A350
TECHNICAL TRAINING MANUAL
MAINTENANCE COURSE - T1+T2 - RR Trent XWB
Onboard Maintenance System

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Under no circumstances should this document be used as a reference

It will not be updated.

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ONBOARD MAINTENANCE SYSTEM

V2414251 - V00T0MM0

ONBOARD MAINTENANCE SYSTEM (OMS) DESCRIPTION (2/3)

Onboard Maintenance System Introduction

The Onboard Maintenance System (OMS) supports line and base maintenance activities, and engineering follow-up.
The OMS main functions are:
- Failure reporting
- System testing
- Software uploading/downloading
- Maintenance documentation access
- Data monitoring of A/C systems
- Configuration management
- Protection Distribution Monitoring and Maintenance Function (PDMMF) (this function is described in ATA 24 chapter).

V2414251 - V00T0MM0 - VM45D1OMS003001

NEED OF MAINTENANCE

ONBOARD MAINTENANCE SYSTEM

- FAILURE REPORTING
- SYSTEM TESTING
- SOFTWARE UPLOADING
- MAINTENANCE DOCUMENTATION ACCESS
- A/C SYSTEM DATA MONITORING
- A/C CONFIGURATION MANAGEMENT
- PROTECTION DISTRIBUTION MONITORING AND MAINTENANCE FUNCTION

A/C READY TO GO !

ONBOARD MAINTENANCE SYSTEM INTRODUCTION

ONBOARD MAINTENANCE SYSTEM (OMS) DESCRIPTION (2/3)

OMS Functions

If there is an A/C system failure, the related A/C system sends to the OMS:
- Maintenance data
- Operational data.

The OMS has functions that follow:
- Diagnosis

Maintenance data (fault messages, cockpit effect) are used for diagnoses.
The diagnosis function:
- Gets the data
- Does the correlation between all received maintenance messages and cockpit effects to cause a correlated fault case with related root cause and consequences.
- Maintenance support

To correct the failure and to support the maintenance, the OMS supplies this set of functions (software applications) :
- Access to electronic maintenance documentation (AirN@v Line)
- Control and monitoring of protection and connection devices (e-breaker access)
- Interactive tests
- Software uploading and files downloading
- Configuration reporting
- Real-time monitoring.
- Prognostic

The OMS also has a prognostic function that operates on the acquisition and analysis of the system operational data. Then, the prognostic function supplies trend and servicing monitoring and monitoring reports for the detection in advance of possible failure appearance.
The OMS can then send information to the ground maintenance control center (in-flight) or to the airline engineering (on-ground) for analyses that can prevent or correct failures.

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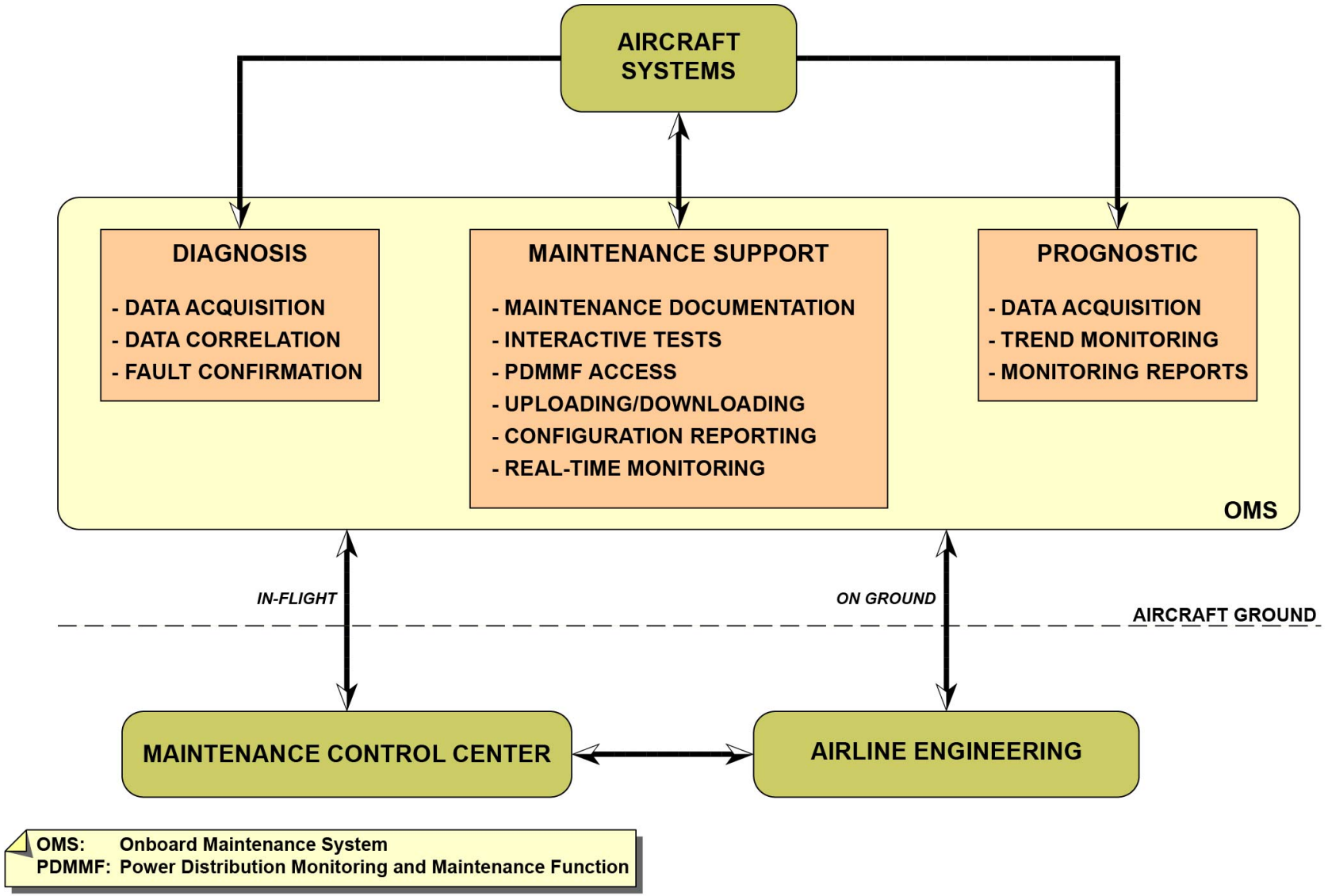

OMS FUNCTIONS

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ONBOARD MAINTENANCE SYSTEM (OMS) DESCRIPTION (2/3)

OMS Description

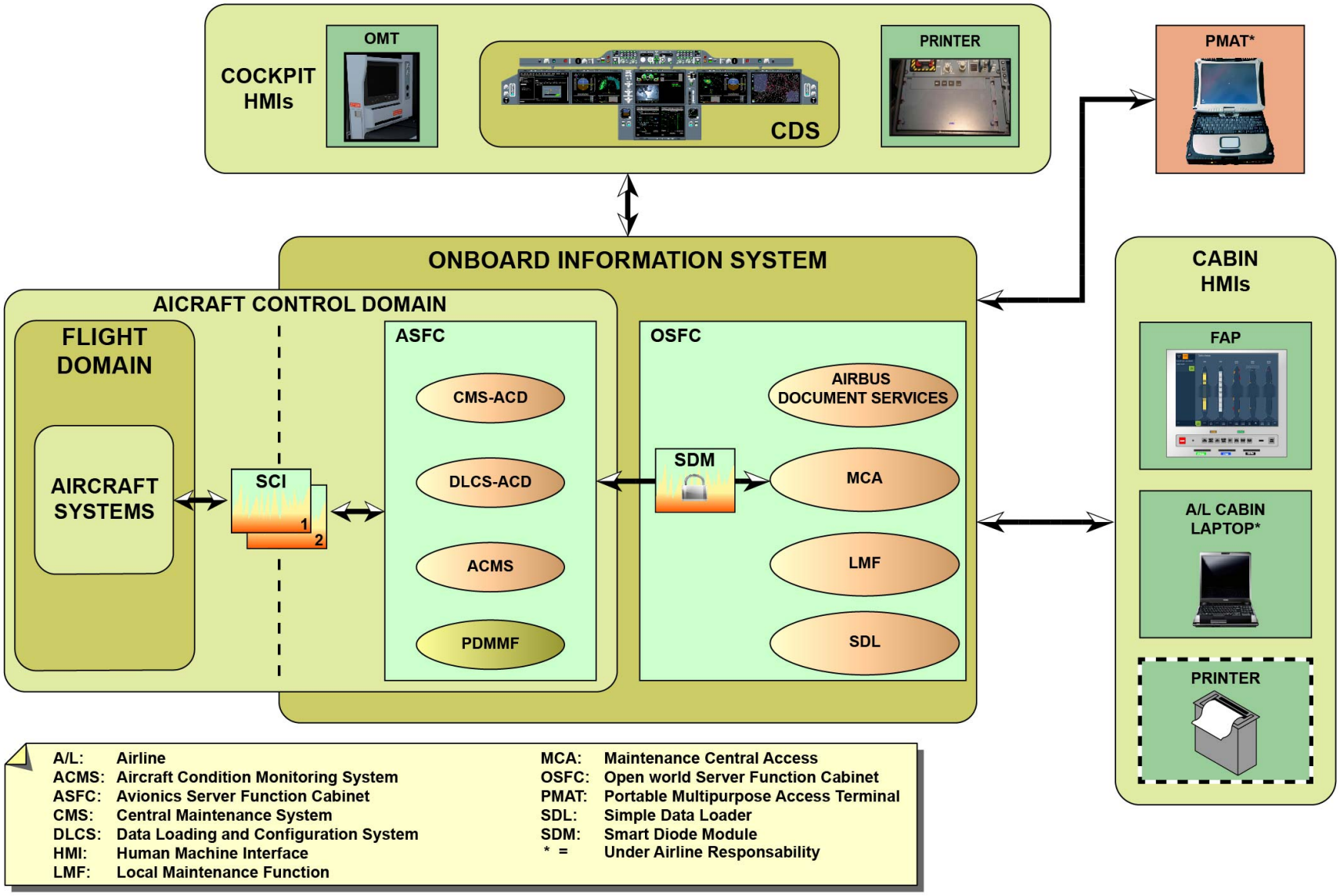
OMS applications

The OMS has different applications dedicated to support A/C maintenance tasks installed in:
- The Avionics Server Function Cabinet (ASFC):
- The Central Maintenance System-Aircraft Control Domain (CMS)-Aircraft Control Domain (ACD) application has the ACD maintenance functions (fault messages or warning reporting, tests, etc.).
- The Data Loading and Configuration System (DLCS)-ACD application does the software uploading and the configuration reporting.
- The Aircraft Condition Monitoring System (ACMS) application does the A/C parameter monitoring and recording
- The Power Distribution Monitoring and Maintenance Function (PDMMF) application which gives:
- Remote control to the contactors and protection devices
- Status monitoring on the CDS (C/B page) or on the Onboard Maintenance Terminal (OMT)/OIS displays.
- The Open-World Server Function Cabinet (OSFC):
- The electronic A/C documentation system, which gives:
- Access and display to the technical data documentation related to the maintenance package (e.g.: troubleshooting procedures, maintenance procedures, schematics and wiring, Functional Item Number (FIN), Part/Number (P/N), C/B, zone, panel, etc.)
- Access and display to the Minimum Equipment List (MEL)/Configuration Deviation List (CDL) procedures.
- The Maintenance Central Access (MCA) calculates and shows the maintenance data (Post Flight Report (PFR)) from the CMS-ACD and Open world Server Function (OSF) Local Maintenance Function (LMF).
- The LMF centralizes the fault messages and manages the tests for the OSFC and the Airline Information Services Domain (AISD) application BITEs.
- The Simple Data Loader (SDL) does the uploading of software and databases into the OSFC.

OMS architecture

The OMS applications are part of the OIS.
The CMS-ACD, DLCS-ACD, ACMS and PDMMF are hosted in the ASFC. They exchange data with the A/C systems in the flight domain through the two SCIs. They can also exchange data with the OSFC applications (MCA, LMF, SDL) through the Smart Diode Module (SDM).
The OMS applications can be accessed from these Human-Machine Interfaces (HMIs):
- The OMT
- The CAPT and F/O outer displays of CDS
- The optional Portable Multipurpose Access Terminals (PMAT)
- The flight attendant panels (decreased functions)
- The airline cabin laptop (decreased functions).

Data can also be retrieved through the cockpit or optional cabin printers.



OMS DESCRIPTION - OMS APPLICATIONS & OMS ARCHITECTURE

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ONBOARD MAINTENANCE SYSTEM (OMS) DESCRIPTION (2/3)

OMS Air-Ground Communications

The OMS applications can send or receive data to or from the ground through different communication means:

- The Avionics Communication Router (ACR) application hosted in a CPIOM through HF, VHF and SATCOM means (Aircraft Communication Addressing and Reporting System (ACARS) network) primary in-flight
- The Wireless Airport Communication Router System (WACS) or through the SATCOM high speed system (IP network) primary on-ground.

The CMS, DLCS and ACMS applications (hosted in the ASFC) can send or receive data in two different ways. Data are first sent to the application of the ACD communication manager (Avionics Message Exchanger (AMEX)) hosted in the ASFC. Then, in relation to the A/C position and airline policy, data are transmitted to:

- The ACR through the SCIs for the HF, VHF and SATCOM transmissions
- The OSFC communication manager application (Information Management Aircraft-ground Communication System (IMACS)) hosted in the OSFC for transmission through WACS (Wi-Fi, cellular, wired) or high speed SATCOM.

on-ground, data exchange is possible with the airline ground facilities: the Airline Operational Control (AOC) centers.

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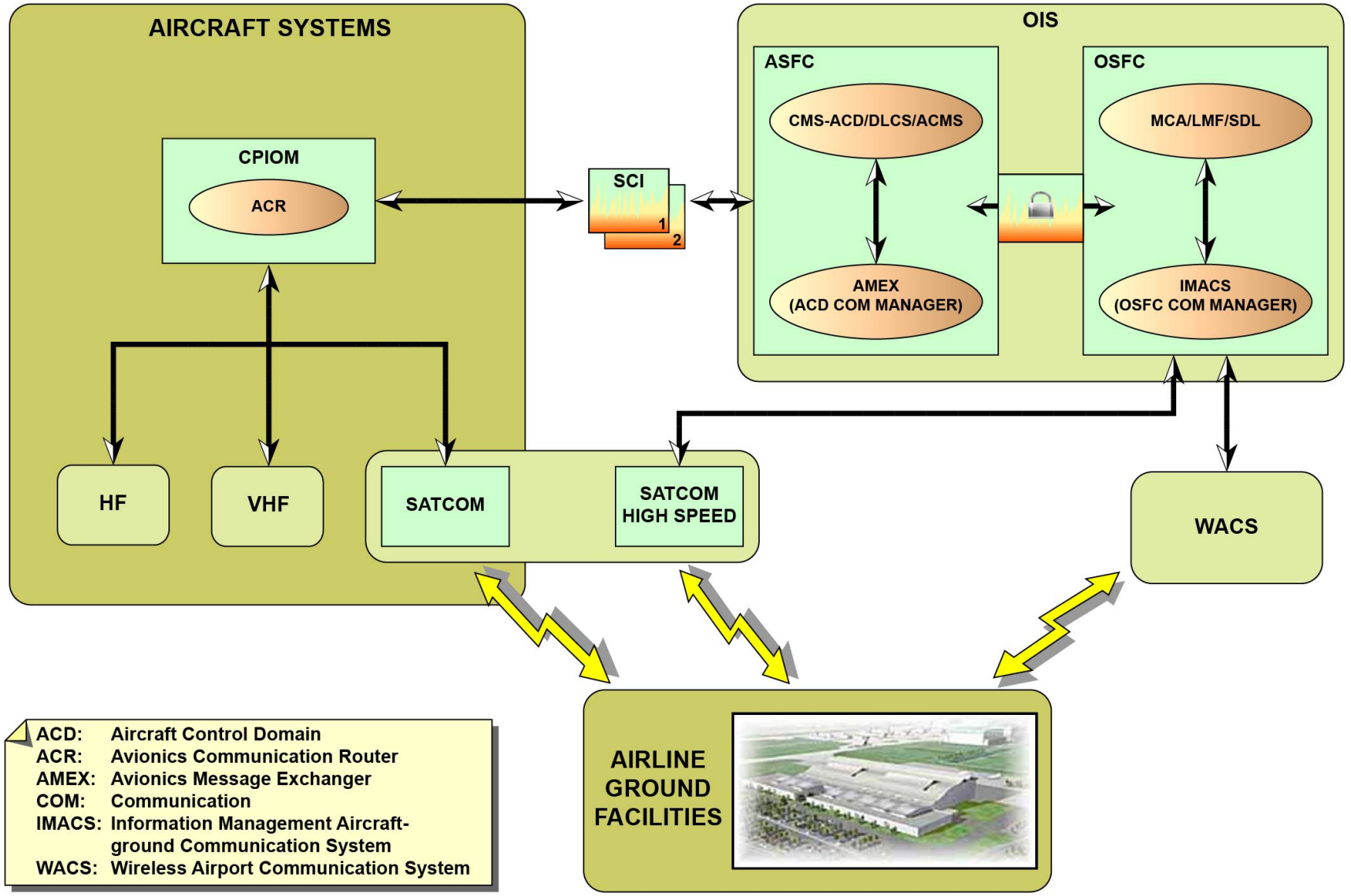

OMS AIR-GROUND COMMUNICATIONS

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CENTRAL MAINTENANCE SYSTEM (CMS) DESCRIPTION (2/3)

CMS Functions

The function of the Central Maintenance System (CMS) is:
- To do the centralization of the data related to the A/C system fault events
- To manage the system testing.

The CMS gets the fault symptoms from the A/C systems and especially from the BITEs of the Line Replaceable Unit (LRUs).

The CMS has two operating modes:
- The normal mode (on-ground and in-flight)
- The interactive mode (only on-ground).

The normal mode:
- Does the system continuous monitoring (BITEs)
- Finds and identifies the failures (BITEs)
- Does the centralization of the failures and parameters sent by the BITEs (CMS)
- Gives maintenance reports (CMS).

The interactive mode:
- Does interactive system tests
- Does system ground scanning
- Does maintenance report history.

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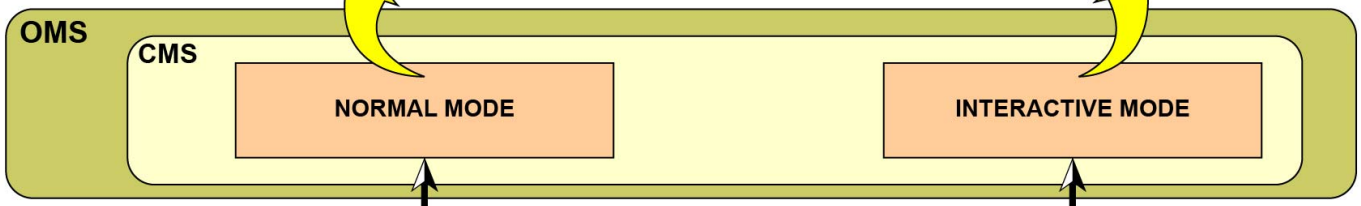
NORMAL MODE
(GROUND/FLIGHT)

- SYSTEM CONTINUOUS MONITORING
- FAILURE DETECTION AND IDENTIFICATION
- CENTRALIZATION OF FAILURE EVENTS AND PARAMETERS SENT BY THE BITES
- MAINTENANCE REPORT GENERATION

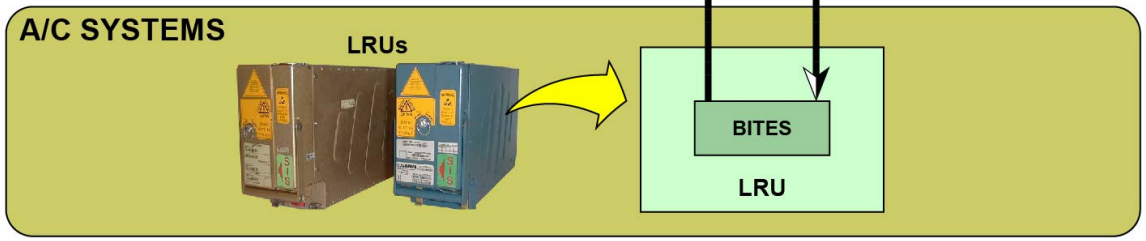
INTERACTIVE MODE
(ON GROUND)

- INTERACTIVE SYSTEM TESTS
- ACCESS TO GROUND SCANNING
- ACCESS TO MAINTENANCE REPORT HISTORY



SYSTEM FAILURES

INTERACTIVE TESTS



CMS: Central Maintenance System
OMS: Onboard Miantenance System

CMS FUNCTIONS

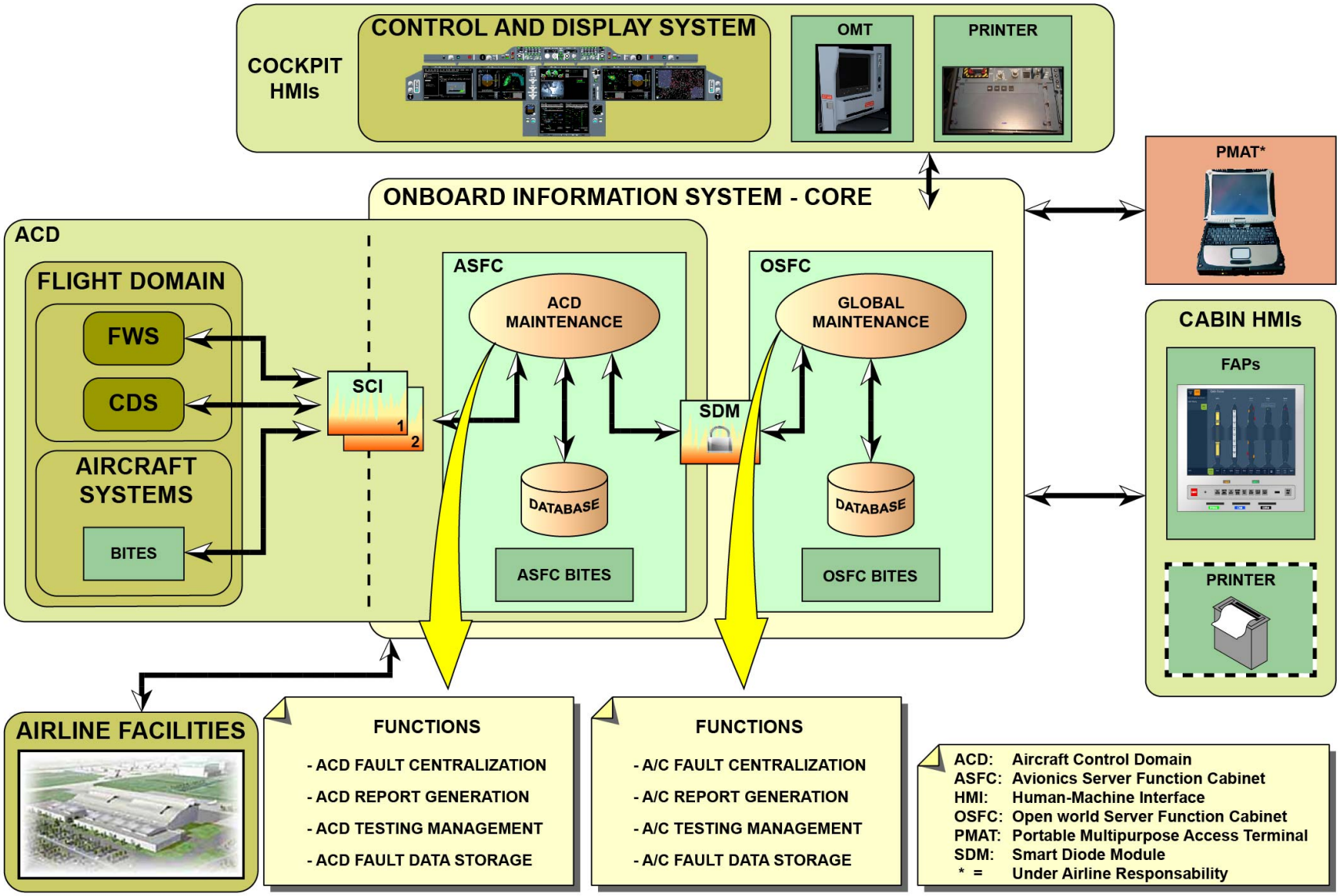
CENTRAL MAINTENANCE SYSTEM (CMS) DESCRIPTION (2/3)

CMS Description

CMS general architecture

The CMS has two functions:
- One is hosted in the Avionics Server Function Cabinet (ASFC),as a part of the Aircraft Control Domain (ACD), and does the ACD maintenance (for equipments hosted in the ACD).
- One is hosted in the Open world Server Function Cabinet (OSFC) and does the OSFC maintenance and the report generation of the global A/C maintenance.
- The ACD maintenance function manages:
- The fault centralization from the flight domain (BITEs + cockpit effects) and the ASFC
- The report generation
- The testing management
- The fault data storage.
- The global maintenance (in the OSFC) manages:
- The faults centralization from the ACD and the OSFC BITEs
- The global report generation, Post Flight Report (PFR)
- The system testing management
- The fault data storage.

The CMS has an interface with:
- All the A/C system components which have a BITE (with ASFCs and the OSFC BITEs)
- The airline equipment for maintenance data exchange (through the A/C Communication Addressing and Reporting System (ACARS) or IP communications)
- Databases hosted in the ASFC and in the OSFC
- The FWS to receive the warning, caution and advisory messages
- The CDS for flags
- Different Human Machine Interfaces (HMIs) (CDS, OMT, Portable Multipurpose Access Terminal (PMAT), etc.).



CMS DESCRIPTION - CMS GENERAL ARCHITECTURE

CENTRAL MAINTENANCE SYSTEM (CMS) DESCRIPTION (2/3)

CMS Description (continued)

CMS detailed architecture and functions

The CMS has two primary applications:
- The CMS-ACD
- The Maintenance Central Access (MCA).

Note that the Local Maintenance Function (LMF) contributes to the CMS functions but it is not a part of them.

The CMS-ACD is responsible for the onboard maintenance function of the ACD domain (i.e. all the A/C systems, plus the ASFC cabinet and the hosted applications). It exchanges data with the avionics components through the SCIs which operate as firewalls.

The CMS-ACD application does the centralization of:
- BITE messages from the ACD LRUs
- BITE messages from the ASFC applications
- Cockpit effects and flight phases given through the FWS (ECAM alerts, status, etc.)
- Flags and local effects from the CDS.

It also receives some other A/C system data, like:
- In-flight or on-ground condition from the LGERS
- Engine operating information from the Propulsion Control System (PCS)
- Calculated Air Speed (CAS) from the Air Data/Inertial Reference System (ADIRS)
- Flight number from the Flight Management System (FMS).

These data are:
- Calculated and primary used to supply and to built maintenance reports as the PFR.
- Stocked in the ASFC memory resources in a dedicated database (but only data related to the last leg).
- Sent to the OSFC and stocked in a dedicated database (the last 20 legs).

The CMS-ACD also:
- Starts the BITE tests for the A/C systems and for the ASFC applications.
- Exchange data with the Aircraft Condition Monitoring System (ACMS) application to ask for and to receive the BITE contextual reports to make the system failure troubleshooting easier. For a given system/component, the BITE contextual report includes in-depth health-status data of this system/component.

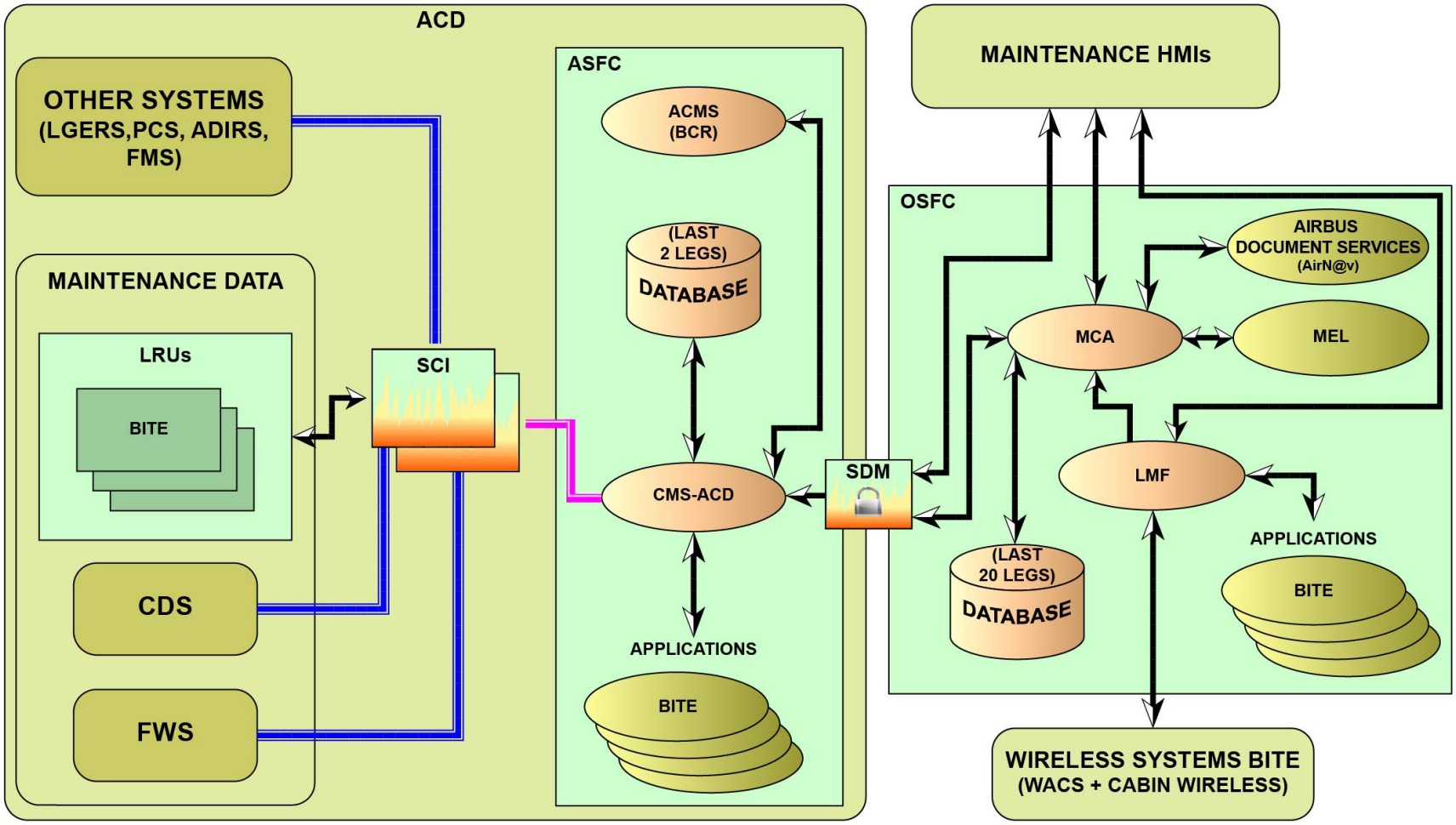
The LMF is responsible for the onboard maintenance function of the OSFC and the wireless system (i.e. the Wireless Airport Communication System (WACS) and cabin wireless).

The MCA is responsible for the onboard global A/C maintenance-function. It receives:
- Maintenance data and reports (PFR) from the CMS-ACD for the ACD part
- Maintenance data from the LMF for the OSFC side.

From this information, the MCA:
- Calculates and supplies a global A/C maintenance report which shows all the A/C current health.
- Stocks the global A/C maintenance reports (with a maximum of 20) and the related history in a dedicated database in the OSFC memory resources.

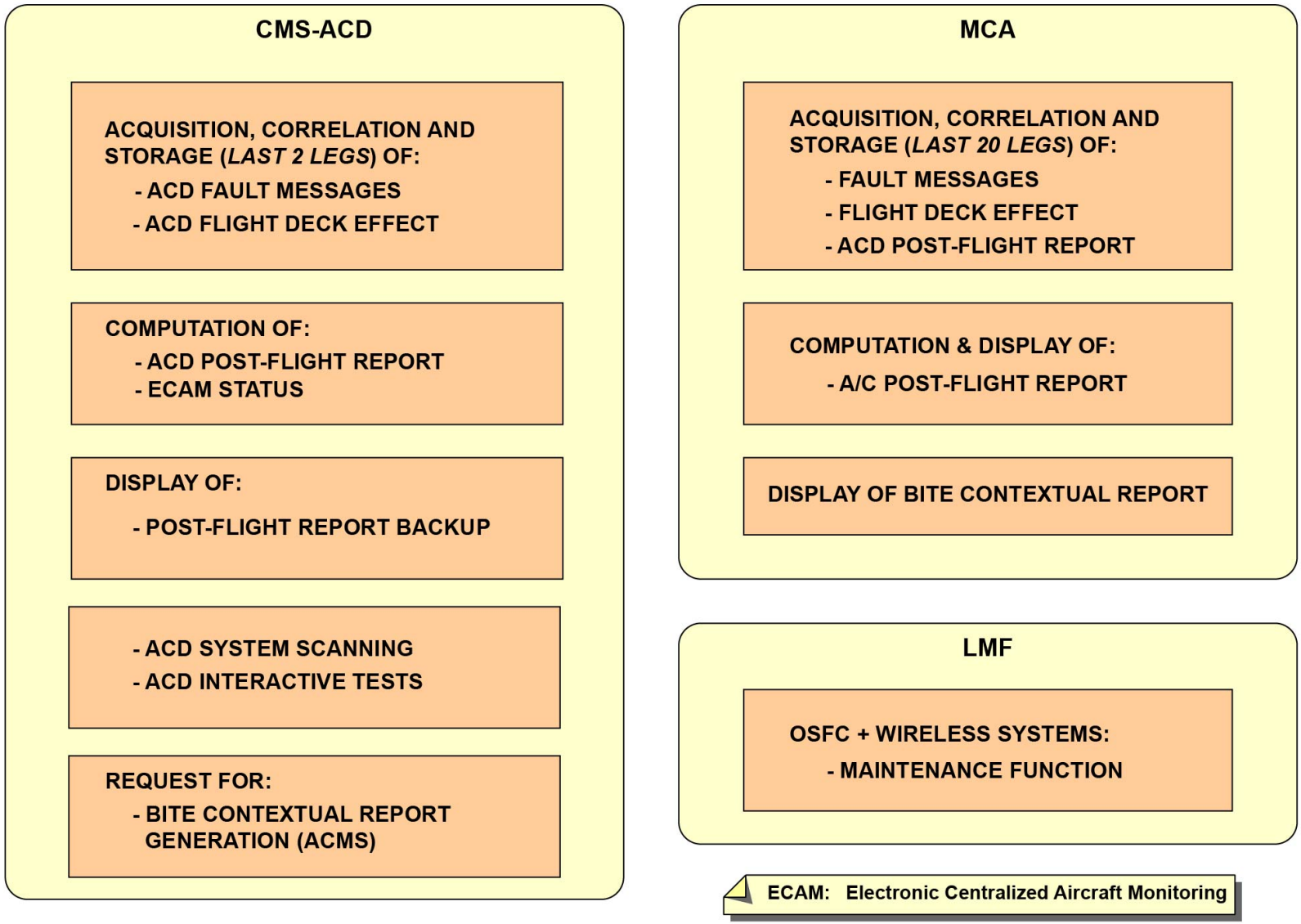
Note that the MCA is connected with other OSFC applications, like:
- The A/C documentation system for hyperlinks from the CMS HMI with related troubleshooting procedures.
- The Minimum Equipment List (MEL) application for hyperlinks from the CMS HMI to correlated MEL items.

There is also a direct link between the CMS-ACD and the maintenance HMIs in order to display a back-up maintenance menu if there is an OSFC or MCA failure.



ACMS:	Aircraft Condition Monitoring System	MCA:	Monitoring and Control Application
ADIRS:	Air Data/Inertial Reference System	MEL:	Minimum Equipment List
BCR:	BITE Contextual Report	PCS:	Propulsion Control System
FMS:	Flight Management System	WACS:	Wireless Airport Communication System
LMF:	Local Maintenance Function		

CMS DESCRIPTION - CMS DETAILED ARCHITECTURE AND FUNCTIONS



CMS DESCRIPTION - CMS DETAILED ARCHITECTURE AND FUNCTIONS

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CENTRAL MAINTENANCE SYSTEM (CMS) DESCRIPTION (2/3)

BITE Description

BITE standard A and B

The A350 system BITEs integrate two different standards:
- Standard A BITEs (e.g.: implemented done on SATCOM, VHF Omnidirectional Range (VOR), Distance Measuring Equipment (DME), Integrated Standby Instrument System (ISIS), etc.)
- Standard B BITEs (e.g.: done on Flight Management Computer (FMC), Electronic Engine Control (EEC), Air Data/Inertial Reference Unit (ADIRU) etc.).

The Standard A BITE is already done on Single Aisle (SA) and Long Range (LR) A/C. Note that on the A350 computers, primary ATA 23 and ATA 34 system computers integrate Standard A BITEs.

The Standard A BITE has these specificities:
- The fault messages are transmitted in plain English to the CMS.
- It only concerns only ARINC 429 subscribers.

The Standard B BITEs introduce these new features:
- The fault messages are transmitted to the CMS using with fault codes.
- The system statuses are continuously monitored (refreshed status).
- It concerns the A350 dedicated ARINC 429 and the AFDX subscribers.

STANDARD A BITES

APPLICABLE TO SA/LR/A380/A350
ATA 23 & 34 MAINLY CONCERNED

SPECIFICITY :

- *FAULT MESSAGES TRANSMITTED IN PLAIN ENGLISH TO THE CMS*
- *ONLY ARINC 429 SUBSCRIBERS*

E.G.: VOR, DME, ISIS, ETC.

