

Software Accomplishment Summary (SAS) for Data Link Communication Application (DLCA-6500)

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1 Scope

1.1 Purpose

The purpose of this document is to fulfill the requirements for Section 11.20, Software Accomplishment Summary of DO-178B [56] based on the guidance from FAA Advisory Circular (AC) 20-115D [70]. In addition to DO-178B [56], the guidance contained in FAA Order 8110.49A [60] was applied to this project. In accordance with the RTCA/DO-178B guidelines, this document contains the following information:

- System Overview,
- Software Overview,
- Certification Considerations,
- Software Characteristics,
- Software Life Cycle,
- Software Life Cycle Data,
- Additional Considerations,
- Software Identification,
- Software Change History,
- Software Status and a
- Compliance Statement.

1.2 Applicability

This document is the Software Accomplishment Summary (SAS) for the Data Link Communications Application (DLCA-6500), RCPN 810-0315-510. The DLCA-6500 software is part of the Pro Line Fusion™ Integrated Modular Avionics (IMA) system. The DLCA-6500 was developed and verified in accordance with the objectives specified in the DO-178B [56] Software Lifecycle Data for Level C software.

The baseline for the DLCA-6500, RCPN 810-0315-510 is the DLCA-6500, RCPN 810-0315-300. The associated Software Accomplishment Summary was RCPN 945-0519-300.

The baseline software was updated to include Route clearance message formatting, logon status page re-design, Tabbed base menu for EDS, Provider abort related issue fixes for VCI and additional Bug fixes described in Section 11. For more details of the changes, see Section 11 Change History.

1.3 Project Overview

Deviation from the PSAC: This section was not part of the PSAC [51].

The DLCA-6500 provides the Link 2000+ implementation of Aeronautical Telecommunication Network (ATN) applications and FANS 1/A+ applications. These applications define the Data Link methods and messages that are exchanged between the aircraft and the ground services in support of Air Traffic Services (ATS) and Air Traffic Control (ATC).

The FANS-1/A+ applications are defined by RTCA DO-258 Rev A [57], which is the interoperability requirement standard that uses ARINC 622 [61] data communications.

The Link-2000 ATN applications are defined by RTCA DO-280B/EUROCAE ED-110B [63], and ICAO 9705[65] plus the PDRs as defined by EUROCONTROL-SPEC-0116[62].

A portion of the ATN CPDLC and FANS 1/A+ functionality provides the opportunity to harmonize the related functionality. The DLCA-6500, and the associated subsystems, provides a harmonized interface to both applications. The DLCA-6500 supports seamless transfer between ATN and FANS, vice versa per RTCA DO-305A [68].

The baseline software (RCPN 810-0315-300) was updated to include Route clearance message formatting, logon status page re-design, Tabbed base menu for EDS, Provider abort related issue fixes for VCI and additional Bug fixes described in Section 11. For more details of the changes, see Section 11 Change History.

The DLCA-6500 itself is not a TSO function, nor is it part of another functional TSO. The DLCA-6500 is certified as part of Parts Manufacturer Approval for the target aircraft.

2 References

The documents listed in this section are referenced in one or more places throughout this document. This section provides the precise title, publisher, control numbers (if any), and date of publication (if necessary for control) of each referenced document.

All referenced documentation shall be revision mentioned in the Software Configuration Index [54], unless otherwise specified. For XXX or XX of RCPN of referenced documents, Refer to Software Configuration Index [54].

2.1 Rockwell Collins Internal Documents

2.1.1 Policies and Procedures

- [1] Commercial Systems Software Quality Engineering Plan, RCPN 945-2477-(XXX)
- [2] Software Configuration Management Plan, RCPN 832-2963-(XXX)

2.1.2 Project-Specific Documents

- [3] Integrated Modular Avionics (IMA) Footprint Process Document, RCPN 964-4841-(XXX)
- [4] CCM-5110 IMA Footprint Analysis, RCPN 945-1834-(XXX)
- [5] Application Footprint Document for the Data Link Communication Application (DLCA-6500) System, RCPN 945-8964-(XXX)
- [6] GUI Conventions Description (GCD) for the ProLine Fusion Product Line Integrated Avionics System, RCPN 964-5034-(XXX)
- [7] Software Development Plan (SDP) for the Commercial Systems (CS) Data Link Projects, RCPN 829-6997-(XXX)
- [8] Coding Standards for C++ Language, RCPN 832-0536-(XXX)
- [9] Data Link Products Peer Review Checklists, RCPN 963-9782-(XXX)
- [10] Peer Review Method Using PREP for the Commercial Systems Data Link Organization, RCPN 945-9104-(XXX)
- [11] High Level Software Requirements Specification (SRS) for the Pro Line Fusion DLCA-6500 Data Link Communications Application, RCPN 945-9216-(XXX)
- [12] Software Requirements Specification (SRS) for the Data Link Communications Application (DLCA) Future Air Navigation System (FANS-1/A), RCPN 945-0516-(XXX)
- [13] Software Requirement Specification (SRS) for Common System Services Data Link Communications Application (DLCA), RCPN 945-0592-(XXX)
- [14] Software Requirements Specification (SRS) for Aeronautical Telecommunication Network Context Management (CM) And Controller Pilot Data Link Communications (CPDLC), RCPN 945-0591-(XXX)
- [15] Software Requirement Specification (SRS) for DLCA-6500 Human Machine Interface (HMI), RCPN 945-0517-(XXX)
- [16] Input/Output Common Format (IOCF) Interface Definition Document for Datalink Communications, RCPN 945-1474-(XXX)
- [17] Software Design Document (SDD) for the Data Link Communications Application (DLCA-6500) Data Link Software Component Design, RCPN 945-7650-(XXX)
- [18] Computer Program Configuration Item for the Data Link Communications Application (DLCA-6500) with A661 for Human Machine Interface (HMI) RCPN 096-6363-(XXX)

- [19] Computer Program Configuration Item (CPCI) for the Data Link Communications Application (DLCA-6500) Core Software Library, RCPN 096-2550-(XXX)
- [20] Computer Program Configuration (CPCI) for the Data Link Communications Application (DLCA-6500) Message Library, RCPN 096-6864-(XXX)
- [21] Computer Program Configuration Item for the XML I/O Configuration, RCPN 096-5697-(XXX)
- [22] Computer Program Configuration Item for the Data Link Communication Application (DLCA-6500) XML Default ATN Addresses, RCPN 096-5698-(XXX)
- [23] Computer Program Configuration Item for the Data Link Communication Application (DLCA-6500) Support Files, RCPN 096-9885-(XXX)
- [24] Computer Program Configuration Item for the Data Link Communication Application (DLCA-6500) A661 Definition Files, RCPN 096-9377-(XXX)
- [25] Computer Program Configuration Item (CPCI) for the Data Link Communication Application (DLCA-6500) XML General Configuration File, RCPN 096-9861-(XXX)
- [26] Computer Program Configuration Item (CPCI) for the Data Link Communication Application (DLCA-6500) Electronic Nameplate, RCPN 096-2552-(XXX)
- [27] Computer Program Configuration Item (CPCI) for the Data Link Communications Application (DLCA-6500) VAPS (Virtual Application Protocol Software) Model, RCPN 096-9378-(XXX)
- [28] Software Verification Procedures and Results (SVPR) for the Data Link Communication Application, RCPN 945-0520-(XXX)
- [29] Computer Program Configuration Item (CPCI) for the Data Link Communication Application (DLCA-6500) Software Verification Procedures and Results (SVPR), RCPN 096-2551-(XXX)
- [30] Software Deliverable for the Data Link Communications Application Message Library, RCPN 072-0951-(XXX)
- [31] Software Deliverable for the Data Link Communications Application, RCPN 811-5733-(XXX)
- [32] Top Level Drawing for the Data Link Communications Application, DLCA-6500, RCPN 810-0315-(XXX)
- [33] CoRE Platform Software Accomplishment Summary, RCPN 815-0524-(XXX)
- [34] Software Accomplishment Summary (SAS) for the Protocol Manager Application (PMA-6000), RCPN 963-6390-(XXX)
- [35] LynxOS-178 (RSC) Version 2.2.2 Software Accomplishment Summary, RCPN AAN-1161-02-XX
- [36] Persistent Storage Design Description, RCPN 815-0020-(XXX)
- [37] CoRE Common Input Output – CIO- SW Design Description, RCPN 815-0119-(XXX)
- [38] Software Verification User's Guide for the Data Link Communications Application (DLCA) ARINC 661 Projects, RCPN 945-9320-(XXX)
- [39] Test Cases for VISTA MC Qualification, RCPN 946-0E30-(XXX)
- [40] Computer Program Configuration Item (CPCI) for the Data Link Communications Application (DLCA-6500) VectorCAST/C++, RCPN 096-9844-(XXX)
- [41] Computer Program Configuration Item (CPCI) for the Data Link Communication Application (DLCA-6500) Message Library Tester 096-9882-(XXX)
- [42] Software Accomplishment Summary for the Reliable User Datagram Protocol (RUDP) Libraries, RCPN 946-0MH2-(XXX)
- [43] Reliable User Datagram Protocol – RUDP Communication Library Design Description, RCPN 815-0686-(XXX)

- [44] Reliable User Datagram Protocol – RUDP Connection Library Design Description, RCPN 815-0712-(XXX)
- [45] Health Monitor SW Design Description, RCPN 815-0594-(XXX)
- [46] Software Accomplishment Summary (SAS) for the AFDX-ASL, RCPN 815-9675-(XXX)
- [47] Software Design Description (SDD) for PMA-6000, RCPN 815-9996-(XXX)
- [48] AFDX Local Area Network – LAN – Design, RCPN 815-0533-(XXX)
- [49] ARINC 661 Application Programming Interface (API) Software Design Document, RCPN 964-2609-(XXX)
- [50] Software Accomplishment Summary (SAS) for the Fusion ARINC 661 Application Programming Interface (A661 API), RCPN 964-9718-(XXX)
- [51] Plan for Software Aspects of Certification (PSAC) for the Data Link Communications Application DLCA-6500, RCPN 945-4430-(XXX)
- [52] System Safety Assessment (SSA) for the CSeries Avionics Communication, Navigation, and Surveillance (CNS) System Document No: TR2014-XX
- [53] Computer Program Configuration Item for the Archive of DOORS Project for DLCA-6500, RCPN 096-2548-(XXX)
- [54] Software Configuration Index (SCI) for the Data Link Communications Application (DLCA-6500), RCPN 946-1T23-510 Rev –
- [55] Future Air Navigation System (FANS)/Aeronautical Telecommunications Network (ATN) Controller Pilot Data Link Communications (CPDLC) Compliance Matrix, RCPN 946-0C00-(XXX)

2.2 External Documents

2.2.1 General Certification Documents

- [56] Software Considerations in Airborne Systems and Equipment Certification, RTCA/DO-178B, December 1992.
- [57] RTCA DO-258A Interoperability Requirements for ATS Applications Using ARINC 622 Data Communications (FANS 1/A Interop Standard), April 7, 2005
- [58] RTCA DO-306 Safety and Performance Standard for Air Traffic Data Link Services in Oceanic and Remote Airspace (Oceanic SPR Standard), October 11, 2007
- [59] RTCA DO-306 Change 1 Safety and Performance Standard for Air Traffic Data Link Services in Oceanic and Remote Airspace (Oceanic SPR Standard), March 17, 2011
- [60] FAA Order 8110.49A Software Approval Guidelines, March 29, 2018
- [61] ARINC 622-4 ATS Data Link Applications Over ACARS Air-Ground Network, Oct 12, 2001
- [62] EUROCONTROL SPECIFICATION on Data Link Services, EUROCONTROL SPECIFICATION, EUROCONTROL-SPEC-0116 Edition 2.1, January 28, 2009
- [63] INTEROPERABILITY REQUIREMENTS STANDARD FOR AERONAUTICAL TELECOMMUNICATION NETWORK BASELINE 1 (ATN B1 INTEROP STANDARD), EUROCAE ED-110B/RTCA DO-280B, December 2007
- [64] SAFETY AND PERFORMANCE REQUIREMENTS STANDARD FOR AIR TRAFFIC DATA LINK SERVICES IN CONTINENTAL AIRSPACE (CONTINENTAL SPR STANDARD), EUROCAE ED-120 with Changes 1 and 2, October 2007

- [65] MANUAL OF TECHNICAL PROVISIONS FOR THE AERONAUTICAL TELECOMMUNICATION NETWORK (ATN), Doc ICAO 9705AN/956, SECOND EDITION – 1999, plus PDR's identified in EUROCONTROL-SPEC-0116
- [66] Certification Authorities Software Team (CAST) Position Paper CAST-8, Use of the C++ Programming Language, January, 2002
- [67] Guidelines for Design Approval of Aircraft Data Link Communications Systems Supporting Air Traffic Services (ATS), AC 20-140B
- [68] Future Air Navigation System 1/A – Aeronautical Telecommunication Network Interoperability Standard (FANS 1/A – ATN B1 Interop Standard), RTCA DO-305A, March 21 2012
- [69] Integrated Modular Avionics Development, Verification, Integration, and Approval Using RTCA/DO-297 and Technical Standard Order – C153, AC 20-170
- [70] Advisory Circular (AC) 20-115D, Airborne Software Development Assurance Using EUROCAE ED-12() and RTCA DO-178(), 2017, July 21
- [71] FAA Order 8150.1D Technical Standard Order Program, March 17, 2017

2.2.2 Project-Specific Certification Documents

Documents referenced in section 2.1.2

2.2.3 Miscellaneous Documents

Deviation from the PSAC: This section was not part of the PSAC [51].

N/A

3 Systems Overview

Deviation from the PSAC: This section has been updated and expanded for clarity and completeness.

The objective of this section is to provide a system overview of the DLCA-6500, which meets the System Overview objective of the Plan for Software Aspects of Certification found in DO-178B [56], section 11.1.a. Descriptions are provided in terms of the architecture and the allocation of hardware and software, as it relates to DLCA-6500.

