0350A
SER	9709A02062
ATA	231101
TTY	U
RED	11-Aug-01
CPI	2
CTH	3576
CTY	4301
RET	VHF TRANSCEIVER - STATIC-RT UNREADABLE.

SHOP

SFI	SH38440
RTI	RM10774
OPR	LTX
AMC	Q400
AIN	4232
MPN	EVR716-11-0350A
SER	4689709A-02062
RED	11-Aug-01
RRC	U
FFC	Y
FCR	Y
MRD	15/08/2001
MFR	32AXV
SHP	25/10/2001
DCT	VHF TRANSCEIVER - STATIC-RT UNREADABLE.
INT	"Power supply failure: Unrelated. Replaced. Intermittent. MX19 OUT - 3522;911M26 - Fault code present: Unrelated. Intermittent. DPU FC 11101;999 - Unit sent to XXX; CONFIRMED DEFECT. DPU BOARD REPROGRAMMED.

The Data Continuum: Root Cause, Problem Identification, and Resolution



Spec2000 Chapter 11

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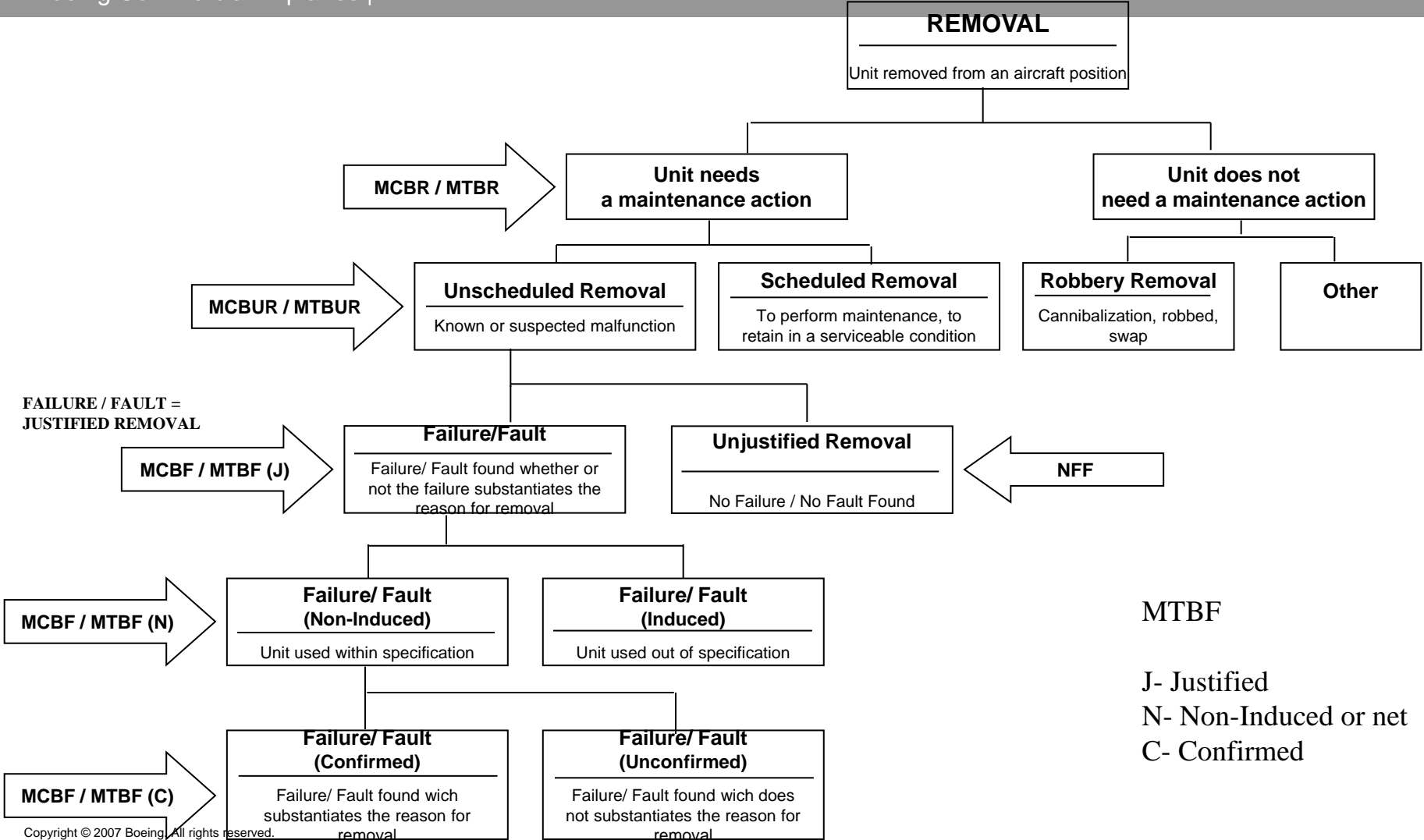
- **Spec2000 Chapter 11 – “Aircraft Reliability Data Collection and Exchange”, has been part of ATA Spec2000 since May 2004**
- **It was endorsed by IATA for use by it’s members in January 2005**
- **It is the recommended method to comply with the FAAs Issue Paper 44 requirement for evolution/optimization of tasks in a current Maintenance Review Board**
- **Called out in ISO STEP 10303 / AP 239 PLCS**