STANDARD B BITES

APPLICABLE TO A350

SPECIFICITY :

- *FAULT MESSAGES TRANSMITTED IN CODED VALUES TO THE CMS (FAULT CODES) FOR CORRELATION PURPOSES*
- *SYSTEM STATUS CONTINUOUS MONITORING*
- *AFDX/ARINC 429 SUBSCRIBERS*

E.G.: FMC, EEC, ADIRU, ETC.

THE A350 CMS USES THE TWO FORMATS

ADIRU:	Air Data/Inertial Reference Unit	LR:	Long Range
DME:	Distance Measuring Equipment	SA:	Single Aisle
EEC:	Electronic Engine Control		

BITE DESCRIPTION - BITE STANDARD A AND B

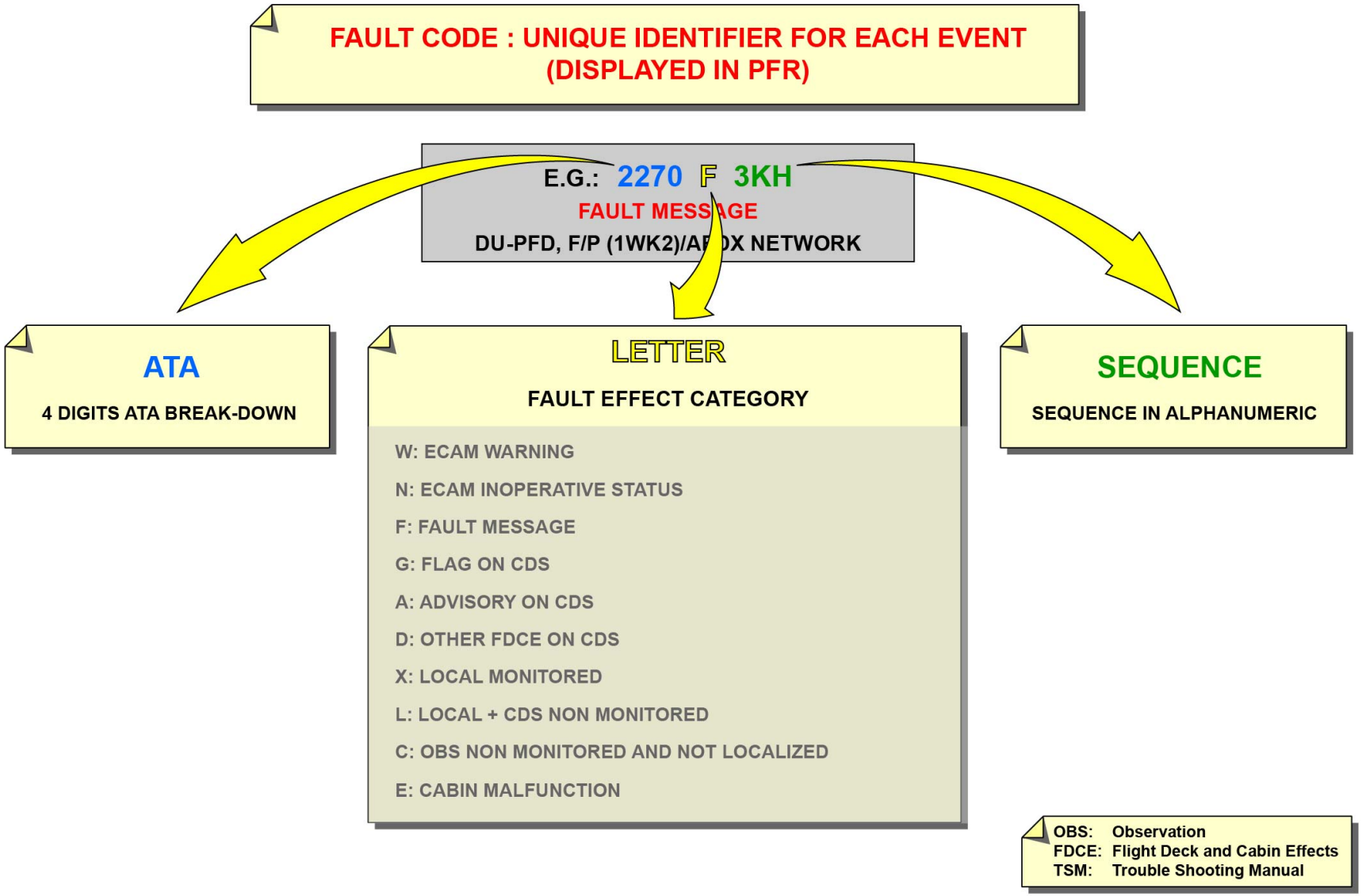
CENTRAL MAINTENANCE SYSTEM (CMS) DESCRIPTION (2/3)

BITE Description (continued)

Fault code description

The fault code is the unique A/C event identifier.
It is composed of:
- Four first characters, which show the ATA chapter related to the system
- A middle letter, which shows the categorization of the event
- Three last characters, which show the sequence of the event.

Note that the CMS uses the fault codes for the correlation procedure. They come into view in the fault-item detail page related to the PFR on the OMS tool/application (entry point to get access to the PFR).



BITE DESCRIPTION - FAULT CODE DESCRIPTION

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CENTRAL MAINTENANCE SYSTEM (CMS) DESCRIPTION (2/3)

Deferred Alerts - Alerts by Combination

Alerts by combination
When a fault 1 is found on the system X, this system sends a maintenance message to the CMS-ACD.
While the fault 1 stays present, the fault 2 comes into view and system X sends:
- A fault message to the CMS-ACD
- A fault message and a global alert request to the FWS.

The FWS starts the global alert which is related to the request and sends the shown alert to the CMS-ACD to correlate the alert and the fault message.

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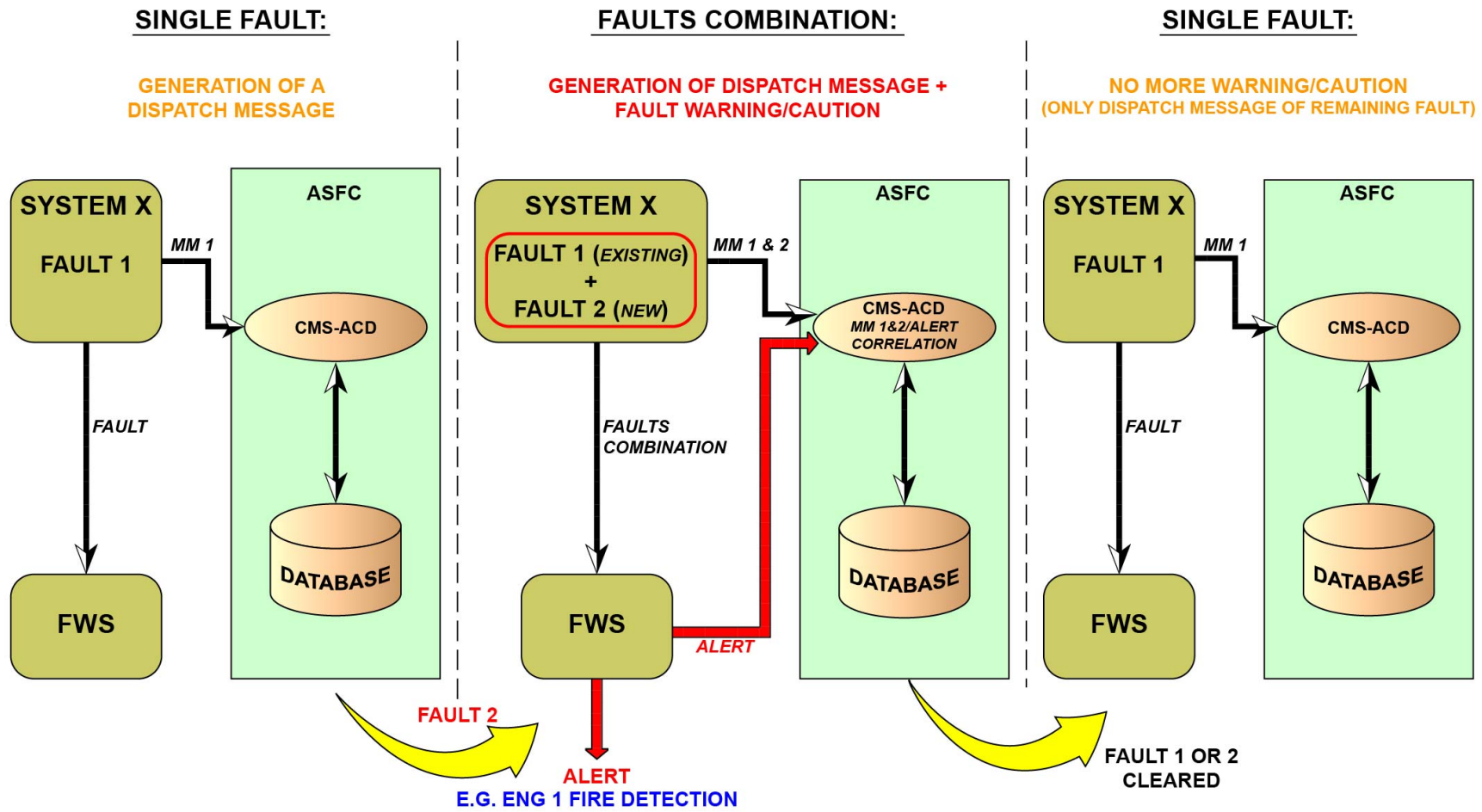


DEFERRED ALERTS - ALERTS BY COMBINATION

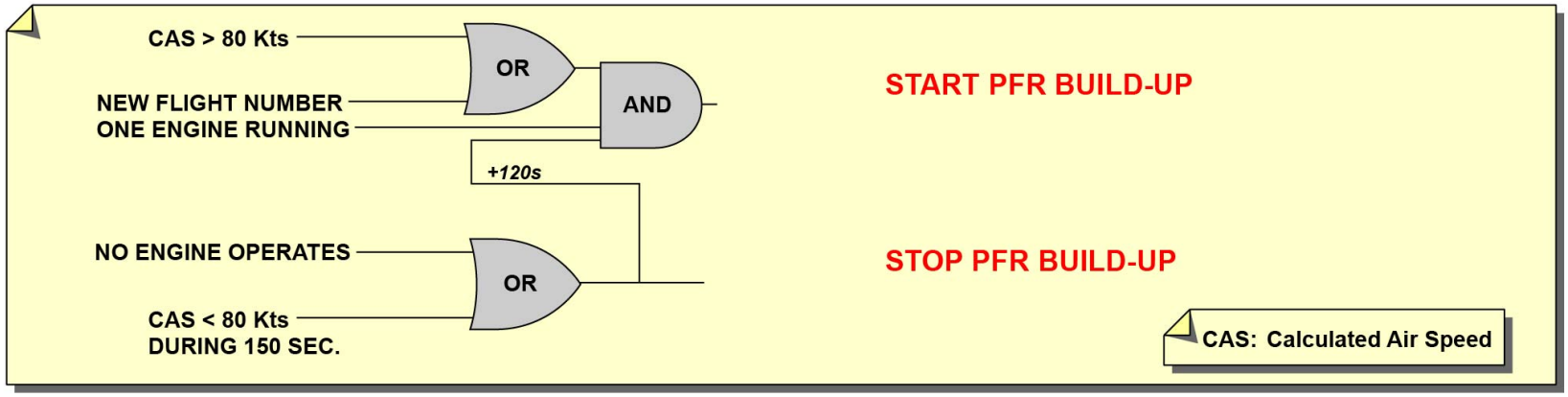
CENTRAL MAINTENANCE SYSTEM (CMS) DESCRIPTION (2/3)

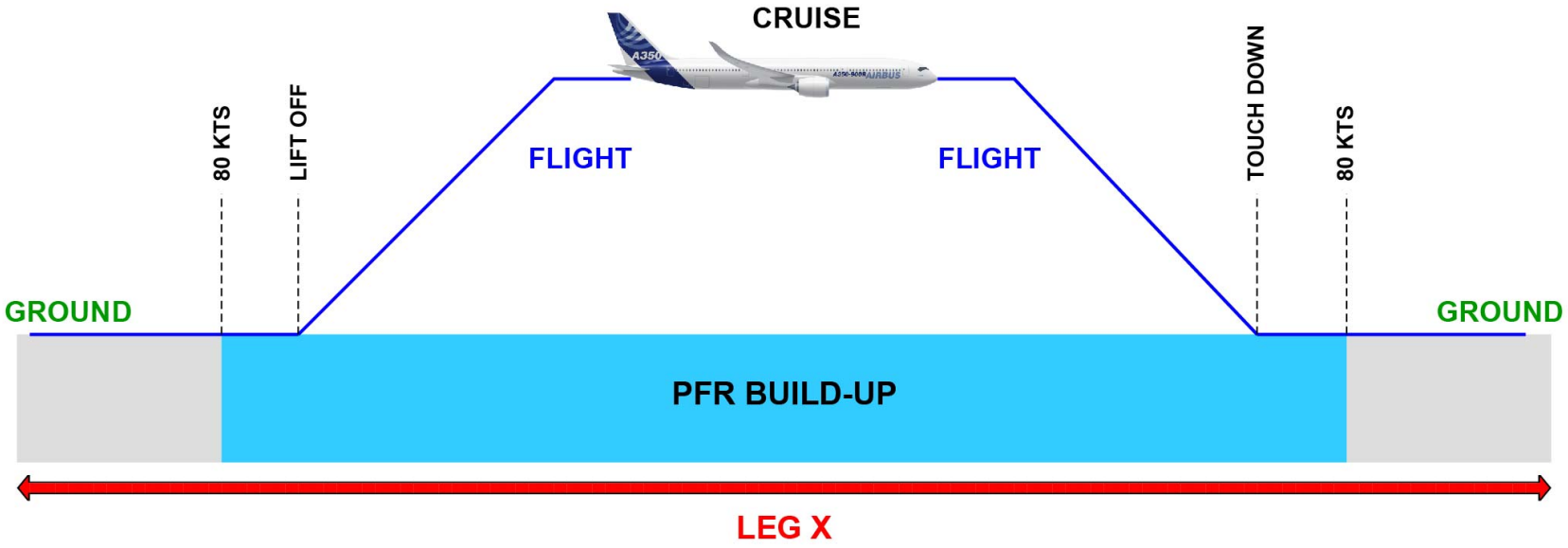
PFR Recording

During a flight, the maintenance data received through the CMS are recorded in a time frame specified through different criteria.
The CMS data recording (PFR build-up) is launched:
- If the last CMS data recording was stopped for a minimum of 120 sec and
- If a minimum of one engine operates for more than 180 sec and
- If:
- The CAS is higher than 80 kts or
- The pilots entered a new flight number.

The CMS data recording (PFR build-up) is stopped when:
- No engine operates
- The CAS is lower than 80 kts during 150 sec.

So, a failure that comes into view out of the PFR recording phase is not reported or shown in the PFR.





PFR RECORDING

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CENTRAL MAINTENANCE SYSTEM (CMS) DESCRIPTION (2/3)

CMS Correlation

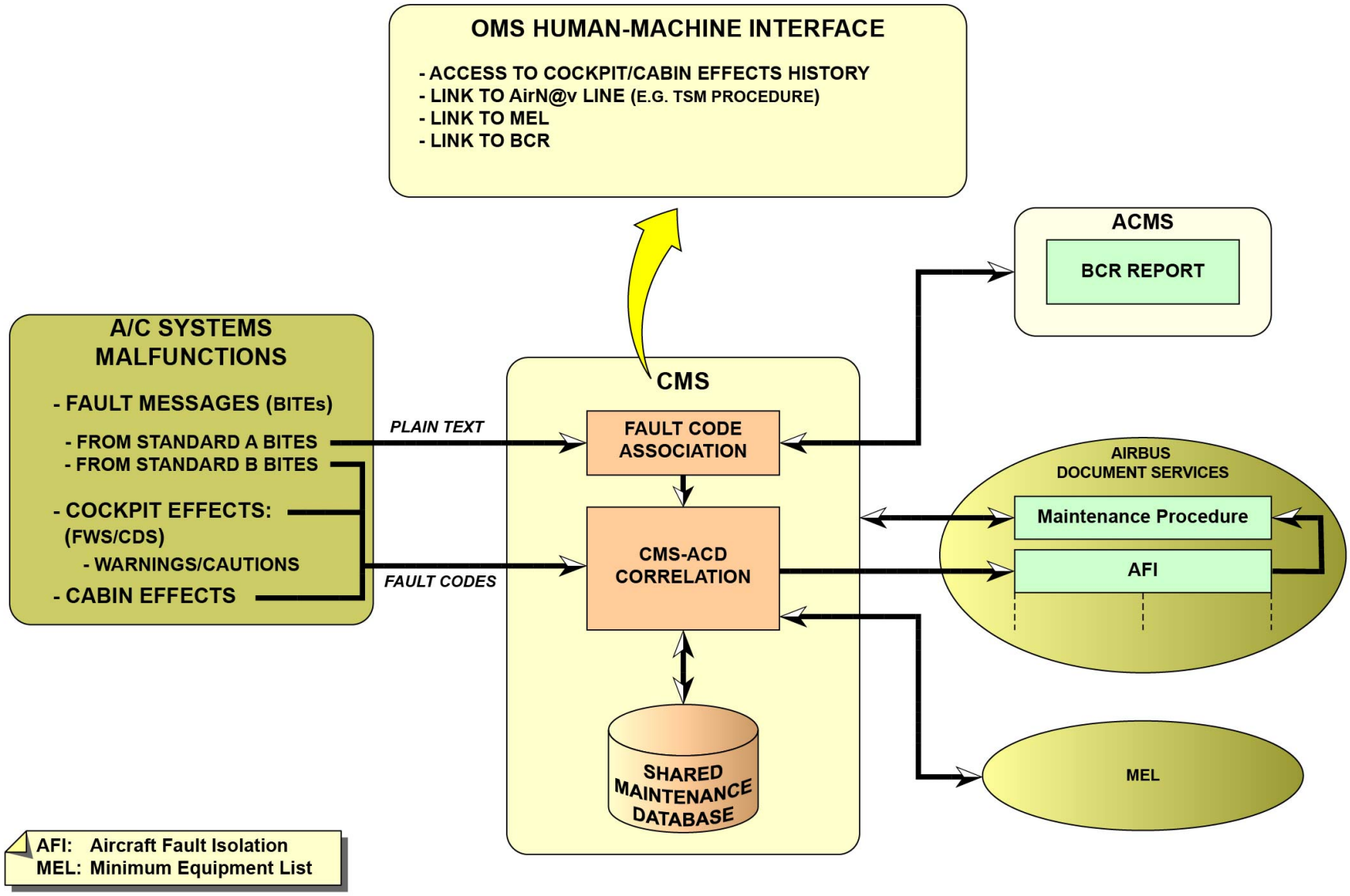
The CMS receives all fault symptoms related to the system failures. These fault symptoms can be A/C systems malfunctions.
From A/C systems, the CMS can receive these data:
- Fault messages from the standard A BITEs (in plain English)
- Fault messages from the standard B BITEs (fault codes)
- Warnings and cautions from the FWS
- Flags or advisories from the CDS
- Cabin failure effects.

The CMS does the centralization of all these data to correlate them. Before correlation, the CMS connects the fault code to each fault message from the standard A BITE to do the correlation with these data. Then, the CMS does the correlation procedure that operates on fault codes.
The CMS correlates the faults events and related symptoms (fault messages, warnings and cautions) to find the origin of the fault. There is only one failure identifier for the mechanics.
Then, this failure identifier is related to:
- Fault item detail:

It gives a detailed list and a description of all correlated fault symptoms related to a failure event.
- Maintenance documentation:

It gives the correct and accurate MEL or Aircraft Fault Isolation (AFI) (Trouble Shooting Manual (TSM)) or maintenance procedure to repair the failure and to dispatch the A/C. This procedure can be directly done through a hyperlink available in the fault-item detail page.
- Maintenance history (maintenance database related to the defective equipment).
- BITE contextual report:

The ACMS report, done in correlation with the correlated fault, gives in-depth complementary information about the system to the mechanics.



CMS CORRELATION

DATA LOADING SYSTEM DESCRIPTION (2/3)

Data loading Introduction

The data loading system operates on these functions:
- Field loadable software import from a USB device or from the ground
- Field loadable software uploading in the A/C computers
- Field loadable software configuration reporting and storage
- Field loadable software repository-management
- Data or file downloading to a USB device or to the ground.

All data loading functions are accessible through the Human Machine Interfaces (HMIs) of the Onboard Maintenance System (OMS), from the OMT, but also from the OIS display and from the optional Portable Multipurpose Access Terminal (PMAT).

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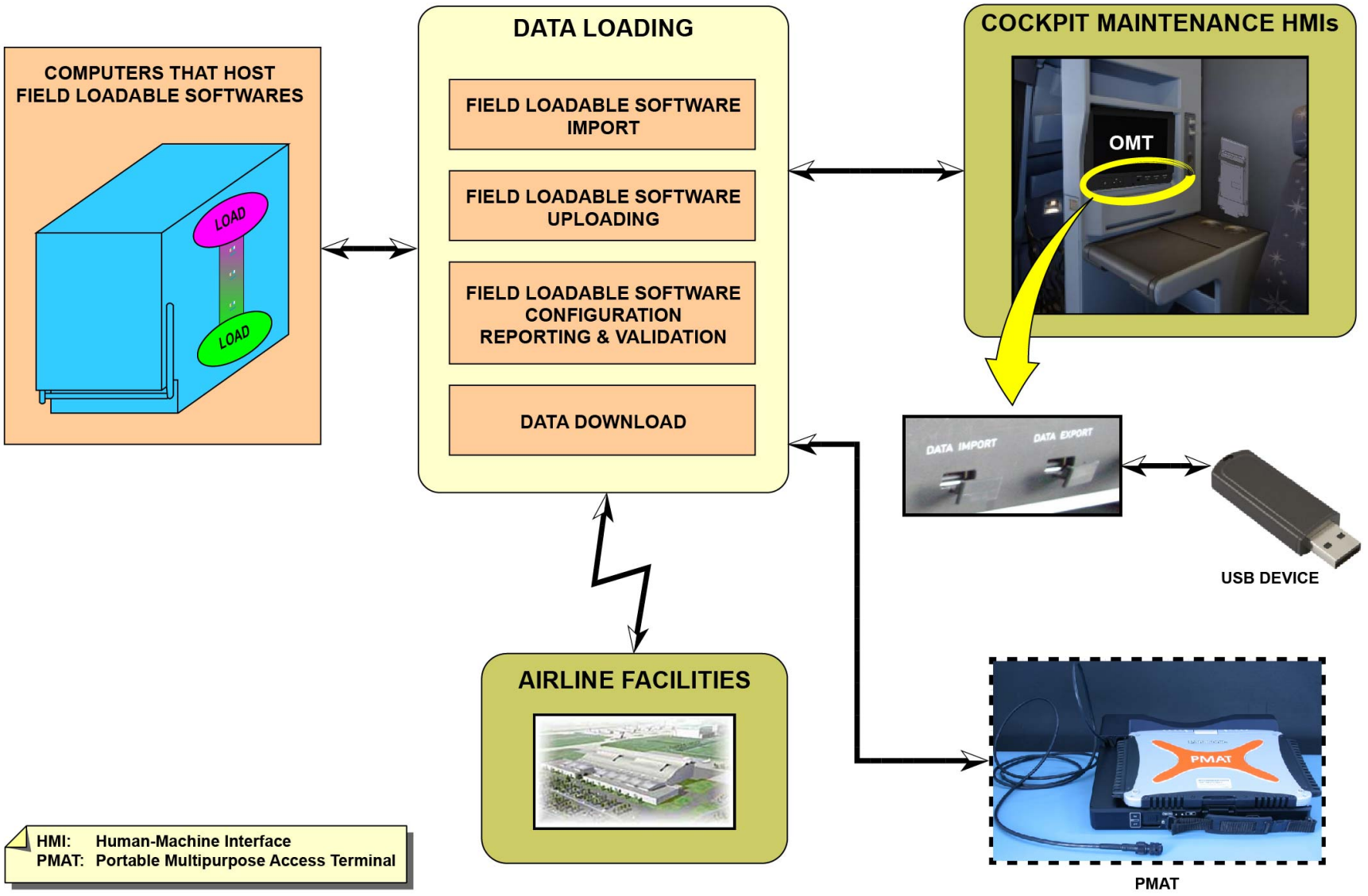


DATA LOADING INTRODUCTION

DATA LOADING SYSTEM DESCRIPTION (2/3)

Uploading Architecture

The data loading system has two applications:
- The Aircraft Control Domain (ACD) of the Data Loading and Configuration System (DLCS) with the data loading functions for the ACD
- The Simple Data Loader (SDL) with data loading functions for the Open world Server Function Cabinet (OSFC) and wireless systems (Wireless Airport Communication System (WACS) and cabin internal wireless system).

The DLCS-ACD application is hosted in the Avionics Server Function Cabinet (ASFC).
The function of the DLCS-ACD is to receive and to upload configurations from:
- The field loadable software (loads) of avionics computers (Line Replaceable Units (LRUs)) through the SCIs
- The ASFC field loadable software.

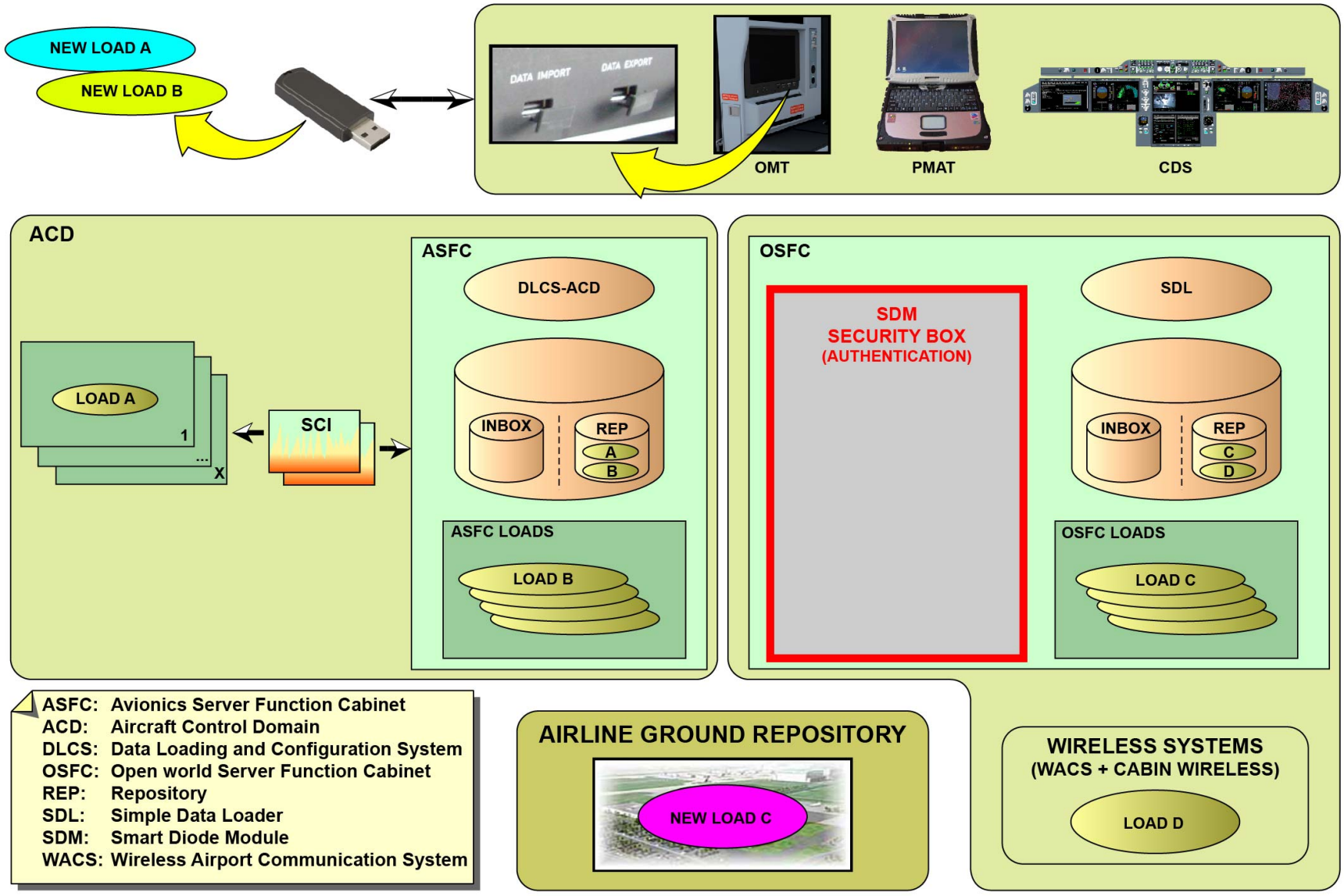
The field loadable software to be uploaded can be selected from two different areas in the field-loadable software repository hosted in the ASFC:
- The inbox area
- The repository area.

The SDL application is hosted in the OSFC.
The function of the SDL is to receive and to upload the configuration from:
- The OSFC field loadable software (loads)
- The WACS field loadable software
- The cabin internal wireless system field loadable software.

The field loadable software to be uploaded can be selected from two different areas in the field loadable software repository, hosted in the OSFC:
- The inbox area
- The repository area.

If there is an uploading of new software, this can be imported from:
- The USB device or
- The airline ground repository.

The primary HMIs dedicated to the data loading activities are the OMT and the optional PMAT. The OIS displays (CDS) can also be used.



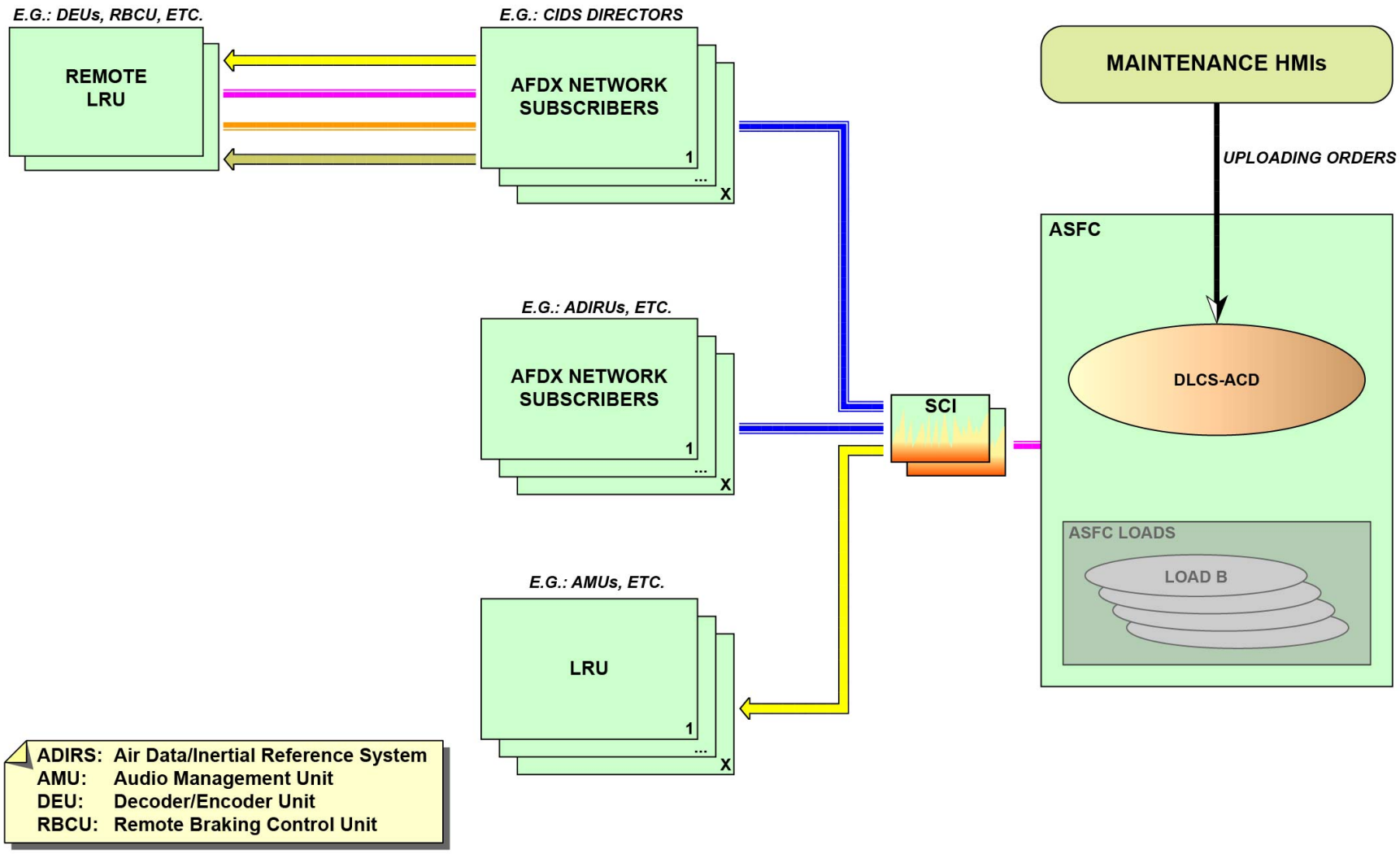
UPLOADING ARCHITECTURE

DATA LOADING SYSTEM DESCRIPTION (2/3)

DLCS Subscribers

One of the functions of the DLCS-ACD is to upload software into the A/C system computers through the SCIs. Note that the DLCS-ACD cannot upload all the avionics components directly (in terms of input/output, but also computing resources).
In fact, the DLCS-ACD can do data loading only on:
- LRUs with the AFDX input/output function (e.g.: Air Data/Inertial Reference Unit (ADIRU), Flight Management Computer (FMC), CPIOMs, CRDCs, etc.)
- LRUs with the ARINC 429 input/output module function (e.g.: Audio Management Units (AMUs), Multi-Mode Receivers (MMRs), etc.).

Some LRUs with an AFDX interface can also operate as gateways to upload remotely other components to which they are connected. In this case, the data transmission from this gateway to the remote LRUs can be managed through ARINC 429, Ethernet, Controller Area Network (CAN) bus or serial buses (e.g.: directors to Decoder/Encoder Units (DEUs), Remote Braking Control Units (RBCUs), etc.).



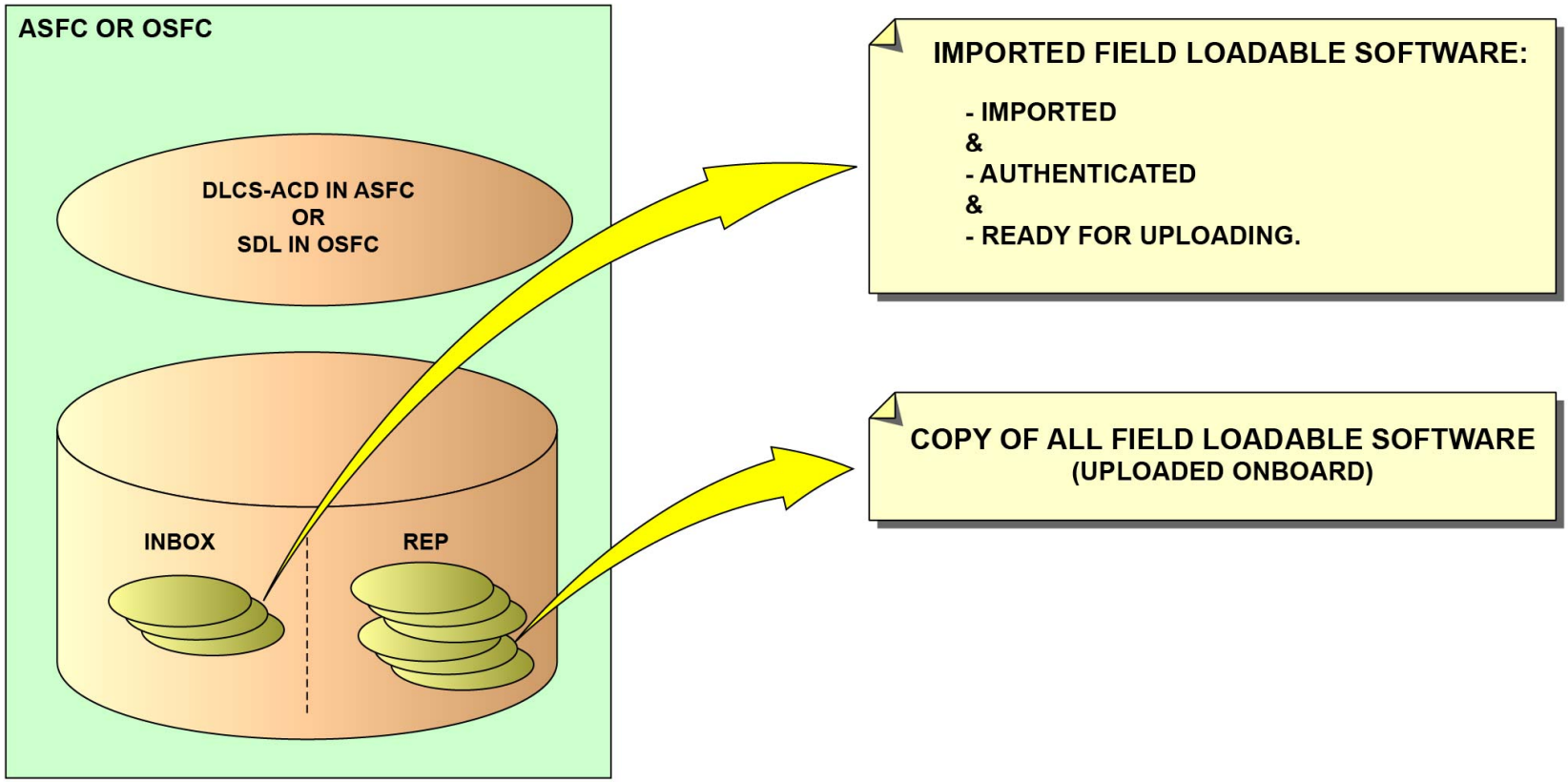
DLCS SUBSCRIBERS

DATA LOADING SYSTEM DESCRIPTION (2/3)

Onboard Software Database Content

The onboard software database is a memory resource dedicated for the storage of a copy of all the field loadable software/loads that operate on the A/C computers.
There are two different databases on the A/C:
- One is hosted in the ASFC and dedicated to the storage of all avionics and the ASFC application software/loads
- One is hosted in the OSFC and dedicated to the storage of the OSFC and wireless system software/loads.