3.1 System Functional Description

Figure 1 High Level Architecture

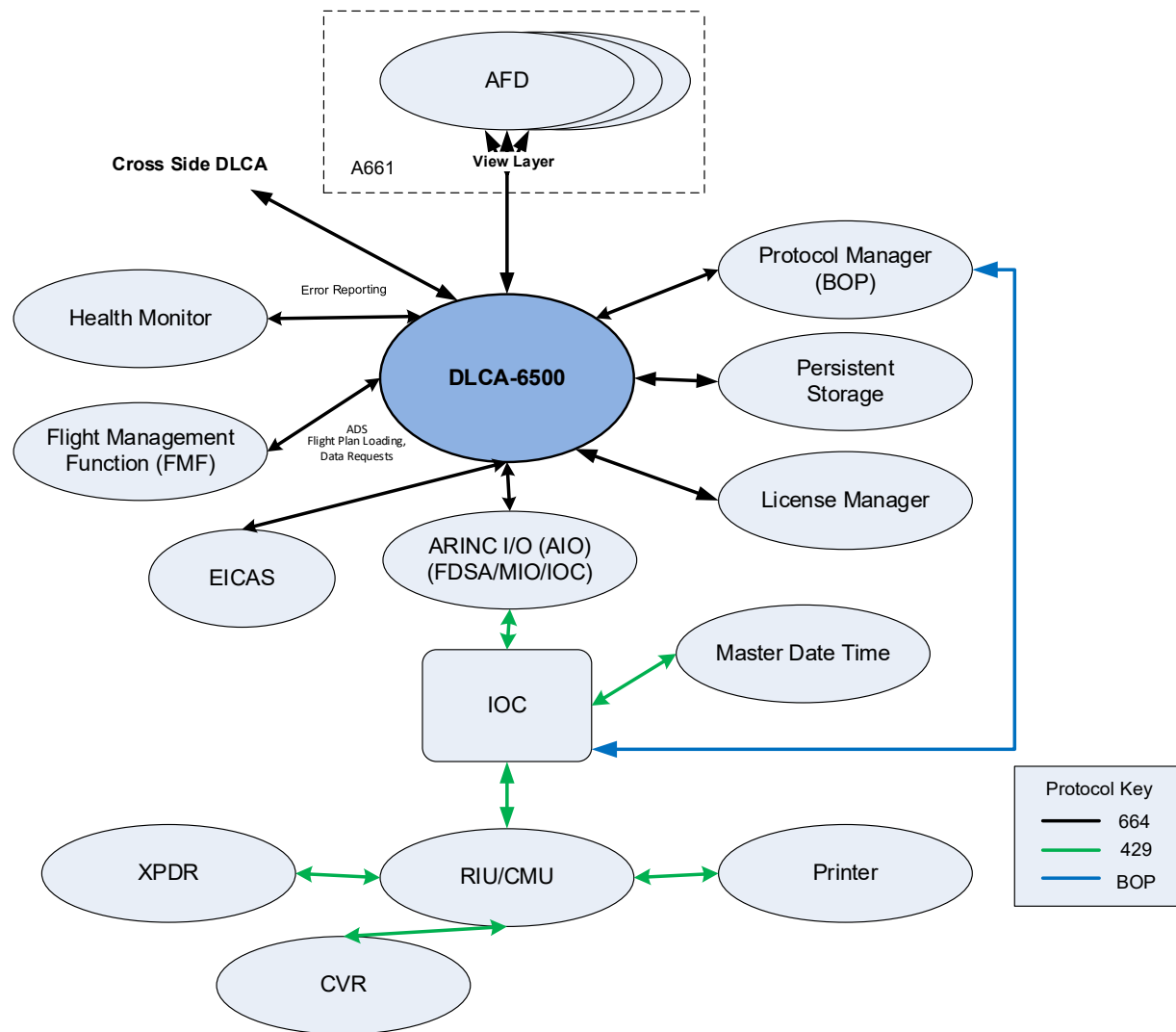


Figure 1 High Level Architecture provides a high level context diagram for the DLCA-6500, which illustrates the major interfaces and data flows to/from the DLCA-6500. The functional components of the DLCA-6500 and the other components are discussed in the subsequent sections.

The DLCA-6500 provides the Link 2000+ implementation of Aeronautical Telecommunication Network (ATN) applications and FANS 1/A+ applications. These applications define the Data Link methods and

messages that are exchanged between the aircraft and the ground services in support of Air Traffic Services (ATS) and Air Traffic Control (ATC).

The applications that make up FANS-1/A+ are:

1. ATS Facilities Notification (AFN),
2. Automatic Dependent Surveillance - Contract (ADS-C), and
3. Controller Pilot Data Link Communication (CPDLC)
4. ACARS Convergent Function (ACF)

The Link 2000+ ATN applications are:

1. Context Management (CM), and
2. Controller Pilot Data Link Communication (CPDLC)

The FANS-1/A+ applications are defined by RTCA DO-258 Rev A [57], which is the interoperability requirement standard that uses ARINC 622 [61] data communications.

The Link-2000 ATN applications are defined by RTCA DO-280B/EUROCAE ED-110B [63], and ICAO 9705[65] plus the PDRs as defined by EUROCONTROL-SPEC-0116[62].

Notable ATN differences from FANS 1/A+ includes:

- Full bit-oriented protocol stack
- Only able to transmit messages over VHF Data Link Mode 2 (VDLM2)
- Currently ATN is primarily used over European domestic airspace, while FANS is primarily used in Oceanic environments.
- Only a subset of the ATN CPDLC messages as defined in the EUROCONTROL-SPEC-0116 [62] are supported. FANS supports the full CPDLC message set as defined in RTCA DO-258 Rev A [57].

A portion of the ATN CPDLC and FANS 1/A+ functionality provides the opportunity to harmonize the related functionality. The DLCA-6500, and the associated subsystems, provides a harmonized interface to both applications. The DLCA-6500 supports seamless transfer between ATN and FANS, vice versa per RTCA DO-305A [68].

3.2 System Safety Considerations

The DLCA-6500 application project was developed and verified to execute with the CoRE Platform Software [33] on a Common Computing Module (CCM). The development and verification process ensured that this application provides sufficient integrity, reliability, and a high degree of redundancy to assure that all requirements associated with avoidance of operational hazards are complied with when integrated with existing and new avionics on the target airplane.

The system safety and partitioning concepts, such as resource management, fault tolerance, and scheduling algorithms, are provided by the underlying platform software in the Integrated Modular Architecture (IMA) environment (see sections 4.2.2 and 4.2.3 below).

3.3 System Architecture

This subsection describes, from a systems perspective, what is known about the hardware architecture with emphasis on system safety. Refer to System Safety Assessment (SSA) document [52], for significant failures and their classification.

The system is based on a modular and integrated architecture that combines multiple concentrated processing centers with localized point-to-point communications and a high-speed communications network between processing centers to minimize the installation requirements on the aircraft.

The DLCA-6500 software executes on a Common Computing Module (CCM) that provides the basic computing resource, operating environment, and communication network. The CCM utilizes the LynxOS-178 operating system [35] that allows “hard” real time partitioning to ensure that no application can “starve” any other application of resources (i.e., time or memory resources).

3.3.1 Hardware Architecture

Details of the Hardware Architecture can be found in the CoRE Platform SAS [33].

3.3.2 Software Architecture

The DLCA-6500 software architecture is explained in section 4.2 Software Architecture, provides a graphical high level overview of the system along with a detailed description of each component.

3.3.3 Hardware/Software Interfaces

Deviation from the PSAC: This section was not part of the PSAC [51].

The DLCA-6500 software does not interact with Hardware directly, it interacts through Core Platform Software. CoRE Platform SAS [33], section 3.4.3 Hardware/Software Interfaces contains the details of Hardware/Software Interfaces.

3.4 System Allocations for the DLCA-6500

The DLCA-6500 code was developed using the C++ programming language for a PowerPC target processor running on LynxOS-178 operating system [35].

The timing and memory requirements allocated to DLCA-6500 are identified in Table 1.

Table 1 Memory and Timing Requirements

Type	DLCA-6500 (CCM) Systems Allocation	DLCA-6500 Actuals
RAM	20MB	17.2MB
FLASH (NOR)	4MB	2.7MB
NVM	3KB	1.282KB
Minor / Major Frame Time	5 ms / 50 ms	3.638 ms / 50 ms

The DLCA-6500 application was allocated a processing time of 5 ms of every 50 ms major frame or 10% of the processing time. DLCA-6500 Actuals in the above Table 1 are obtained from Footprint document [5].

4 Software Overview

The following subsections provide a brief overview of the software components included in this equipment. The descriptions include the identification of the software component, with emphasis on how safety considerations have been addressed, and a brief description of the approach taken for each consideration. Where the use of previously approved software impacts safety considerations, a description of the scope of reuse is provided, including references to the source of the previously developed software. The descriptions also address the use of new technologies, significant architectural features, and safety techniques such as fail safes, fault tolerance, redundancy, and partitioning.

The DLCA-6500 Application is comprised of the Computer Program Configuration Items (CPCIs) listed in Figure 2 below. The DLCA-6500 Application is built using the HMI, Core Library, Message Library and Support files. In addition the DLCA-6500 Application relies on a set of external libraries that are described in section 4.2.3 External Libraries. The external libraries are covered by their own SAS which is identified in section 4.2.3 for each external library.

The XML files listed in Figure 2 below are used to provide startup and configuration information for the DLCA-6500 Application, the XML files are described in section 4.2.1.4 XML Files and are covered by this SAS. The A661 Definition File CPCI is described in section 4.2.1.5 A661 Definition Files and is covered by this SAS.

The Software Configuration Index (SCI) for the Data Link Communications Application (DLCA-6500), [54] serves as a software configuration index for DLCA-6500.

The Appendix G Software Life Cycle Environment Configuration Index serves as SECI.

The following terms are used in the subsection below and are defined here:

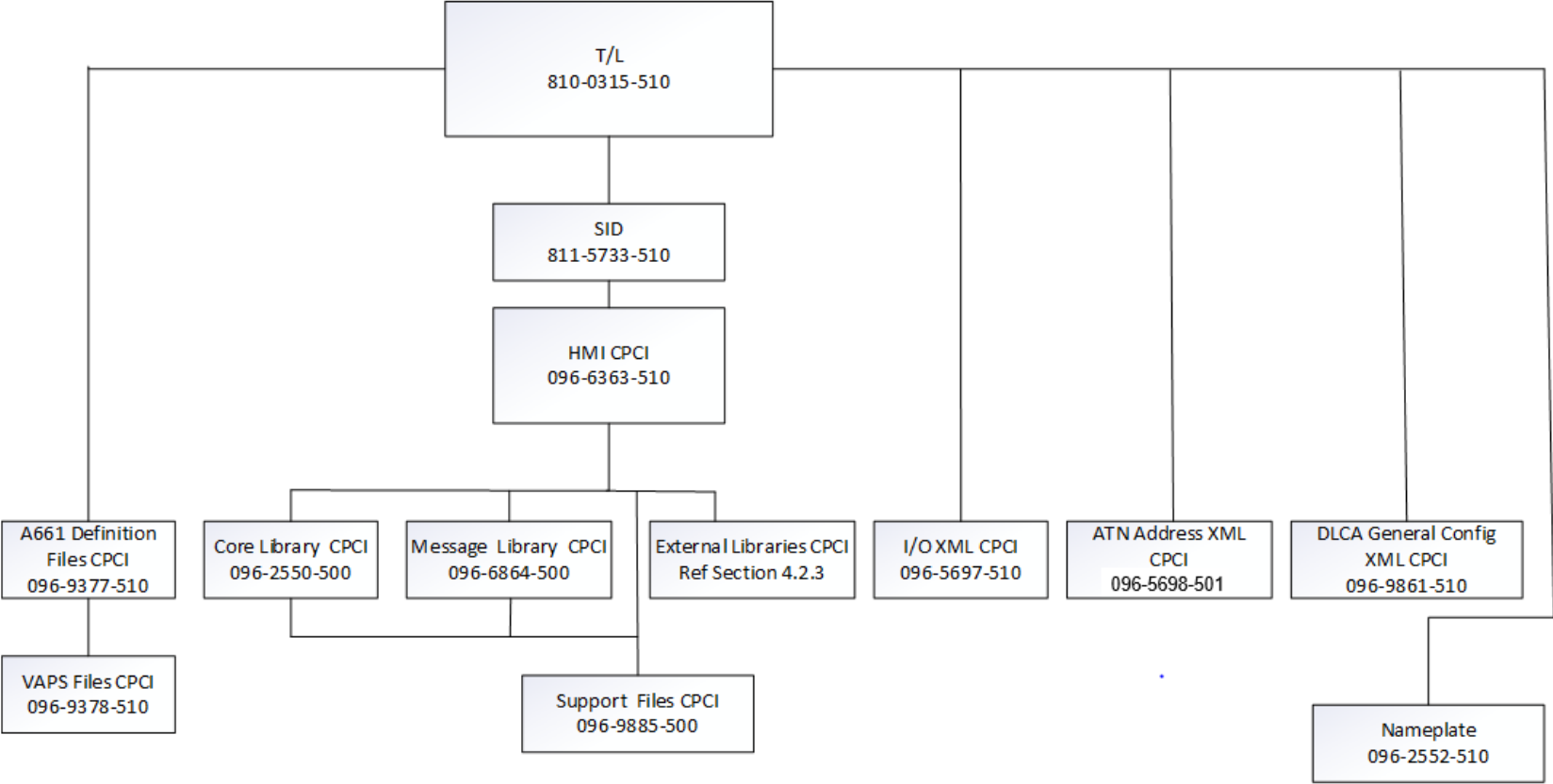
Computer Software Component (CSC) – Collection of more than 1 source file.

Computer Software Unit (CSU) – A single source file.

Executable – A CPCI that is compiled, linked, and executes on the target CPU.

Library – CPCI to be used later during the creation of the DLCA-6500 Application.