Spec2000 Chapter 13.2

Reliability Metrics

Spec2000 Chapter 13.2 Component Removal Metrics

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MTBR =

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Accumulated_Component_Flight_Hour_in_a_Period

Number_of_Component_removal_(scheduled_&_Unscheduled)_in_the_same_period.

MTBR = ((Quantity Per Aircraft) multiplied by (Flight Hours)) divided by Total Removals
(Unscheduled plus scheduled)

$MTBR = (TQA \times FHL) / TRS$

MTBR : Mean Time Between Removal Definition = A performance figure calculated by dividing the total unit flying hours accrued in a period by the number of unit removals (scheduled plus unscheduled) that occurred during the same period. (see previous figure to determine MTBR)

MTBUR =

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Accumulated _ Component _ Flight _ Hour _ in _ a _ period

Number _ of _ unscheduled (justified _ & _ unjustified) _ component _ removal _ in _ the _ same _ period

MTBUR = ((Quantity Per Aircraft) multiplied by (Flight Hours)) divided by Total Unscheduled Removals

$$\text{MTBUR} = (\text{TQA} \times \text{FHL}) / \text{CUC}$$

MTBUR : Mean Time Between Unscheduled Removal Definition = A performance figure calculated by dividing the total unit flying hours (airborne) accrued in a period by the number of unscheduled unit removals that occurred during the same period. (see previous figure to determine MTBUR)

Spec2000 Chapter 13.2

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- **Component Reliability Metrics** – Released May 2005

- **Technical Delay and Cancellation Exclusion List** –
 - In 2008 Airbus, Boeing, Bombardier and Embraer agreed to use the Reliability Exchange of Airline Data International's (READI) Exclusion List for Delay & Cancellation benchmarking purposes

- To be released in June 2010
 - **Dispatch Metrics** –
 - Reliability definition and calculation
 - Schedule Reliability definition and calculation
 - **Logbook Rates** –
 - Definitions and calculations

Spec2000 Chapter 15, Aircraft Delivery Data

Spec2000 Chapter 15, Aircraft Delivery Data

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- **The purpose of this record is for detailing a limited list of installed parts on an aircraft as-delivered from a seller to a buyer**
- **Typically it is to be completed by an airframe manufacturer to be provided to an operator**
- **But in the future the team is considering expanding this to include from an operator to an operator or lessor**
- **To be released June 2010**

Roadmap to the Future

Roadmap to the Future

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Industry Adoption

2005 Refined the Standard

- Developed much tighter industry cooperation toward refining the reliability and maintenance data standard
- Held our first Maintenance Information Software provider meeting
- Learned we need more information to convince the industry to follow our lead to use ATA Spec2000 Chapters 11 and 13 as the industry standard data exchange protocol

1997 ~ 2004 Developed Reliability & Maintenance Data Exchange Standard (ATA Spec2000 Chapter 11)