Each database has two different partitions:
- The repository part contains a copy of all the validated field loadable software uploaded into the A/C computers.
- The inbox part contains all the imported (manually or automatically) and authenticated field loadable software, ready for uploading. This field loadable software is only removed from the inbox when the uploading procedure was validated through the DLCS HMI (i.e. configuration ok).



ONBOARD SOFTWARE DATABASE CONTENT

DATA LOADING SYSTEM DESCRIPTION (2/3)

Software Upload from Repository

A software uploading from the repository does the uploading or re-loading of software into its computer in two different cases:
- An unusual software operation
- A removal or installation of the hosting computer, if the software was not pre-loaded into the computer before the installation on A/C (software missing).

In this type of configuration, the mechanic selects the software for the re-loading in the repository part of the ASFC or OSFC (in relation to the target computer). Then, when the mechanic activates the uploading order, the software in the repository is copied in the target computer(s) to get the correct configuration.

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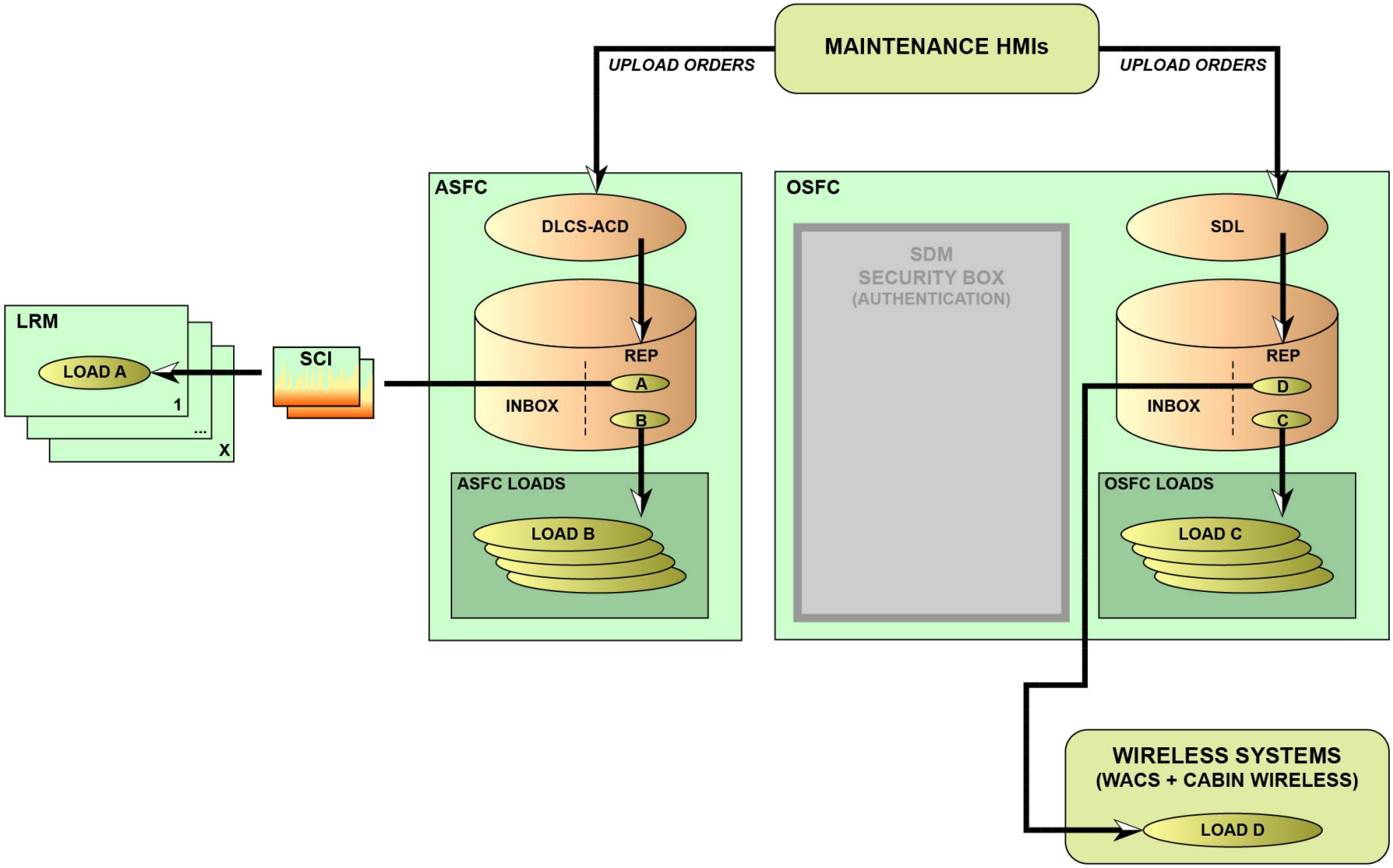


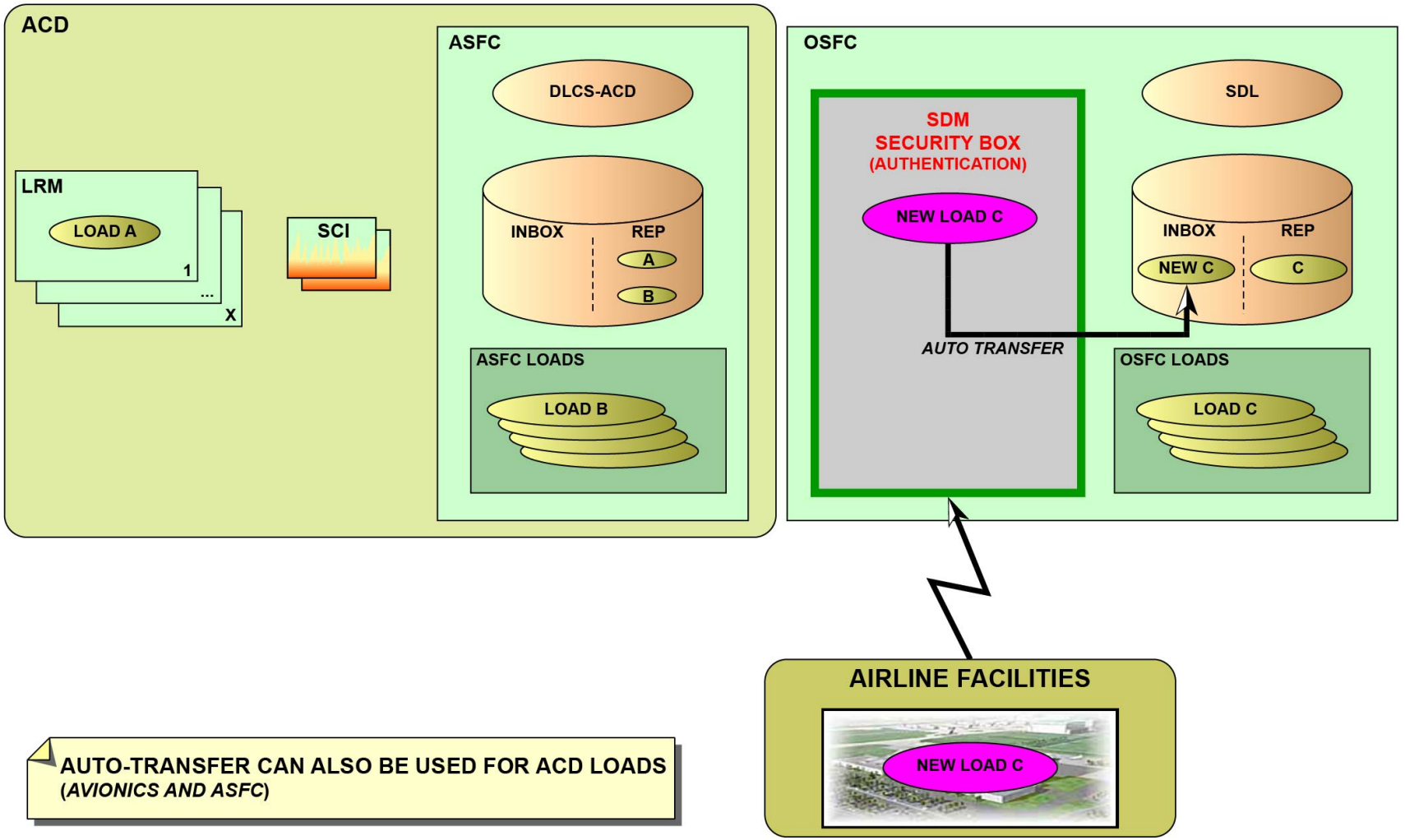
SOFTWARE UPLOAD FROM REPOSITORY

DATA LOADING SYSTEM DESCRIPTION (2/3)

Software Import

Software automatic import

If there is a software upgrade (e.g. new software version because of a Service Bulletin), the new software version must be imported into the ASFC or OSFC inbox (in relation to the system) for the selection on the DLCS or SDL HMI.
The new load is sent to the A/C OSFC. Then, the Smart Diode Module (SDM) security-box function analyzes the load for authentication:
- If it is possible that the load is malicious, the SDM automatically deletes it.
- If the load is authenticated, it is automatically moved to the related inbox (in the ASFC or in the OSFC), in relation to the load to be uploaded in the ACD domain or in the OSFC/wireless systems.



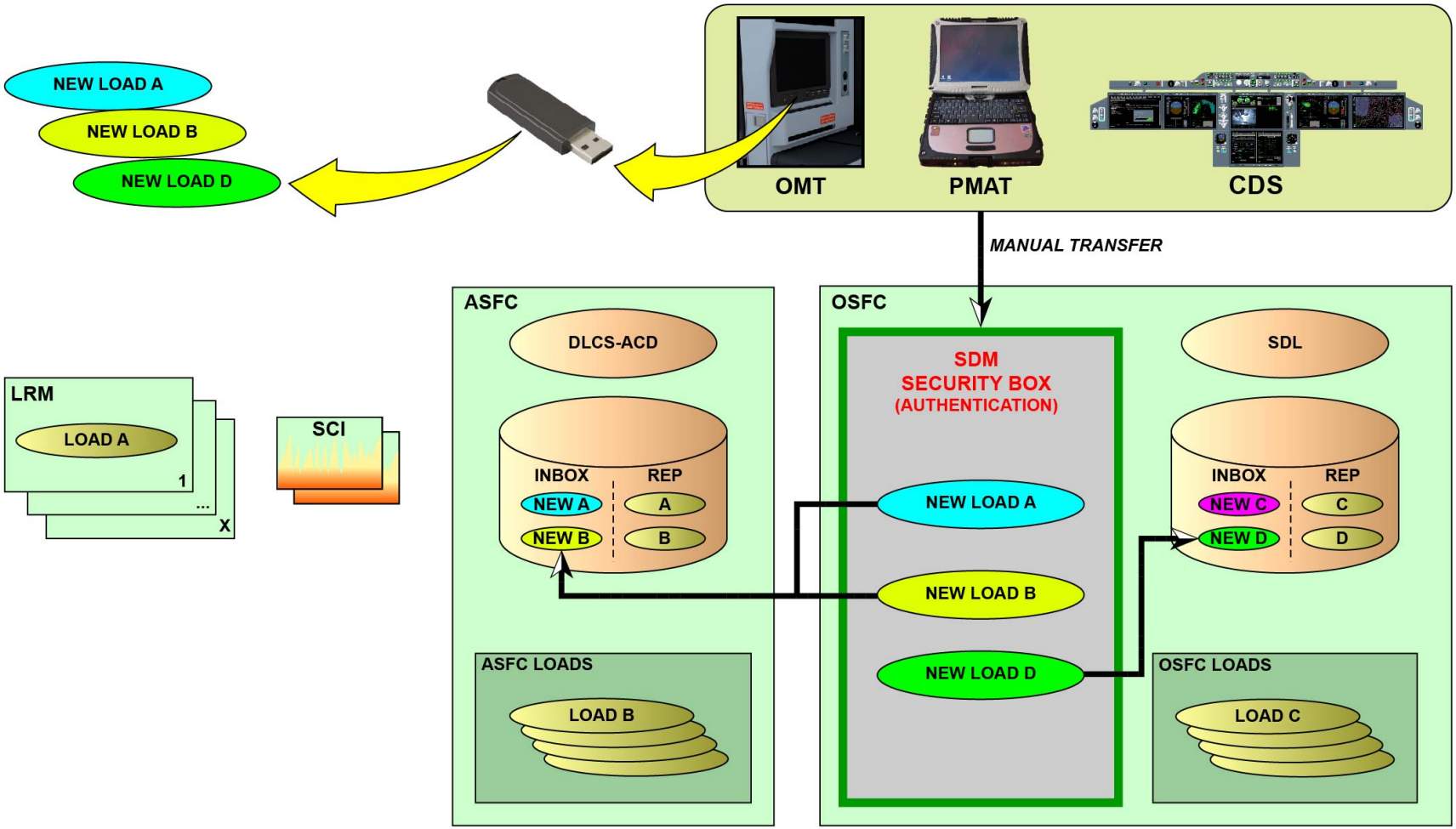
SOFTWARE IMPORT - SOFTWARE AUTOMATIC IMPORT

DATA LOADING SYSTEM DESCRIPTION (2/3)

Software Import (continued)

Software manual import

If there is a software upgrade, a manual import is also possible with an USB device: the USB device must be connected to the import plug of the OMT front face. Then, a dedicated menu on the OMS lets the mechanic import the software from the USB device in the inbox repository partition.
The SDM security-box function first analyzes the load for authentication:
- If it is possible that the load is malicious, the SDM automatically deletes it.
- If the load is authenticated, it is automatically moved to the related inbox repository (in the ASFC or in the OSFC), in relation to the load which is to be uploaded in the ACD domain or in the OSFC/wireless system



SOFTWARE IMPORT - SOFTWARE MANUAL IMPORT

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DATA LOADING SYSTEM DESCRIPTION (2/3)

Software Uploading from Inbox

The software uploading from the inbox does the uploading of new software or of an upgraded software version already uploaded into the A/C, typically in the frame of the application of a Service Bulletin.
In this type of configuration, the mechanic selects the software to upload in the related targets among software available in the inbox part of the ASFC DLCS or OSFC SDL repository (related to the target computer).
Then, when the mechanic starts the uploading order, the software in the inbox repository is uploaded in:
- The target computer(s) and
- The related repository to keep a copy onboard the A/C.

Then the software is removed or erased from the inbox.

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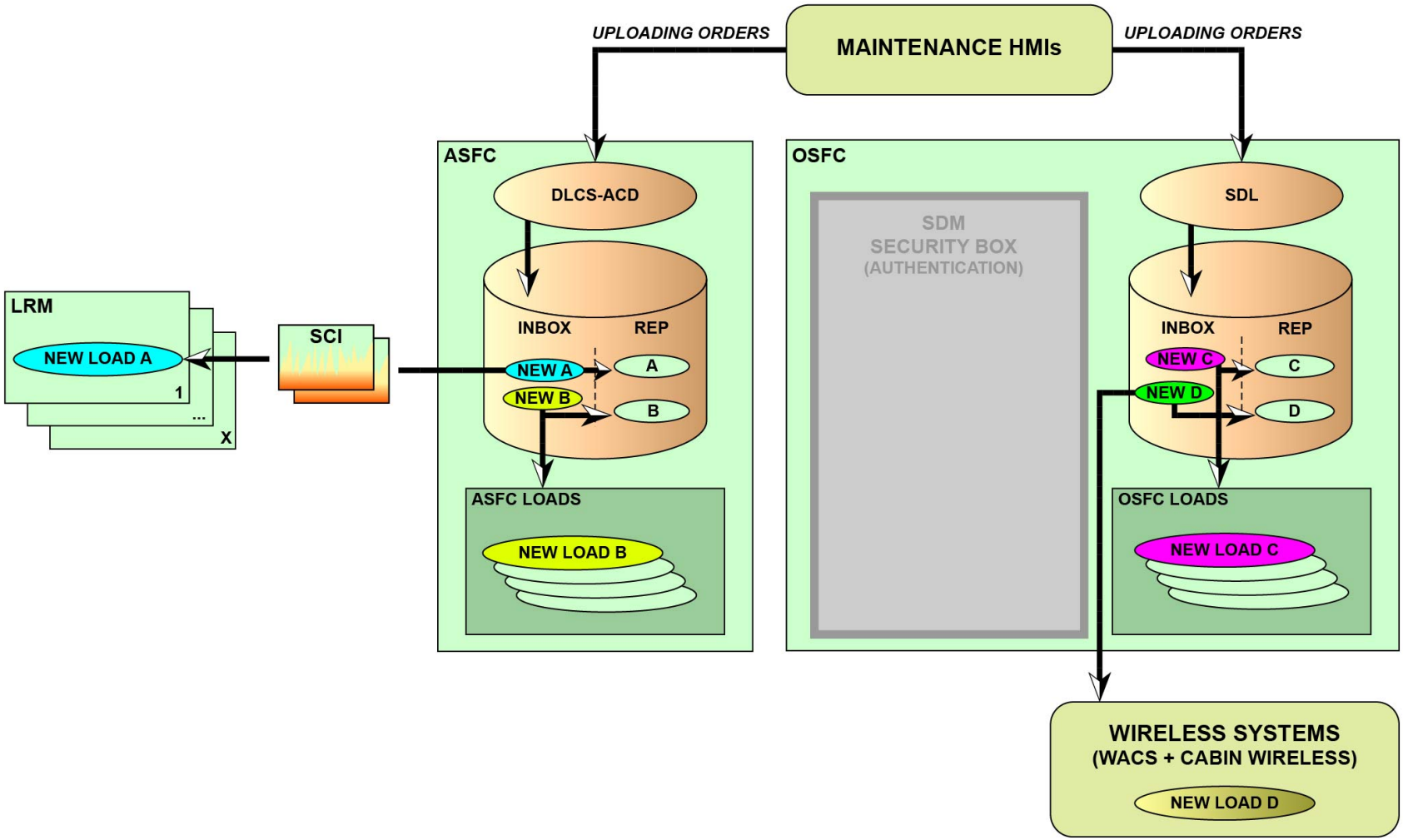
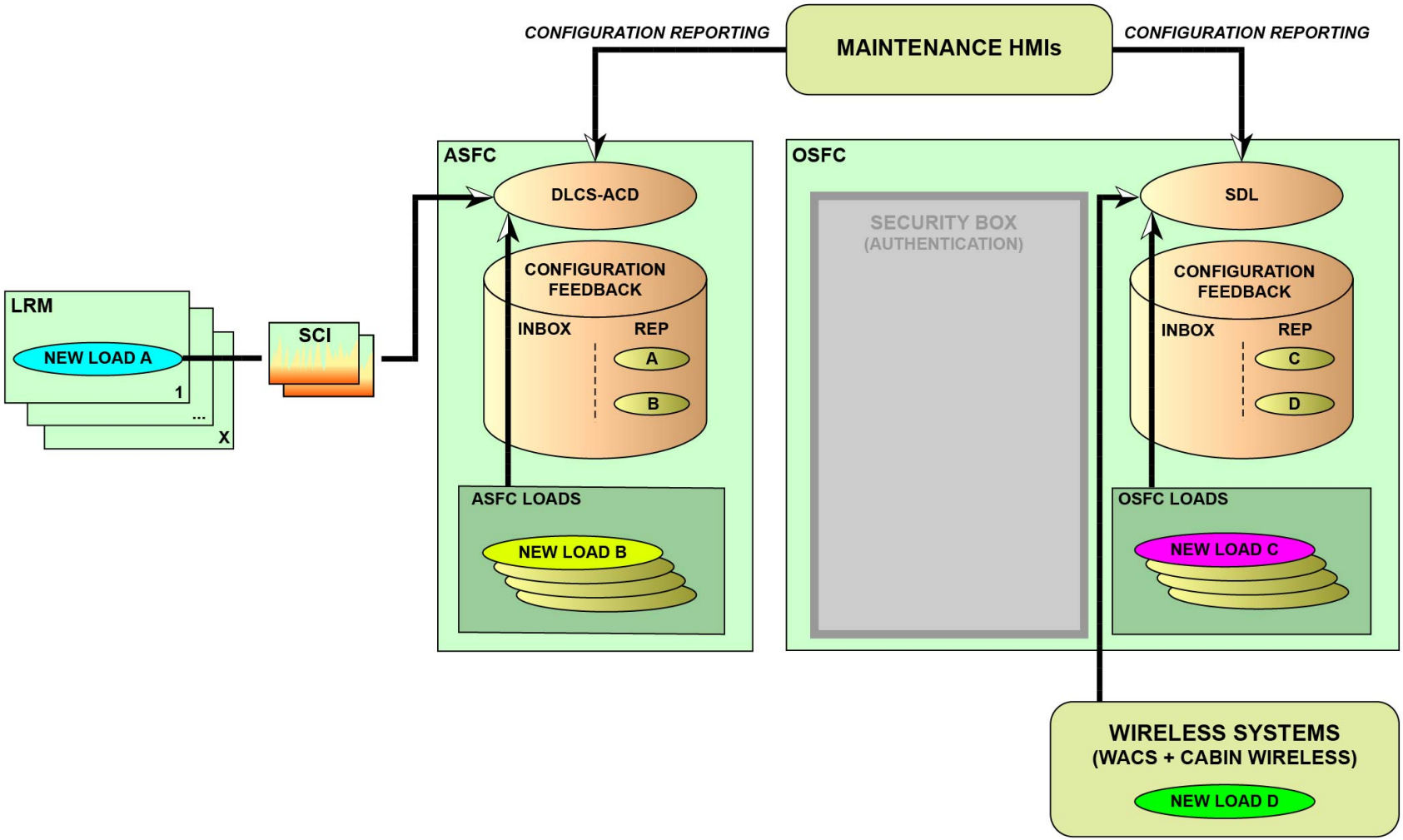


SOFTWARE UPLOADING FROM INBOX

DATA LOADING SYSTEM DESCRIPTION (2/3)

Configuration Reporting

After an uploading operation, the uploaded software transmits its configuration to the DLCS-ACD/SDL. This configuration is sent on the OMS HMI for validation by the mechanic.

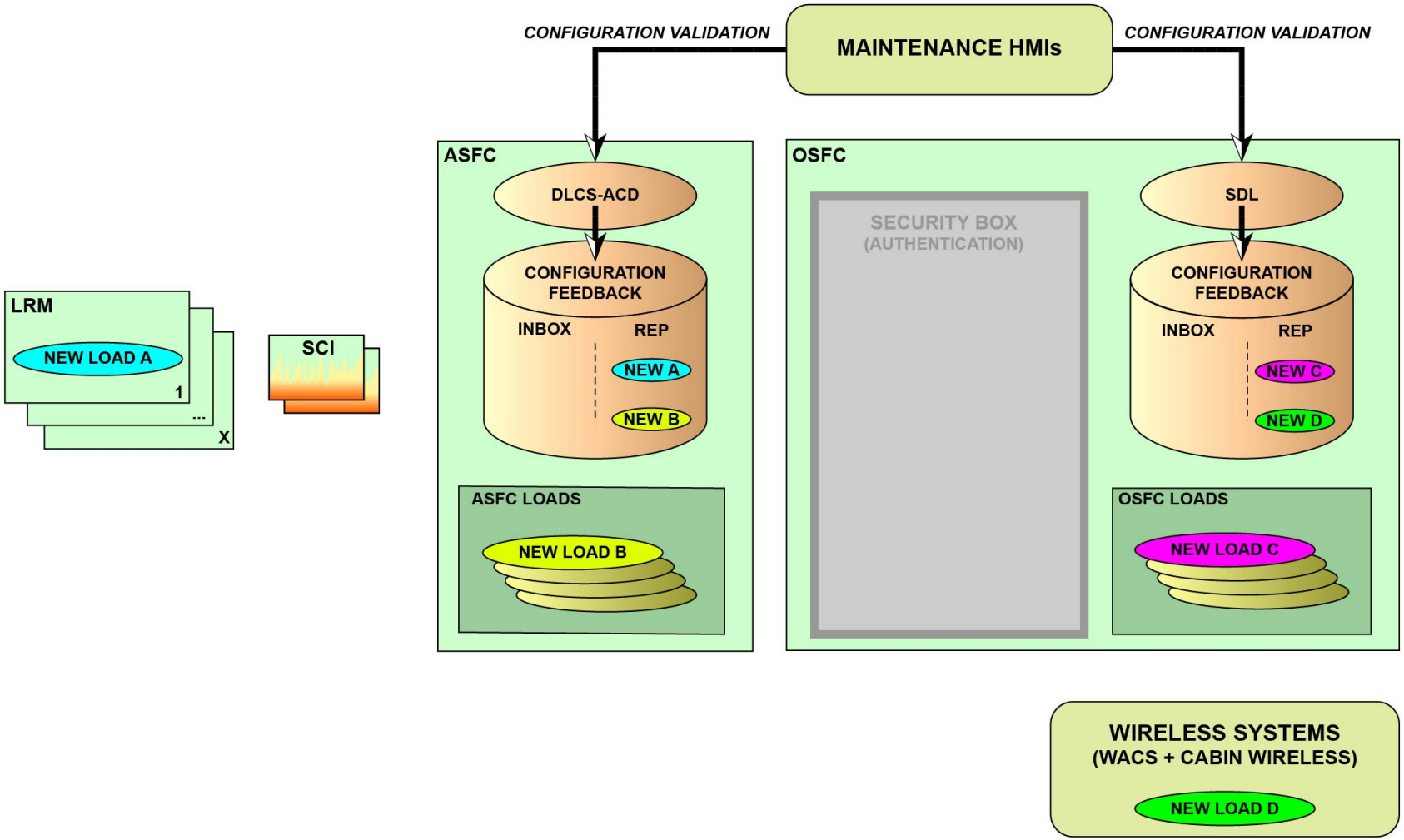


CONFIGURATION REPORTING

DATA LOADING SYSTEM DESCRIPTION (2/3)

Configuration Validation

When the mechanic has validated the new configuration, the former version of the software is removed from the Reference (REF) repository. Then, the REF repository only contains the copy of the new software version.



CONFIGURATION VALIDATION

DATA LOADING SYSTEM DESCRIPTION (2/3)

Upload Menus/Domains

In terms of HMI, the mechanic uses the maintenance HMIs (OMT, OIS display, PMAT) to manage data loading procedures. But in relation to the uploading software and especially to the related target computers, the software items must be uploaded:
- Into the ACD part (for avionics and ASFC hosted software) through the DLCS-ACD or
- Into the OSFC/wireless systems through the SDL.

Note that the DLCS-ACD and SDL application is not managed through the same menu on the OMS HMI. So, the mechanic is necessary for the data-loading maintenance procedures to get access to:
- The DLCS-ACD menu (A/C management - software upload and configuration validation) for the ACD software or
- The SDL (additional functions - open world upload and configuration validation) for the OSFC and wireless system software.

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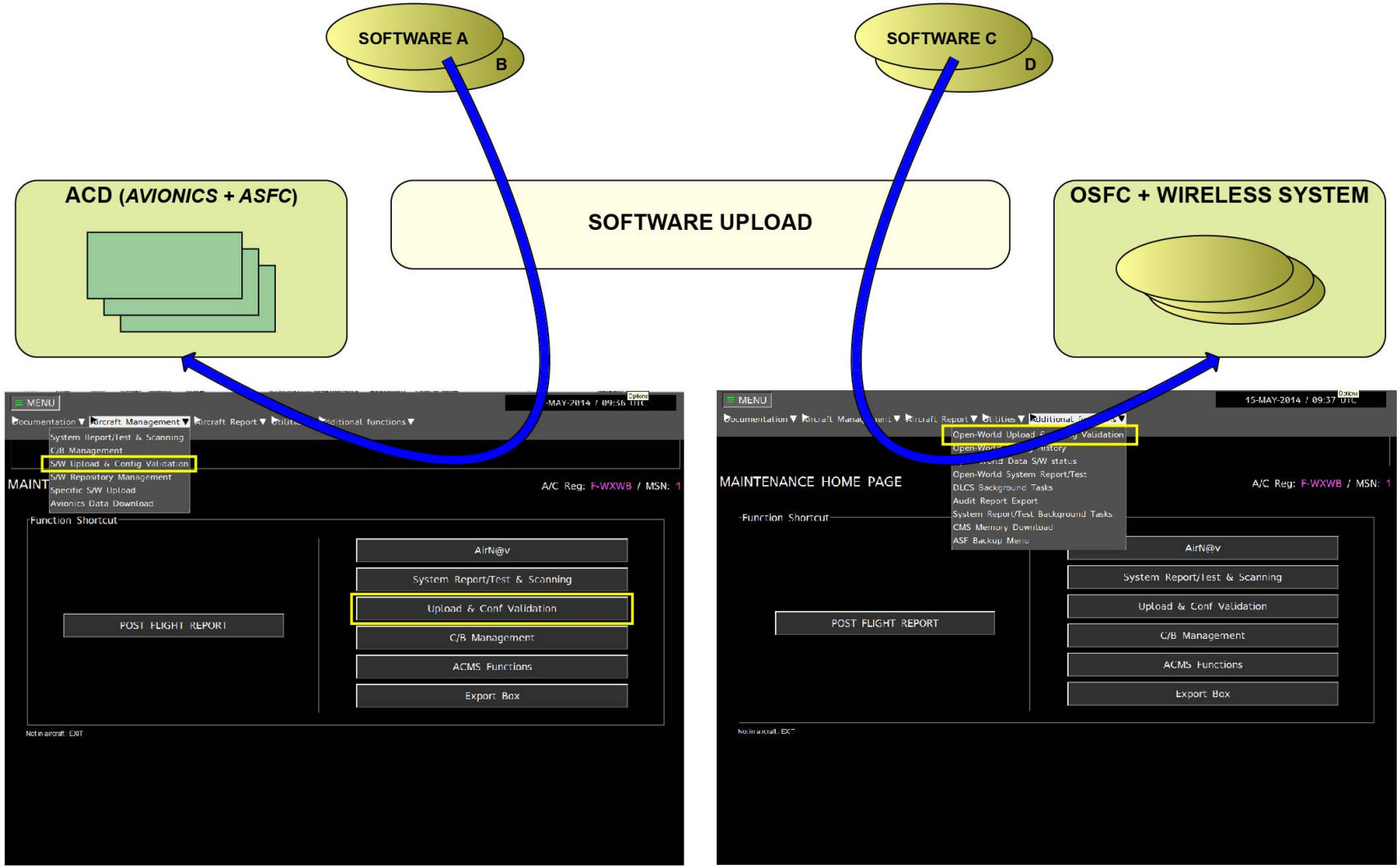


DLCS-ACD MENU **SDL MENU**

UPLOAD MENUS/DOMAINS

DATA LOADING SYSTEM DESCRIPTION (2/3)

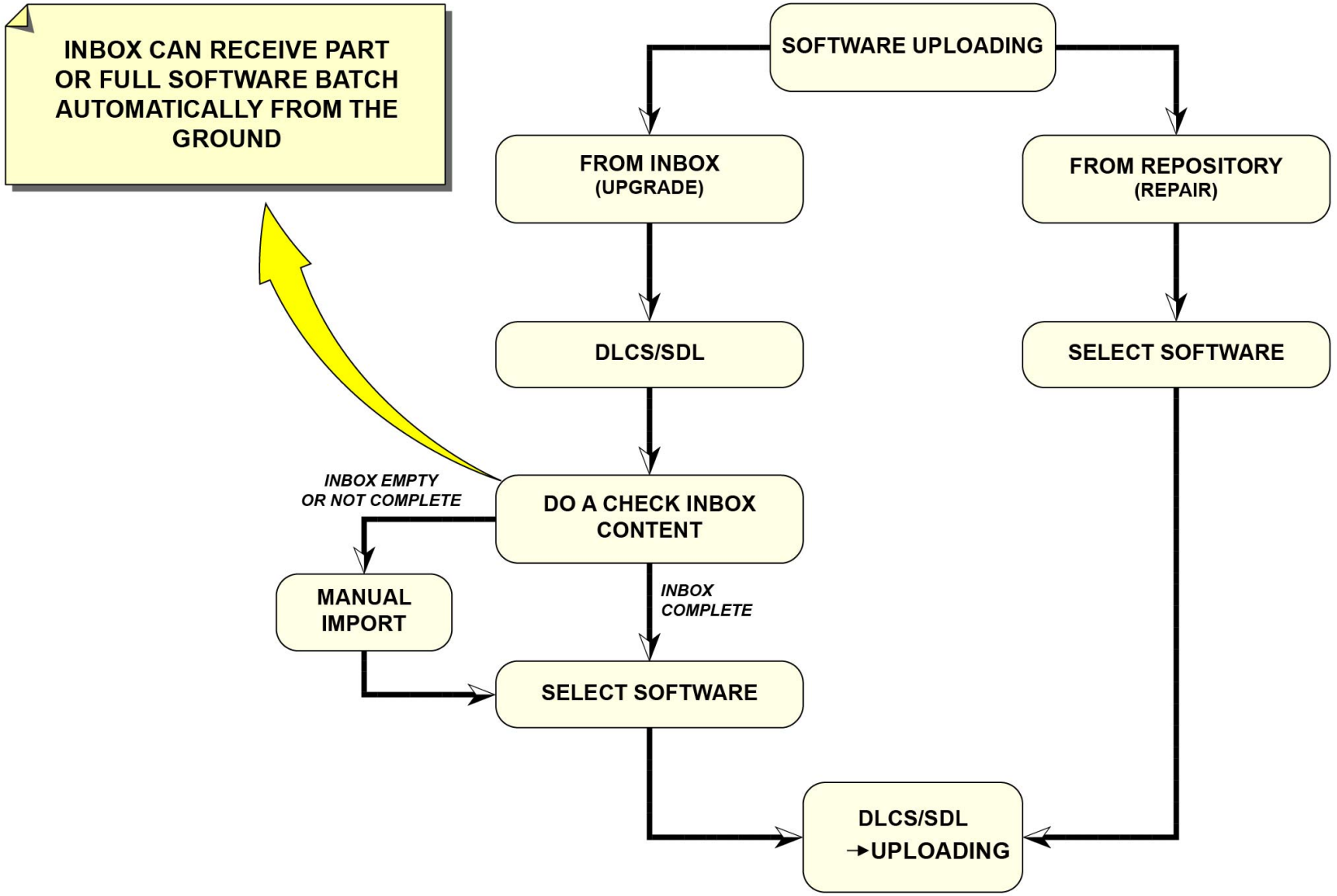
Software Upload Synoptic

Here is a summary of the different workflows related to the software uploading procedures.
First within the frame of the software uploading, two scenarios are possible:
- Repair of a software (from the REF repository)
- Upgrade of a software (from the inbox repository).

General workflow of the software repair:
- Get access to the correct data loading HMI (DLCS-ACD for ACD or the SDL for OSFC/wireless systems).
- Select the uploading software in the REF repository (onboard is a copy of the software).
- Start the uploading procedure.

General workflow of the software upgrade:
- Get access to the correct data loading HMI (DLCS-ACD for ACD or SDL for OSFC/wireless systems).
- Do a check of the content of the inbox repository (result of an automatic software import or a former manual import).

There are two cases:
- The inbox is empty or some software items are missing:
- Do a manual import of the related software
- Select the software
- Start the uploading procedure.
- The inbox content is correct:
- Select the software
- Start the uploading procedure.



SOFTWARE UPLOAD SYNOPTIC

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DATA LOADING SYSTEM DESCRIPTION (2/3)

Configuration Reporting Functions

The DLCS-ACD and SDL data loading applications also have a configuration reporting function, which does the:
- Reporting of the current software configuration
- Validation of a new software configuration (after the uploading)
- Monitoring of the software configuration (from the target source reporting)
- Storage and comparison of the current and former configurations (REF N/N-1/N-2).
- Reporting of the current software configuration

The configuration reporting application does the requests, acquirements and storage of the configurations of all the A/C computers which can report their hardware and software configurations (LRU).
This function gives the validation from the maintenance operator, to timestamp it and to do its storage.
- Monitoring of the software configuration

This function does a check of the software configuration reporting through the LRUs. When there is an unusual configuration reporting, a warning is shown to the operator.
- Storage and comparison

The system does the storage of different software configurations. Then, the function cyclically compares the last refreshed LRU configuration with the validated one and if there are differences, it proposes a related uploading operation to fix the trouble.
The mechanic will be asked to do a check of the current A/C computer software configuration before and after each uploading procedure.