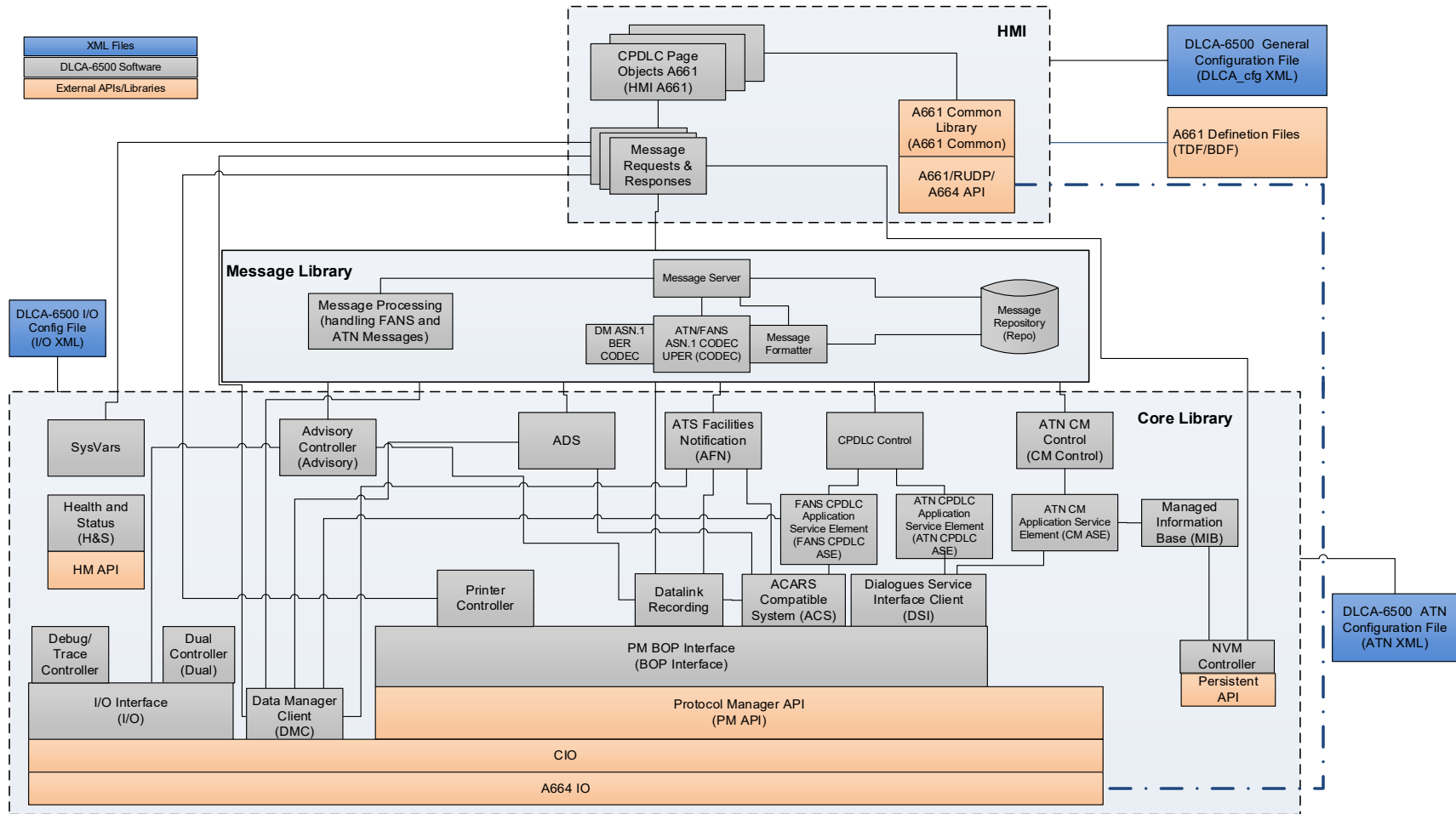
Figure 2 DLCA-6500 Software Configuration Part Numbers



4.1 Software Functions

The DLCA-6500 Application is responsible for providing the functions in Figure 3 below. The details of DLCA Software components HMI, Message Library and Core Library are included in Sec 4.2.

Figure 3 Detailed Software Architecture



4.2 Software Architecture

4.2.1 Application Specific Layer

The DLCA-6500 application specific software layer is made up of software covered by this SAS and also includes libraries not covered by this SAS.

The application specific software layer provides the following set of specific functions to support the capabilities described in section 3.1 System Functional Description. The following subsections address the software in Figure 3 covered by this SAS. Section 4.2.3 gives a description of the external libraries used by DLCA-6500 that are not covered by this SAS.

4.2.1.1 HMI

The Human Machine Interface (HMI) is a collection CSC's which provide support for page presentation and interface to the DLCA-6500. The following subsection describes in more detail the CSC's that make up the HMI.

4.2.1.1.1 CPDLC Page Objects A661 (HMI A661)

The Controller Pilot Data Link Communication (CPDLC) Page Objects CSC is made up of CSU's that define and manage the logical views (pages) for an ARINC 661 based HMI for crew interaction with DLCA-6500. These logical views are arranged to form a hierarchical menu structure of pages that allow the crew to:

- Initiate ATS Facilities Notification (AFN) or Context Management (CM) Logon contact with ground Air Traffic Services Units (ATSU).
- Categorically select and compose CPDLC downlink messages.
- View and respond to CPDLC uplink messages.
- Display message log of CPDLC uplink and downlink messages.
- Display Automatic Dependent Surveillance (ADS) connection and contract status.
- Display DLCA-6500 system health and status.
- Terminate CPDLC connection.

4.2.1.1.2 Message Requests and Responses

The Message Requests and Responses CSC is made up of CSU's that provide the mechanism through which the HMI can generate downlink requests and obtain information about the operating environment. Message requests interact with the core message logic to generate downlink message. If several displays happen to be viewing and/or manipulating a particular type of request message, each of those displays communicate with one host for that message type. In this way, all the displays are synchronized to the current contents of the message data as contained within that common host.

4.2.1.2 Core Library

4.2.1.2.1 Automatic Dependent Surveillance Contract (ADS)

The Automatic Dependent Surveillance (ADS) CSC is responsible for implementing the airborne ADS application as defined in DO-258A [57]. This CSC manages up to four connections with ground ATSU centers and provides air/ground contract management for the various types of ground-initiated ADS contracts (immediate, periodic, and event triggered). This CSC utilizes the Data Manager (DM) Client to establish local contracts with the on-board FMS to retrieve the required data elements at the required time to provide downlink responses for each air/ground contract. There is a 1:1 relationship between an air/ground contract and a local DM contract with the FMS. The ADS CSC has ultimate responsibility for providing air/ground contract responses within the required timeframe, and does so by using default data as described in DO-258A if the FMS and/or DM system becomes unresponsive/unavailable.

4.2.1.2.2 Data Manager Client (DMC)

The Data Manager Client CSC is responsible for establishing a link with one or more Flight Management System (FMS) Data Manager Servers to exchange data element transfers required by the CPDLC and ADS applications to support a fully integrated Data Link solution with the FMS. Data element exchanges are managed using contracts between the DM client and DM server. Contracts are used to manage the following message types:

- Input Message – Data to be loaded into the FMS
- Request Message – Data requested from the FMS
- Output Message – Response message to a request
- Status Message – Facilitates connection and contract state management

Only the DM client initiates a contract, and both the DM client and DM server maintain contract handlers (state machines) until the contract is fulfilled. The DM client monitors the connection status with the active FMS DM server and re-establishes the connections as necessary.

4.2.1.2.3 Dialogue Service Interface Client (DSI)

The Dialogue Service Interface (DSI) Client CSC is used to establish a communication channel via Bit Oriented Protocol (BOP) from DLCA-6500 to the DSI Provider to access the ATN stack. The DSI Provider and ATN stack are hosted on either the Radio Interface Unit (RIU) or the Communications Management Unit (CMU). The Protocol Manager API manages the communication channel between the DSI Provider (RIU/CMU) and the DSI Client (DLCA-6500).

4.2.1.2.4 Managed Information Base (MIB)

The Managed Information Base (MIB) CSC stores and retrieves application information including addresses, facility designator, application type and version, and aircraft address. The MIB provides an interface that is used by other components which need access to this information.

4.2.1.2.5 ATN CPDLC Application Service Element (CPDLC ASE)

The Aeronautical Telecommunications Network CPDLC ASE manages states that correspond to establishing an ATN CPDLC connection, accepting CPDLC messages, and closing the CPDLC dialogue.

The states relating to CPDLC connection can only be reached when the ground server sends an uplink requesting a connection to be established. Once the connection is established, the ATN CPDLC ASE accepts CPDLC messages. DLCA-6500 can't be able to send or receive CPDLC messages until this state is reached. The ASE accepts CPDLC messages from the ground server that established the connection until the dialogue is closed. When the CPDLC dialogue is closed, through an end indication or an abort, the DLCA-6500 no longer accept messages from this ground server until a connection is established with it.

When indications (e.g. end, start, dialogue) are received from the DSI, the ATN CPDLC ASE is responsible for moving these messages along to the CPDLC Control to allow confirmation of these indications. CPDLC Control sends responses and messages to the ASE, and in turn the ASE moves the state as needed as well as send the messages and responses to the DSI client so that these can be sent down to the ground server.

4.2.1.2.6 FANS CPDLC Application Service Element (CPDLC ASE)

The Future Air Navigation System CPDLC ASE manages states that correspond to establishing an FANS CPDLC connection, accepting CPDLC messages, and closing the CPDLC dialogue.

The states relating to CPDLC connection can only be reached when the ground server sends an uplink requesting a connection to be established. Once the connection is established, the FANS CPDLC ASE accepts CPDLC messages. DLCA-6500 can't be able to send or receive CPDLC messages until this state is reached. The FANS CPDLC ASE accepts CPDLC messages from the ground server that established the connection until the dialogue is closed. When the CPDLC dialogue is closed, through an end indication or

an abort, the DLCA-6500 no longer accept messages from this ground server until a connection is established with it.

When indications (e.g. end, start, dialogue) are received from the ACS, the FANS CPDLC ASE is responsible for moving these messages along to the CPDLC Control to allow confirmation of these indications. CPDLC Control sends responses and messages to the FANS CPDLC ASE, and in turn the FANS CPDLC ASE moves the state as needed as well as send the messages and responses to the ACS so that these can be sent down to the ground server.

4.2.1.2.7 ATN CM Control (CM Control)

The ATN CM Control is responsible for processing all CM messages that are received from the ATN CM ASE. The ATN CM Control provides automatic responses including processing incoming connections and providing information via the ASE which ultimately be received by the ground peer, such as the ATC capability of the aircraft. Control includes the capability to manage building and sending Logon Requests, or Aborts. Control also maintains the current ATN logon status.

4.2.1.2.8 ATN CM Application Service Element (CM ASE)

The Aeronautical Telecommunications Network Context Management ASE accepts three types of uplink messages: Contact, Update and Logon responses. Contact and Update messages can be received by DLCA-6500 when DLCA-6500 is not currently logged on. The messages are used to update the Message Identification Number (MIN) by adding to or updating what is currently present. Logon response messages are received in reply to logon requests sent from DLCA-6500.

DLCA-6500 is responsible for sending logon requests to the ground server in order to begin communication. An ATN CPDLC connection cannot be established until DLCA-6500 is Logged On (i.e. a manually initiated CM Logon has successfully completed). DLCA-6500 opens a CM dialogue when it sends the logon request down and closes the dialogue, unless the ground server requests otherwise, once there is a response. If the dialogue remained open, DLCA-6500 does not close the dialogue until a termination is received from either DLCA-6500 or the ground server.

4.2.1.2.9 CPDLC Control

The CPDLC Control processes messages received from FANS CPDLC ASE or ATN CPDLC ASE, and when messages are requested to be sent by the HMI. CPDLC Control detects if errors are present within uplink messages received from the ground peer including verifying the included integrity check value. This ensures the message was received from the correct ground peer, was intended for this aircraft, and was not corrupted. CPDLC Control is responsible for generating automated downlink responses such as start or end is accepted or rejected, and CPDLC system messages such as logical acknowledgement, error, current data authority, not current data authority, etc.

CPDLC Control contains and uses message dialogue objects in order for messages that require a response, from either the DLCA-6500 or the ground peer to be monitored. If a CPDLC message does not require a response, the message dialogue closes once it is processed. Messages that do require a response does not close the message dialogue until a CPDLC message response is sent or received for the initial message, or the time allowed for a response to be sent or received expires.

In the interface between the CPDLC HMI and CPDLC Control, the CPDLC Control keeps track of information that deals with the ATC center. The CPDLC Control facilitates the communication between the ground peer and the aircraft; giving information to the HMI to display or transferring messages via the ASE to the ground peer. It provides information the CPDLC HMI requests in respect to connection maintenance such as the current data authority (CDA) and next data authority (NDA).

4.2.1.2.10 Advisory Controller (Advisory)

The Advisory Controller is responsible for setting/clearing bits in the output word(s) that are broadcast to the Engine Indicating Crew Alert System (EICAS) for aural and visual alerting. The controller is also responsible for building and maintaining a list of inactive and active advisories. It then uses this list to inform when and what advisory should be displayed or cleared.

4.2.1.2.11 ACARS Compatible System (ACS)

The ACARS Compatible System (ACS) implements the ARINC 622 [61] ACARS Convergence Function, which takes binary encoded downlink messages and converts them into character-oriented format for transport over the ACARS character-oriented network. Likewise, for uplink messages, it converts from character-oriented format to native binary encoded format.

4.2.1.2.12 ATS Facilities Notification (AFN)

The AFN CSU is responsible for establishing the initial logon connection with the ground. It is also responsible for handling autonomous ATS facility transfers from one center to the next (CDA to NDA).

4.2.1.2.13 Health and Status (H&S)

Health and Status provides reporting of application faults to the system Health Monitor. This may include detecting a failure of the peer DLCA-6500 application (in a dual installation) or detecting a loss of I/O with an external peripheral or application.

4.2.1.2.14 Dual Controller (Dual)

The Dual Controller is responsible for determining the active/standby mode for each peer DLCA-6500 in a dual installation. This determination is made on initial startup to ensure that one peer is active, and the other is standby, based on a defined set of rules. Additionally, the Dual Controller monitors for switching conditions during runtime, such that the standby DLCA-6500 becomes active (and vice versa) when conditions warrant a mode change.

4.2.1.2.15 PM BOP Interface (BOP Interface)

The PM BOP Interface provides a method to send and receive BOP messages via PM. The BOP interface also manages the flow control of uplink/downlink messages, CVR data, and printer messages and provides methods to maintain the link and disconnect when necessary.