- Airbus, Boeing, Bombardier, Dassault and Embraer began working together on Spec2000 Chapter 11
- Changed data exchange paradigm from data protection to data sharing
- Spec2000 Chapter 11 published by the ATA in May 2004
- Spec2000 Chapter 11 received IATA endorsement in Jan 2005

2006 ~ 2011 Industry Application

- Airbus and Boeing are able to accept Spec2000 Chapter 11 formatted data
- Participate in regional meetings to share our collective Spec2000 Chapter 11 implementation value propositions, benefits and lessons learned
- Beginning in 2008 the following companies intend to use Spec2000 Chapter 11 as the primary means to exchange Reliability and maintenance data

Ability to share standard and accurate data with minimum transaction cost or effort

Companies that Intend to Comply with Spec2000

Chapter 11

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- Airbus
- Boeing
- Bombardier
- Dassault
- Embraer

- Air Canada
- Continental
- Delta
- FedEx (plus or minus mid 2008)
- Lufthansa Technik
- SAS
- Turkish Airlines
- Virgin Atlantic Airways
- WestJet

- GE Aviation

- BAE Systems
- C&D Aerospace
- Goodrich Wheels and Brakes
- Hamilton Sundstrand
- Honeywell
- Moog
- Nabtesco
- Panasonic
- Parker
- Rockwell Collins
- Smiths
- Thales

- Edatasystems
- EmpowerMX
- MIRO
- Maintenix (MXi)
- RussellAdams
- SAP (2010)
- Swiss Aviation Software (AMOS)
- Teradata
- TRAX
- Ultramain

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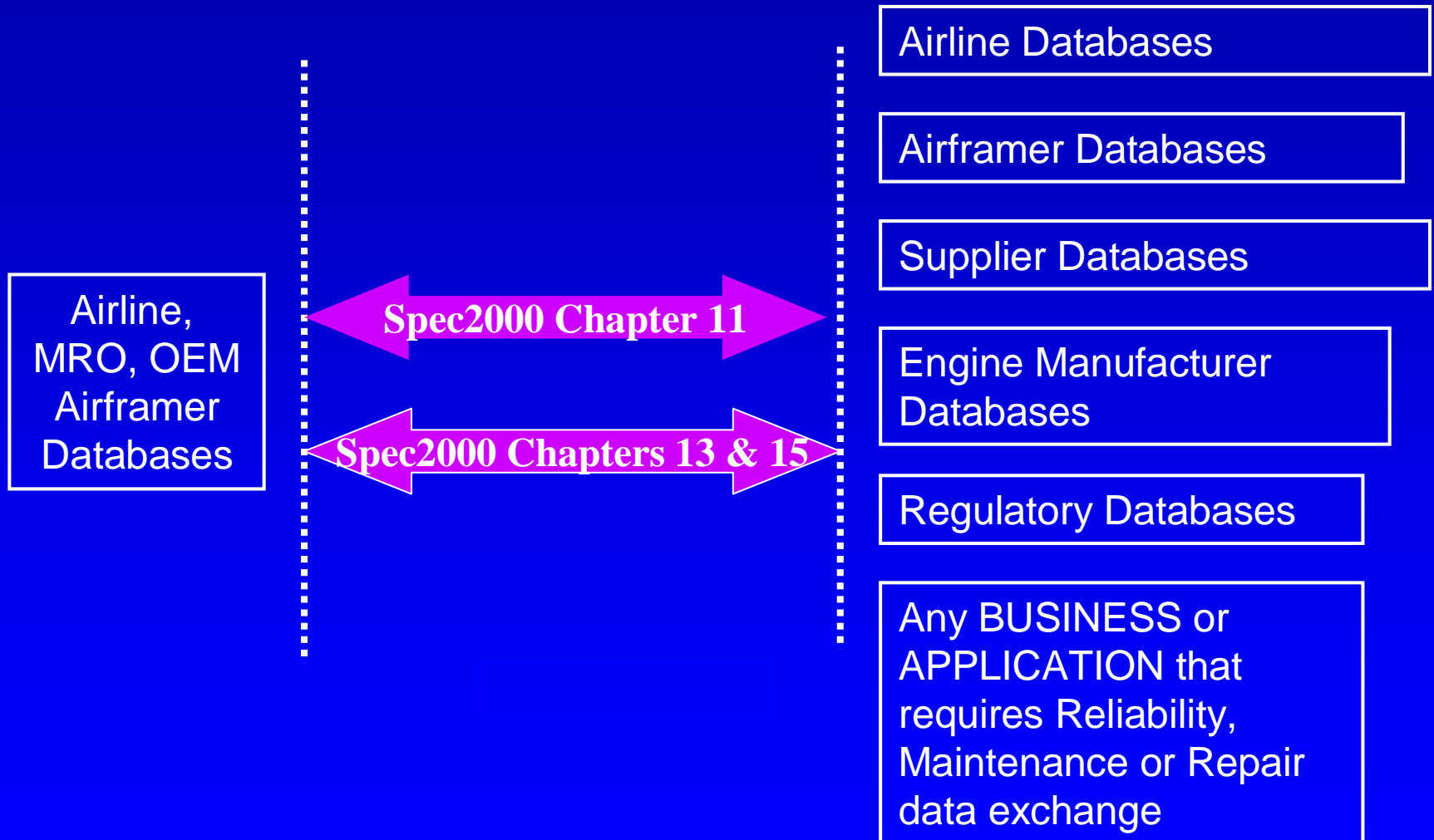
Summary