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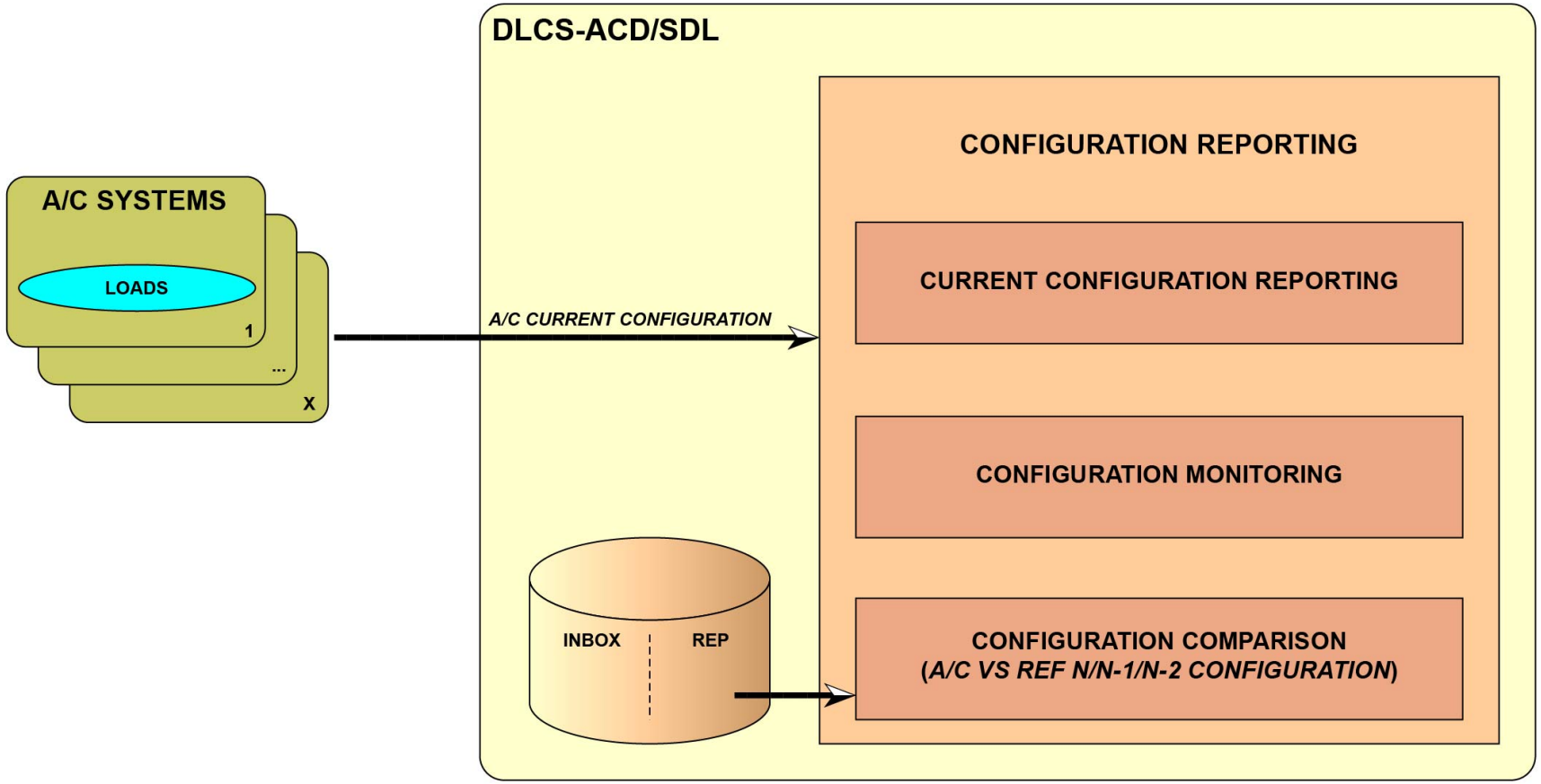

CONFIGURATION REPORTING FUNCTIONS

DATA LOADING SYSTEM DESCRIPTION (2/3)

Files Downloading

The downloading function lets the maintenance operators retrieve different data files from the ATA XX systems (e.g.: maintenance and specific data, etc.).
This function concerns only the LRUs, managed through the DLCS-ACD.
The mechanics select the files to download from the dedicated HMI.
Then, these files are sent to the export box, from which they can retrieve them with an USB device or through transmission to the ground with wireless systems through the OSFC Communication (COM) manager.

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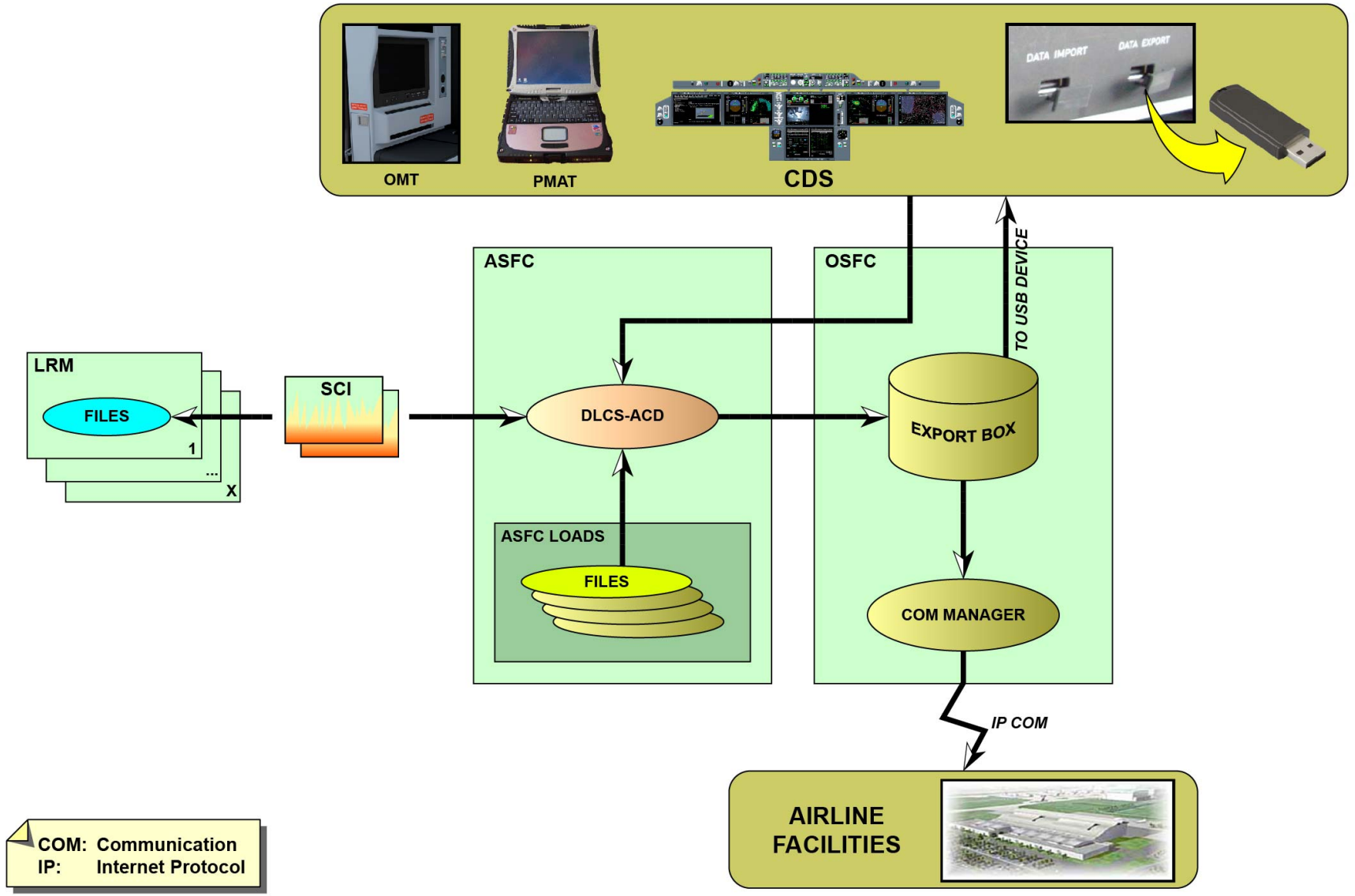

FILES DOWNLOADING

AIRCRAFT CONDITION MONITORING SYSTEM (ACMS) DESCRIPTION (2/3)

ACMS Introduction

The primary function of the Aircraft Condition Monitoring System (ACMS) is to give scheduled, preventive maintenance and in-depth troubleshooting, through the monitoring of the efficiency and the degradation of the A/C systems and environment.
For that, the ACMS monitors:
- The engine condition
- The A/C system condition
- The A/C performance condition.

To get these functions, the ACMS can do:
- The generation of reports (automatically or manually)
- The recording of data
- The display of A/C parameters in real-time.

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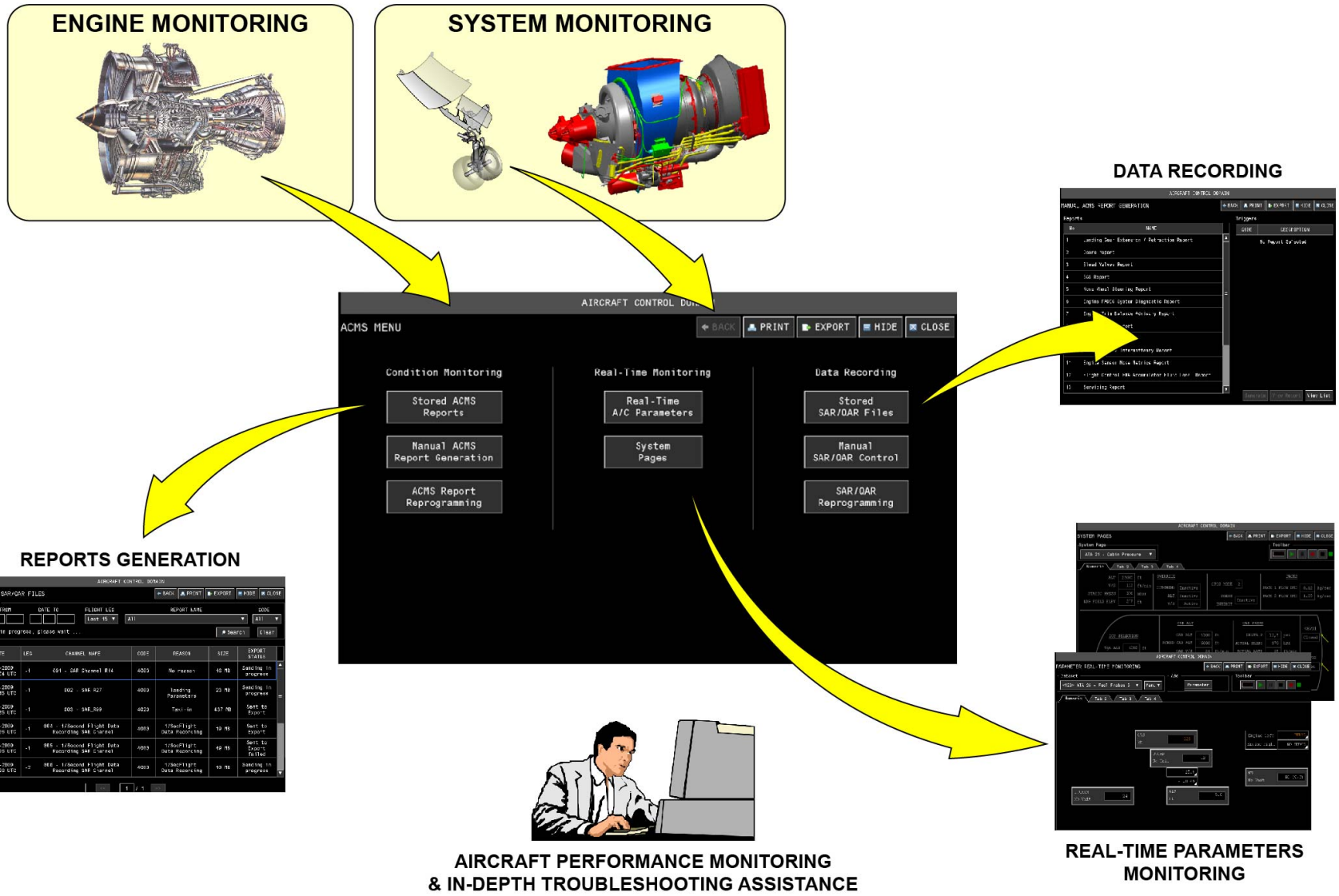

ACMS INTRODUCTION

AIRCRAFT CONDITION MONITORING SYSTEM (ACMS) DESCRIPTION (2/3)

ACMS Functions

The ACMS functions are:
- A/C data acquisition through the Centralized Data Acquisition Unit (CDAU)
- Data recording on:
- USB device (export function)
- OIS
- Optional Digital ACMS Recorder (DAR).
- Data retrieval function from Human-Machine Interface (HMI) are:
- Condition monitoring
- Real-time monitoring
- Recorded data.
- Data transmission to the ground (reports, etc.).

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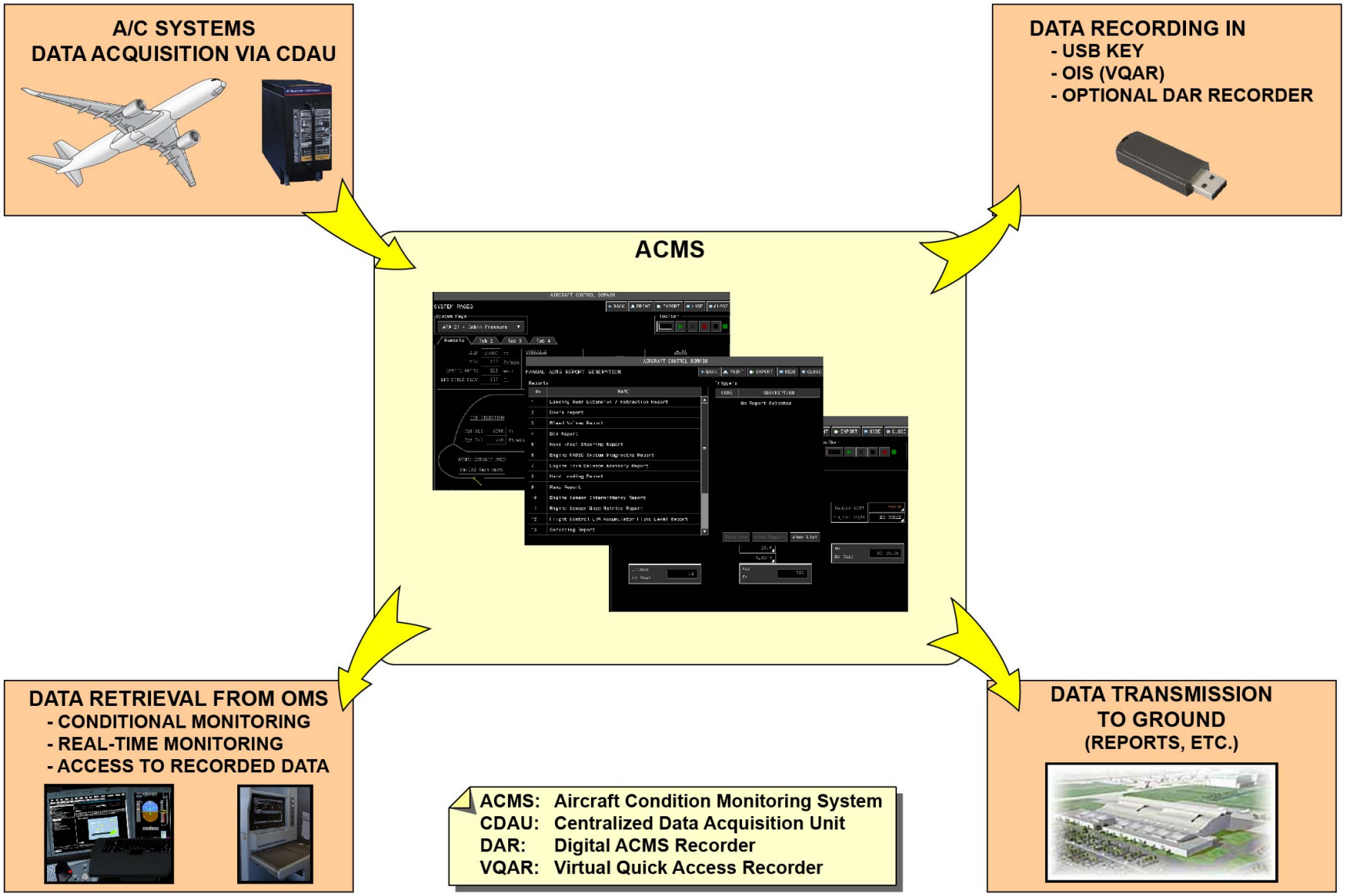


ACMS FUNCTIONS

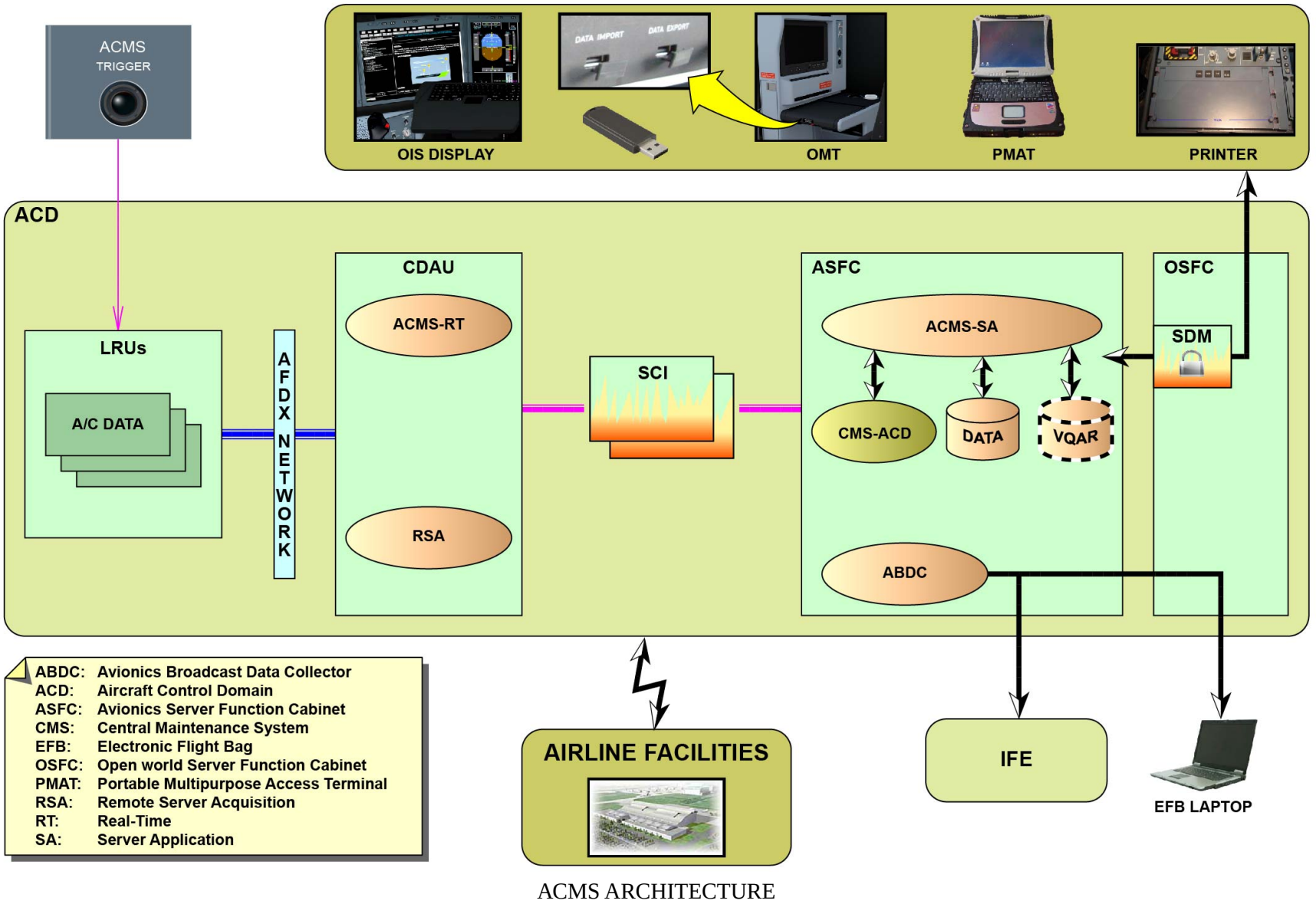
AIRCRAFT CONDITION MONITORING SYSTEM (ACMS) DESCRIPTION (2/3)

ACMS Architecture

The ACMS system has two primary applications:
- The ACMS real-time acquisition part for the acquisition and the real-time monitoring of the A/C data.
This acquisition part is hosted in the CDAU in the Aircraft Control Domain (ACD) and gets data from the A/C systems (LRUs) through the AFDX network. Then, data/reports are sent to the Avionics Server Function Cabinet (ASFC) for post-processing and recording.
As an option, the CDAU can also send data to an optional DAR.
- The ACMS server application that is hosted in the ASFC.
This ACMS application does the storage and the output management of ACMS data and lets the user get access to the ACMS through the HMIs (OMT, OIS display, Portable Multipurpose Access Terminal (PMAT)).
The ACMS application records:
- The ACMS data in a dedicated database in the memory resources of the ASFC
- A copy of the Digital Flight Data Recorder (DFDR) data in a Virtual Quick Access Recorder (VQAR).
This ACMS application can send BITE contextual reports to the Central Maintenance System (CMS)-ACD on request. The BITE contextual reports contain a lot of in-depth complementary information on A/C systems and are used to make the system failure troubleshooting easier.
The ACMS also has two additional applications dedicated to supply OIS and IFE applications (airshow) with serviceable A/C data:
- The remote server acquisition, hosted in the CDAU, which collects and transmits data necessary for different applications (e.g. flight show) to the ASFC (Avionics Broadcast Data Collector (ABDC) application).
- The ABDC application, hosted in the ASFC. Its primary function is to decode data received from the remote-server acquisition application to transmit this information to the related user applications in the OIS (with the Electronic Flight Bag (EFB) laptop).

All the information received and calculated by the ACMS applications (real-time and remote server acquisition) hosted in the CDAU, are transmitted to the ASFC ACMS applications (server application and ABDC) through the two SCIs.
The ACMS applications are connected to different HMIs through the Open world Server Function Cabinet (OSFC).
The HMIs which are used to control the ACMS are:
- The OMT
- The CAPT and F/O OIS Display Units (DUs) (CDS)
- The optional PMAT
- The cockpit printer (for the ACMS reports).

An ACMS remote trigger-button is installed on the overhead panel. When the flight crew pushes it in, this button starts the pre-specified reports for post-flight investigation in relation to the flight phase. This trigger mechanism operates on the ACMS flight phase and is programmed in the ACMS. The maintenance crew can use the same mechanism, for example during the engine run-up.
Note that the ACMS exchanges data with the airline ground equipment. The data can also be retrieved on a USB device that is plugged in the OMT front face.



ACMS ARCHITECTURE

AIRCRAFT CONDITION MONITORING SYSTEM (ACMS) DESCRIPTION (2/3)

ACMS Reports

ACMS reports groups

One of the functions of the ACMS is to give the A/C system reports for the system monitoring and the in-depth analysis.
There are four groups of the ACMS reports:
- The Airbus standard reports
- The Airbus customer support reports
- The airline programmed reports
- The onboard/on-ground reports.

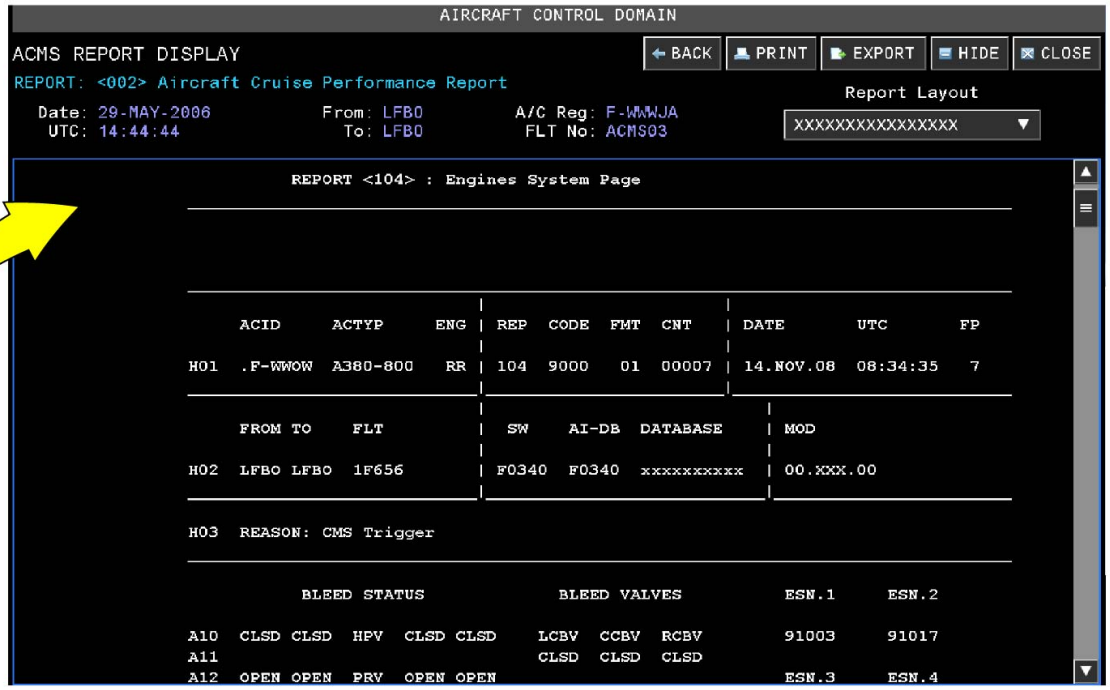
The Airbus standard reports are validated and approved by Airbus. A re-certification is necessary if there is a change in these reports (more than the modification of some limits and constants).
They include:
- Engine reports (for trend monitoring and event analysis)
- System reports (for trend monitoring and event analysis)
- BITE contextual reports
- A servicing trend monitoring reports.

The Airbus customer support reports are dedicated to airline engineering, but only engineers of the Airbus Customer Services can change them through software uploading.
The Airline programmed reports can be changed by the Airline authorized staff through software uploading.
The onboard/on-ground reports can be changed by the Airline authorized staff through Aircraft Communication Addressing and Reporting System (ACARS) software uploading or through the onboard HMI.
The ACMS reports can be started through different conditions:
- Automatic pre-specified triggering logic
- Manual request from onboard HMIs (OMT, PMAT, etc.)
- ACMS remote trigger-button
- Request from the ground (ACARS)
- Request from the CMS-ACD for the BITE correlation.

The ACMS reports can be retrieved through:
- Onboard HMI display consultation
- Transmission to the ground
- Downloading on the USB device
- Onboard cockpit printer.

ACMS REPORTS GROUPS

- A350 STANDARD REPORTS
- ON-REQUEST AIRBUS REPORTS
- AIRLINE / SUPPLIERS PROGRAMMED REPORTS
- ONBOARD / ON-GROUND PROGRAMMED REPORTS



ACMS REPORTS TRIGGERING CONDITIONS

- AUTOMATIC PREDEFINED TRIGGER CONDITION
- MANUAL REQUEST VIA HMI (OMT, PMAT, ETC.)
- ACMS REMOTE TRIGGER BUTTON
- REQUEST FROM THE GROUND (VIA ACARS)
- REQUEST FROM CMS FOR BITE CORRELATION

ACMS REPORTS DATA RETRIEVAL

- DISPLAY ON HMI (OMT, PMAT, ETC.)
- TRAMSMISSION TO THE GROUND
- DOWNLOAD ON USB KEY
- VIA ONBOARD COCKPIT PRINTER

ACARS: Aircraft Communication Addressing and Reporting System
HMI: Human-Machine Interface

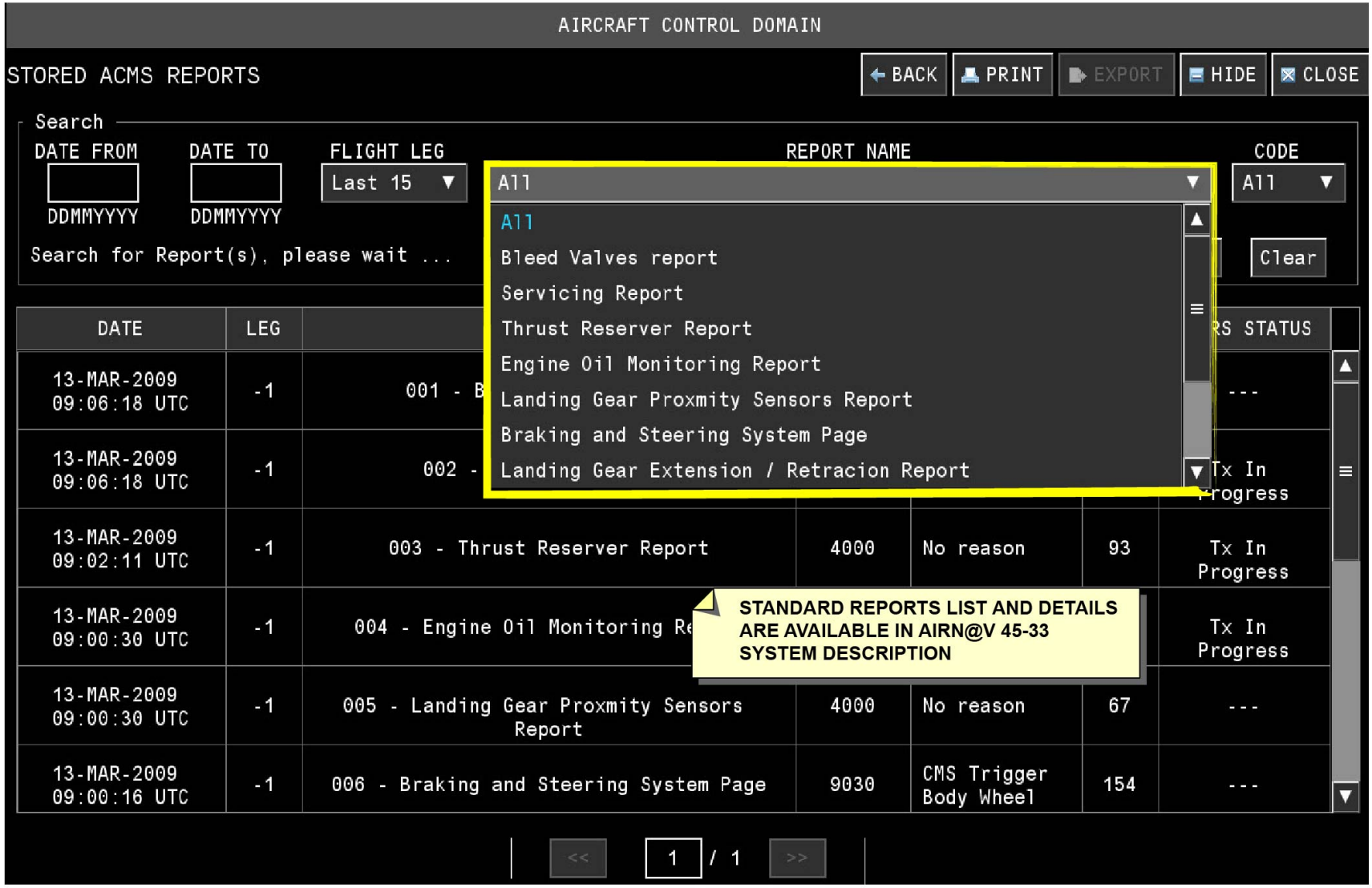
ACMS REPORTS - ACMS REPORTS GROUPS

AIRCRAFT CONDITION MONITORING SYSTEM (ACMS) DESCRIPTION (2/3)

ACMS Reports (continued)

ACMS reports list

The ACMS report list is detailed in AirN@v line of chapter 45-33.



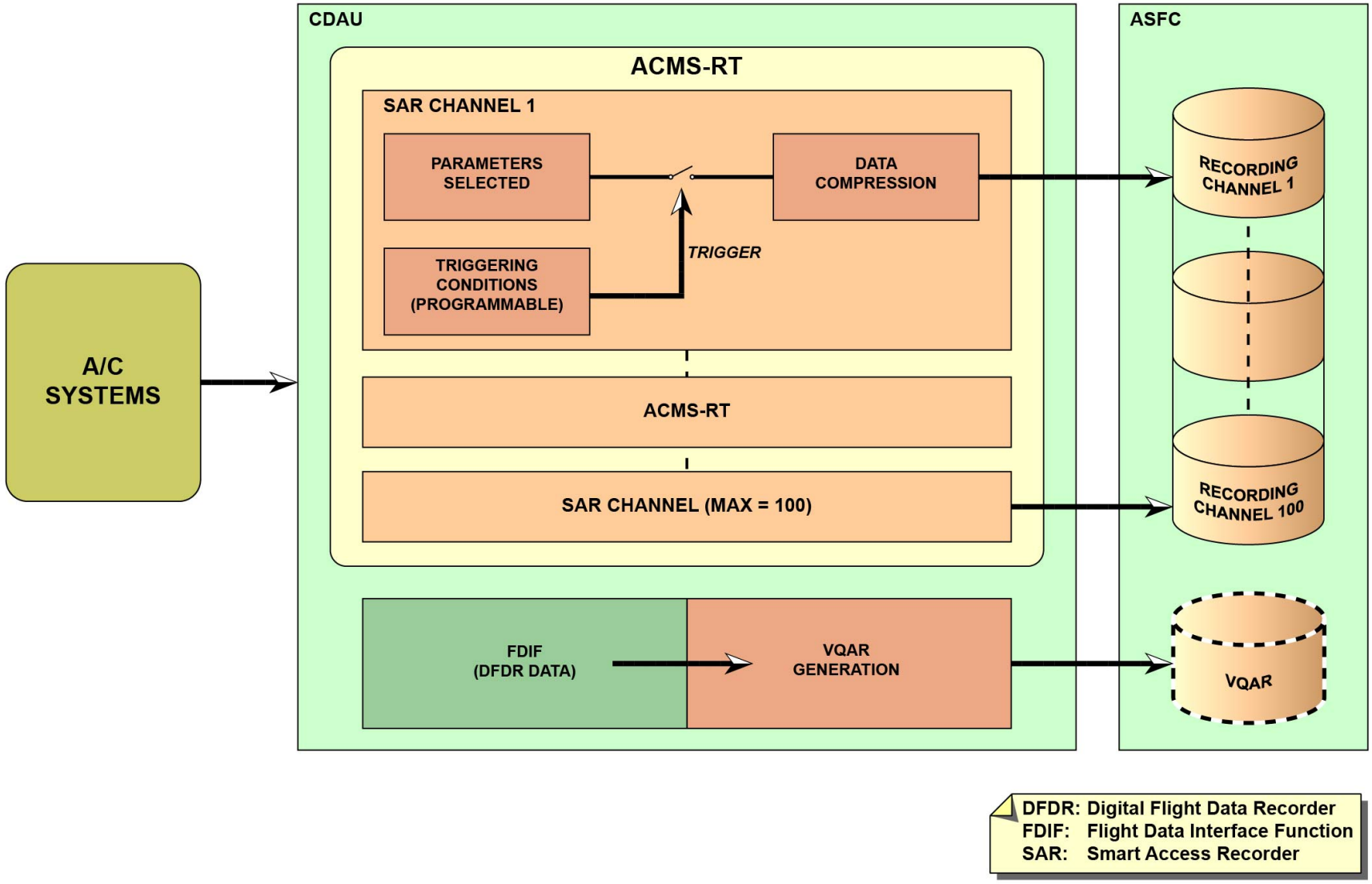
ACMS REPORTS - ACMS REPORTS LIST

AIRCRAFT CONDITION MONITORING SYSTEM (ACMS) DESCRIPTION (2/3)

Smart Access Recorder/Quick Access Recorder Data

The ACMS also records the A/C system parameters for visualization on the onboard HMIs or for recording.
The recorded data are dedicated to the in-depth analysis for the troubleshooting procedures, or for prognostic activities at the airline engineering level.
Two types of data are recorded:
- The Smart ACMS Access Recorder (SAR) data
- The Quick Access Recorder (QAR) data.

The SAR data are recorded on logic channels (100 channels max). Data are permanently received from A/C systems through the CDAU.
Following the channel logic, dedicated parameters are selected, and if the triggering is achieved, the recording procedure is started. Then the data are compressed and sent to the ASFC (ASCM-SA) for recording and consultation through the onboard HMI.
The QAR data are received from the Flight Data Interface Function (FDIF) which does the collecting of the mandatory Digital Flight Data Recording System (DFDRS). A copy of these data is transmitted into the CDAU to a VQAR recording function, which sends these data to the ASFC for the recording procedure in the VQAR database. Then, these data can be downloaded or consulted from the onboard HMIs or can be sent to the ground.



SMART ACCESS RECORDER/QUICK ACCESS RECORDER DATA

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ONBOARD MAINTENANCE SYSTEM (OMS) CONTROL AND INDICATING (2/3)

OMT (2)

The Onboard Maintenance Terminal (OMT) is located in the cockpit and is accessible from the third occupant seat.
The OMT is the main maintenance station used by mechanics to get access to the Onboard Maintenance System (OMS) Applications.
Captain and F/O Onboard Information system (OIS) Displays are part of the Control and Display System (CDS). They are respectively located on extreme left and right sides of the Main Instrument Panel. They are mainly dedicated to the flight crew and enable them to consult and use OIS Flight Operations Applications. Note that maintenance staff has also the possibility to use the OIS displays to get access to the OMS Applications depending on workload and displays availability.