4.2.1.2.16 I/O Interface

The I/O Interface uses the CIO library, or set of APIs, to communicate with other subsystems using AFDX. As depicted in Figure 3, this interface is used by DLCA-6500 Health and Status and Dual Controller software modules. The interface abstracts the communication functionality. DLCA-6500 Data transfers include Cross talk data and status, trace data, chime alerts, and status words.

4.2.1.2.17 SysVars

SysVars is the manager and central repository for DLCA-6500 application system data.

4.2.1.2.18 Debug/Trace Controller

Debug/Trace Controller manages whether print statements are enable/disabled.

4.2.1.2.19 Printer Controller

Printer Controller manages the format and delivery of a message to the printer, the messages are those in a closed state. Printer Controller also manages whether the print prompt is displayed or not.

4.2.1.2.20 NVM Controller

The NVM Controller manages the DLCA-6500 application data that needs to be stored persistently. The NVM controller uses the API provided by the external Persistent Storage API library.

4.2.1.2.21 Datalink Recording

Provides a single point for formatting and delivering messages for Datalink Recording. Provides methods for sending ASCII copies of uplink/downlink messages to the CVR. Provides methods for sending messages detailing the status of the DLCA, state of CPDLC, and state of advisories to the CVR.

4.2.1.3 Message Library

4.2.1.3.1 Message Server

The Message Server provides the interface to encode, decode, and build a formatted textual message for display on the AFD.

4.2.1.3.2 Message Processing

The Message Processing invokes the encoder/decoder and message formatter. It also checks if the message can be encoded/decoded using the codec(s).

4.2.1.3.3 DM ASN.1 Codec

The Data Manager (DM) Abstract Syntax Notation One (ASN.1) Codec is used to encode and decode all messages that are transferred between the Flight Management System's Data Link Data Manager (DLDM) software and DLCA. The codec provides a uniform means to exchange data in a uniform manner that can be interpreted by different systems.

4.2.1.3.4 ATN/FANS ASN.1 Codec UPER (Codec)

The FANS/ATN Abstract Syntax Notation One (ASN.1) Codec Packed Encoding Rules, unaligned variant (UPER) is used to decode and encode all FANS and ATN CPDLC uplink/downlink messages, FANS ADS messages, and CM/AFN messages. This codec complies with the ASN.1 syntax defined in DO-258A [57] and ED-110B [63]. The codec provides a uniform means to exchange data in a uniform manner that can be interpreted by different systems.

4.2.1.3.5 Message Formatter

The message formatter is used to build a textual string to print or display using the raw data received from an uplink or downlink.

4.2.1.3.6 Message Repository

The Message Repository is the storage location for all uplink and downlink messages. This contains the message header information as well as the message attributes. It allows you to delete and add new messages.

4.2.1.4 XML Files

The DLCA-6500 relies on XML files for customization of program specific options and for I/O configuration information. The XML files the DLCA-6500 application uses are covered by this SAS. Each XML file is a unique CPCI. Each XML file is used during verification testing of the DLCA-6500. This verification testing validates the XML file is properly configured for the program.

4.2.1.4.1 XML I/O Configuration File

The XML I/O Configuration File [21] is an XML text file that describes the external interfaces and data flows for the DLCA-6500 application. It contains the Well Known Names (WKN), Well Known Services (WKS) and the NDO IDs as defined in DLCA-6500's IOCF document [16] for this platform.

This component is configuration controlled as its own entity in order to facilitate common reusable software on different platforms; however, it is not intended to be individually loadable in the field. The content of this file is verified together with the DLCA-6500 application and then released/fielded as a bundled load.

4.2.1.4.2 XML ATN Configuration File

The XML ATN Configuration File [22] contains the default list of ATN facilities and their respective CM addresses that are going to be pre-loaded in the DLCA-6500 application software. The ATN addresses contained in this file represents the stations the pilot can logon to in ATN service type. In addition to the ATN Addresses, other ATN configuration data is stored in this file. This data includes information such as ATN Timers.

4.2.1.4.3 XML General Configuration File

The XML General Configuration File [25] is an XML file that contains parameters used to configure DLCA-6500 human machine interface and to determine if this is a CCM or AFD-37X0 environment. This file is to provide a method to modify configurable items within the HMI without requiring a change to the source code.

The XML General Configuration File [25] is an XML text file that provides the ARINC 661 Graphical Server (AGS) connection required for the DLCA-6500 application. It contains the Well-Known Names (WKN), Well Known Services (WKS) that are used to communicate with AGS as defined in DLCA-6500's IOCF document [16] for this platform. It also includes configuration settings required for the Configurable Inbox.

This component is configuration controlled as its own entity in order to facilitate common reusable software on different platforms; however, it is not intended to be individually loadable in the field. The content of this file is verified together with the DLCA-6500 application and then released/fielded as a bundled load.

4.2.1.5 A661 Definition Files

The definition file is used to inform the AGS of the widget data necessary to allocate the memory resources for graphics, as well as to establish a means for the DLCA-6500 to describe and update the user interface details. The definition file is a binary file auto generated based on the DLCA-6500 Virtual Avionics Prototyping System (VAPS) [27] widget layout.

Deviation from PSAC: The PSAC document [51] section 4.4.1.5 A661 Definition Files, mentions "The Binary Definition File is read by the AFDA-6500 Display Application as part of the process to create the AFD Configuration Table (AFDT) files. Refer to the PSAC for the Flight Display System Application for further detail regarding BDF loading, and validation checks.", which is N/A under DLCA-6500 SAS (this document).

The A661 Definition file also contains a Text Data File (TDF). This file is a human readable form of the BDF.

The VAPS A661 Definition file is created and developed by the DLCA team and covered under the DLCA-6500 SAS (this document). For VAPS A661 Definition file, refer CPCI for the DLCA-6500 VAPS [27].

4.2.2 Platform Specific Layer

The platform specific layer provides software components that allow the DLCA-6500 application to be hosted on the CCM-5110 platform, See CoRE PLATFORM SOFTWARE SAS [33]. Some of these software components are listed below for the CCM-5110 platform:

- Boot.
- Kernel Download Image (KDI)
 - LynxOS-178
 - Hardware Support
 - System Applications
 - Static Device Drivers
- User File System (USRFS)
- Platform Software Libraries.

- LynxOS-178 Standard Libraries and Includes
- Persistent Storage
- Common I/O (CIO)
- Reliable User Datagram Protocol (RUDP) Communication
- Reliable User Datagram Protocol (RUDP) Connection
- Device drivers – NAND, CRC, and IOC Mezzanine.

The collection of these device drivers and libraries are utilized by DLCA-6500 but are not part of the DLCA-6500 high-level design and are not covered by this SAS.

4.2.3 External Libraries

In order to communicate with other applications within the IMA system, the DLCA-6500 application statically links in external libraries that contain client APIs. These APIs establish a common path for multiple applications to communicate with the services provided by the serving application.

All client APIs/libraries linked into the DLCA-6500 software application are required to be separately maintained and verified by the applications providing the service. The development of these client APIs and their related documentation and verification is completely independent of the DLCA-6500 and is outside the scope of this SAS. All of the client APIs that are linked into the DLCA-6500 application code go through independent verification to DO-178B level C standards or higher.

4.2.3.1 Platform Libraries

4.2.3.1.1 LynxOS-178 Standard Libraries and Includes

The LynxOS-178 Standard Libraries & Includes API provides a set of functions used for accessing the operating system. This allows the DLCA-6500 to communicate with the hardware without having to understand the lower-level hardware/software protocols.

This library is covered by the CoRE Platform SAS [33].

4.2.3.1.2 Persistent Storage Library

The Persistent Storage API provides the DLCA-6500 an interface to store its operational data persistently in Non Volatile Memory (NVM). The data includes CM ground facilities and their ATN address, and ATN settings such as timers, and strapping data.

This library is covered by the CoRE Platform SAS [33] See the Persistent Storage Design Description [36], section 5.1.1 for API definitions.

4.2.3.1.3 Common I/O (CIO) Library

The Common I/O library provides an API for an application to transfer information over the Avionics System LAN (ASL) to other applications.

This library is covered by the CoRE Platform SAS[33] See the CIO Design Description [37], section 3.3.5 for API definitions.

4.2.3.1.4 Reliable User Datagram Protocol (RUDP)

4.2.3.1.4.1 RUDP Communication Library

The RUDP Communication library provides the API to send and receive data over the ASL.

This library is covered by the Reliable User Datagram Protocol (RUDP) Libraries SAS [42] . See the RUDP Connection Library Design Description [43], section 3.3.1 for API definitions.

4.2.3.1.4.2 RUDP Connection Library

The RUDP Connection library is used on the remote application's side. The RUDP Connection library uses a connection based API to interface with the remote application software.

This library is covered by the Reliable User Datagram Protocol (RUDP) Libraries SAS [42]. See the RUDP Connection Library Design Description [44], section 3.3.1 for API definitions.

4.2.3.1.5 Error Logging and Watchdog Library

The Error Logging and Watchdog library provides the APIs for the Health Monitor error logging, error status, and software watchdog functionality.

This library is covered by the CoRE Platform SAS [33]. See the Health Monitor SW Design Description [45], section 4.1 for API definitions.

4.2.3.1.6 Protocol Manager Client library

The Protocol Manager Client library is used to interact with the Protocol Manager server which provides Bit-Oriented protocol interfaces. The Protocol Manager Client (PM) API software provides the applications access to standard ARINC protocol functions, such as ARINC 429 Williamsburg file transfer services. The DLCA-6500 Application uses the API provided by the library to access the ARINC 429 Williamsburg file transfer services to exchange messages with RIU/CMU.

This library is covered by the Protocol Manager SAS [34]. See the SDD for PMA-6000 [47], section 4.1 for API definitions.

4.2.3.1.7 Avionics Full Duplex Avionics System LAN (AFDX-ASL)

The software modules covered by the AFDX-ASL support the Avionics System LAN (ASL) network.

4.2.3.1.7.1 AFDX_ASL WinSock2 API

Provides a WinSock2 based sockets API to provide applications an interface to the AFDX-ASL device driver.

The WinSock2 API is covered by the AFDX Avionics System LAN (ASL) SAS [46]. See AFDX – LAN Design [48], section 4.2 for API definitions.

4.2.3.1.7.2 AFDX-ASL ARINC 653 User API

Provides an ARINC 653 Inter-Partition API to provide applications an interface to the AFDX-ASL device driver.

The ARINC 653 User API is covered by the AFDX Avionics System LAN (ASL) SAS [46]. See AFDX – LAN Design [48], section 4.2 for API definitions.

4.2.3.1.8 A661 API and A661 Common Library

The ARINC 661 API is responsible for connecting and managing ARINC 661 communications to and from multiple AGS's. The ARINC 661 common library functions include:

- Sending keep alive / heart beat messages to AGSs.
- Synchronizing DLCA-6500 widget states and data with the CDS's.
- Handling layer, widget, and exception events from AGS's and Window Manager.
- Re-establishing and re-synchronizing broken connections from AGS's.

The ARINC 661 common library provides the API interface for the application to communicate with ARINC 661 Graphics server using ARINC 661 protocol. This library is used to exchange messages between DLCA application and the AGS for the DLCA-6500 A661 HMI pages. Using A661 library application updates the information that is display and presented to the user by AGS.

The ARINC 661 API is covered by the ARINC 661 API SAS [50] See ARINC 661 SDD [49], for API definitions.

4.3 Overview of Applied New Technology

There is no applied new technology used to develop the DLCA-6500 application.

4.4 Software Fault Management Techniques

The DLCA-6500 software application handles and reports internal software errors (i.e., loss of data, cycle slip, etc.) as well as errors in establishing or maintaining connections with other applications. The platform software provides an API for the DLCA-6500 software application to communicate its health status with the platform Health Monitor function. Along with the error, the DLCA-6500 software also reports the severity of the error as determined by the application.

The following list of fault detection mechanisms is performed by the DLCA-6500:

1. Monitor for errors such as being unable to connect to its interfaces, cycle slips, out of memory, and initialization failures. It logs all errors and outputs them to the Health Monitor application.
2. Validate all XMLs specified in Figure 2. This includes file integrity, range checking, and data-type checks. File integrity is determined by parsing through an XML file to verify the XML file contains all the required data and that the format of the data is correct. In the event that an XML file fails parsing, the DLCA-6500 application gets shut down.
3. Perform a CRC check on all uplink messages received from the RIU/CMU to ensure the data was not corrupted while passing through the DAL D portions of the RIU/CMU. If the CRC check does not pass it discards the message. Each CRC attached to an uplink message is covered by industry specification in which both the producer of the message and consumer of the message must conform to.
4. Transmit/receive all CPDLC and ADS data to/from the Flight Management Function (FMF) via ASN.1 encoding. Any data from the FMF that does not pass the ASN.1 decoding process are discarded.
5. Range check all data entry received from HMI devices prior to accepting it. The range check is based on the field where the data is entered to confirm it meets the requirements for that given field.

Refer to the CoRE IPS-5000 Platform Software SAS [33] for the applicable System Layer Documentation for additional information. This allows DLCA-6500 to interact with application of various DAL levels. Refer to the CoRE IPS-5000 Platform Software SAS [33] for information on software partitioning, cache, pipelining, and MMU covered by the RTOS.

4.5 Software Partitioning

There is no partitioning within the DLCA-6500. DLCA-6500 is a single threaded application.

The time and space partitioning is provided by the LynxOS-178B operating system.

In the IMA environment, software partitioning is provided by the underlying platform software based on the LynxOS-178 operating system, which manages the control and communication between applications of various DAL levels.

4.6 Software Timing and Scheduling Strategies

At a system level, the DLCA-6500 is scheduled to run in its time slice based on an algorithm implemented by CPR (Common Process Resource). DLCA-6500 is a single threaded application. The DLCA-6500 software application does not manage shared resources. Resource management algorithms are

implemented by the CPR. Refer to the CoRE IPS-5000 Platform Software SAS [33] for the applicable system layer documentation for additional information on scheduling and the means of communication between the software components, and the impact on timing to schedule all the software components.

5 Certification Considerations

This section describes the certification basis, the means of compliance and the software criticality level of each function implemented in software and covered by this SAS. It also provides the justification for the software criticality level assignment based on a safety assessment of the software and its use within the airborne system, including a description of the potential software failure conditions.