Summary

- **ATA Spec2000 Chapter 11 is an industry standard XML data format for collecting and exchanging aircraft and component reliability, maintenance and repair data**
- **ATA Spec2000 Chapter 13.2 outlines a method to compute Reliability metrics using Spec2000 Chapter 11's data elements**
- **ATA Spec2000 Chapter 15 is an XML format airplane delivery record made from data elements from Chapter 11**
- **Many airlines, suppliers, engine manufactures, airframe manufacturers and Maintenance Software providers are, or will, be ATA Spec2000 Chapter 11 compliant**
- **Airbus and Boeing are Spec2000 Chapter 11 compliant today**

Bottom Line

Standard Protocol for Reliability, Maintenance and Repair Data Exchange



Questions?



ValSpec2000 Value Analysis CD

Purpose of Value Analysis CD

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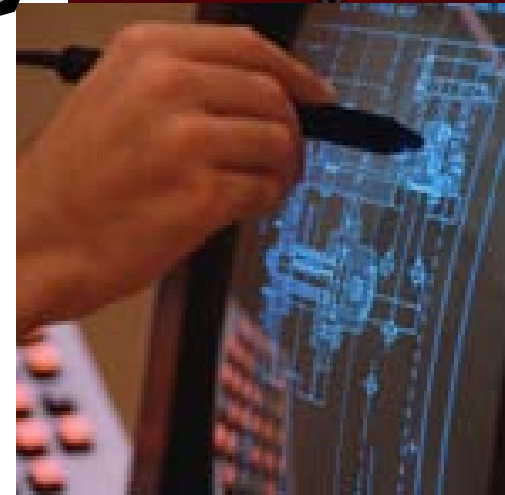
- **Standards are coming to your area! This is another step in the journey toward the digital world**
- **The value analysis CD, ValSpec2000, was created by Boeing with input from the ATA Reliability Interest Group members of airlines, suppliers, airframe manufacturers, maintenance software providers, etc.**
- **To provide an interactive method to weigh software implementation costs against the potential maintenance cost savings that can be expected from standardized data collection and exchange**
- **The CD is designed for an airline's CIO or VP of IT to help them assess the value of implementing Spec2000 Chapter 11**

ValSpec2000 CD

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- CD has default ground rules that can be updated to match an airline's operation
- CD allows for the selection of an airline's participation level utilizing the airline's own ground rules
 - Level 1 = airline is internally compliant with Spec2000 Chapter 11
 - Level 2 = airline shares data using Spec2000 Chapter 11
 - Level 3 = airline shares data with airframe manufacturer using Spec2000 Chapter 11
- CD estimates the value of incorporating Spec2000 Chapter 11 over a defined study period by calculating Net Present Value and payback period

Let's Work an Example using ValSpec2000 CD



Are There Any Questions?

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