Aircraft Status Reports Consultation (2)

The A/C Post Flight Report (PFR) is an aircraft faults report generated by the Maintenance Central Access (MCA) Application at the end of the flight. It includes faults from both Aircraft Control Domain (ACD) and Aircraft Information System Domain (AISD) domains.
The PFR categorizes fault cases by types of aircraft effects: Cockpit, Cabin, Maintenance or Faults with no effect. Inside each category, following data are presented for each fault case:
-Number
-Date/UTC
-ATA
-Effect message
Note that the "message" column presents warnings/cautions and associated Dispatch message and also associated Maintenance Messages. Cockpit effect could have been raised.
To get access to the PFR, on OMT AISD Maintenance Home Page (Top area + Application Area):
On Menu bar, select "Aircraft Reports".
Then select "PFR" - correlated items are ordered in different tabs according to the produced effects (cockpit, cabin, etc...):
- "Cockpit" tab: all fault cases with a cockpit effect are listed
- "Cabin" tab: all fault cases with a cabin effect are listed
- "Maintenance" tab: all fault cases without cockpit effect (only Maintenance Message)
- Select "Faults with no effect" tab: all faults with unknown cockpit effects
-When you select one effect in the "Cockpit" list, you get access to the associated Fault Item Detail page. Each fault Item Detail page is associated to one fault case. Item Detail page presents fault case correlated logbook entry (if any), effect(s) (if any) and fault message (if any).
"MEL/CDL" gets access to associated MEL Item;
FAULT CODE gets access to associated TSM procedure.
BCR code gets access to BITE Contextual Report (BCR) information.
Active ECAM alerts function provides a list of all ACD warnings and correlated ACD Maintenance Messages present when the operator does a report request or refreshes it manually.

System Report/Test and Scanning (2)

To get access to the interactive BITE and scanning functions, on OMT AISD Maintenance Home Page (Top area + Application Area), select "Aircraft Management" then "System Report/test & Monitoring", or
On Maintenance Home Page, select "System Report/Test & Scanning" in "Function Shortcut"
Then in SYSTEM REPORT/TEST & SCANNING" page:
In "System Selection" area: select one ATA and then one system
Interactive BITE: To check a system, the operator has the possibility to perform several interactive tests or specific functions in order to obtain several information related to the system. Each system defines its own tests and functions.
In "Interactive BITE" area:
Select "Add" then select "Remove"
Select another system and then "Add"

Select "Start Interactive BITE"
Select "System Tests"
Select "Module Test", then Start Test"
System Monitoring: The System BITE Scanning provides operator with all the current active Maintenance Messages for pre-selected avionics system (ATA identified and then BITE side) at a current time (messages reception in real-time).
In "System BITE Scanning" area
Select "Add" then select "Remove"
Select another system and then "Add";
"Remove all" and then select "Start Scanning";
BITE scanning page is then displayed;
Select "FAULT CODE" and get access to associated TSM procedure - back
Select "START SCAN" to refresh data
This "System Report/Test background tasks" displays the list of current running interactive sessions and gives possibility to get access to corresponding interactive work area.
To get access to System Report/Test background tasks:
On OMT AISD Maintenance Home Page (Top area + Application Area), select "FSA-NG platform management"
then "System Report/test background tasks"- explain
Click on one "System Test" - back

A/C system Memory Dump (2)

The Resource BITE memory dump consists in dumping the content of an A/C system into a physical media in order to get back all raw data for post-analysis at the shop office.
To get access to systems BITE Memory dump, on OMT AISD Maintenance Home Page (Top area + Application Area), select "Aircraft Management" and then "System Report/Test & Monitoring", or
On Maintenance Home Page, select "System Report/Test & Scanning" in "Function Shortcut"
Then in System "REPORT/TEST & MONITORING" page:
In "System Selection" area: select one ATA and then one system;
Interactive BITE: in "Interactive BITE" area:
select "Add"
select "Start Interactive BITE"
select "Specific Functions"
select "RESOURCE BITE Memory dump"

Maintenance Application Backup Menus (2)

In normal configuration, it is possible to get access to a "Backup PFR" which is PFR including only maintenance data from OIS ACD side. To get access to this "Backup PFR", select "FSA-NG Platform Management" and then "Backup PFR".
In case of MHM or OSFC problem, ACD maintenance applications are still available and accessible from Maintenance Backup menus
On OMT Backup menu, select "Maintenance"
- Then select ACMS "DISPLAY"- "CLOSE"
- Select CMS "DISPLAY" - "CLOSE"
- Select DLCS "DISPLAY"- "CLOSE"

MCA Recorded Data Retrieval and Clearing (3)

Access to PFR History
The "PFR History" function lets the mechanics get access to the list of last recorded flight legs reports and associated PFR. From this list the mechanics can select one report in order to get access to the content of the report.
To get access to "PFR History", on OMT AISD Maintenance Home Page (Top area + Application Area), select "Aircraft Report"
Then select PFR History;
Select one PFR report in the list and get access to the report content - back
Access to Data Search function
The PFR Data Search function offers the possibility to retrieve PFR information (effects or maintenance messages for example) recorded in OSFC memory.

The MCA stores the following data at least during the last 20 legs, and as long as the Logbook Entry associated with data is not closed:
. Maintenance data:
o Maintenance messages and data associated with them,
o RFDEs and data associated with them,
o Correlated items,
Reports: Logbook entries list item details, PFRs.
On OMT AISD Maintenance Home Page (Top area + Application Area), select "Aircraft Report"
Then select "PFR Data Search";
To retrieve one information (Maintenance message or effect) enter associated criteria in corresponding filter area (leg, date, ATA, etc...)

CMS Memory Dump (3)

Access to and perform system CMS Memory Download
The "CMS Memory Download" function is made in order to enable operator to download the internal CMS memory in a dedicated media (USB Key) in order to get back all raw data for post-analysis.
To get access to the "CMS Memory Download", on OMT AISD Maintenance Home Page (Top area + Additional Functions), select "CMS Memory Download" then "Dump CMS Memory".

Data Loading of Software/Batch (2)

The Data Import menu on OMS enables the mechanics to import software from USB key into the INBOX Repository Partition.
To do that, on OMT (A USB stick is already plugged in the Import Plug):
Select Utilities Menu
Select Data import Menu
For ex:ADIRU-1
Select Import PN soft key
On IMPORT CONFIRMATION page
Depress Confirm soft key
Purpose of the Uploading function is to upload software into avionics targets.
To get access to the Uploading function, on OMT AISD Maintenance Home Page (Top area + Application Area), select "Aircraft Management"
Then select "S/W Upload & Conf Validation": the "Upload & CONF Validation - Target Search" page comes into view; this page enables maintenance operator to select LRUs for upload operations or for configuration validation:
Using "ATA" and/or "FIN" and/or "Functional designation", search for LRU(s) to be uploaded
Select ITEMS to be uploaded in the list and then confirm: "Upload & CONF Validation - Target List" page comes into view; this page enables the operator to upload and/or validate LRUs configuration
Select software to be uploaded from Inbox and check with reference if relevant or not
Select "Upload P/N" and "confirm"
Validate configuration
Purpose of the Downloading function is to retrieve files or data from avionics targets.
To get access to the Downloading function, on OMT AISD Maintenance Home Page (Top area + Application Area), select "Aircraft Management".
Then select "Avionics Data Download": the "Download" page comes into view; this page enables the operator to transfer LRU internal data contained in specific files, to a dedicated storage area on OIS, named the Export Box

A/C LRUs Configuration (3)

Access to ACD Configuration Status
The "ACD Configuration Status" function enables maintenance operator to verify respectively the Electronic LRU Configuration Status (ELCS), i.e. the last acquired configuration and the current validated configuration for each LRU.
In order to get access to the "A/C Config Status" function, on OMT AISD Maintenance Home Page (Top area + Application Area), select "Aircraft Report"
Then select "A/C Config Status";

Using filter tabs (ATA, FIN, Functional Designation) search system for which you want to check configuration
Check system configuration relevancy
Access to S/W Repository Management
The "S/W Repository Management" function enables the operator to ensure and control the consistency of Onboard FLS Repository Reference Area and Onboard FLS Repository Inbox Area.
In order to get access to the "S/W Repository Management" function, on OMT AISD Maintenance Home Page (Top area + Application Area), select "Aircraft Management"
Then select "S/W Repository Management";
In Manual Management area, in INBOX, select software you want to load in the Reference Repository; select the arrow to activate loading
Remove a software from Reference Repository.

ACMS Real Time Monitoring (2)

The ACMS Real-Time Monitoring (RTM) gives a Real-Time Parameter display, which can show all parameters, which are available through the AFDX network. The parameters are displayed in real-time on numerical or graphical screen.
To get access to ACMS RTM function, on OMT AISD Maintenance Home Page (Top area + Application Area), select "Aircraft Management" and then "ACMS Functions", or
On Maintenance Home Page, select "ACMS Functions", in "Function Shortcut"
Then in "Real-Time Monitoring" tab: Select "Dataset"; the "PARAMETER REAL TIME MONITORING" page comes into view:
Click on the applicable parameter Dataset.
If no parameter values show, click on the "Play" button to start Real Time display.
Basically, the numerical view is displayed. Select graphical view through control in Toolbar area.
Then in "Add Parameter" menu, type an Alpha call up parameter into the Data Field "Alpha Call-up to search" (e.g. ALT). If this is not possible, then use the filter area to specify the criteria and query the parameter database. Filter types:
ATA Chapter,
Type,
Parameter Name
Click on the applicable line select key (e.g. ALT:1) and on the "Add" button. Click on "OK" button
If no parameter values show, click on the "Play" button to start Real Time display
Airbus gives some pre-configured parameter datasets, which show the most important aircraft parameters on system basis. To get access to ACMS RTM function, on OMT AISD Maintenance Home Page (Top area + Application Area), select "Aircraft Management"
then "ACMS Functions", or
On Maintenance Home Page, select "ACMS Functions", in "Function Shortcut"
Then in "Real-Time Monitoring" tab: Select "System Parameter"; the "SYSTEM PAGES" page comes into view:
Click on the applicable "System Page" to select dedicated ATA and system to display
If the display shows no parameter values: in the "Toolbar" box click on the icon button "PLAY" to start Real Time display.

ACMS Condition Monitoring (2)

The "ACMS Reports Display" area gives the users access to generated and stored ACMS Reports for further analysis. It shows a table with ACMS Reports, which were generated in the past and which are stored on the Server.
The user can:
sort and filter the table records,
select individual table records for detailed ACMS Report display,
print the list of ACMS Reports,
print the content of an ACMS Report,
send the content of an ACMS Report to the ground.

To get access to ACMS Reports Display function, on OMT AISD Maintenance Home Page (Top area + Application Area), select "Aircraft Management"
and then "ACMS Functions", or
On Maintenance Home Page, select "ACMS Functions", in "Function Shortcut"
Then in "Condition Monitoring" tab: select "ACMS Report Display"
Click on the ACMS report: opens and shows the selected ACMS report.

ACMS Condition Monitoring (3)

Access the ACMS Manual Report Generation Menu
The "ACMS Manual Report Generation" function enables to get access to the list of all ACMS report in order to manually activate generation of selected reports. It also offers the possibility to have a view of report content.
In order to get access to the "ACMS Manual Report Generation", on OMT AISD Maintenance Home Page (Top area + Application Area), select "Aircraft Management"
On Menu bar, select "ACMS Functions" or
On Maintenance Home Page, select "ACMS Functions", in "Function Shortcut"
Then select "Manual Report Generation Menu"
Select the report you want to generate
select "Generate" to activate manual generation
select "View" to monitor parameter trend

ACMS Data Recording (2)

The "ACMS Generated and Stored SAR/DAR/QAR files" area gives users access to generated and stored ACMS SAR/DAR/QAR files for further analysis. It shows a table with ACMS Recording channels which were generated in the past and which are stored on the Server.
The user can:
sort and filter the table records,
select individual table channel for detailed display,
print the list of ACMS recording channels,
send the content of an ACMS Report to the ground.
To get access to ACMS Reports Display function, on OMT AISD Maintenance Home Page (Top area + Application Area), select "MENU"
On Menu bar, select "Advanced Functions" and then "ACMS Functions", or
On Maintenance Home Page, select "ACMS Functions", in "Function Shortcut"
Then in "Condition Monitoring" tab: select "ACMS Report Display"
Click on the ACMS report: opens and shows the selected ACMS report.

ACMS Data Recording (3)

Access to Manual ACMS SAR/QAR Controls
The "Manual ACMS SAR/QAR Controls" function enables to activate ACMS SAR/QAR channel(s) recording.
In order to get access to the "Manual ACMS SAR/QAR Controls", on OMT AISD Maintenance Home Page (Top area + Application Area), select "Aircraft Management"
On Menu bar, select "ACMS Functions" or
On Maintenance Home Page, select "ACMS Functions", in "Function Shortcut"
Then select "Manual ACMS SAR/QAR Controls"

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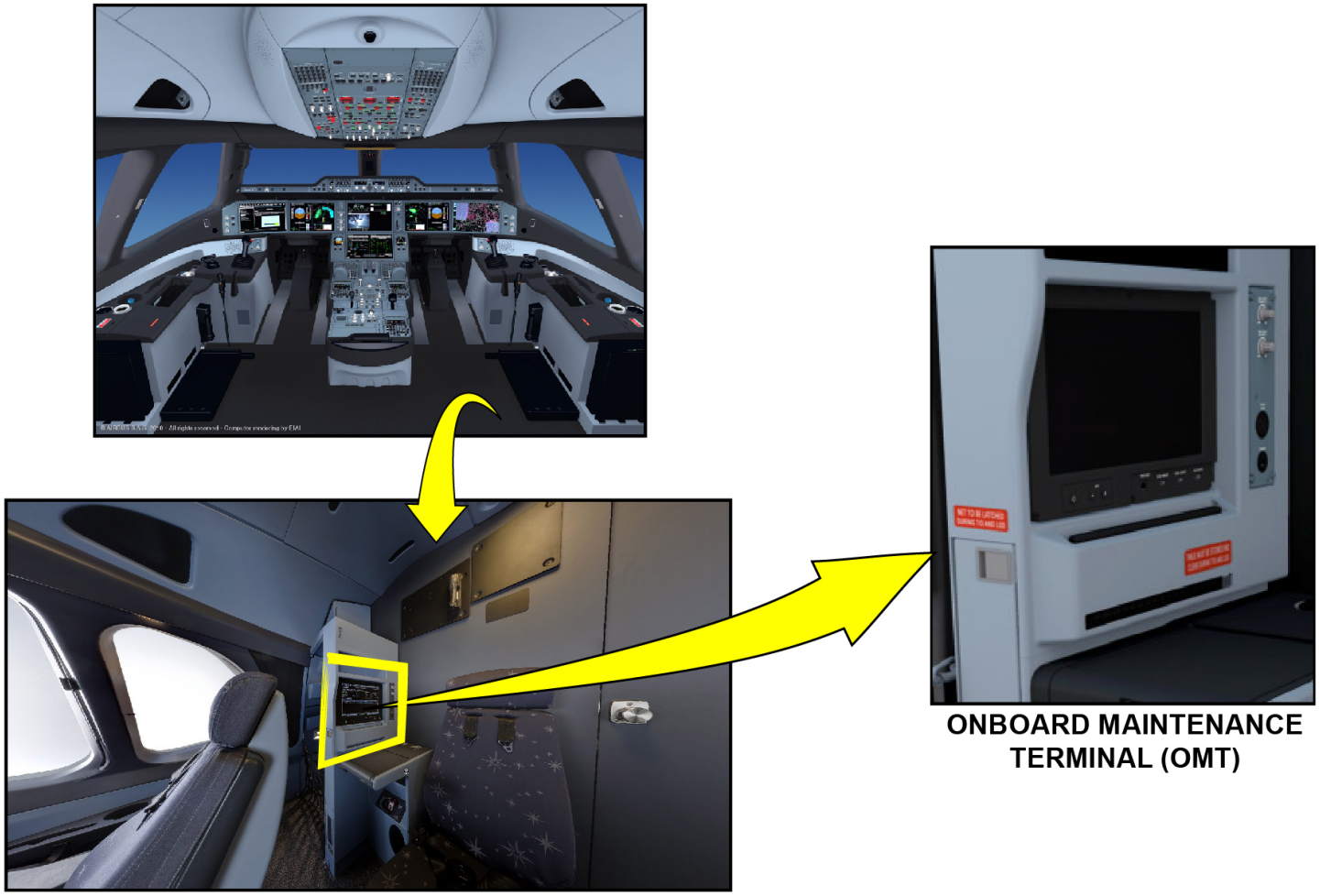

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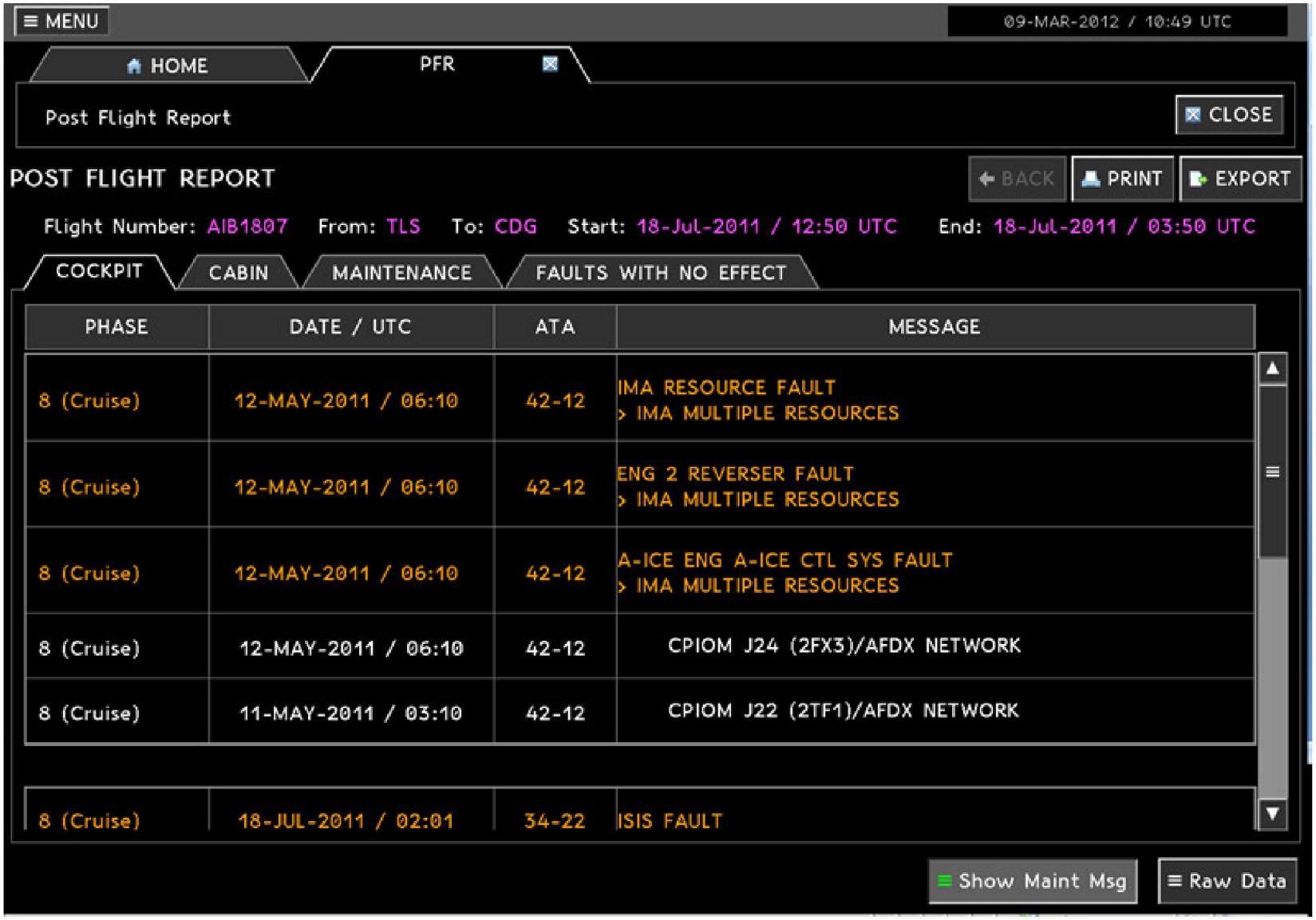

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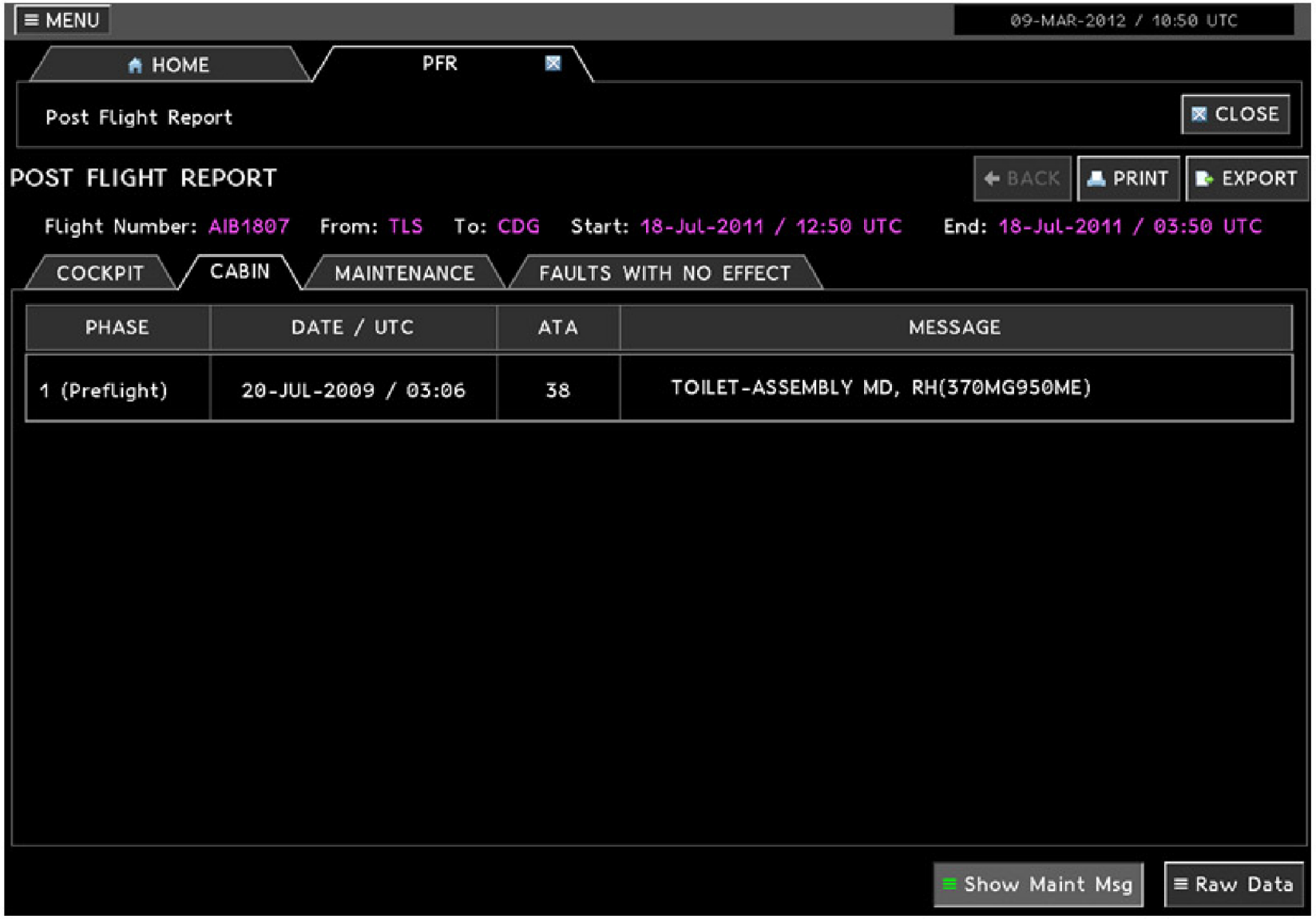

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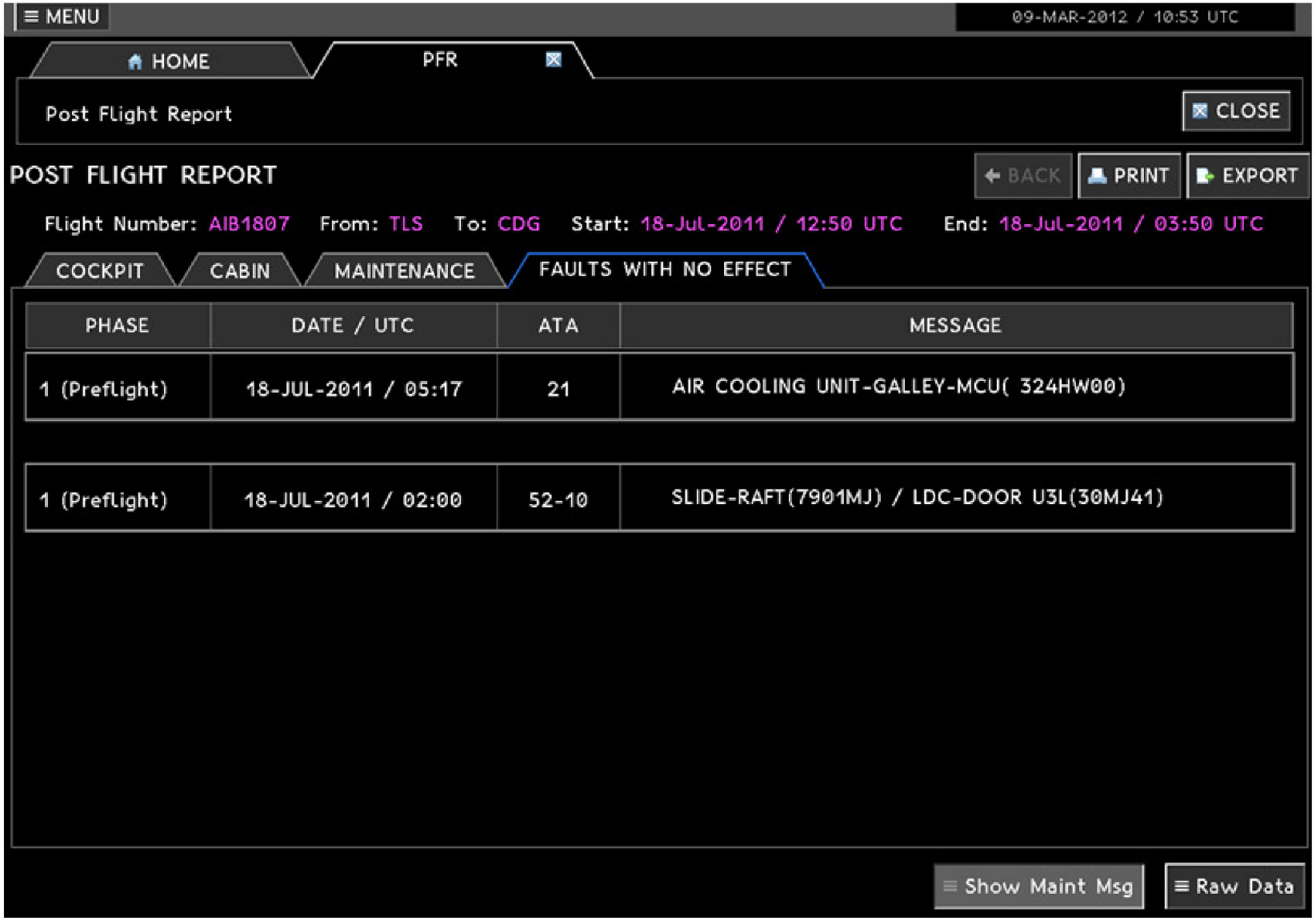

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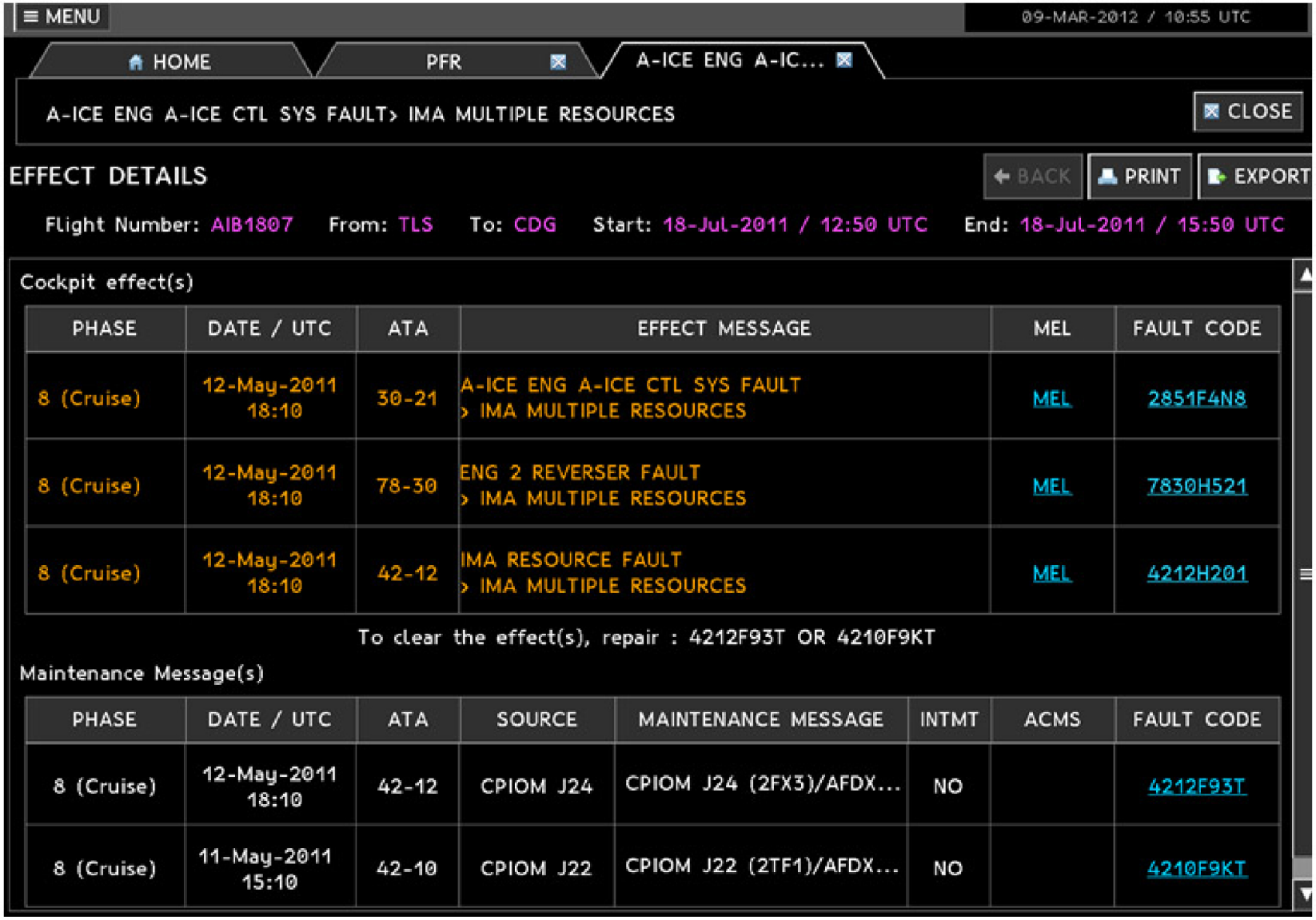

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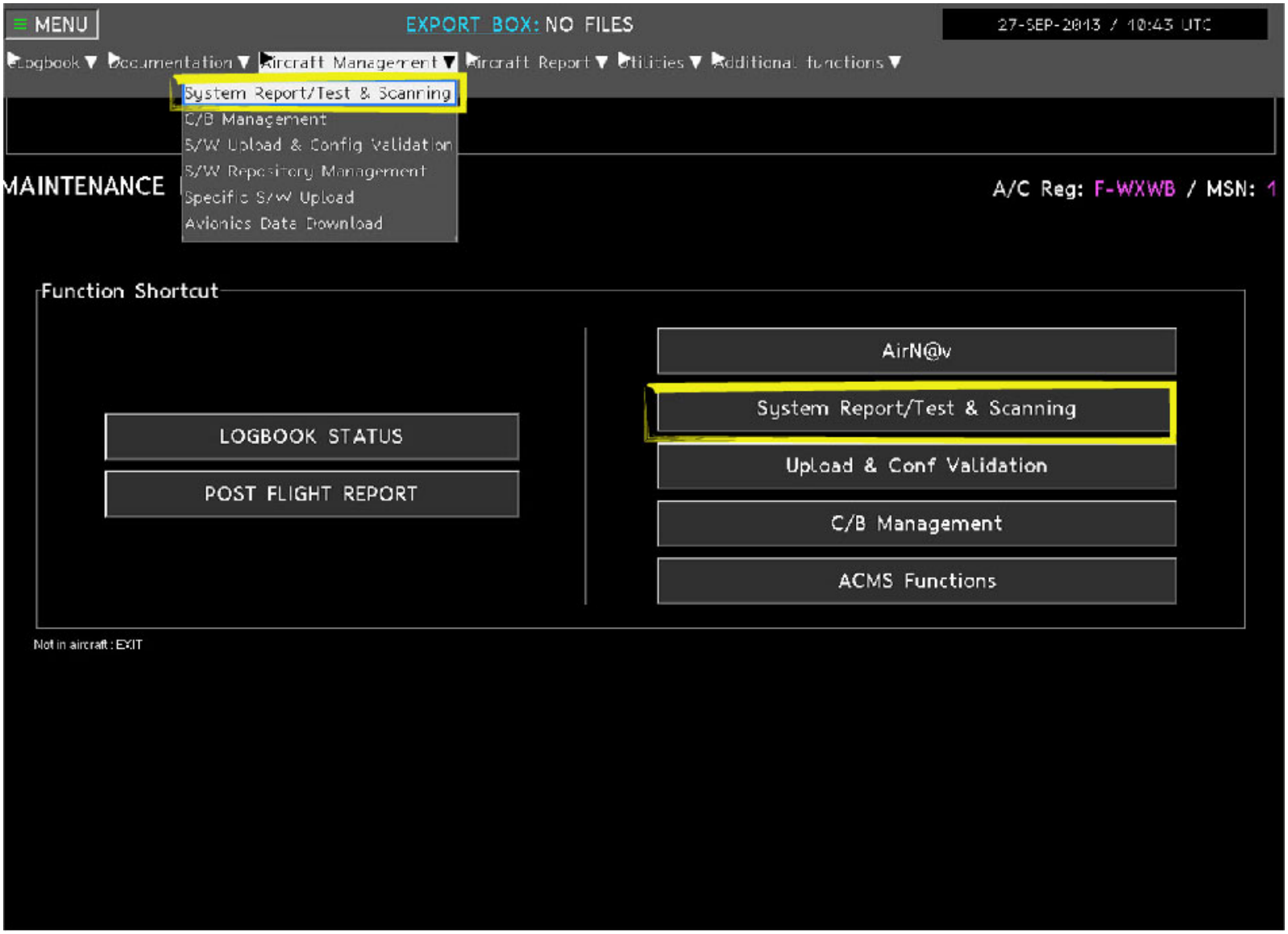

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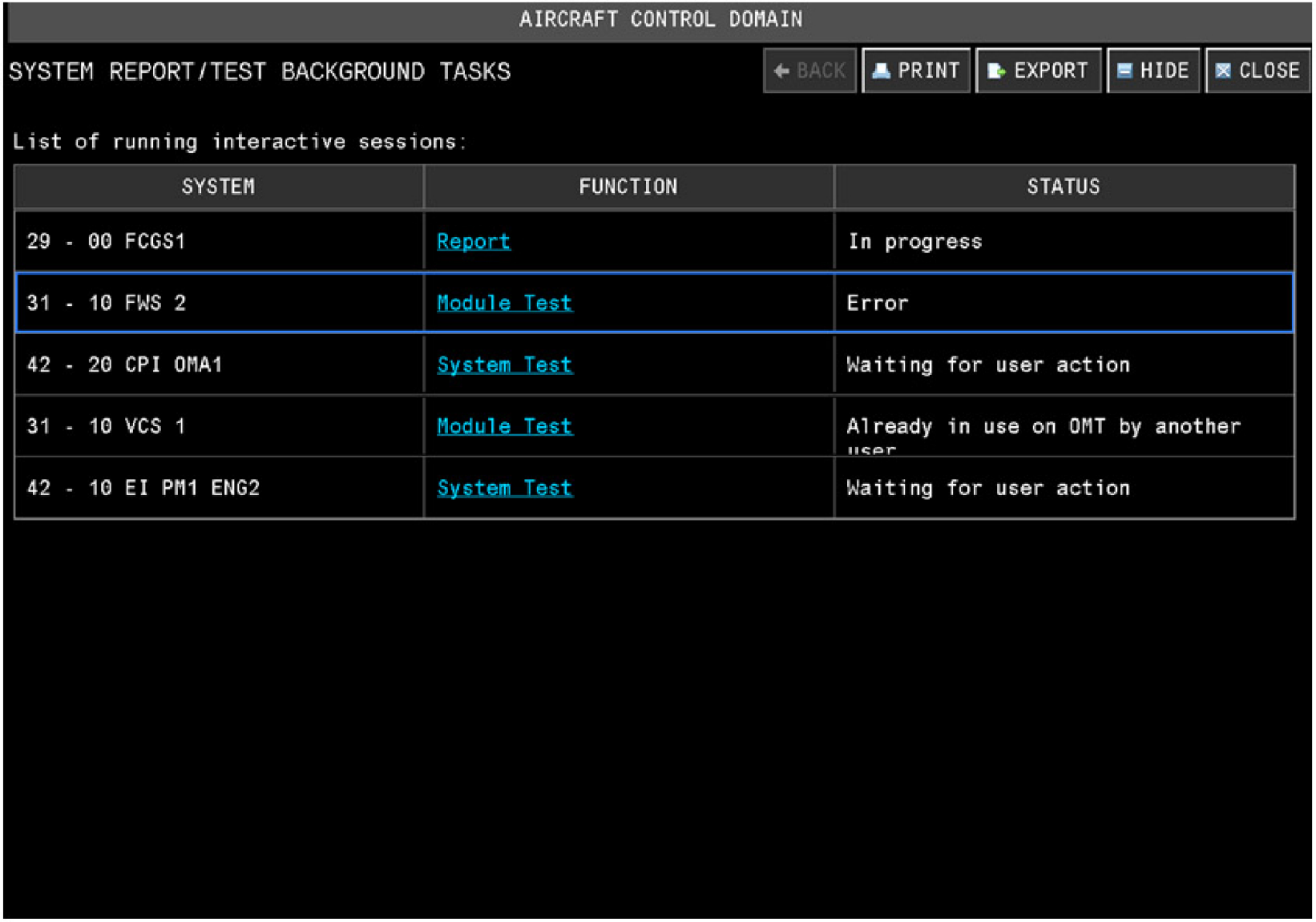