5.1 Certification Basis and Proposed Means of Compliance

Deviation from PSAC: Data Link Communications Application (DLCA-6500), RCPN 810-0315-510 is compliant with AC 20-140B [67]. The PSAC document [51] Section 5.1, mentions AC 20-140A. In addition PSAC also refers Rockwell Collins Technical Consistent Process (RC-TCP), in the same section, but it is N/A for the DLCA-6500.

The certification basis for the DLCA-6500 software is DO-178B [56]. The proposed means of compliance are methods, activities, and the software life cycle data defined in this document and the associated Software Development Plan [7]. The SDP has been written in compliance with objectives defined in DO-178B [56] to demonstrate that the objectives defined in DO-178B [56] have been met.

The DLCA-6500 itself is not a TSO function, nor is it part of another functional TSO. The DLCA-6500 is certified as part of Parts Manufacturer Approval for the target aircraft. The proposed means of compliance is documented verification results demonstrating interoperability and compliance to applicable industry standards. AC 20-140B [67] provides interoperability, safety, and performance criteria and identifies requirements specified in industry standards that may be used as a means of compliance. For certifications through European Aviation Safety Administration (EASA) an Acceptable Means of Compliance (AMC) document is not yet available. As such, EASA currently provides a Certification Review Item (CRI) document that is unique to a specific certification. The CRI provides interoperability, safety, and performance criteria, again including references to requirements in industry standards. See section 3.1 System Functional Description for information on FANS and ATN industry standards.

5.2 Software Criticality Level

The DO-178B software design assurance level for the DLCA-6500 software components are summarized in Table 2 DLCA-6500 Software Design Assurance Level. The rationale for Level C is based on the assessment of the operational hazards for FANS and ATN use summarized in Table 3 DLCA-6500 Criticality Data.

Table 2 DLCA-6500 Software Design Assurance Level

Application Software (CPCI)	DO-178B Level
Computer Program Configuration Item (CPCI) for the Data Link Communications Application (DLCA-6500) Electronic Nameplate [26]	C
Computer Program Configuration Item (CPCI) for the Data Link Communication Application (DLCA-6500) XML General Configuration File [25]	C
Computer Program Configuration Item (CPCI) for the Data Link Communications Application (DLCA-6500) XML I/O Configuration File [21]	C
Computer Program Configuration Item (CPCI) for the Data Link Communications Application (DLCA-6500) XML Default ATN Addresses [22]	C
Computer Program Configuration Item (CPCI) for the Data Link Communications Application (DLCA-6500) Application with A661 for Human Machine Interface (HMI) [18]	C
Computer Program Configuration Item (CPCI) for the Data Link Communications Application (DLCA-6500) Core Software Library [19]	C
Computer Program Configuration Item (CPCI) for the Data Link Communications Application (DLCA-6500) Message Library [20]	C
Computer Program Configuration Item (CPCI) for the Data Link Communications Application (DLCA-6500) A661 Definition Files [24]	C
Computer Program Configuration Item (CPCI) for the Data Link Communications Application (DLCA-6500) Support Files [23]	C

FANS operational hazards are defined in RTCA DO-306 Safety and Performance Standard for Air Traffic Data Link Services in Oceanic and Remote Airspace (Oceanic SPR Standard), October 11, 2007 [58] and augmented by RTCA DO-306 Change 1 Safety and Performance Standard for Air Traffic Data Link Services in Oceanic and Remote Airspace (Oceanic SPR Standard), March 17, 2011 [59].

ATN operational hazards are defined in SAFETY AND PERFORMANCE REQUIREMENTS STANDARD FOR AIR TRAFFIC DATA LINK SERVICES IN CONTINENTAL AIRSPACE (CONTINENTAL SPR STANDARD), EUROCAE ED-120 with Changes 1 and 2, October 2007 [64].

The highest FANS and ATN failure condition is classified as Major, which DO-178B [56], section 2.2.2 correlates with Level C.

Table 3 DLCA-6500 Criticality Data below summarizes the Major hazards from the noted FANS and ATN industry standards.

Table 3 DLCA-6500 Criticality Data

Ref#¹	Hazard Description	Classification
FANS Operational Hazards		
H-CRD-7 H-IER-7 H-PR-7	Undetected late or expired message	Major

Ref# ¹	Hazard Description	Classification
H-CRD-8 xH-IER-8 H-PR-8	Undetected misdirection of a message	Major
H-CRD-9 H-IER-9 H-PR-9	Undetected corruption of a message	Major
H-CRD-10 H-IER-10 H-PR-10	Undetected spurious/inadvertent message delivery	Major
ATN Operational Hazards		
H-ACL-3	Undetected early delivery of a message used for separation	3 (Major)
H-ACL-6	Undetected late or expired message used for separation	3 (Major)
H-ACL-9	Undetected misdirection of a message used for separation	3 (Major)
H-ACL-12	Undetected corruption of a message used for separation	3 (Major)
H-ACL-15	Undetected out of sequence CPDLC messages used for separation	3 (Major)

¹Hazard reference identifiers are based on the associated Data Link services, where...

ACL = ATC Clearance

CRD = Clearance Request and Delivery service

IER = Information Exchange and Reporting service

PR = Position Reporting service

5.3 Non-TSO Functionality

Deviation from the PSAC: This section was not part of the PSAC [51].

The DLCA-6500 is non-TSO functionality. Non-TSO functionality is identified based on the definition from FAA Order 8150.1D [71] chapter 8-1 as follows:

A non-TSO function is a function that is not covered by a TSO-approved MPS, does not support or affect the hosting article's TSO function(s), and could technically be implemented outside of the TSO article.

5.4 Outsource / Offshoring Entity and Risk Summary

Deviation from PSAC: The PSAC document [51] under section 5.3 Outsourced Supplier Management, has sub sections about Engineering Oversight, Tasks and Responsibilities, Problem Reporting and Resolution, Configuration Management, Quality Assurance. These details are moved to sub sections in Appendix H, of this SAS document.

The DLCA-6500 team includes offshore and outsourced partners. An Offshoring/Outsourcing Risk Assessment (OORA) has been completed during PSAC, refer PSAC [51].

The DLCA-6500 team used the Global Engineering Technology Center- India (GETC-I) (Hyderabad and Bangalore, India) as an offshore partner. Off-shore partners' responsibilities included requirements definition, software development and verification. The DLCA-6500 team also used onsite contractors from HCL Technologies, an Indian engineering firm. The onsite HCL contractors were utilized for development and verification.

The Rockwell Collins USA team has primary responsibility for meeting all the objectives of the software planning, requirements definition, software development, verification, and developmental configuration management processes. See Section Appendix H for additional details.

6 Software Life Cycle

This section provides a brief discussion of the software life cycle processes that was used for this project. The discussion explains how the objectives of each life cycle process have been satisfied, and specifies the organizations involved, the organizational responsibilities, the system life cycle processes and certification liaison process responsibilities.

The development of the Product Line DLCA-6500 Data Link Communication Application software is based on the previously approved DLCA-6500 software. The new software is developed from previously approved software by adding new requirements and/or modifying the existing requirements. The bug fixes were implemented by adding requirements when necessary. Other artifacts were added or modified to implement the scope defined in the Work Packages included in Section 11. An iterative process model is followed, where a series of builds are developed, each one closer to satisfying the final requirements. Interim deliveries are produced to allow the customer to assess the product functionality and refine the requirements. Software intended for production is verified to DO-178B [56] standards, with the design assurance level specified in Section 5.2. Interim deliveries are tested to ensure appropriate functionality for the intended system use.

6.1 Description of the Software Life Cycle Processes

Deviation from PSAC: The PSAC document [51] Section 6.1 refers to Rockwell Collins Technical Consistent Process (RC-TCP), but it is N/A for the DLCA-6500.

The entire software life cycle for the DLCA-6500 software conforms to the process documented in DO-178B [56]. The specific processes followed on this project are documented in more detail in the SDP [7].

There were multiple internal/intermediate builds that were part of the iterative development process. These intermediate builds were used to support internal development and verification.

The software development was performed using both host and target platforms. The host platform is Windows PC that utilizes a host compiler to generate host builds and a cross compiler to generate builds for the target hardware. The host environment also includes a simulation tool that enables the host build to run in the host environment.

6.1.1 Planning

The software development plan and the supporting integral activities for the DLCA-6500 are defined in this SAS, the Software Development Plan [7] the SCM plan [2], and the Commercial Systems Software Quality Engineering Plan [1]. The transition criteria, inter-relationships, and sequencing among these processes are defined in the SDPs [7] (see section 5.1).

Project plans were developed to meet the following objectives:

- Provide process activity definitions.
- Define transition criteria, inter-relationships and sequencing among processes.
- Define the software life cycle.
- Define software development standards.

Reviews of the project plans were completed per the Peer Review process [10] and SDP [7]. Any significant changes to the software plans results in the updating of one or more of the software planning documents discussed in this section. A DAC Representative reviewed these changes to ensure they were coordinated.

6.1.2 Software Development Processes

The Software Development Plan [7] defines the software development processes to:

- Analyze system/subsystem requirements to define software requirements.
- Analyze software requirements to define the software architecture and low-level requirements.

- Design and code the software to implement the software architecture and low-level requirements.
- Verify the outputs of the software requirements process, design process, and coding process by having peer reviews.
- Integrate the software on the host platform and target hardware.

The processes produced development artifacts that are accurate and consistent, verifiable, traceable to the system requirements, and compatible with the target computer.

Process Deviations/Additions Appendix I contains a list of known deviations/additions to some of the detailed process steps in the SDP [7] for which this project followed.

6.1.2.1 Software Development Environment

The Software Development Plan [7] provides a detailed description of the software development environment and the planned tools to be used for each of the life cycle processes. Appendix G Software Configuration Index provides a description of the tools called used in each life cycle process.

DO-178B [56] Section 12.2 Tool Qualification provides guidance for when a development or verification tool is required to be qualified.

“Qualification of a tool is needed when processes of this document are eliminated, reduced or automated by the use of a software tool without its output being verified...”

Tools used for this development that meet the above criteria:

- VISTA is a multi-process simulation environment suitable for use in the development and testing of avionics software.
- VectorCAST is a tool used for Structural Coverage Analysis.

6.1.2.2 Software Requirements Process

The development of software high-level requirements (HLRs) was performed in accordance with the process defined in the Software Development Plan [7] section 6.1.

The DLCA-6500 software high level requirements was captured in the High Level Software Requirements Specification (SRS) for the Pro Line Fusion DLCA-6500 Data Link Communications Application [11].

Note that the DLCA-6500 product is largely driven by detailed industry interoperability specifications, where these specifications target specific aircraft software applications (e.g. CPDLC) and contain detailed requirements that are already decomposed to govern specific application behavior. In these cases, the industry specifications [57][58][59][61][62][65][64][63][67][68] are linked as a reference to the low-level software requirements. This results in the software low-level requirements tracing to either the software high-level requirements in the High Level SRS, or directly to the industry requirements, or both. The requirements and the traceability were placed under formal configuration management by releasing the DOORS CPCI for DLCA-6500 Project archive [53] to SCL.

DLCA-6500 create an industry compliance matrix [55]. The Compliance Matrix [55] contains allocations to the domains, required to meet an industry requirement and if we are compliant or not.

6.1.2.3 Software Design Process

The development of the software architecture, detailed design, and low-level requirements (LLRs) was performed in accordance with the process defined in the Software Development Plan [7] section 6.2.

The software architecture and detailed design were documented in the Software Design Document for DLCA [17] and included descriptions of the high-level software architecture, data flow and control, and pertinent design decisions with associated rationale.

The software low-level requirements are captured in the project Software Requirements Specifications [12][13][14][15].

The IOCF [16] is captured to include Input/Output interfaces of DLCA-6500 as part of the design process.

The SDD [17] contains Software Architecture, Design decisions, High-Level and Detailed Design. Traceability of Code to low level requirements is included in this document. The SDD [17] describes each software unit that satisfies both the high and low-level software requirements.

6.1.2.4 Software Coding Process

The development of the software source code was performed in accordance with the process defined in the Software Development Plan [7] section 6.3. The DLCA-6500 software was implemented using the C++ programming language and VAPS Coding.

The software source code and XML's was formally released in the DLCA-6500 CPCIs [6] [18][19][20][21][22] [23] [24] [25][26][27].

6.1.2.5 Software Integration Process

The software integration was performed in accordance with the process defined in the Software Development Plan [7] section 6.4.

6.1.3 Software Verification Processes

This section provides a brief summary of the software verification processes used to verify the results of the software development processes. The Software Verification User's Guide [38] provides additional information on the verification environment.

6.1.3.1 Verification of Software High-Level Requirements

The software high-level requirements were verified to meet the required objectives of DO-178B using the Peer Review method [10] as described in the Software Development Plan [7] section 7.4.1.

6.1.3.2 Verification of Software Architecture

The software architecture was verified to meet the required objectives of DO-178B using the Peer Review method [10] as described in the Software Development Plan [7] section 7.4.2.

6.1.3.3 Verification of Software Low-Level Requirements

The software low-level requirements were verified to meet the required objectives of DO-178B using the Peer Review method [10] as described in the Software Development Plan [7] section 7.4.2.

6.1.3.4 Verification of Software Source Code

The software source code was verified to meet the required objectives of DO-178B using the Peer Review method [10] as described in the Software Development Plan [7] section 7.4.3.

6.1.3.5 Verification of Software Integration

The software integration process was verified to meet the required objectives of DO-178B using the Test method as described in the Software Development Plan [7] section 7.4.4.

6.1.3.6 Development of Software Test Cases

The development of software test cases was performed in accordance with the process defined in the Software Development Plan [7] section 7.4.5.

6.1.3.7 Verification of Software Test Cases

The software verification test cases were verified to meet the required objectives of DO-178B [56] using the Peer Review method [10] and the Requirements Based Test Coverage Analysis method as described in the Software Development Plan [7], section 7.4.6.

6.1.3.8 Development of Software Test Procedures

The development of software test procedures was performed in accordance with the process defined in the Software Development Plan [7] section 7.4.7.