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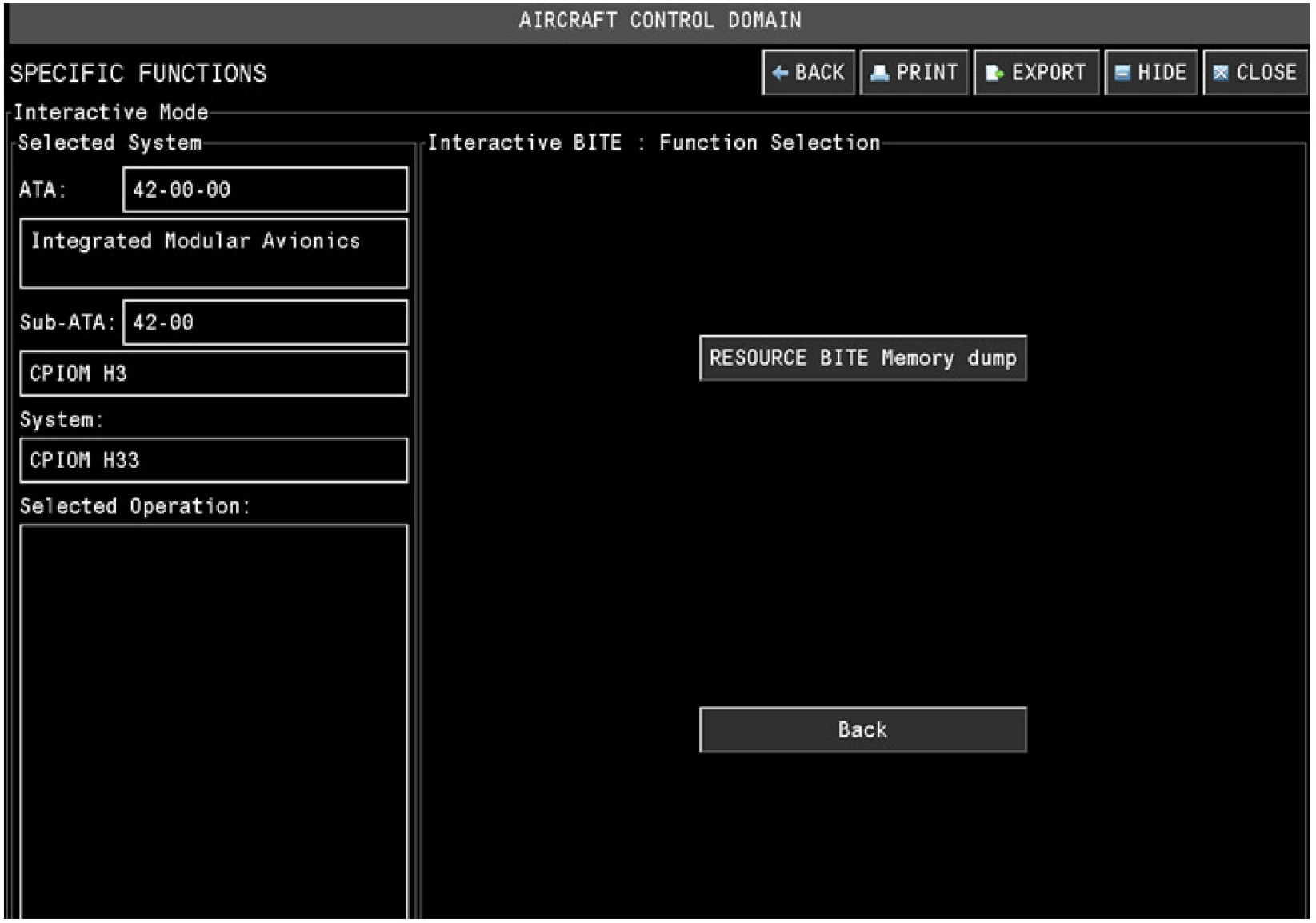

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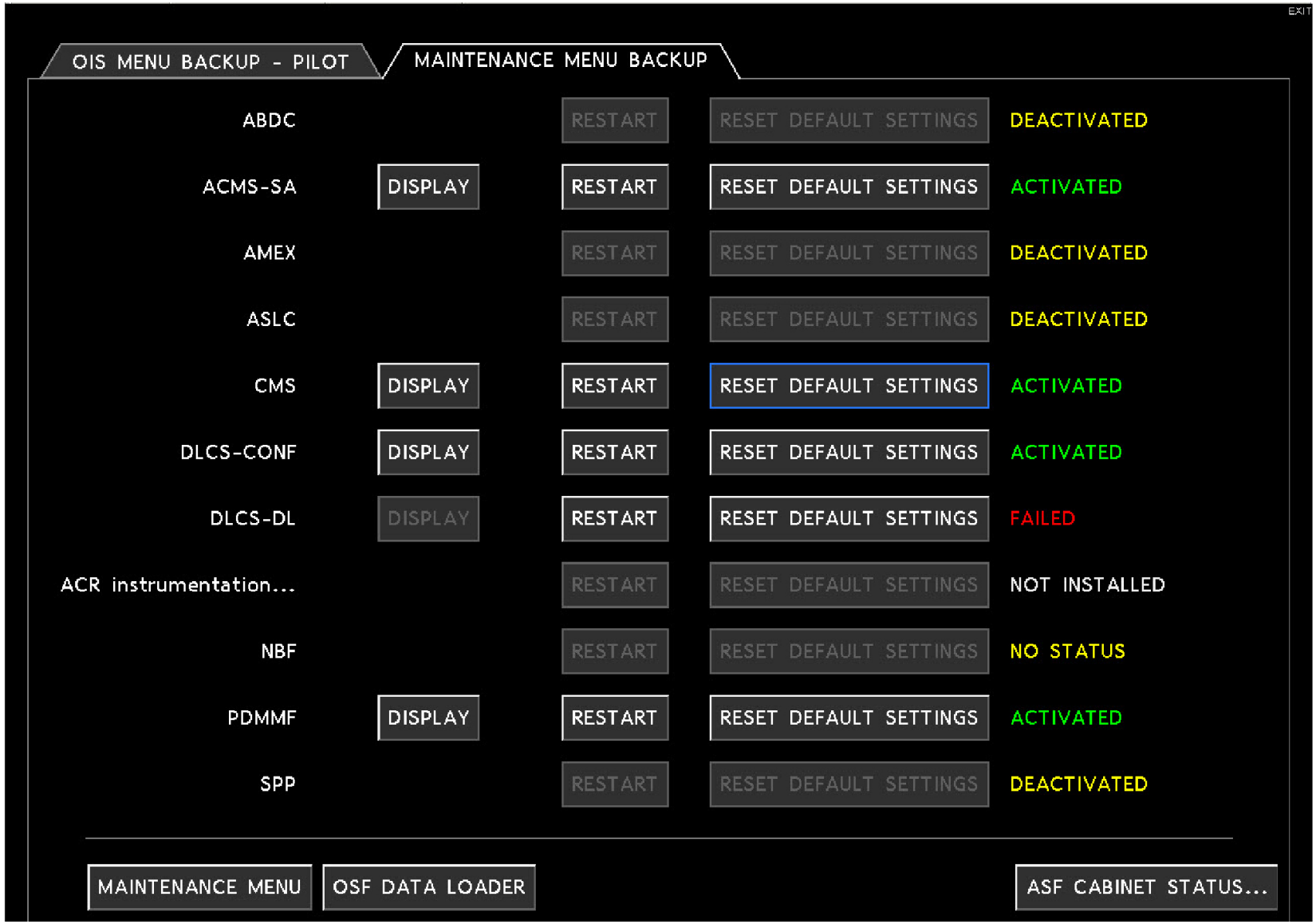

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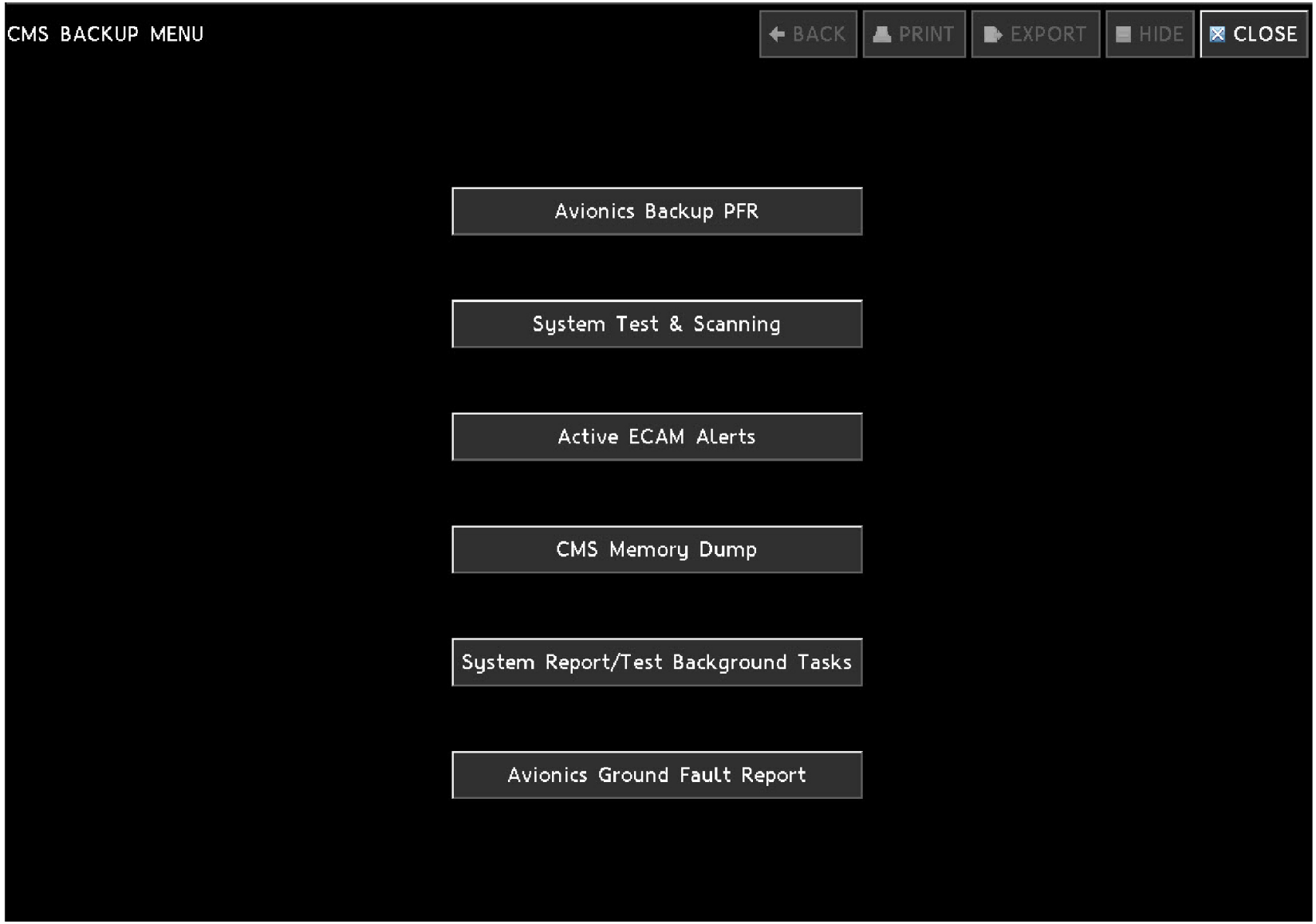

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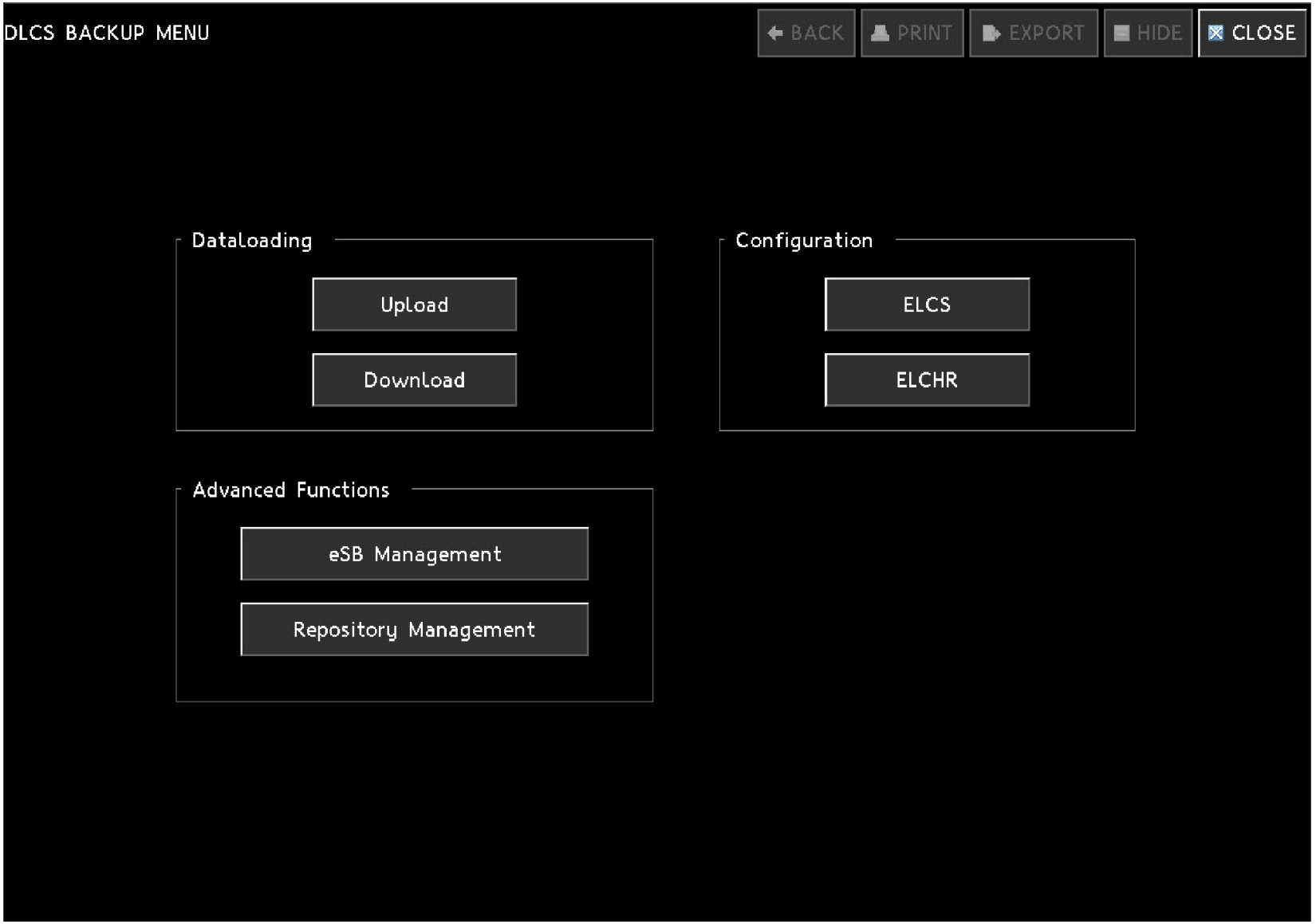

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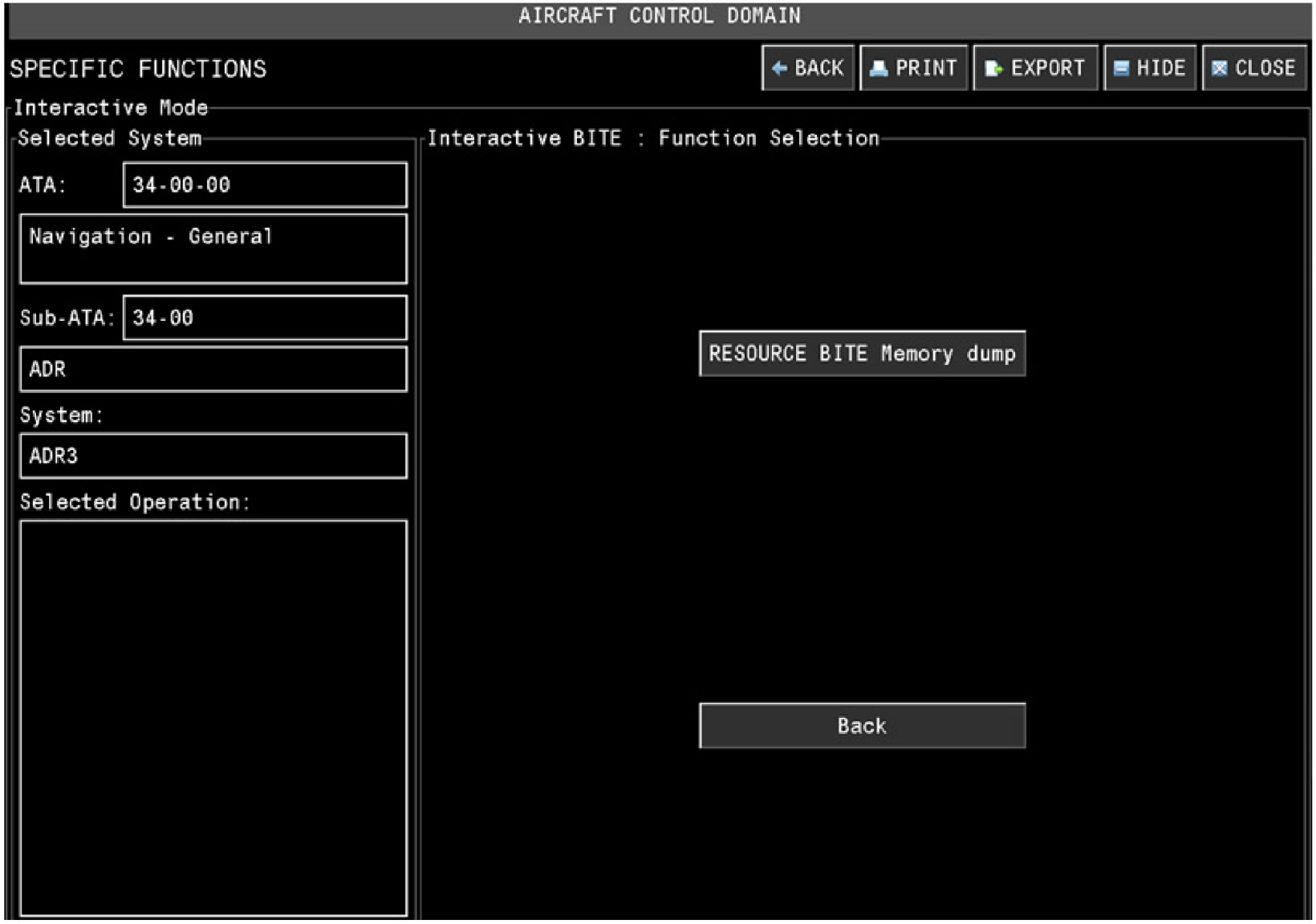

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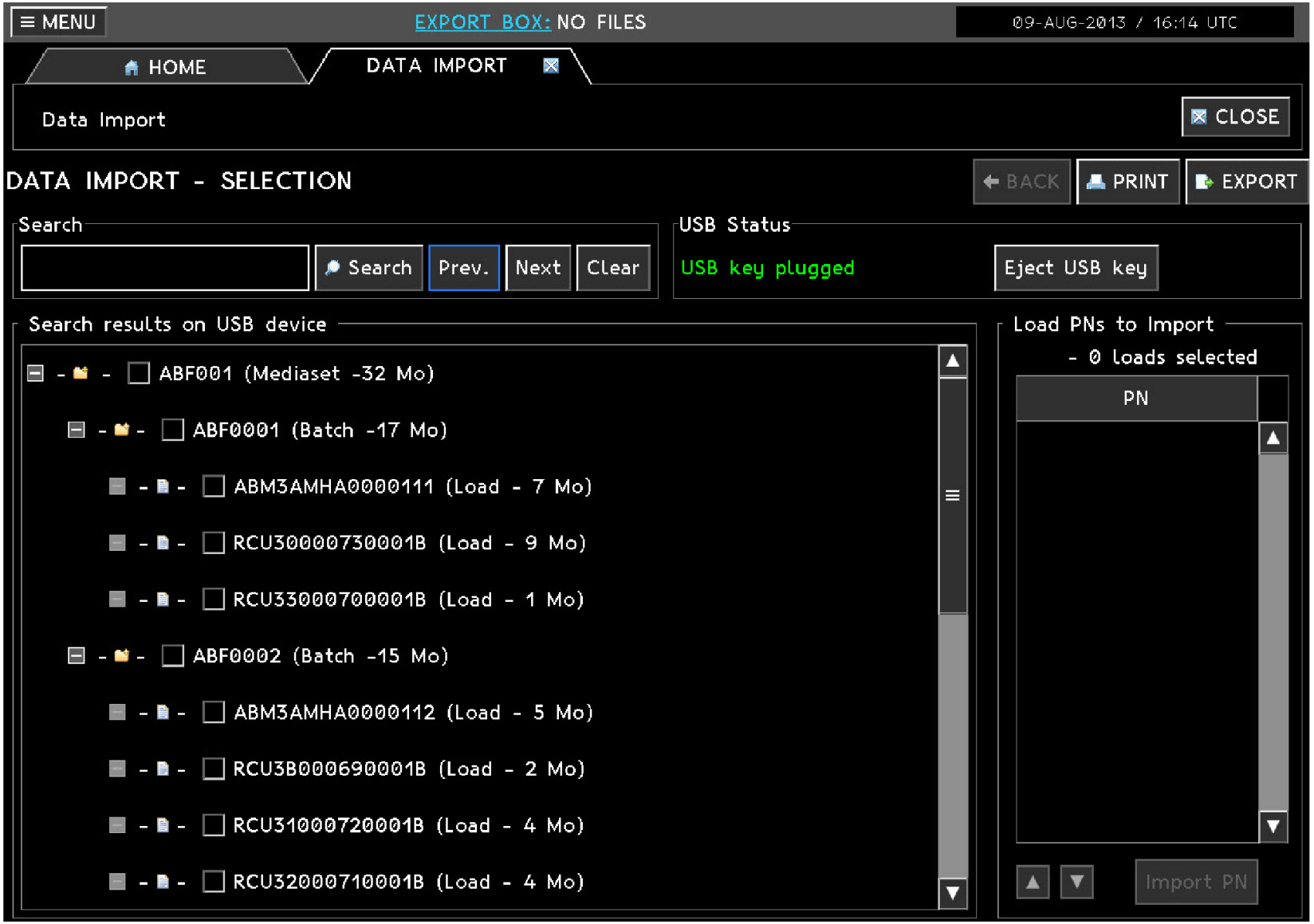

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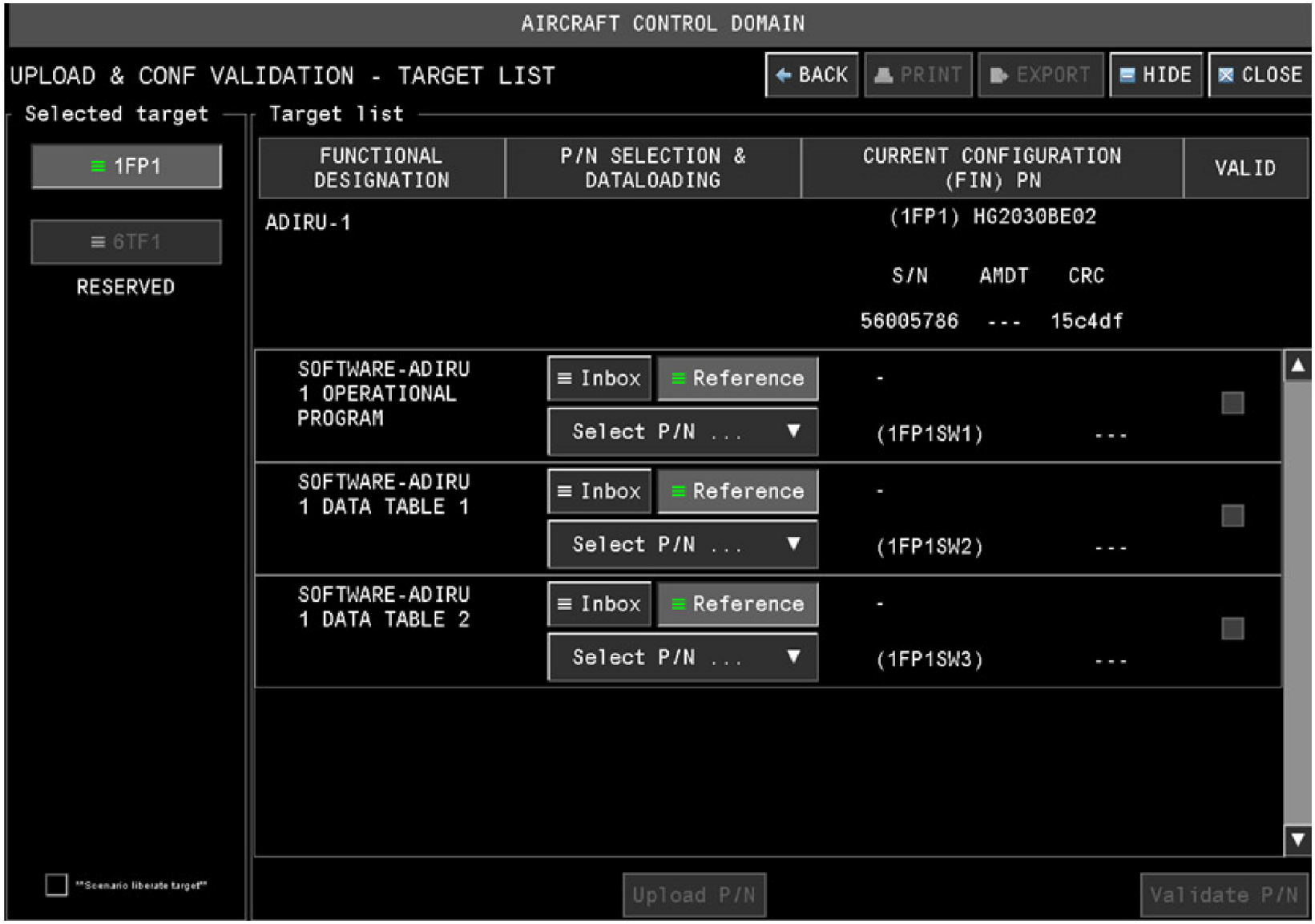

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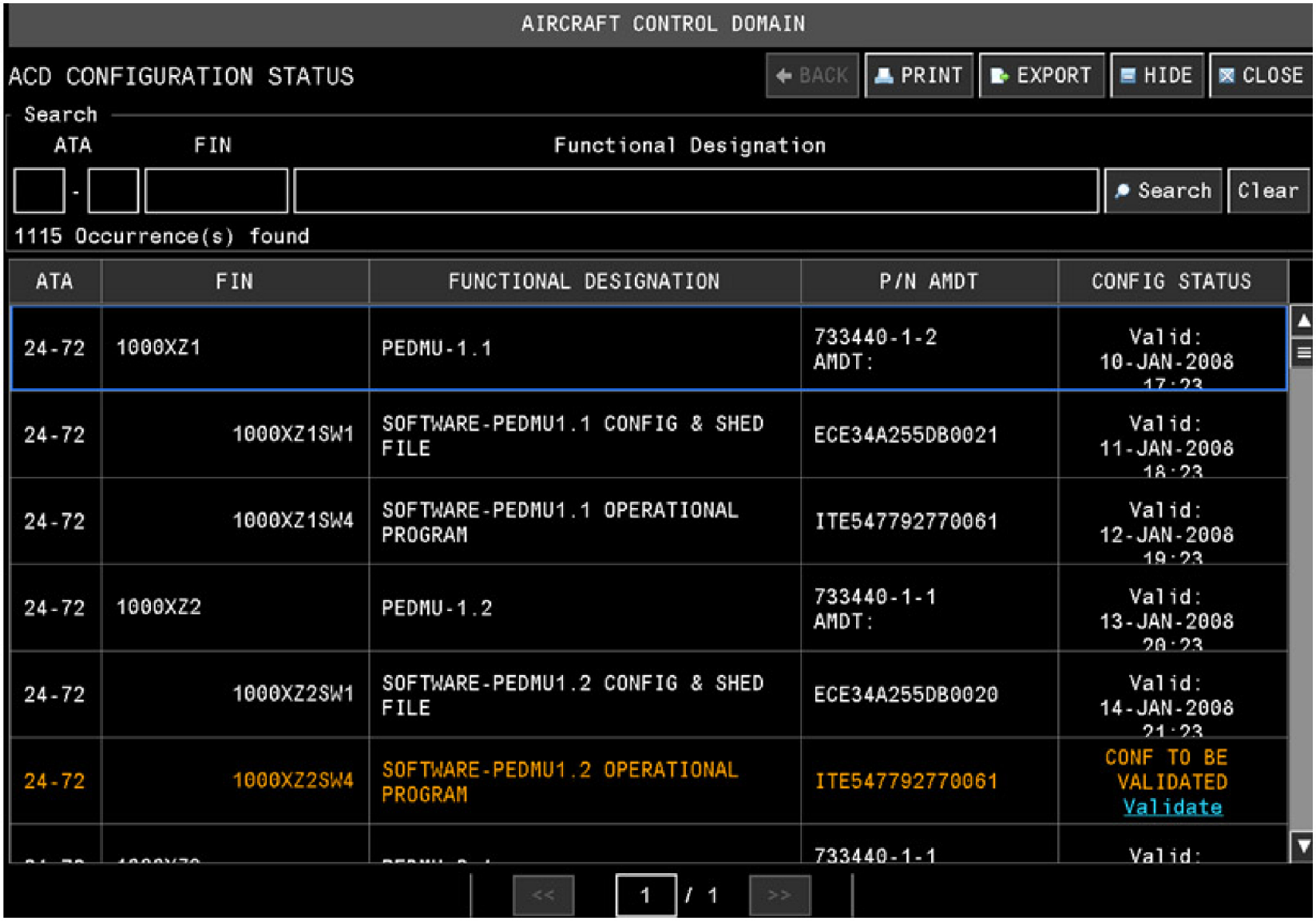

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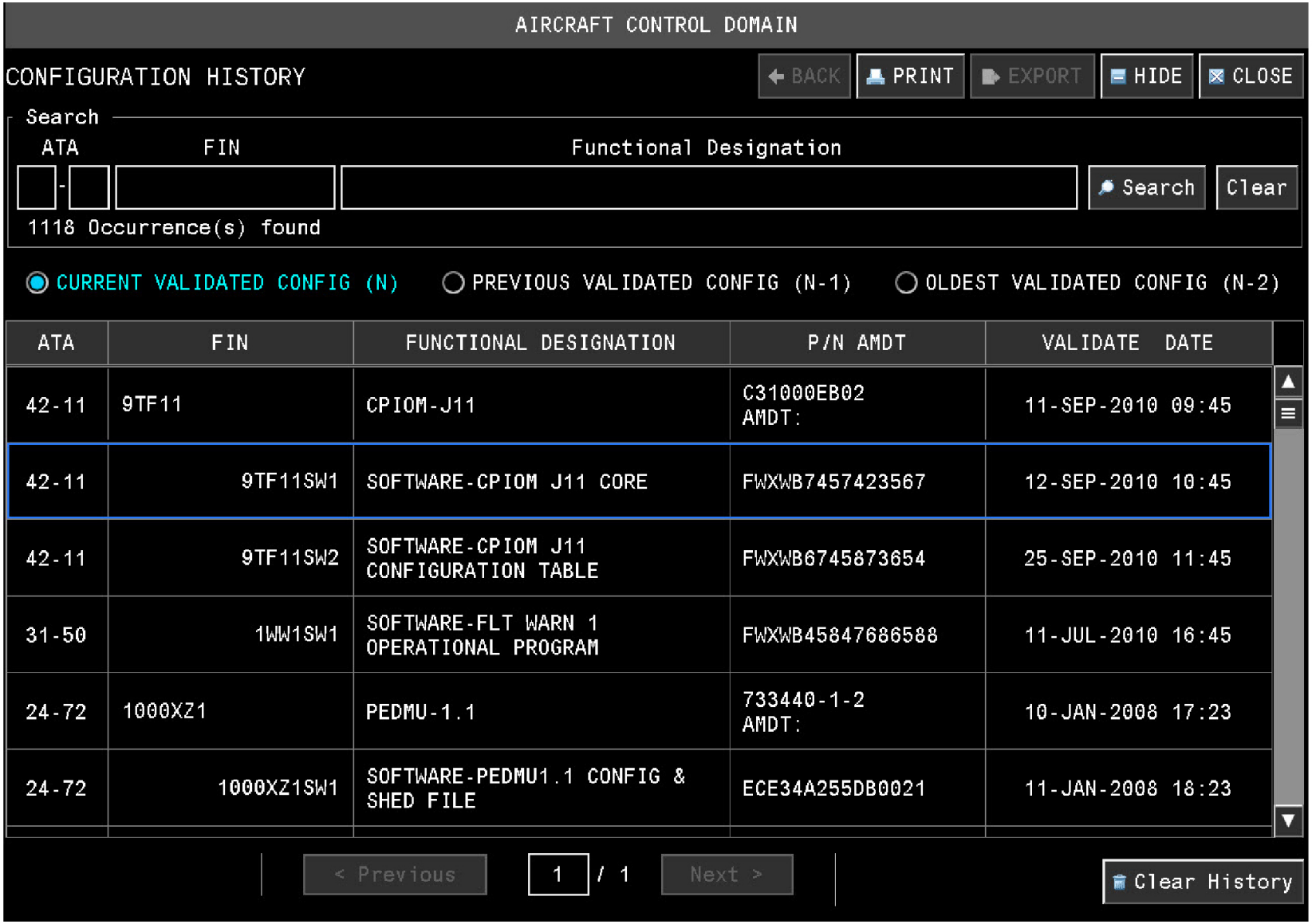

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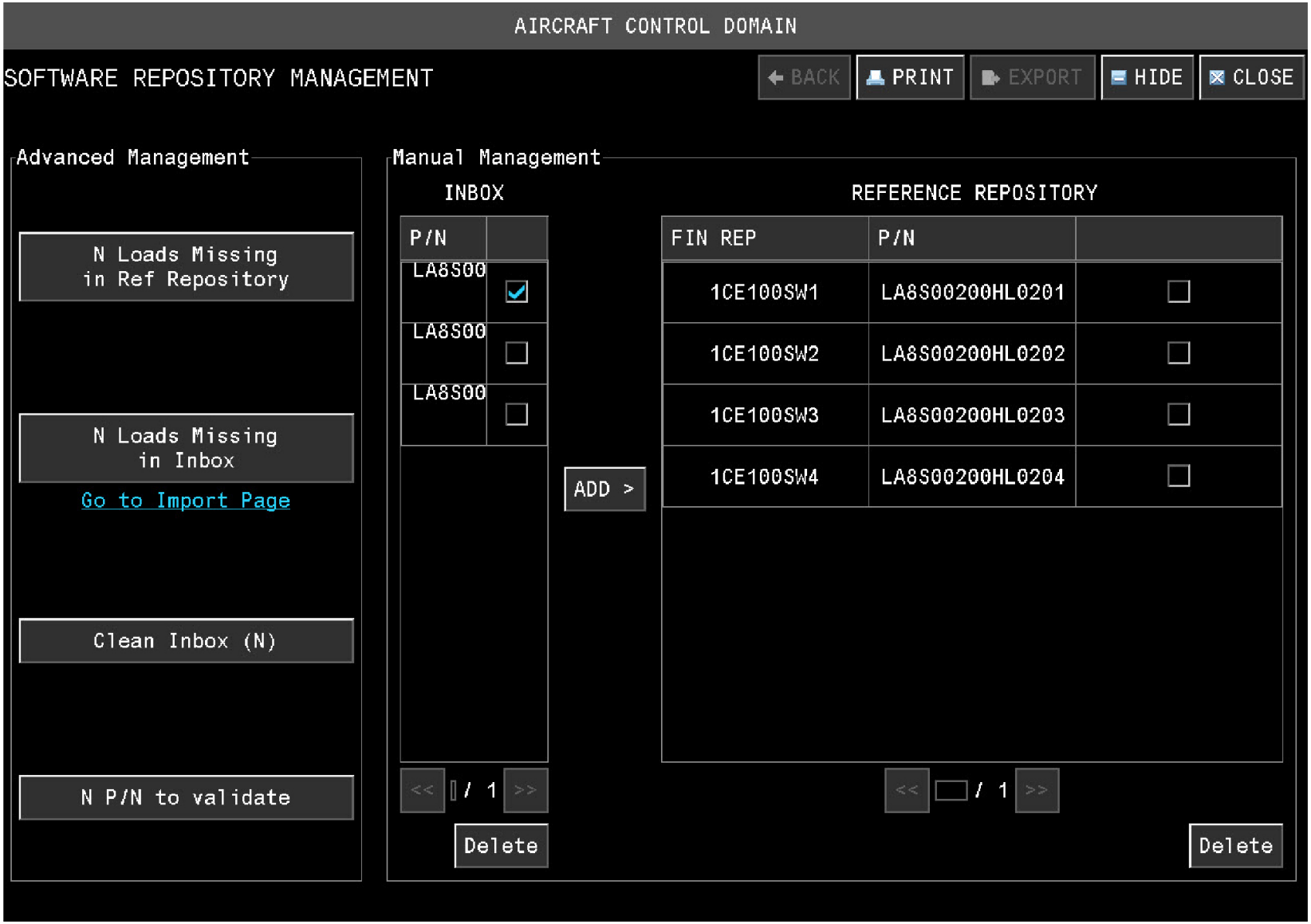