6.1.3.9 Verification of Software Test Procedures

The software verification test procedures were verified to meet the required objectives of DO-178B using the Peer Review method [10] as described in the Software Development Plan [7] section 7.4.8.

6.1.3.10 Software Verification Testing

Control coupling analysis was performed in conjunction with SCA, where statements that were not covered were analyzed to ensure that no adverse effects on the logical control of execution would occur if the statements were to execute. Likewise, data coupling analysis was performed in conjunction with SCA, where statements that were not covered were analyzed to ensure that no adverse effects on shared data would occur if the statements were to execute. See Software Verification Procedures and Results (SVPR)[28].

Full software verification testing (requirements based testing) was performed in accordance with the process defined in the Software Development Plan [7] section 7.4.9.

6.1.3.11 Verification of Test Results

The software verification test results were verified to meet the required objectives of DO-178B [56] using the Peer Review method [10] as described in the Software Development Plan [7] section 7.4.10.

Structural Coverage Analysis was performed using Vector Cast [40] Qualified Verification tool. The SCA annotation files are peer reviewed using the Peer Review method [10] as described in the Software Development Plan [7] section 7.3.2.2.

See Software Verification Procedures and Results (SVPR)[28] for more details.

6.2 Peer Review Process

The Peer Review process is described in detail in the Peer Review Method Using PREP for the Commercial Systems Data Link Organization [10].

Process Deviations/Additions Appendix I (I.1 and I.2) contains a list of known deviations/additions to some of the Peer Review process in the Peer Review Method Using PREP for the Commercial Systems Data Link Organization [10] for which this project followed.

6.3 Software Configuration Management

The Software Configuration Management process described in detail in the Software Development Plan [7], Section 8 is followed during this DLCA-6500 development.

6.4 Software Quality Assurance

The Software Quality Assurance Plan described in the Software Development [7], Section 9 and in the Commercial Systems Software Quality Engineering Plan [1] is followed during this DLCA-6500 development.

6.5 Organizational Responsibilities

Section 4.1 of the Software Development Plan [7] provides a detailed description of the organization in terms of roles and responsibilities.

6.6 Certification Liaison

Deviation from PSAC: PSAC document [51], section 6.3 Certificate Liaison, mentions only “This PSAC will be submitted to the applicable Program Office for transmittal to the OEM for approval”, additional information is captured in this section of SAS regarding submittal of this SAS document, 945-0519-510.

The Certification and Regulatory Coordinator is responsible for Certification Liaison process activities. The Certification and Regulatory Coordinator provides advice to the project and evaluates the preliminary documents. The Certification and Regulatory Coordinator is also responsible for coordinating qualification activities with the regulatory authority and the project.

SOI activity is performed throughout the initial project development and verification processes - Planning Review (SOI-1), Development Review (SOI-2), Verification Review (SOI-3) and Final Review (SOI-4). Following initial equipment approval, subsequent SOI activities focused on changed areas only. For example, SOI 1 is repeated for follow-on projects if only the planning documents previously reviewed are changed. Likewise, SOI 2 and SOI 3 examined the changed areas of the design and previous SOI 2 and SOI 3 reviews remain valid.

FAA Order 8110.49A, Chapter 2 “Software Review Processes” [60] provides objectives of the software review process and guidance on the certification authority involvement.

The PSAC [51], SDP [7], This SAS are submitted to the applicable Program Office for transmittal to the OEM for approval. Please note that DLCA-6500 is not associated with a Technical Standard Order (TSO).

No Open Action Items from SOI1, SOI2 & SOI3.

7 Software Life Cycle Data

Table 4 DLCA-6500 Life Cycle Data Items (below) identifies the software life cycle data items that were generated as part of the DLCA-6500 development. All software life cycle data items are kept under configuration control at Rockwell Collins. The numbers in the DO-178B column are the numbers of the equivalent software life cycle data items as outlined in section 11 of the Plan for Software Aspects of Certification found in RTCA DO-178B [56].

The "Submit" columns lists items that are submitted as part of this certification package or available for review at a Rockwell Collins facility.

- S – Submitted as a part of the certification package
- A – Available for review at a Rockwell Collins Facility

Table 4 DLCA-6500 Life Cycle Data Items

DO-178B Life Cycle Data	Rockwell Collins Equivalent	Submit
11.1 Plan for Software Aspects of Certification	Plan for Software Aspects of Certification for the Data Link Communications Application (DLCA-6500) [51]	S
11.2 Software Development Plan	Software Development Plan for the Commercial Systems Data Link Products [7]	S
11.3 Software Verification Plan	Software Development Plan for the Commercial Systems Data Link Products [7]	S
11.4 Software Configuration Management Plan	Software Configuration Management Plan [2]	A
11.5 Software Quality Assurance Plan	Deviation from PSAC: In PSAC document [51], Design Quality Assurance Plan for Hardware, Software and System Development, RCPN 946-5892-100 is referred. Commercial Systems Software Quality Engineering Plan [1]	A
11.6 Software Requirements Standards 11.7 Software Design Standards 11.8 Software Code Standards	Deviation from PSAC: In PSAC document [51], there is no reference to the VAPS coding standard, GUI Conventions Description (GCD) for the ProLine Fusion Product Line Integrated Avionics System[6]. Software Development Plan for the Commercial Systems Data Link Products [7] C++: C++ Coding Standards [8] VAPS: GUI Conventions Description (GCD) for the ProLine Fusion Product Line Integrated Avionics System [6]	A A A

DO-178B Life Cycle Data	Rockwell Collins Equivalent	Submit
11.9 Software Requirements Data	High Level SRS for the Pro Line Fusion DLCA-6500 Data Link Communications Application [11] CPCI for DOORs Archive [53]	A A
11.10 Design Description	SRS for the Data Link Communications Application (DLCA) Future Air Navigation System (FANS-1/A) [12] SRS for Common DLCA System Services[13] SRS for Aeronautical Telecommunication Network Context Management (CM) And Controller Pilot Data Link Communication (CPDLC) [14] Software Requirement Specification (SRS) for HMI [15] Software Design Document (SDD) for the DLCA-6500 Data Link Software Component Design [17] CPCI for DOORs Archive [53]	A A A A A A
11.11 Source Code	CPCI for the Human Machine Interface (HMI) DLCA-6500 [18] CPCI for the DLCA-6500 Core Software Library [19] CPCI for the DLCA-6500 Message Library [20] CPCI for the DLCA-6500 XML I/O Configuration File [21] CPCI for the DLCA-6500 XML ATN Default Addresses [22] CPCI for the DLCA-6500 XML General Configuration File [25] CPCI for the A661 Definition Files [24] CPCI for the A661 VAPS Model [27] CPCI for the Support Files [23]	A A A A A A A A A
11.12 Executable Object Code	Software Deliverable for the DLCA-6500 Message Library [30] Software Deliverable for the DLCA-6500 [31]	A A
11.13 Software Verification Cases and Procedures	SVPR for the DLCA-6500 [28] CPCI for the DLCA-6500 SVPR [29]	S S

DO-178B Life Cycle Data	Rockwell Collins Equivalent	Submit
11.14 Software Verification Results	SVPR for the DLCA-6500 [28] CPCI for the DLCA-6500 SVPR [29]	S S
11.15 Software Life Cycle Environment Configuration Index a. Identify the software life cycle environment hardware and its operating system software. b. Identify the software development tools c. Identify the test environment used to verify the software product. d. Identify qualified tools and their associated tool qualification data.	Appendix G Software Configuration Index (this document). Covers RTCA DO-178B [56] objectives 11.15.a, 11.15.b, 11.15.c, 11.15.d. Software Development Plan [7]. Covers RTCA DO-178B [56] objectives 11.15.b, 11.15.c. Software Verification Procedures and Results for the DLCA-6500 [28]. Covers RTCA DO-178B [56] objectives 11.15.c. Deviation from PSAC: In PSAC document [51], there is no reference to the Computer Program Configuration Item (CPCI) for the Data Link Communications Application (DLCA-6500) VAPS [27] CPCI's for the DLCA-6500 [18][19][20][21][22][23][24][25][27]. Covers RTCA DO-178B [56] objectives 11.15.a, 11.15. b. Section 8.4 Tool Assessment and Qualification, of this SAS covers RTCA DO-178B[56] , objective d.	S A S A S
11.16 Software Configuration Index	Deviation from PSAC: In PSAC document [51], there is reference to Top Level Drawing[32], for SCI; during SAS only Software Configuration Index (SCI) for the Data Link Communications Application (DLCA-6500) [54] is considered for SCI. Software Configuration Index (SCI) for the Data Link Communications Application (DLCA-6500) [54]	 S
11.17 Problem Reports	Problem Reports ¹	A
11.18 Software Configuration Management Records	SCM Records ²	A
11.19 Software Quality Assurance Records	SQA Records ³	A
11.20 Software Accomplishment Summary	DLCA Software Accomplishment Summary for the DLCA-6500 (This Document) DLCA-6500 Footprint Document [5]	S S

¹ Work Package (WP) records are archived in a change tracking tool database.

² Software Configuration Management (SCM) records are archived in the Enterprise Product Data Management database.

³ Software Quality Assurance (SQA) records are archived in an audit tool database.

8 Additional Considerations

8.1 Use of Previously Developed Software

According to AC 20-115D [70], paragraph 9, Previously Approved Software is software that was approved using ED-12/DO-178, ED-12A/DO-178A, or ED-12B/DO-178B. DLCA does not have any Previously Approved software that was approved using ED-12/DO-178 or ED-12A/DO-178A.

DLCA-6500 reused life cycle artifact of the baseline (Refer to section 1.2 of this document for baseline information). The baseline modifications were driven by new requirements and software enhancements, which were developed and verified in accordance with the applicable objectives for DO-178B, resulting in this version of the DLCA-6500 software. There were no changes to any of the existing DAL levels.

Certification credits are taken for all artifacts that did not change from the baseline version. The Baseline version for this SAS is the Software Accomplishment Summary (SAS) for the Data Link Communication Application (DLCA-6500) 945-0519-300. The baseline SAS version 945-0519-300 is approved and certified by the FAA during the PMA (Parts Manufacturer Approval) certification approval of 810-0315-300(T/L drawing). For artifacts that changed from the baseline version, partial credit is taken for the unmodified portions of those artifacts, whereas verification was performed on the changed and affected portions. The verification effort included requirement based testing and functional based testing as well as structural coverage analysis. A Full RFS and SCA was performed for the version of software being released under this SAS.

The DLCA-6500 SAS (this document) identifies the final set of artifacts changed.

8.2 Commercial Off The Shelf (COTS) Software

N/A – there is no Commercial off the Shelf Software (COTS) in the DLCA-6500.

8.3 Product Service Experience

N/A - there is no product service experience for DLCA-6500.

8.4 Tool Assessment and Qualification

See Table 5 DLCA-6500 S/W Tools for a list of tools used in the development of the life cycle data for DLCA-6500. Qualification is required for all software tools which:

1. Can insert an error into the airborne software or fail to detect an existing error in the software within the scope of the intended use of the tool; and
2. Will not have the output of the tool verified as specified in Section 6 of DO-178B [56]; and
3. Eliminate, reduce, or automate a process of DO-178B by the use of the tool.

Deviation from the PSAC: The PSAC document [51] Section 6.1.2.1, mentions Tool qualification for Vision Framework, a tool used for testing of avionics HMI. But for this version of SAS, 945-0519-510 Rev -, Vision Framework tool is not used. Hence it is not mentioned in below Table 5 DLCA-6500 S/W Tools, so its Tool qualification is also not applicable. DLCA-6500 uses VISTA for the verification, as an alternate for Vision Framework tool. The Vision Test Tool compares the crafted HMI page images to the HMI pages on the AFD whereas the VISTA uses the python utilities to determine the A661 widget from the HMI pages on the AFD.

Applying this assessment to the tools planned for use in the DLCA-6500 resulted in two tools requiring qualification. They are discussed in the sections below.

Table 5 DLCA-6500 S/W Tools

Life Cycle	Tool Capability	Tool Used	DO-178B Qualification Required?
Support	Documentation	Microsoft Office Excel	No
Support	Documentation	DOORS	No
Support	Documentation	Microsoft Office Word	No
Support	Documentation	Microsoft Office VISIO	No
Support	Documentation	Microsoft Office PowerPoint	No
Support	Schedule Management	Microsoft Project	No
Support	Schedule Management	SAP	No
Support	Problem Report Tracking	JIRA	No
Support	Configuration Management	Subversion	No
Support	Peer Review Tool	Rockwell Collins PREP	No
Support	Traceability	DOORS	No
Requirements	Specification	DOORS	No
Requirements	Specification	Microsoft Word	No
Requirements	Modeling	Microsoft Office Visio	No
Design	Modeling	Microsoft Word	No
Design	Modeling	DOORS	No
Design	Design graphical layout	VAPS XT	No
Design	IDE	Eclipse	No
Coding (Intel based target)	Source Code Analyzer	Gimpel PC Lint for C/C++	No
Coding (Intel based target)	Source Code Analyzer	Dr.Memory	No
Coding (Intel based target)	IDE	Eclipse CDT	No

Life Cycle	Tool Capability	Tool Used	DO-178B Qualification Required?
Coding (PPC based target)	C/C++ Compiler	LynxOS-178 CDK GNU gcc PPC cross compiler for Windows	No
Coding (PPC based target)	Source Code Analyzer	Gimpel PC Lint for C/C++	No
Software Verification	Coverage Analysis	Vector Cast	Yes
Software Verification	Test Simulation	AGPS	No
Software Verification	Test Simulation	ATC Ground Station	No
Software Verification	Test Simulation	Airtel ATN Router	No
Software Verification	Test Simulation	Message Library Tester [41]	No
Software Verification	Test Simulation	Trace Tool	No
Software Verification	Test Simulation	VISTA	Yes
Software Verification Procedures & Results	Documentation	MS Word	No
Software Verification Procedures & Results	Documentation	MS Excel	No

8.4.1 Qualification Overview

Rockwell Collins developed tools that require verification tool qualification per DO-178B and FAA Order 8110.49A [60] .

All tools selected for qualification are qualified per DO-178B [56] and FAA Order 8110.49A [60].