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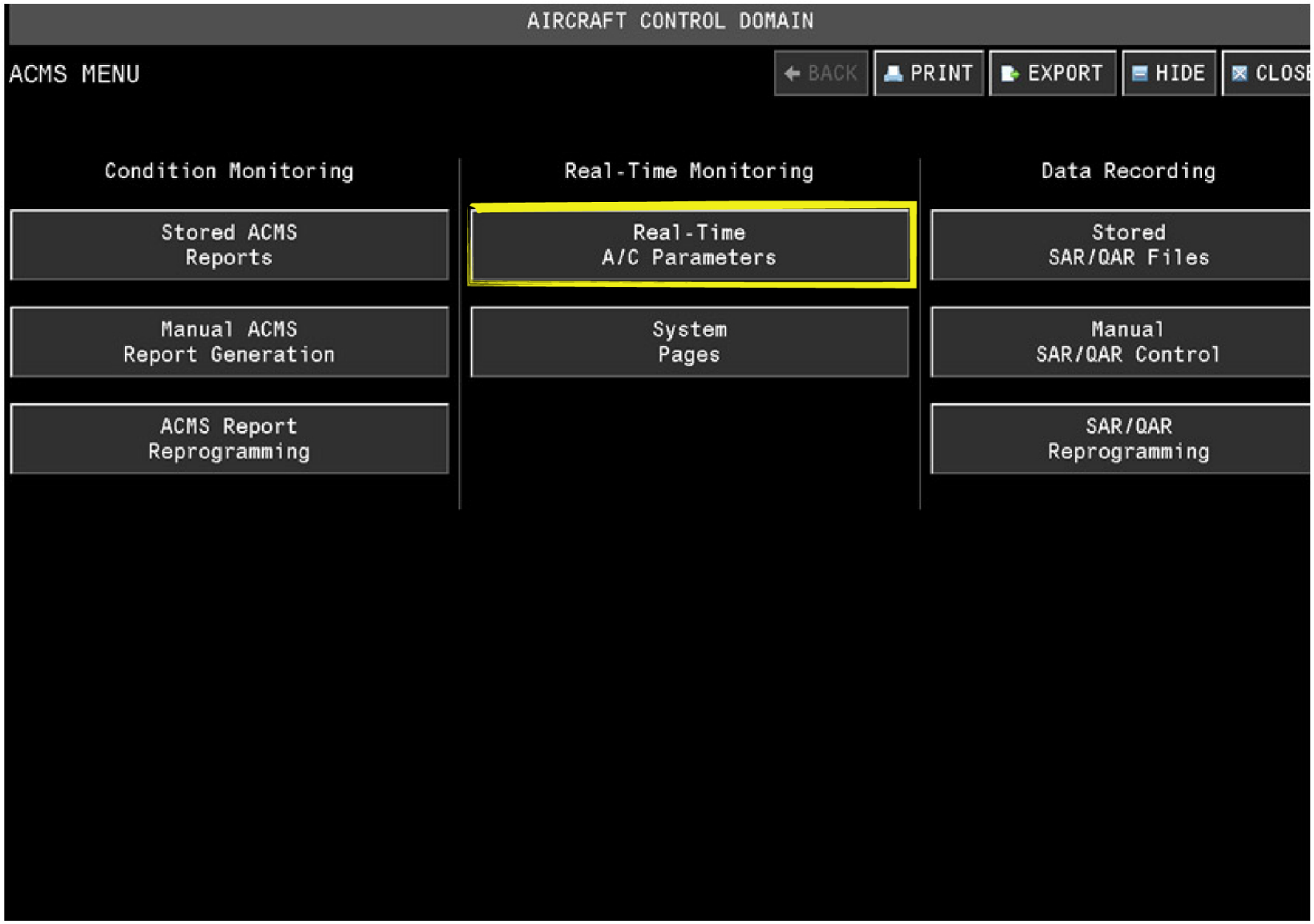

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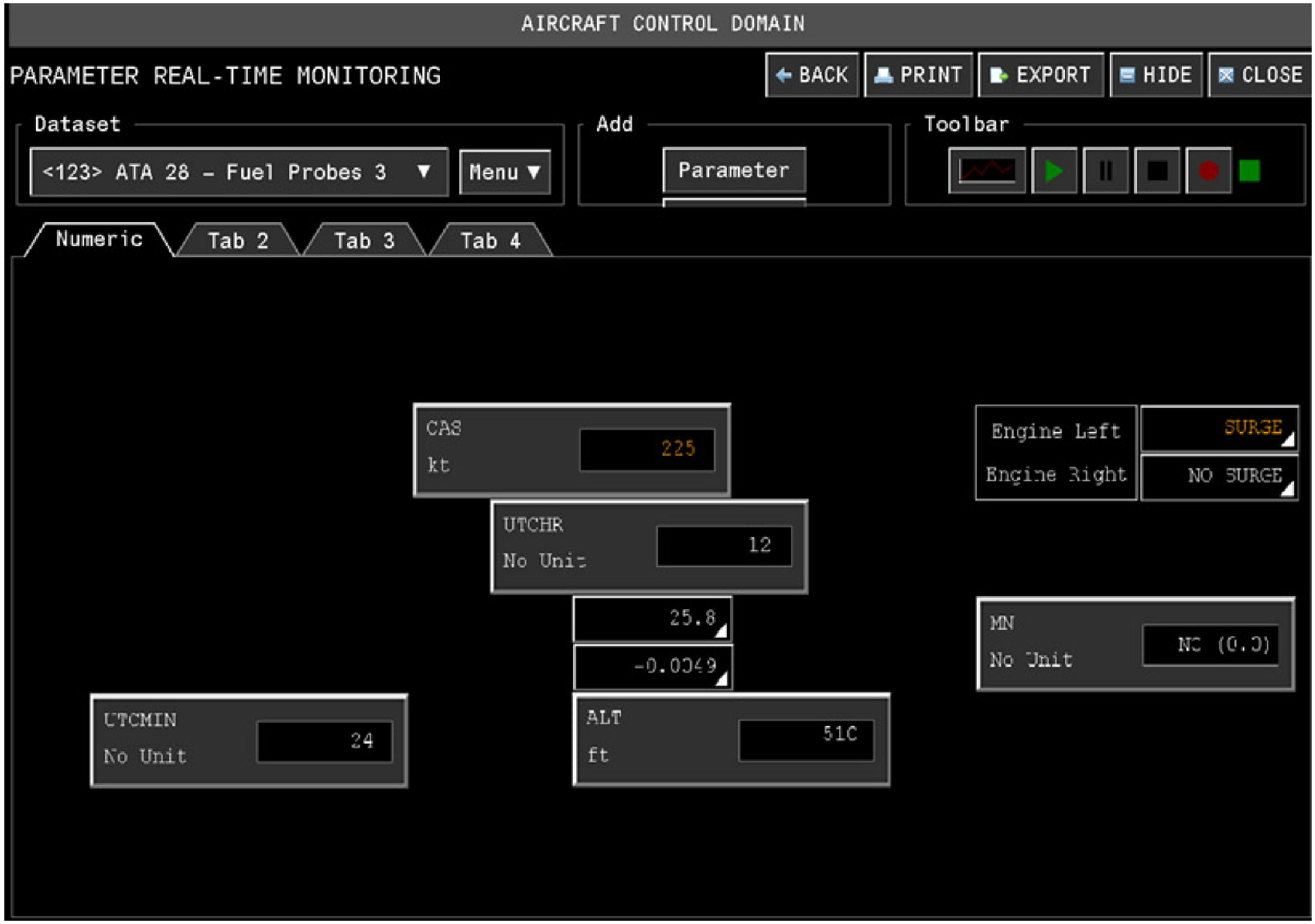

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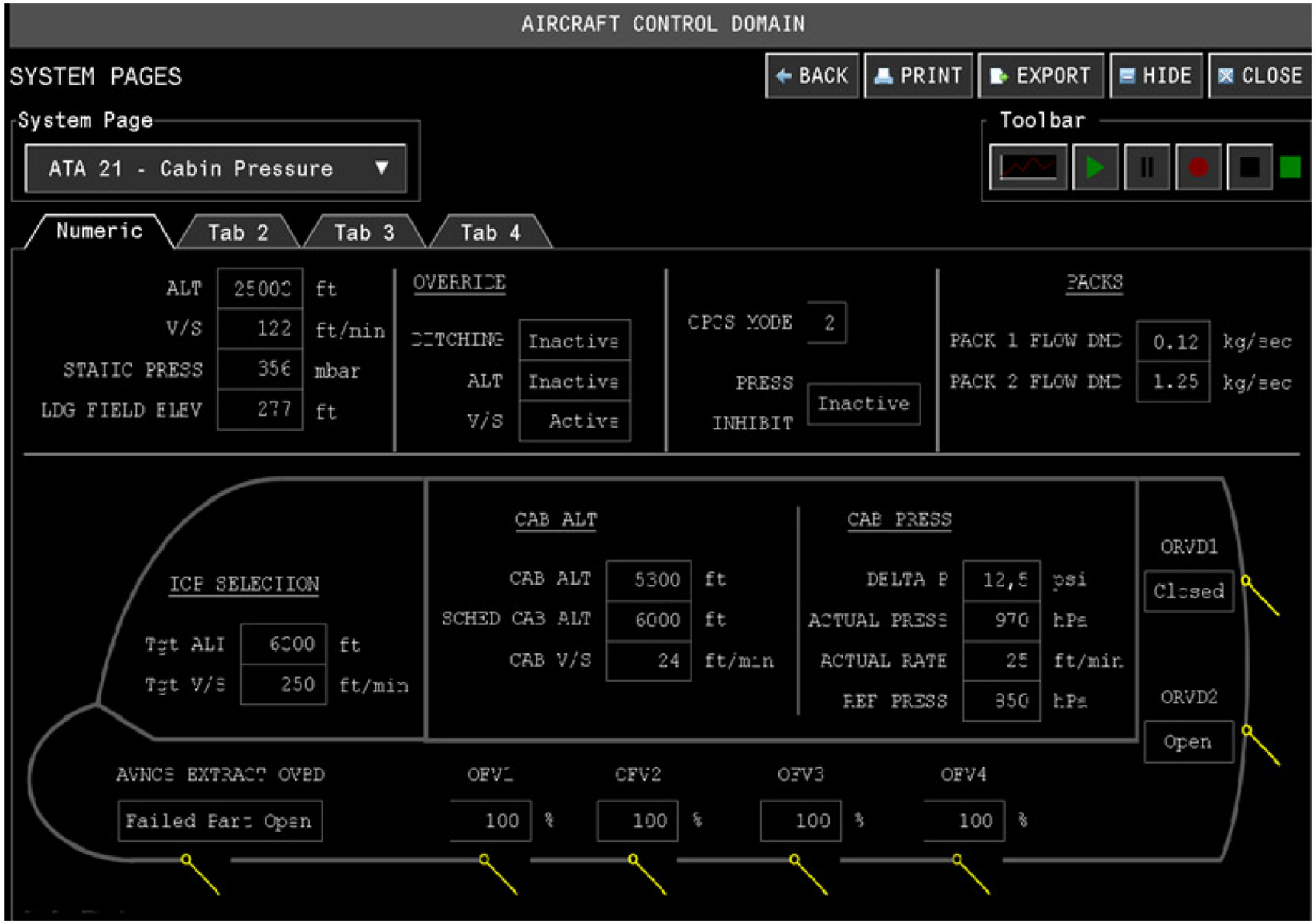

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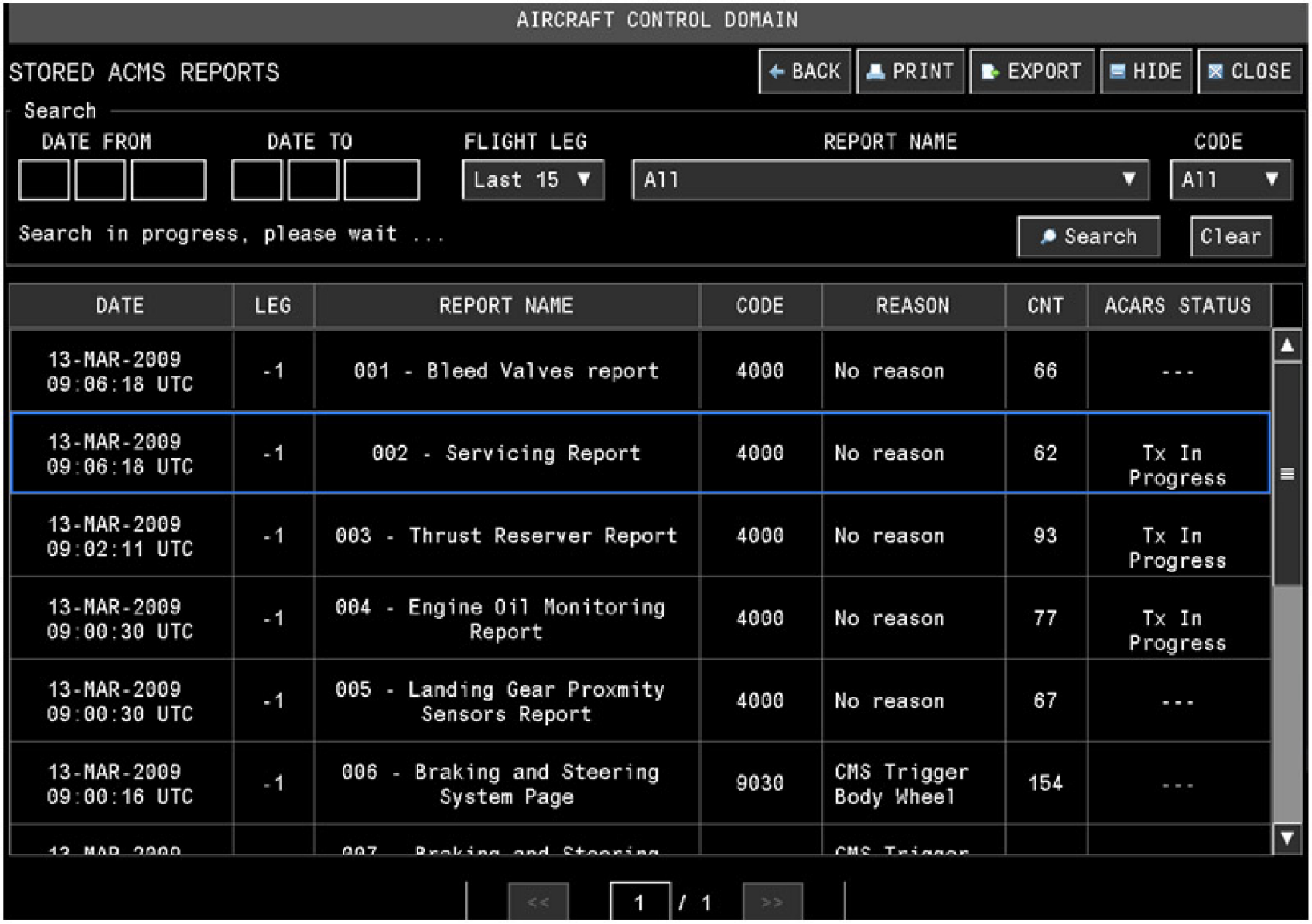

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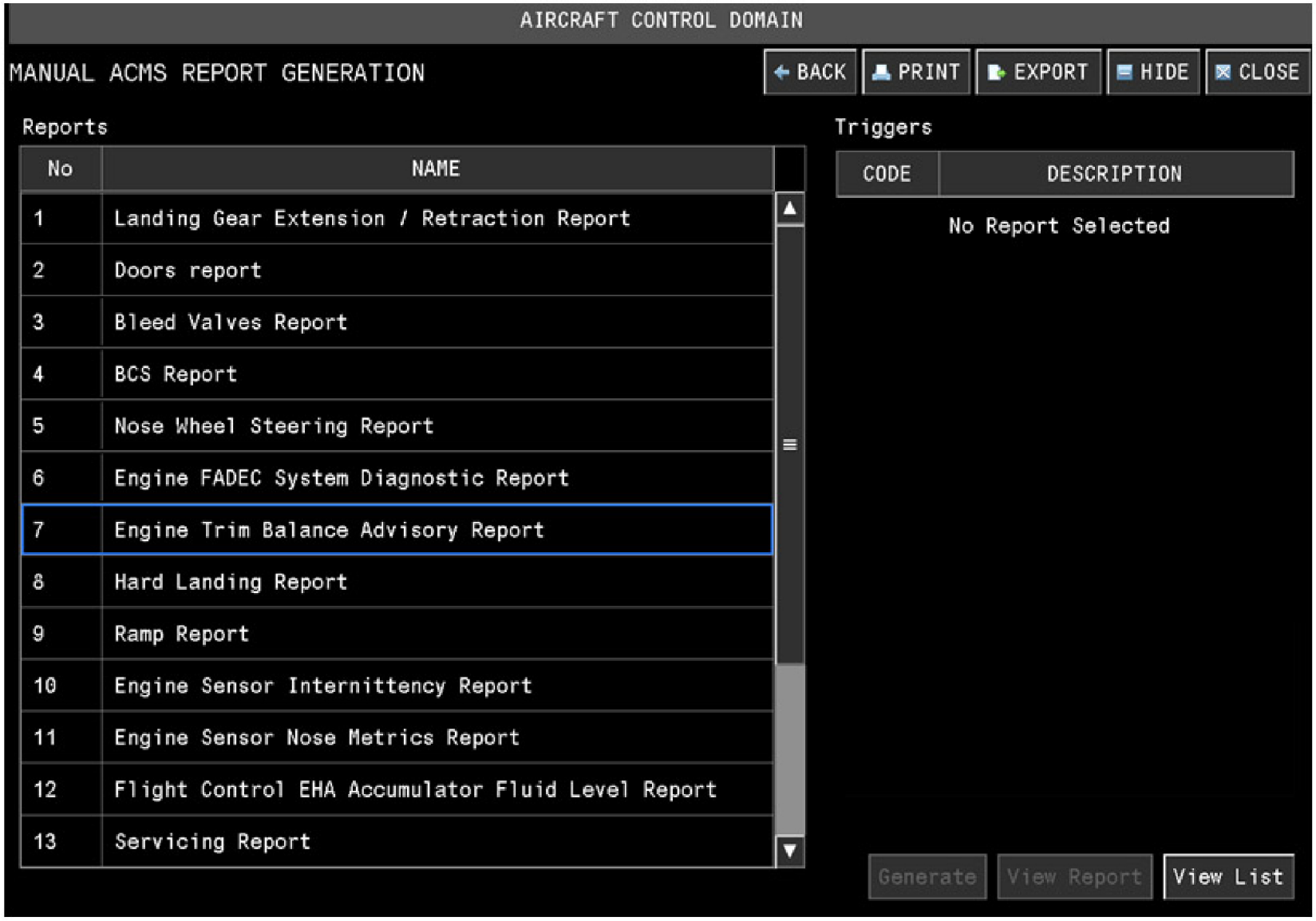

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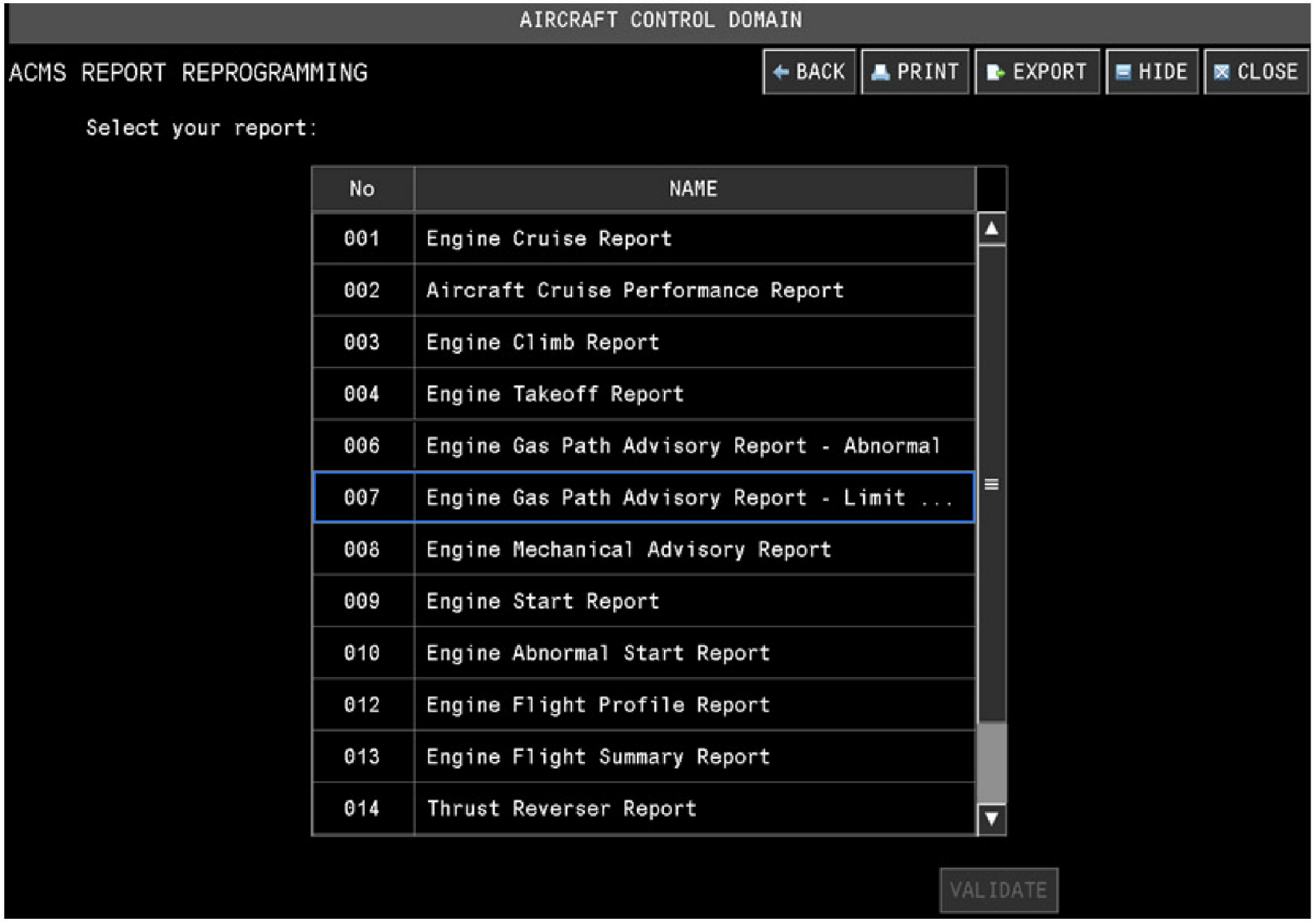

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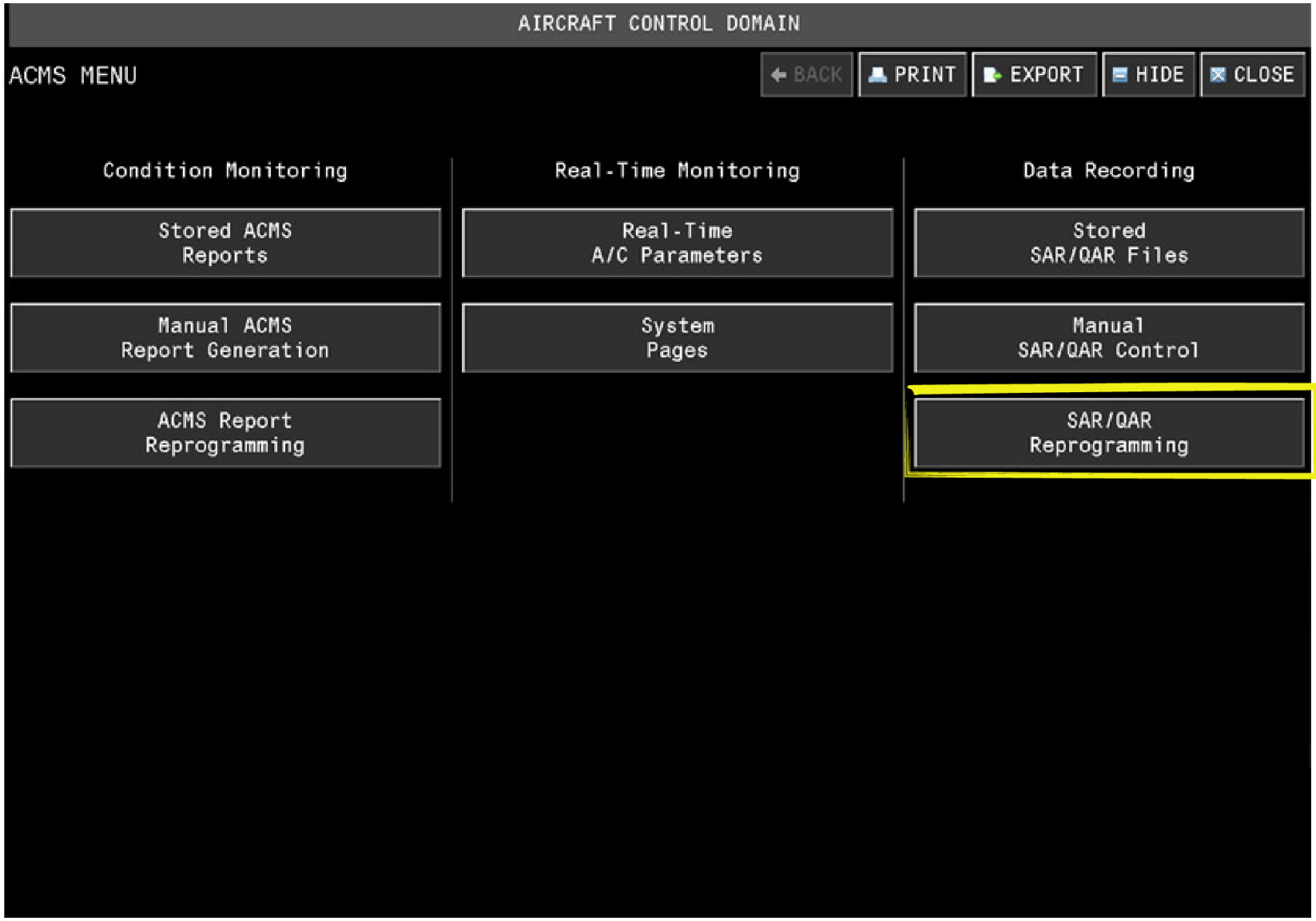

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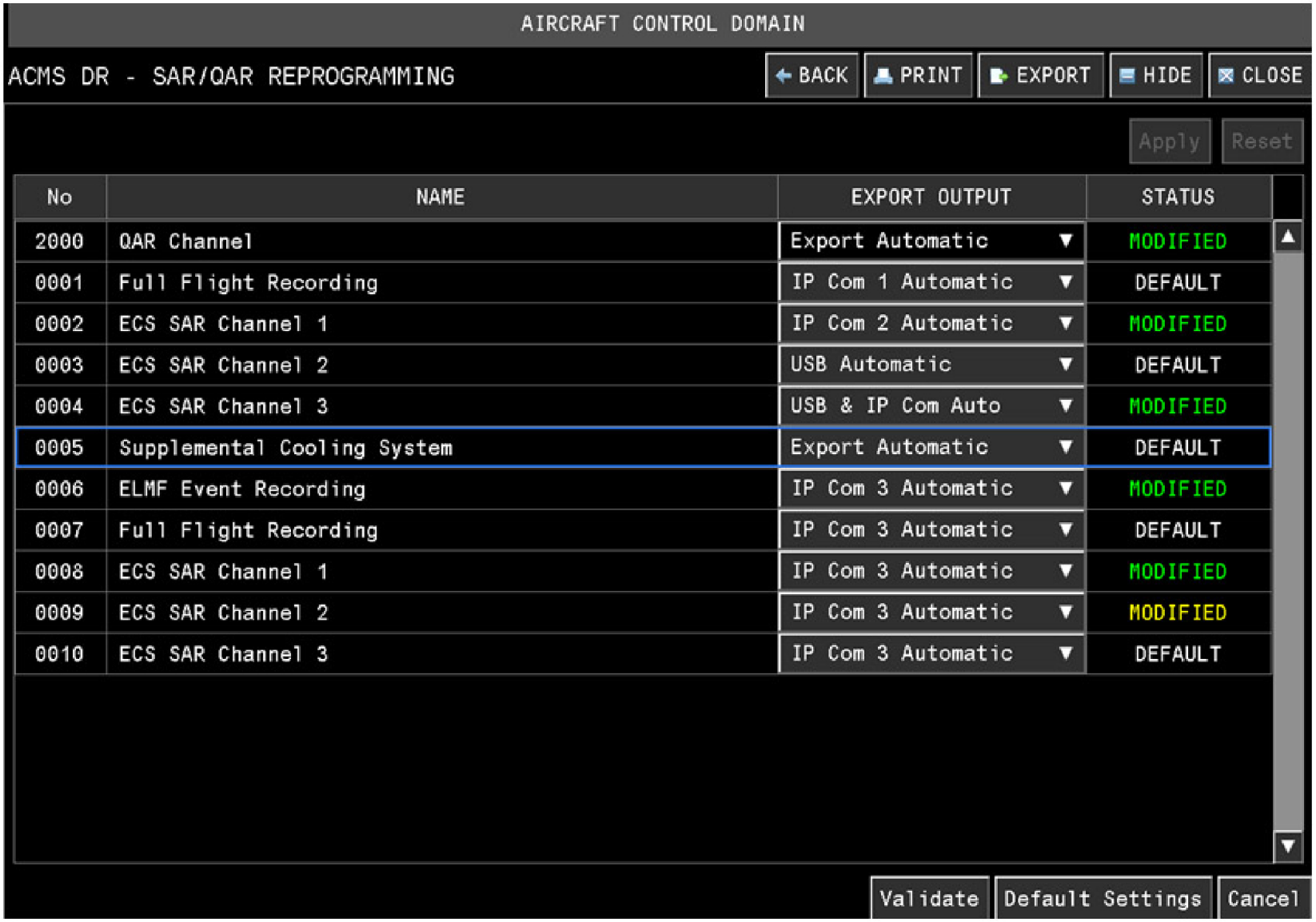

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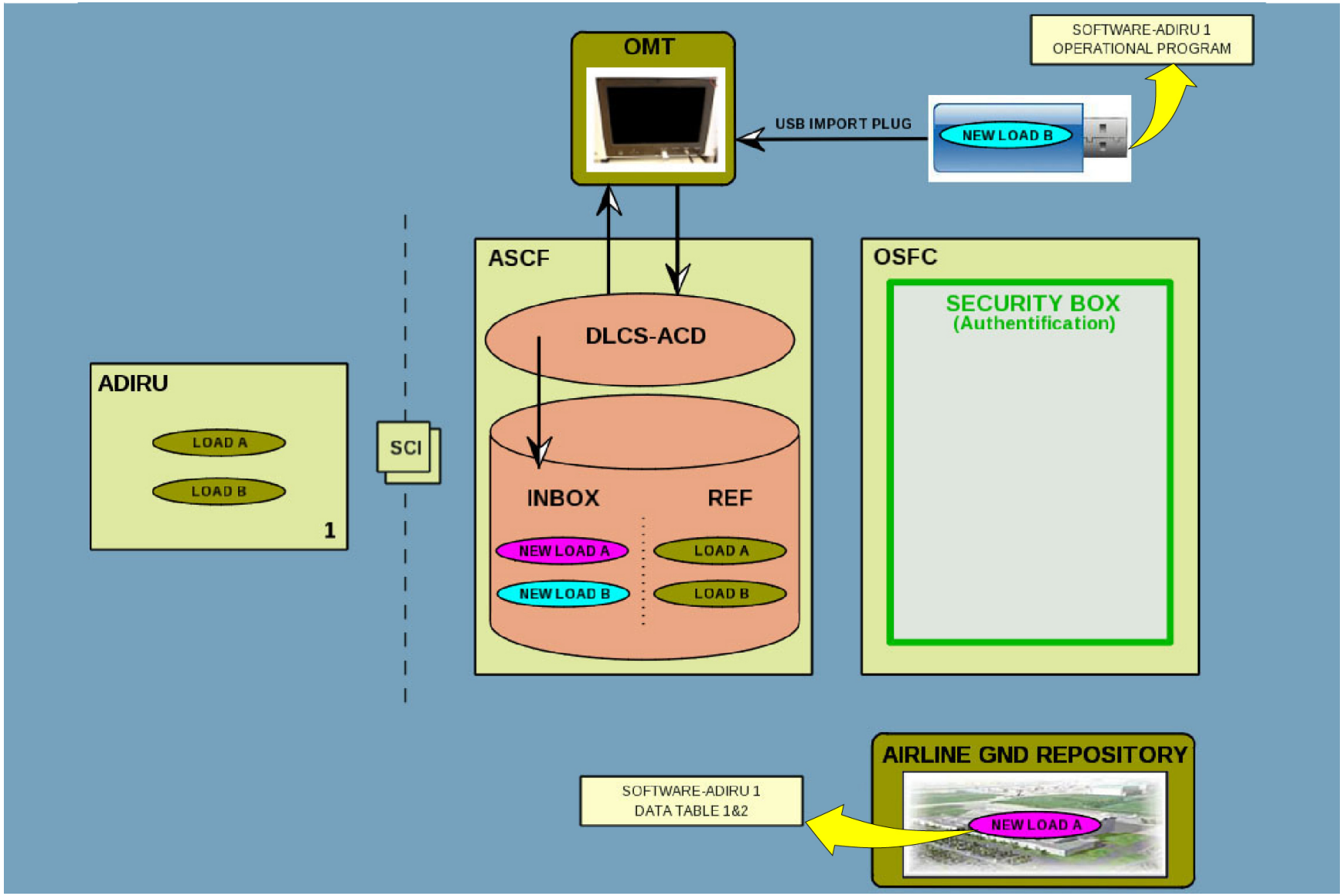

OMT (2) ... ACMS DATA RECORDING (3)

AIRCRAFT MAINTENANCE DISPATCH WORKFLOW DESCRIPTION (2/3)

Paper Logbook Configuration

After a flight, the mechanics must first do a check of the A/C logbook to see if there are entries that come from the flight crew.
The regulations impose that the mechanics must give an answer to each entry that the flight crew made to release the A/C.
On the A350, one logbook configuration can be operated:
- Standard paper logbook

PAPER LOGBOOK ONBOARD

--> USE OF PAPER LOGBOOK SCENARIO

PAPER LOGBOOK

START MAINTENANCE PHASE:

--> CONSULT LOGBOOK

PAPER LOGBOOK CONFIGURATION

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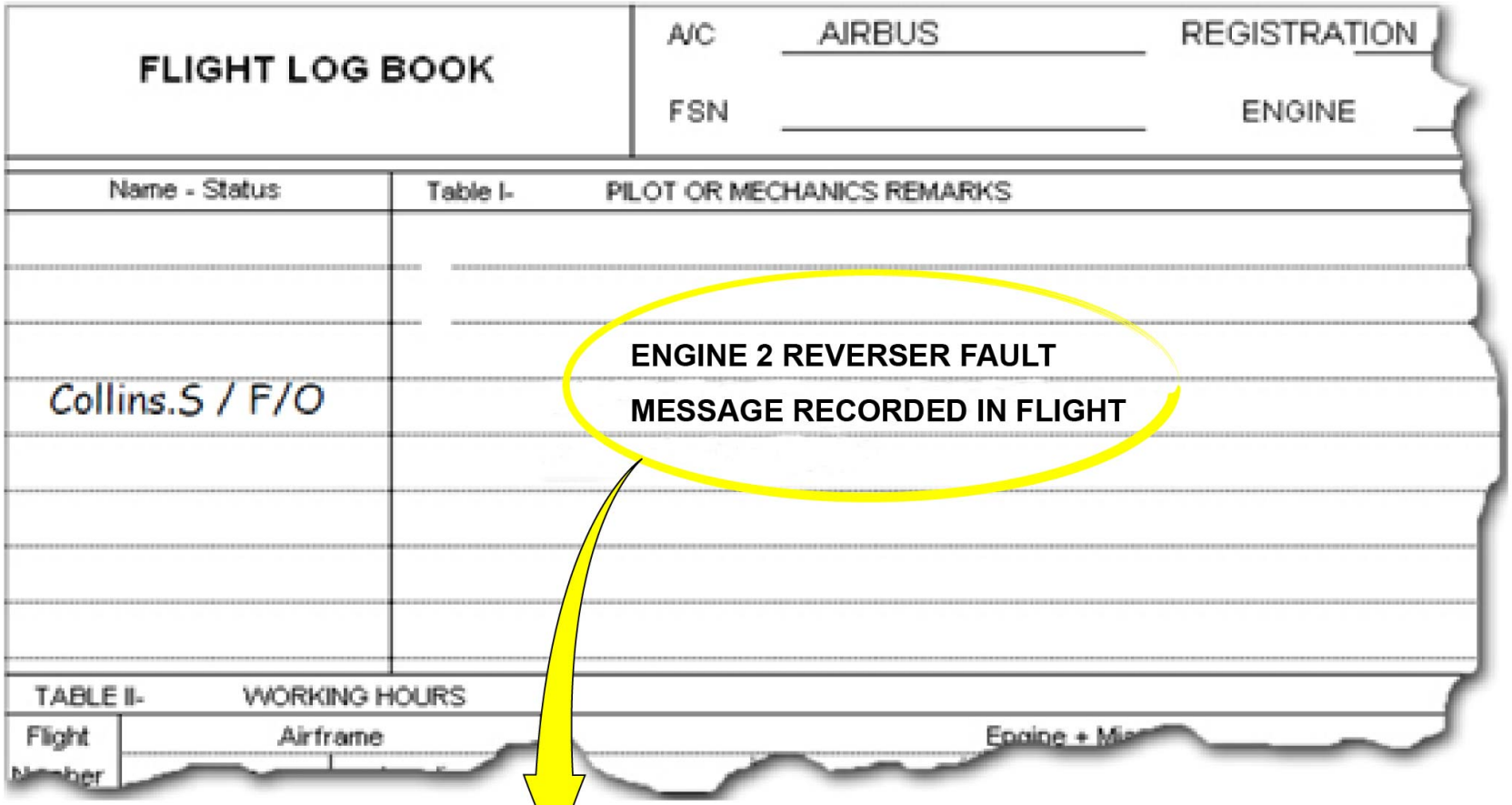
AIRCRAFT MAINTENANCE DISPATCH WORKFLOW DESCRIPTION (2/3)

Paper Logbook Configuration (continued)

Consult paper logbook

The mechanics can use the paper logbook to consult possible flight crew entries.
The technical logbook shows that there is one open entry ENG 2 REVERSER FAULT message recorded in-flight.
So, the mechanics must consult the MEL to do the A/C dispatch assessment.