8.4.1.1 VectorCAST Cover Tool Suite

VectorCAST Cover Tool Suite is developed by VectorCAST and is a software tool used to automate the collection and reporting of structural coverage results, whereby the source code is instrumented with tags that record statement coverage during functional requirements based testing. The reports are used to assist engineering in performing Structural Coverage Analysis (SCA).

VectorCAST offers a Tool Qualification Kit and enables clients and certification authorities to audit the VectorCAST Tool Suite for use in projects. Rockwell Collins coordinated with VectorCAST to obtain the Tool Qualification Kit and perform the qualification testing (see [40]).

8.4.1.2 VISTA

VISTA is a software tool used throughout the development and verification processes of the DLCA-6500 product. This tool facilitates code execution, debugging, and verification testing in both target hardware and host-based environments. Selected features of this tool are used to automate the gathering of verification test results. Therefore, these features of the tool are qualified. VISTA was developed by Rockwell Collins. The qualification of this tool was performed by the VISTA development group (see [39]).

8.5 Option Selectable Software

Deviation from PSAC: The PSAC document [51] under Option Selectable Software section, has details about option selectable code in DLCA-6500, regarding Inbox, Configurable Inbox Style, IOC flows, Top Level Menuing. These details are moved to Section 8.9 Parameter Data Items, of this SAS document.

Option selectable software is synonymous with deactivated software and represents functional code segments that can be enabled/disabled by an external configuration item – such as a license key or strap. For all such code segments, the software verification test procedures tested the function when enabled and tested that the function did not execute when disabled, through requirement based testing.

The following option selectable software exists in the DLCA-6500:

- Dual DLCA Key: Enables active/standby mode determination logic with a peer DLCA-6500.
- FANS Key: Enables the FANS applications within the DLCA-6500.
- ATN Key: Enables the ATN applications within the DLCA-6500.

Table 6 DLCA Options (Licenses Keys/Strapping)

Valid Keys/Strapping
No DLCA active
Single DLCA with FANS
Single DLCA with ATN
Single DLCA with FANS & ATN
Dual* DLCA with FANS
Dual* DLCA with ATN
Dual* DLCA with FANS and ATN

Note: * indicates Active/Standby Dual Installation

8.6 User Modifiable Software

N/A – there is no user-modifiable software in the DLCA-6500 product.

8.7 Field Loadable Software

The DLCA-6500 application is field-loadable. Data load functionality allows the software to be updated without removing hardware from the aircraft. Data load software included as a part of the Platform Software SAS [33] provides field loadable capability for the DLCA-6500 application. Entry into the data load software is controlled by the platform's Level A boot software, which ensures that the hardware is in the proper configuration before allowing data load to begin. When data load is complete, the hardware is rebooted. The Level A platform software then verifies the integrity of the new software load via CRC before allowing the software to run.

Refer to the Platform Software SAS [33] for information on the data load software.

8.8 Multiple Version Dissimilar Software

N/A – multiple-version dissimilar software is not being used in the DLCA-6500 product.

8.9 Parameter Data Items

Deviation from the PSAC: This section was not part of the PSAC [51].

DLCA-6500 has 3 XML files that are considered as PDI data, XML I/O Configuration File, XML General Configuration File and XML ATN Default Addresses.

Refer to Computer Program Configuration Item (CPCI) for the Data Link Communications Application (DLCA-6500) XML I/O Configuration File [21], for DLCA-6500 XML I/O Configuration File which lists all of the network connections and NDO to be registered at start-up. All connections are specified in the DLCA-6500 Input/Output Common Format (IOCF) [16].

Refer to Computer Program Configuration Item (CPCI) for the Data Link Communication Application (DLCA-6500) XML General Configuration File [25], The DLCA-6500 XML General Configuration File contains AGS Connections and Inbox Configuration updates needed to support DLCA-6500 software for the A220 program.

Refer to Computer Program Configuration Item (CPCI) for the Data Link Communications Application (DLCA-6500) XML Default ATN Addresses [22], XML Default ATN Addresses contains the default list of ATN facilities and their respective CM addresses that are going to be pre-loaded in the DLCA-6500 application software. The ATN addresses contained in this file represents the stations the pilot can login to in ATN service type. In addition to the ATN Addresses, other ATN configuration data is stored in this file. This data includes information such as ATN Timers.

The following option selectable code exists in DLCA:

- Inbox: The DLCA software can enable the Configurable Inbox, the Non-Configurable Inbox or deactivate the inbox. This is managed in the XML General Configuration File [25].
The A220 program's XML General Configuration File [25] has enabled the Non-Configurable Inbox and disabled the Configurable Inbox.
- Configurable Inbox Style: The Configurable Inbox can use a Message Log or operate without one. This is managed in the XML General Configuration File [25].
The A220 program's XML General Configuration File [25] has enabled the Non-Configurable Inbox and disabled the Configurable Inbox, hence the Configurable Inbox Style is not applicable.
- IOC Flows: The ICAO Address and Data Link Interlock Status word can use a different number of flows on the CCM hardware versus the AFD-37X0 hardware. With the CCM hardware, the DLCA uses 4 flows and with the AFD-37X0 hardware, the DLCA uses 2 flows. This is managed in the XML I/O Configuration File [21].
The A220 program's XML I/O Configuration File [21] has 4 flows [RIU_LEFT_ICAO, RIU_RIGHT_ICAO, RIU_LEFT_INTERLOCK_STATUS_WORD, RIU_RIGHT_INTERLOCK_STATUS_WORD].
- Top Level Menuing: The DLCA software can enable the drop-down menu logic or tab menu logic. This is managed in the XML General Configuration File [25].
The A220 program's XML General Configuration File [25], has SystemType set to IPS, for drop down menu logic.

For those items that correspond to an enabled/disabled option, the requirement base software verification tests the function when enabled and tests that the function is not executed when disabled.

8.10 Model-Based Development (MBD) Methods and Tools

Deviation from the PSAC: This section was not part of the PSAC [51].

MBD Methods and Tools are N/A for DLCA-6500 project.

8.11 Multi-Core Processor Software

Deviation from the PSAC: This section was not part of the PSAC [51].

The target hardware does not host a multi-core processor; therefore, the software does not contain any provisions for running on a multi-core processor.

8.12 Object Code Coverage Analysis

Deviation from the PSAC: This section was not part of the PSAC [51].

Object Code Coverage Analysis is Not applicable. DLCA-6500 is DAL C.

8.13 Dynamic Memory Allocation

The DLCA-6500 software has its own locally managed dynamic memory allocation function. A fixed-sized heap is allocated once from the system during initialization, and all subsequent system calls to allocate and deallocate memory (new, delete, malloc, free) are overridden to utilize the locally managed heap. The managed heap is implemented using a “buddy heap” algorithm; such that adjacent free blocks are merged to form larger blocks to prevent fragmentation. The following implementation details are also employed to provide speed and prevent fragmentation:

- The free list is sorted by block size such that allocations are performed “best fit first” and ensuring that the largest block is always the last to be subdivided.
- Merging of adjacent free blocks (buddies) occurs immediately when a block is freed for reuse. Up to three blocks may be merged in one operation.
- Blocks are paragraph aligned on 16 byte boundaries.
- Sizes are allocated on paragraph alignment.

In the DLCA-6500 design, objects that serve as the fundamental operational components of the system are designed following the Singleton Pattern, and thus instantiated only once at program initialization. The operational software itself is not designed to dynamically change. This ensures a more deterministic execution profile. Only objects that contain data as a result of an external data-driven event are dynamically allocated. In these instances, protection from too many events/messages is handled in the same manner as if a static allocation were exceeded – the application identifies the limit and reset. The rationale is based on the concept that static limits are not intended to be exceeded “by design”, and that there is no logical advantage for continued operation in a degraded mode. This error is also annunciated on the diagnostic output port.

Additionally, a continuous monitor function exists to record low and high water marks on the heap and is periodically annunciated on the diagnostic output port. This monitor function is examined during verification testing to empirically test against memory leaks and to verify the system returns to the same quiescent state following repeated bursts of data activity.

8.14 Object Oriented Methods and Languages

This section addresses the concerns noted in the FAA CAST position paper CAST-8 [66] regarding use of the C++ programming.

The sections below follow the same outline as in the CAST-8 [66] position paper, and provide discussion aimed at each of the stated concerns within that paper.

8.14.1 Compile-Time Issues

8.14.1.1 Dead/Deactivated Code

Deactivated code is addressed in Section 8.5. The DLCA-6500 software does not contain any dead code.

8.14.1.2 Encapsulation

Encapsulation is one of the major tenets of a good object oriented design. The DLCA-6500 software design incorporates encapsulation techniques in the interest of producing software that is maintainable and extensible. The public interfaces defined for every class is sufficiently documented such that the programmer understands internal side effects as well as pre- and post-conditions. Furthermore, the source code management system allow each programmer full access to the detailed implementation of every class design in the DLCA-6500 software system to aid in class utilization.

8.14.1.3 Inheritance

Inheritance was utilized in accordance with the DLCA coding standards referred in the SDP [7].

8.14.1.4 Overloading

Overloading is a powerful C++ mechanism for creating a family of related functions that only differ in type and number of arguments. The DLCA-6500 software design utilize function overloading with the following constraints to eliminate confusion:

- Functions are not created with the same name for different purposes, i.e. the overloaded functions perform essentially the same service.
- Subclasses was not to overload a function inherited from a superclass. Overloading inherited functions can cause confusion between what's been overridden and overloaded and can lead to unexpected implicit type conversions.

8.14.2 Run-Time Issues

8.14.2.1 Dynamic Binding/Dispatch

Another powerful tenet of C++ and object oriented design; dynamic binding is used to support polymorphism. The DLCA-6500 software design limits the use of dynamic binding to those capabilities provided by the C++ virtual function pointer table implementation as part of the certified LynxOS-178 C++ run-time library. No other implementation of dynamic binding was developed in the DLCA-6500 application domain. Additionally, the use of Run-Time Type Identification (RTTI) was not allowed in the DLCA-6500 software design.

8.14.2.2 Polymorphism

Supported by dynamic binding discussed above, polymorphism is a fundamental asset to good object oriented design. The DLCA software design utilizes polymorphism to define consistent levels of abstraction between similar objects with different behavior. To eliminate ambiguity and tracing complexity, polymorphic classes have been designed using interface (pure virtual) classes at the desired level of abstraction, and implementation of those interface classes only at the last derived subclass level. Implementation of a public or protected method in a base or intermediate class are only allowed when the method is defined as virtual in the class, and the implementation must be overridden by all derived classes. For a derived class where the parent's class implementation is fully sufficient, the derived class's override method was the only explicitly call the parent class method. This allows structural coverage tools to clearly demonstrate the execution of inherited functions by all derived classes.

8.15 Alternative Methods

DO-178B guidance is applied to this project, No alternative methods of compliance were used on this project.

9 Software Characteristics

Table 7 DLCA-6500 SLOC, summarizes the logical SLOC for the DLCA-6500 software:

Table 7 DLCA-6500 SLOC

CPCI	SLOC
HMI [18]	41823
Core [19]	26790*
Message Lib [20]	20706
Support Files [23]	6727
Totals	96046

* Note: SLOC for the Core [19] in the above Table 7 DLCA-6500 SLOC is excluding Support Files in it, as Support Files [23] SLOC is considered separately in the same Table 7.

Software characteristics were documented in the Application Footprint [5] document in keeping with the IMA Footprint Process [3]. The Application Footprint defines the software characteristics and the IMA platform resources required for the DLCA-6500 to perform its function.

The throughput, timing and memory measurements for this certification effort are found in the DLCA-6500 Footprint Document [5]. The DLCA-6500 Footprint Document references the SAS version it is associated with.

In accordance with AC 20-170 Appendix A. 4 [69] guidance, the target hardware used during software verification testing is functionally identical to the hardware used during Environmental Qualification Test. The CCM-5110 IMA Footprint Analysis [4] document has been reviewed. The Qualification Test Software has been deemed sufficient to meet or exceed all processing performed by this product and compliant to the specified TSO performance requirements under standard and environmental conditions by analysis, test, similarity or FAA approved deviation.

10 Software Identification

The top level part number for this DLCA-6500 release is 810-0315-510 [32].

This SAS applies to the Computer Program Configuration Items which are listed below:

- Computer Program Configuration Item (CPCI) for the Data Link Communications Application (DLCA-6500) Electronic Nameplate [26]
- Computer Program Configuration Item (CPCI) for the Data Link Communication Application (DLCA-6500) XML General Configuration File [25]
- Computer Program Configuration Item (CPCI) for the Data Link Communications Application (DLCA-6500) XML I/O Configuration File [21]
- Computer Program Configuration Item (CPCI) for the Data Link Communications Application (DLCA-6500) XML Default ATN Addresses [22]
- Computer Program Configuration Item (CPCI) for the Data Link Communications Application (DLCA-6500) Application with A661 for Human Machine Interface (HMI) [18]
- Computer Program Configuration Item (CPCI) for the Data Link Communications Application (DLCA-6500) Core Software Library [19]
- Computer Program Configuration Item (CPCI) for the Data Link Communications Application (DLCA-6500) Message Library [20]
- Computer Program Configuration Item (CPCI) for the Data Link Communications Application (DLCA-6500) A661 Definition Files [24]
- Computer Program Configuration Item (CPCI) for the Data Link Communications Application (DLCA-6500) Support Files [23]

11 Change History

This version of DLCA-6500 is based on the baseline DLCA-6500 RCPN 810-0315-300.

This release includes implementation of Route clearance message formatting, logon status page re-design, Tabbed base menu for EDS, Provider abort related issue fixes for VCI and additional Bug fixes . The Work Packages (WPs) implemented are included in Appendix C. Table 8 WPs Implemented Classification includes the classification of WPs implemented in this release.

Table 8 WPs Implemented Classification

Criticality	Description	Number of WPs
0A	Safety Impact No Mitigation	0
0B	Safety Impact with Mitigation	0
1A	Significant Operational Impact	5
1B	No Significant Operational Impact	135
2	No Operational Impact	74
3A	Significant Process Deviation Impact	77
3B	Non-Significant Process Deviation Impact	147
4A	Product Improvement	91
4B	Documentation Improvement	36
4C	New Feature	2
	Total:	567

12 Software Status

12.1 Verification Results

The complete verification results for the DLCA can be found in the Software Verification Procedures and Results [28] and CPCI for Software Verification Procedures and Results [29].