GET ACCESS TO DISPATCH PAGE TO CHECK IF THERE IS A DISPATCH MESSAGE RELATED TO THE LOGBOOK ENTRY

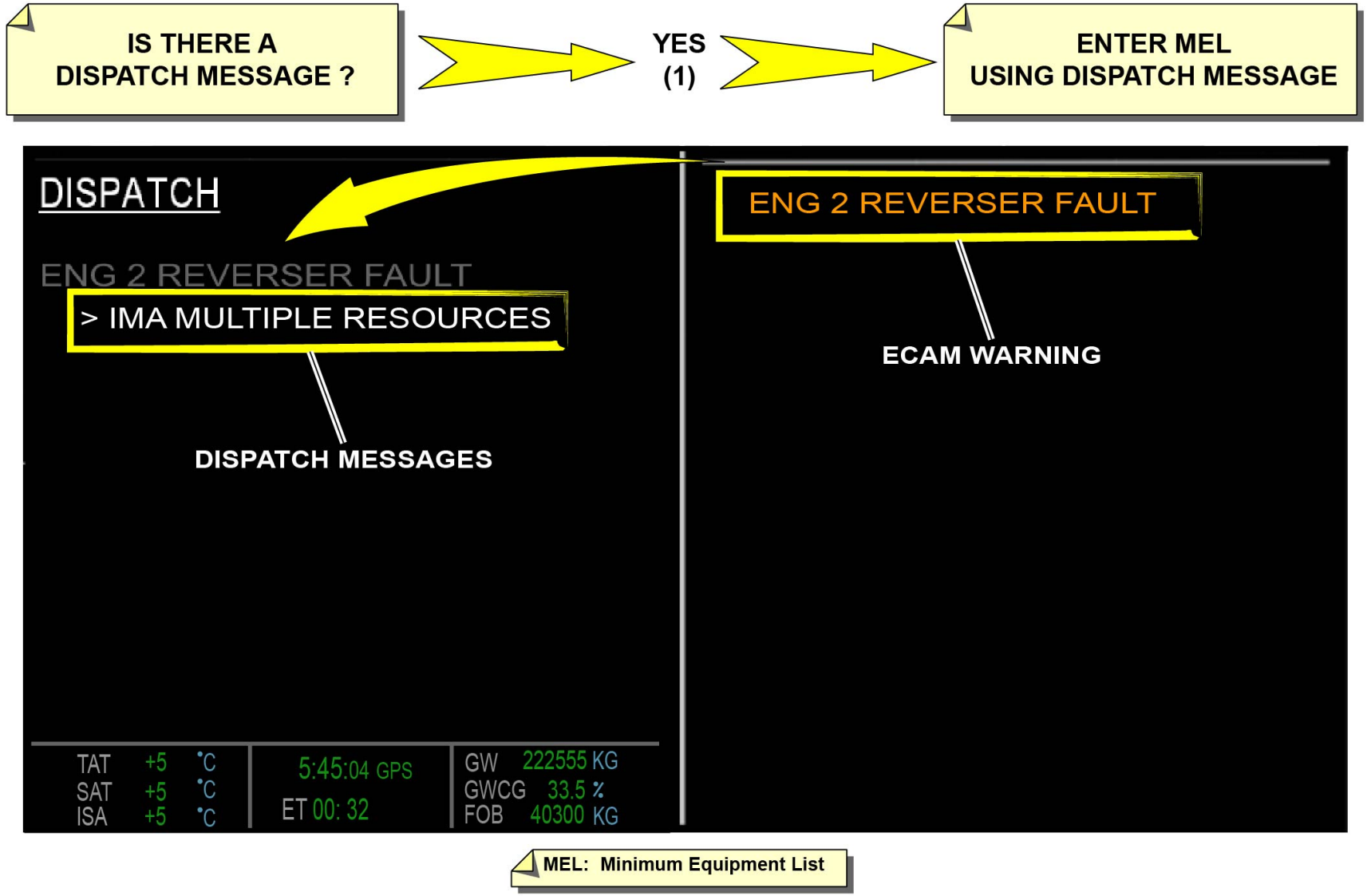
PAPER LOGBOOK CONFIGURATION - CONSULT PAPER LOGBOOK

AIRCRAFT MAINTENANCE DISPATCH WORKFLOW DESCRIPTION (2/3)

Paper Logbook Configuration (continued)

Consult dispatch page and warning display

On the A350, the dispatch messages are used as an entry point into the MEL.
The mechanics must consult the dispatch page on the ECAM system display to find the dispatch message related to the logbook entry.
A related warning message (if there is one) is shown on the ECAM warning display.
In this example, a dispatch message IMA MULTIPLE RESOURCES is shown on the dispatch page.
There is also a related warning message ENG 2 REVERSER FAULT.
So, the mechanics can get access to the MEL with this dispatch message.



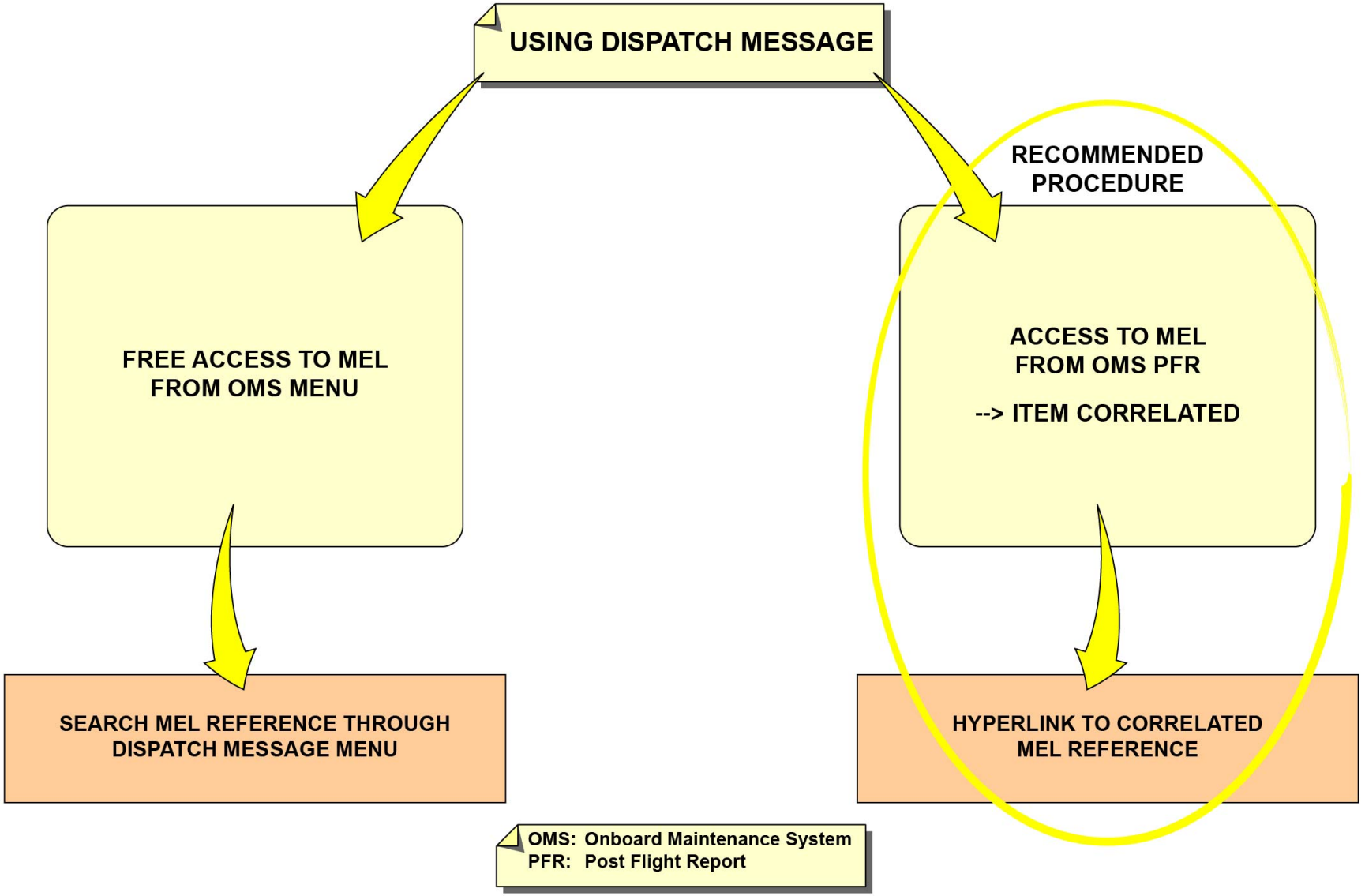
PAPER LOGBOOK CONFIGURATION - CONSULT DISPATCH PAGE AND WARNING DISPLAY

AIRCRAFT MAINTENANCE DISPATCH WORKFLOW DESCRIPTION (2/3)

Get Access to MEL from Dispatch Message

The mechanics must get access to the MEL to determine the dispatch condition status related to the flight crew entry.
There are two different ways to get access to the MEL:
- Free access from the OMS documentation menu
- Direct access to the MEL correlated entry from a dedicated hyperlink on the OMS Post Flight Report (PFR) page.

V2414251 - V00T0MM0 - VM45D5DISPH3001



GET ACCESS TO MEL FROM DISPATCH MESSAGE

V2414251 - V00T0MM0 - VM45D5DISPH3001

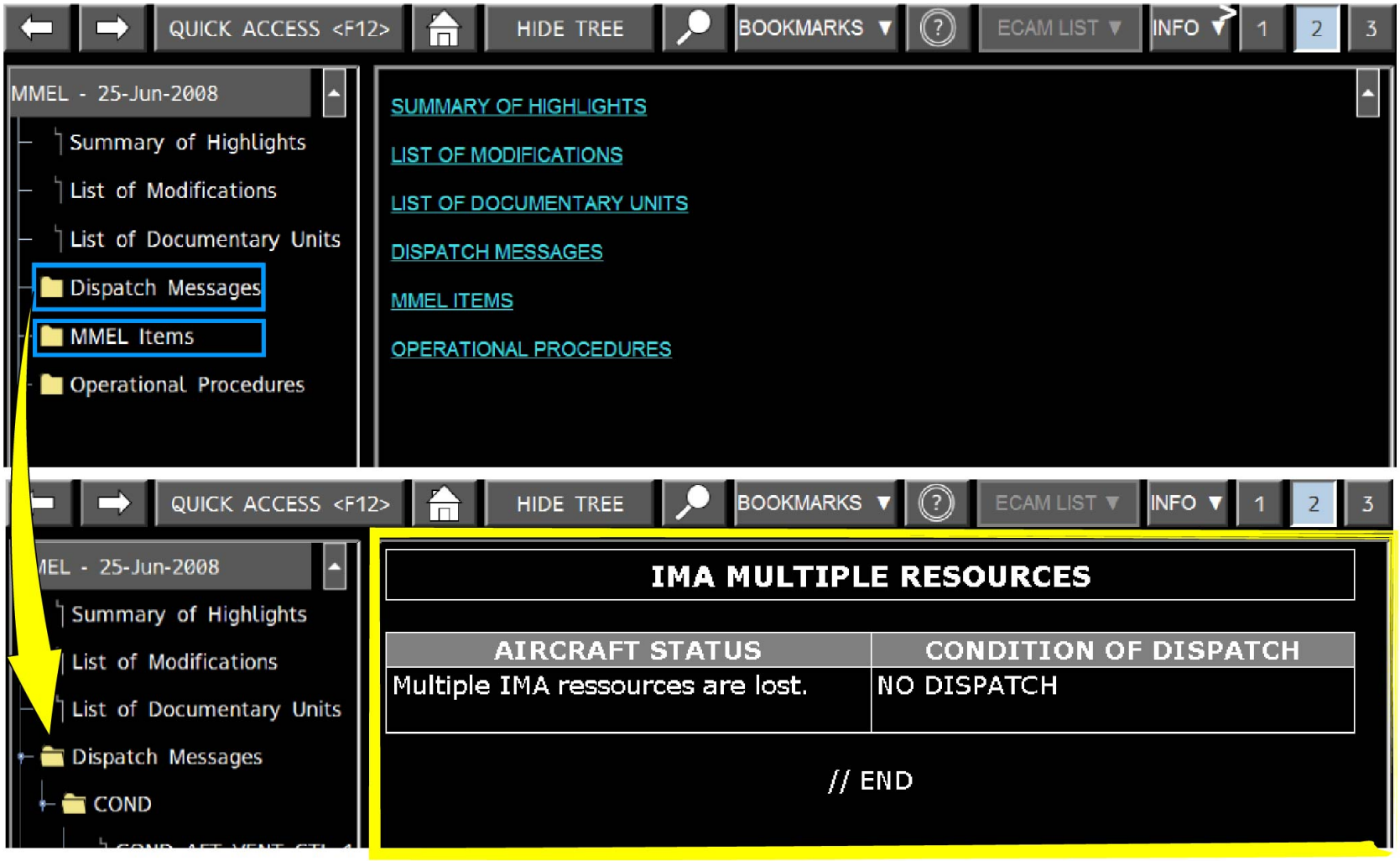
AIRCRAFT MAINTENANCE DISPATCH WORKFLOW DESCRIPTION (2/3)

Get Access to MEL from Dispatch Message (continued)

Free access to MEL

Free MEL access from the OMS documentation menu.
In this case, the mechanics must first select dispatch message topic on the MEL home page. Then, they must retrieve in the list the dispatch message shown on the ECAM. When the dispatch is found, the mechanics must select it for the display of its dispatch condition.
In this example, the dispatch condition is NO DISPATCH.

FREE ACCESS TO MEL FROM OMS MENU



GET ACCESS TO MEL FROM DISPATCH MESSAGE - FREE ACCESS TO MEL

AIRCRAFT MAINTENANCE DISPATCH WORKFLOW DESCRIPTION (2/3)

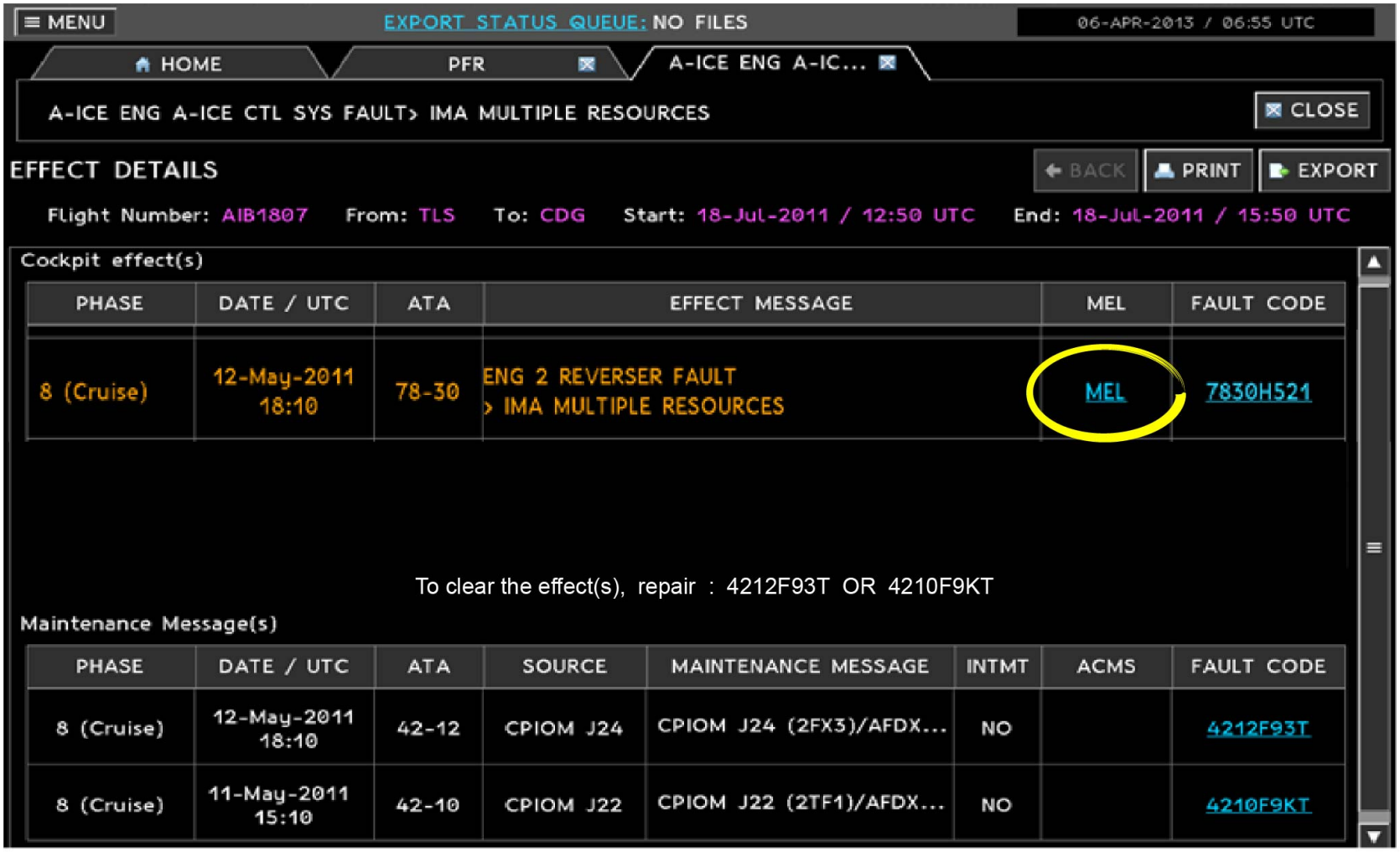
Get Access to MEL from Dispatch Message (continued)

Access MEL from PFR

A different way to get access to the MEL dispatch condition related to the logbook entry is to do it through the PFR.
The mechanics can select the PFR from the OMS home page. Then, they select the couple warning/dispatch message related to the logbook entry. The effect detail page comes into view. On this page, there is detailed information correlated with the fault case, especially the correlated MEL entry. Select the hyperlink to get access to the dispatch condition status.

V2414251 - V00T0MM0 - VM45D5DISPH3001

ACCESS TO MEL FROM OMS PFR CORRELATED HYPERLINK



GET ACCESS TO MEL FROM DISPATCH MESSAGE - ACCESS MEL FROM PFR

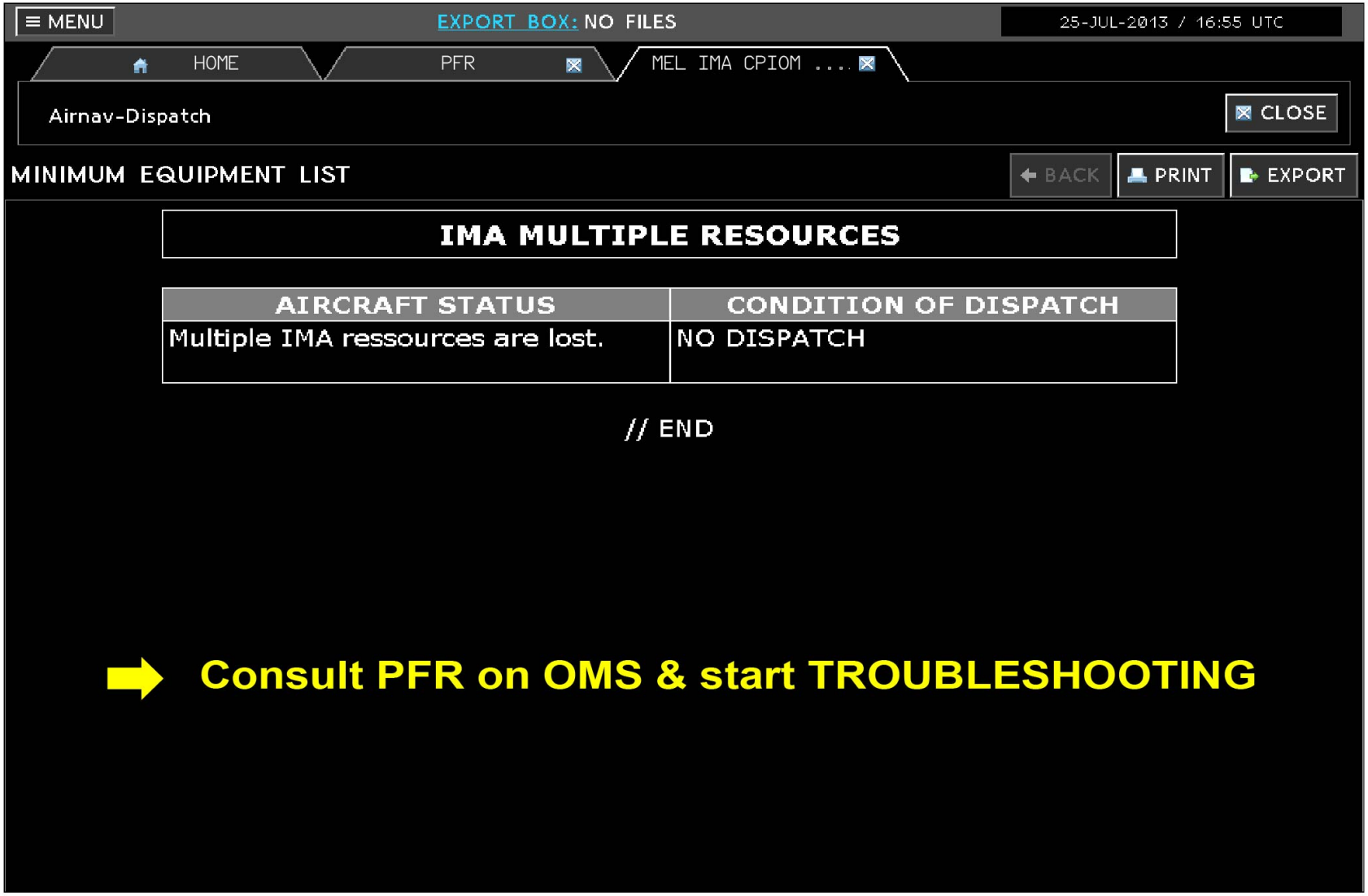
AIRCRAFT MAINTENANCE DISPATCH WORKFLOW DESCRIPTION (2/3)

Get Access to MEL from Dispatch Message (continued)

Dispatch assessment

From the MEL correlated page, the mechanics can do the dispatch assessment related to the selected open entry.
In this case, the related condition of dispatch is NO DISPATCH for the IMA MULTIPLE RESOURCES dispatch message.
So, the mechanics must repair the failure to make the maintenance release of the A/C possible.

V2414251 - V00T0MM0 - VM45D5DISPH3001



GET ACCESS TO MEL FROM DISPATCH MESSAGE - DISPATCH ASSESSMENT

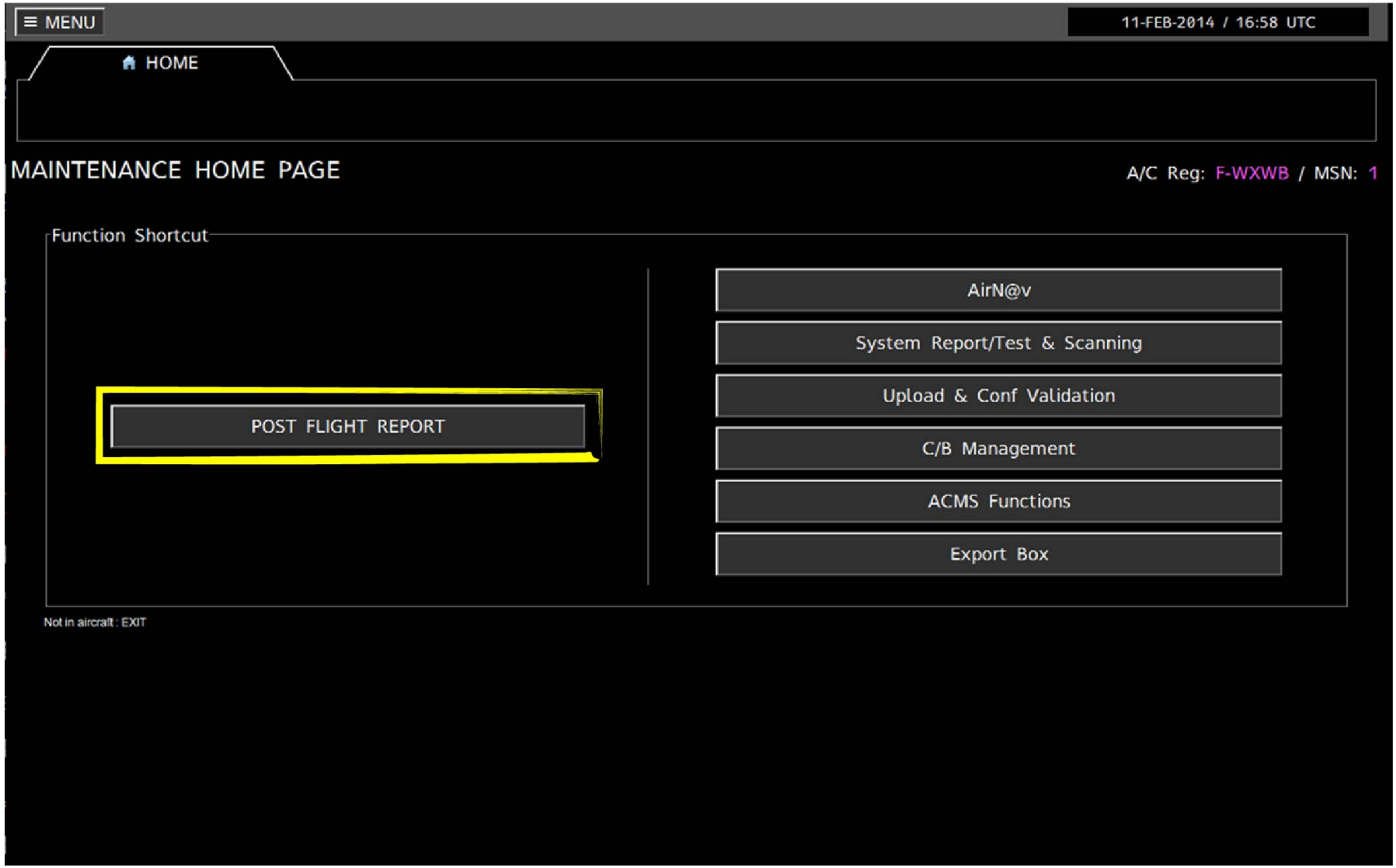
AIRCRAFT MAINTENANCE DISPATCH WORKFLOW DESCRIPTION (2/3)

Troubleshooting Workflow

OMS home page

The dispatch condition assessment is done, its status is NO DISPATCH.
In such a case, the only possibility to dispatch the A/C is to repair the fault.
To repair the fault, it is necessary to start the troubleshooting phase, to first isolate the fault and to identify the root cause.
First get access to the PFR function from the OMS, to benefit from the A350 technological improvements.

V2414251 - V00T0MM0 - VM45D5DISPH3001



TROUBLESHOOTING WORKFLOW - OMS HOME PAGE

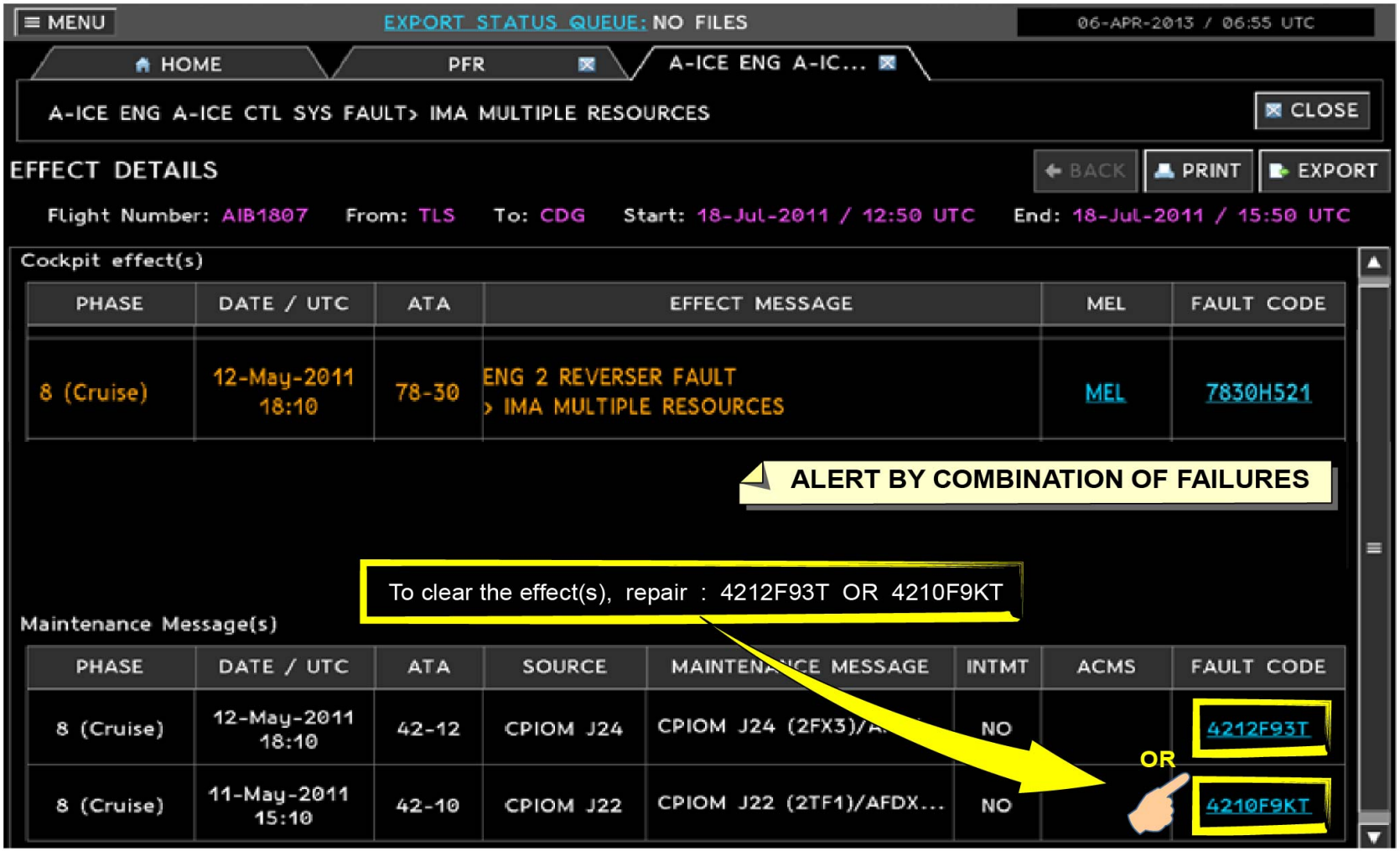
AIRCRAFT MAINTENANCE DISPATCH WORKFLOW DESCRIPTION (2/3)

Troubleshooting Workflow (continued)

Get access to the PFR

Then, select the relevant warning/dispatch message couple in the PFR, to get access to the related effect detail.
On the effect detail page, select the fault code related to the fault root cause. This is a hyperlink to the correlated Aircraft Fault Isolation (AFI) procedure.

ACCESS TO MEL FROM OMS PFR CORRELATED HYPERLINK



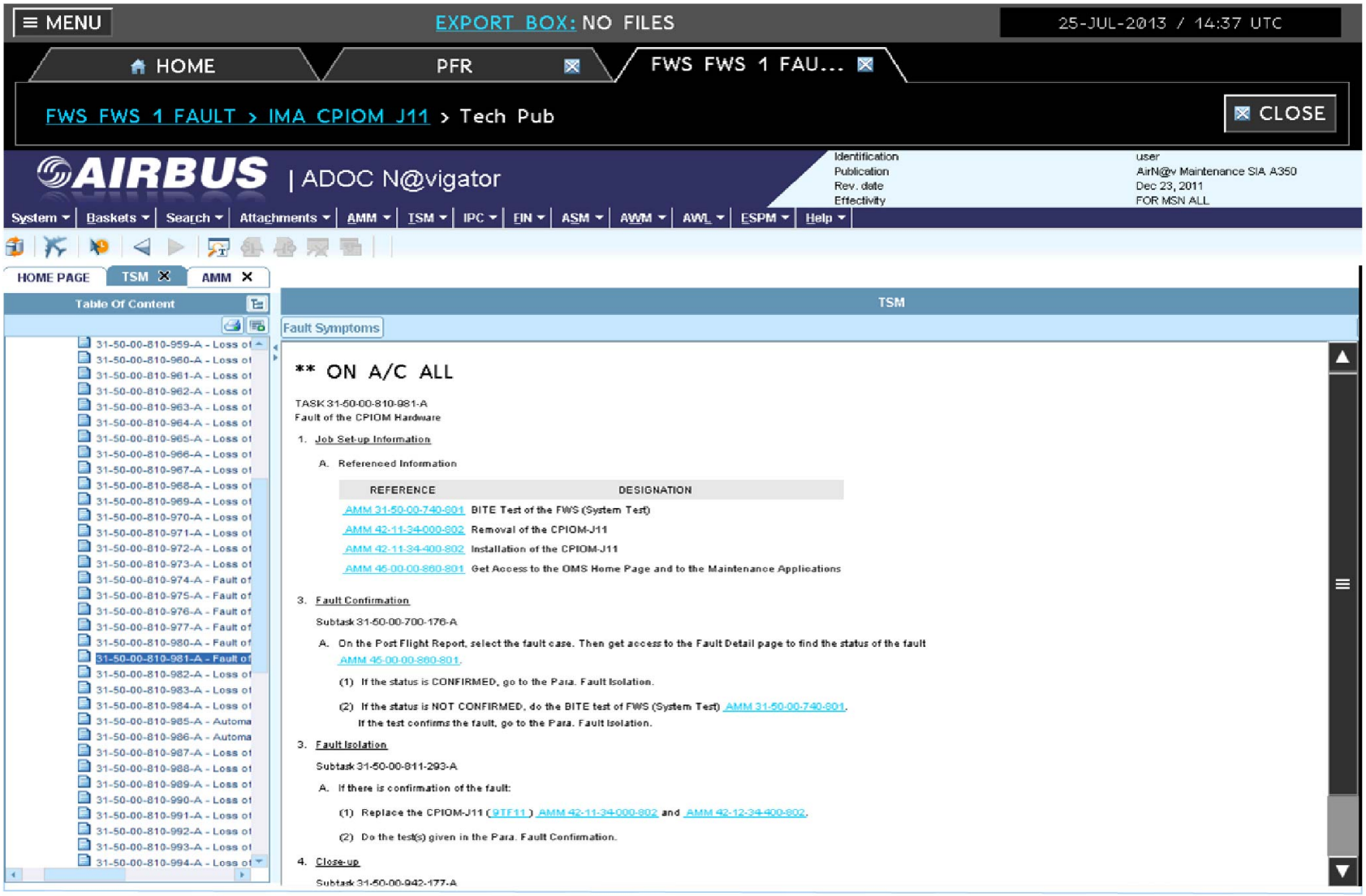
TROUBLESHOOTING WORKFLOW - GET ACCESS TO THE PFR

AIRCRAFT MAINTENANCE DISPATCH WORKFLOW DESCRIPTION (2/3)

Troubleshooting Workflow (continued)

Get access to AFI procedure and repair failure

In the AFI correlated procedure, all information necessary for the failure isolation and the root cause repair is shown, with hyperlinks to the related maintenance procedures. You can manage the repair phase from this point if there is a good use of the A/C documentation.



TROUBLESHOOTING WORKFLOW - GET ACCESS TO AFI PROCEDURE AND REPAIR FAILURE

AIRCRAFT MAINTENANCE DISPATCH WORKFLOW DESCRIPTION (2/3)

Troubleshooting Workflow (continued)

Release the aircraft

The A/C documentation lets manage the repair of the failure.
To assume that the fault is really repaired, get access to the ECAM pages and make sure that the warning/dispatch messages have disappeared.
When the repair and clean configuration is validated, fill in the paper logbook to answer to the flight crew entry.
At this step, the maintenance release for the dispatch can be done if there are no other faults, also faults that came into view during the maintenance phase.

- REPAIR THE FAULT AS PER AFI
- CONFIRM WARNINGS/CAUTIONS/LOCAL DISPATCH MESSAGES DISAPPEARED ON ECAM
- FILL IN THE LOGBOOK --> ACTION REPORTING
- RELEASE THE AIRCRAFT FOR DISPATCH

AFI: Aircraft Fault Isolation

TROUBLESHOOTING WORKFLOW - RELEASE THE AIRCRAFT

AIRBUS S.A.S.
31707 BLAGNAC cedex, FRANCE
STM
REFERENCE V2414251
JUNE 2014
PRINTED IN FRANCE

AN EADS COMPANY