The full set of test procedures were executed on the target hardware. The test procedures were executed on a VM configuration that conforms to the Application Footprint defined in the DLCA Footprint Document [5]. This ensures that when the DLCA-6500 is included in a Fusion IMA system per the System Configuration Process [3] the DLCA-6500 correctly performs its function.

Complete verification results are contained in the DLCA SVPR [28] and in the DLCA SVPR CPCI [29]. There are no known problems with this software that limit its functionality. A summary of open problem reports and an analysis of why the open PRs do not have safety-of-flight impact are included in this document.

12.2 Known Problems

12.2.1 Open Problem Reports

All the Open Problem Reports (WPs) that are associated with this DLCA-6500 release are included in Appendix D.1. The open WPs included in Appendix D.1 represent the known problems (errors, faults, failures, deviations) not implemented associated with the software and documentation.

Each of the open WPs in Appendix D.1 have been analyzed and reviewed by a team of senior data link engineers as well as the software architect to determine impact on safety, flight deck impact, and functional criticality. Safety Engineer has reviewed these open WPs and determined no safety impact.

It has been determined by this team of senior engineers that the WPs listed in Appendix D.1 are not safety issues, have little or no flight deck effect, and are not functionally critical to the overall successful operation of the DLCA-6500. Corrections to these open problems will be addressed and considered in subsequent software releases. All open WPs will be reviewed during the software planning for the next development to determine inclusion.

All known issues listed in Appendix D.1 are categorized as below in Table 9 Open WPs Classification.

Table 9 Open WPs Classification

Criticality	Description	Number of WPs	AMC Classification 20-189
0A	Safety Impact No Mitigation	0	Significant: Assessed at the product, system, or equipment level, a Problem Report (PR) that has an actual or potential effect on the product, system, or equipment function that may lead to a Catastrophic, Hazardous or Major failure condition, or may affect compliance with the operating rules.
0B	Safety Impact with Mitigation	0	
1A	Significant Operational Impact	1	
1B	No Significant Operational Impact	38	Functional: A PR that has an actual or a potential effect on a function at the product, system, or equipment level.
2	No Operational Impact	31	Life Cycle Data: A PR that is linked to a deficiency in a life cycle data item but not linked to a process non-compliance or process deficiency.
3A	Significant Process Deviation Impact	5	Process: A PR that records a process non-compliance or deficiency that cannot result in a potential safety, nor a potential functional, effect.
3B	Non-Significant Process Deviation Impact	17	Life Cycle Data: A PR that is linked to a deficiency in a life cycle data item but not linked to a process non-compliance or process deficiency.
	Total:	92	

12.2.2 No Change/Duplicate Problem Reports

All Open Problem Reports (WPs) associated with baseline SAS (945-0519-300 Rev -) were re-evaluated, during this DLCA-6500 development and Problem Reports included in Appendix D.2 are moved to Duplicate or No Change.

12.3 External OPR

OPRs in Appendix E are from the LynxOS-178 (RSC) Version 2.2.2 Software Accomplishment Summary [35]. These OPRs have been reviewed and determined that there is no impact to the DLCA-6500 application.

13 Compliance Statement

The processes documented in this Software Accomplishment Summary were followed during the development of the software identified in this Software Accomplishment Summary and the documents produced during this process demonstrate compliance with the DO-178B guidelines for software with a criticality Level C.

Appendix A List of Acronyms

AC	ADVISORY CIRCULAR
ACARS	AIRCRAFT COMM ADDRESSING AND REPORTING SYSTEM
ACL	ATC CLEARANCE
ACF	ACARS CONVERGENT FUNCTION
ACS	ACARS COMPATIBLE SYSTEM
ADS	AUTOMATIC DEPENDENT SURVEILLANCE
AFD	ADAPTIVE FLIGHT DISPLAY
AFDA	ADAPTIVE FLIGHT DISPLAY APPLICATION
AFDT	ADAPTIVE FLIGHT DISPLAY TABLE
AFDX	AVIONICS FULL DUPLEX ETHERNET
AFN	ATS FACILITY NOTIFICATION
AGPS	AIR GROUND PROTOCOL STACK
AGS	ARINC-661 GRAPHICS SERVER
AOC	AIRLINE OPERATIONS CONTROL
API	APPLICATION PROGRAMMING INTERFACE
APP	APPLICATION
ARINC	AERONAUTICAL RADIO INCORPORATED
ARR	ARRIVAL
ASCII	AMERICAN STANDARD CODE FOR INFORMATION INTERCHANGE
ASL	AVIONICS SYSTEM LOCAL AREA NETWORK (LAN)
ATA	AIR TRANSPORT ASSOCIATION
ATC	AIR TRAFFIC CONTROL
ATN	AERONAUTICAL TELECOMMUNICATION NETWORK
ATS	AIR TRAFFIC SERVICES
ATSU	AIR TRAFFIC SERVICES UNIT
BDF	BINARY DEFINITION FILE
BOP	BIT ORIENTED PROTOCOL
CAGE	COMMERCIAL AND GOVERNMENT ENTITY
CAST	COMMERICAL AVIATION SAFETY TEAM
CCB	CHANGE CONTROL BOARD
CCM	COMMON COMPUTING MODULE
CDA	CURRENT DATA AUTHORITY
CIO	COMMON INPUT/OUTPUT
CM	CONFIGURATION MANAGEMENT
CMU	COMMUNICATIONS MANAGEMENT UNIT

CNS	COMMUNICATION, NAVIGATION AND SURVEILLANCE
CODEC	CODER DECODER
COMM	COMMUNICATION
CON	CONNECTION
CONFIG	CONFIGURATION
COTS	COMMERCIAL OFF THE SHELF
CPA	COMMON PROCESSING ASSEMBLY
CPCI	COMPUTER PROGRAM CONFIGURATION ITEM
CPDLC	CONTROLLER/PILOT DATA LINK COMMUNICATIONS
CPN	COLLINS PART NUMBER
CPR	COMMON PROCESSING RESOURCE
CPU	CENTRAL PROCESSING UNIT
CRC	CYCLIC REDUNDANCY CHECK
CRD	CLEARANCE REQUEST AND DELIVERY SERVICE
CRI	CERTIFICATION REVIEW ITEM
CS	COMMERCIAL SYSTEMS
CSS	COMMON SYSTEM SERVICES
CSU	COMPUTER SOFTWARE UNIT
CT	CHANGE TASK
CVR	COCKPIT VOICE RECORDER
DA	DIGITAL TO ANALOG
DAC	DESIGN ASSURANCE CENTER
DAL	DESIGN ASSURANCE LEVEL
DEED	DATA ENTRY ERROR DISPLAY
DL	DATA LOAD
DLCA	DATA LINK COMMUNICATION APPLICATION
DM	DATA MANAGER
DMC	DATA MANAGER CLIENT
DO	DOCUMENT
DOORS	DYNAMIC OBJECT ORIENTED REQUIREMENTS SYSTEM
DS	DESIGN SHEET
DSI	DIALOGUE SERVICE INTERFACE
DSK	DOUBLE STACKED KNOB
EASA	EUROPEAN-AVIATION SAFETY AGENCY
ED	ELECTRODYNAMIC
EICAS	ENGINE INDICATION AND CREW ALERTING SYSTEM
EOF	END OF FLIGHT

EUROCAE	EUROPEAN ORGANISATION FOR CIVIL AVIATION EQUIPMENT
FAA	FEDERAL AVIATION ADMINISTRATION
FANS	FUTURE AIR NAVIGATION SYSTEM
FD	FLIGHT DIRECTOR
FDE	FLIGHT DECK EFFECT
FDSA	FLIGHT DISPLAY SYSTEM APPLICATION
FMF	FLIGHT MANAGEMENT FUNCTION
FMS	FLIGHT MANAGEMENT SYSTEM
GB	GIGABYTE
GND	GROUND
GUI	GRAPHICAL USER INTERFACE
HEX	HEX DECIMAL
HF	HIGH FREQUENCY (3-30 MHZ)
HLRs	HIGH LEVEL REQUIREMENTS SPECIFICATION
HMI	HUMAN/MACHINE INTERFACE
HW	HARDWARE
ICAO	INTERNATIONAL CIVIL AVIATION ORGANIZATION
ID	IDENTIFICATION
GETC-I	GLOBAL ENGINEERING TECHNOLOGY CENTER- INDIA
IMA	INTEGRATED MODULAR AVIONICS
IO	INPUT/OUTPUT
IOC	INPUT OUTPUT CONCENTRATOR
IOCF	INPUT/OUTPUT COMMON FORMAT
IPS	INTEGRATED PROCESSING SYSTEM
KDI	KERNEL DOWNLOAD IMAGE
LAN	LOCAL AREA NETWORK
LONG	LONGITUDE
MIB	MANAGEMENT INFORMATION BASE
MKP	MULTIFUNCTION KEYBOARD PANEL
MMU	MASS MEMORY UNIT
NDA	NEXT DATA AUTHORITY
NDO	NETWORK DATA OBJECT
NVM	NON-VOLATILE MEMORY
OEM	ORIGINAL EQUIPMENT MANUFACTURER
OS	OPERATING SYSTEM
PC	PERSONAL COMPUTER
PDR	PRELIMINARY DESIGN REVIEW

PM	PROTOCOL MANAGER
PMA	PROTOCOL MANAGER APPLICATION
POS	POSITION
PPC	POWER PC
PREP	PEER REVIEW ECLIPSE PROGRAM
PSAC	PLAN FOR SAFETY ASPECTS OF CERTIFICATION
QOS	QUALITY OF SERVICE
RAM	RANDOM ACCESS MEMORY
RBT	REQUIREMENT BASED TEST
RC	ROCKWELL COLLINS
RCI	ROCKWELL COLLINS INCORPORATED
RCPN	ROCKWELL COLLINS PART NUMBER
REV	REVISION
RFS	RUN FOR SCORE
RIU	RADIO INTERFACE UNIT
RTCA	RADIO TECHNICAL COMMISSION FOR AERONAUTICS
RTOS	REAL-TIME OPERATING SYSTEM
SAS	SOFTWARE ACCOMPLISHMENT SUMMARY
SATCOM	SATELLITE COMMUNICATION
SCA	STRUCTURAL COVERAGE ANALYSIS
SCI	SAFETY CRITICAL ITEM
SCL	SOFTWARE CONTROL LIBRARY
SCM	SOFTWARE CONFIGURATION MANAGEMENT
SDD	SOFTWARE DESIGN DOCUMENT
SDP	SOFTWARE DEVELOPMENT PLAN
SEE	SOFTWARE ENGINEERING ENVIRONMENT
SLOC	SOURCE LINES OF CODE
SPEC	SPECIFICATION
SQA	SOFTWARE QUALITY ASSURANCE
SRS	SOFTWARE REQUIREMENTS SPECIFICATION
SW	SOFTWARE
TCR	TSO COMPLIANCE REPRESENTATIVE
TDF	TEXT DEFINITION FILE
TOR	TOOL OPERATIONAL REQUIREMENTS
TQD	TOOL QUAL DATA
TSO	TECHNICAL STANDARD ORDER

UTC	UNIVERSAL TIME COORDINATE
VHF	VERY HIGH FREQUENCY
WKN	WELL KNOWN NAME
WKS	WELL KNOWN SERVICE
WP	WORK PACKAGE

Appendix B DO-178B Matrix

DO-178B Document	DO-178B Guideline	SAS Template Section
System Overview	11.20.a	3
Software Overview	11.20.b	4
Certification Considerations	11.20.c	5
Software Characteristics	11.20.d	9
Software Life Cycle	11.20.e	6
Software Life Cycle Data	11.20.f	7
Additional Considerations	11.20.g	8
Software Identification	11.20.h	10
Change History	11.20.i	11
Software Status	11.20.j	12
Compliance Statement	11.20.k	13

Appendix C DLCA-6500 Implemented Work Packages

Implemented WPs are categorized in subsections of this Appendix C.

Baseline SAS RCPN 945-0519-300, includes all the applicable Version 3.X WPs, and implemented WPs in it are included till DLNK_DLCA6500_3.6, _DLNK_DLCA6500_3-REQ/TEST. Hence for this SAS starting WPs are from Version 4.X.

C.1 DLCA-6500 Implemented Work Packages between V4.0.0 to V5.0.7

Work Package #	Summary	Criticality	Build
DLSS-16595	DLCA6500: Application Resets after NO COMM Timer expires in ATN Network	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.6
DLSS-16647	DLCA-6500 : CPDLC Connection is not Terminated for any uplink combination of (N Type + W/U Type + Endwithmsg) (ATN Only)	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.6
DLSS-16929	DLCA6500: Build 5.0.3 SCA Dead Code Removal Set-2	2 - No Operational Effect	DLNK DLCA6500 5.0.6
DLSS-16928	DLCA6500: Build 5.0.3 SCA Dead Code Removal Set-1	2 - No Operational Effect	DLNK DLCA6500 5.0.6
DLSS-16006	DLCA-6500: LOGON UPDATE Related Issues	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.5
DLSS-16002	DLCA-6500: RESET when disabling CPDLC during CM logon	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.5
DLSS-16027	DLCA6500- Word Wrapping Issue for the Last Word in a Uplink Message.	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.5

Software Accomplishment Summary (SAS) for Data Link Communication Application (DLCA-6500)

Work Package #	Summary	Criticality	Build
DLSS-15763	DLCA-6500: The Greyed out Standby button need to be invisible when Uplink message contains End of Service	4A - Product Improvement	DLNK DLCA6500 5.0.5
DLSS-15949	DLCA-6500: Dual Display Issue with LOGON/STATUS display of "LOGGED ON"	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.5
DLSS-15874	DLCA-6500 - CPDLC UIDI Issues	4A - Product Improvement	DLNK DLCA6500 5.0.5
DLSS-15754	DLCA-6500 : Update DLCA for DLCA - VAPS change to LOGON/STATUS page	4A - Product Improvement	DLNK DLCA6500 5.0.5
DLSS-15746	DLCA6500: Connection Termination & Logon Page Navigation Issue	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.5
DLSS-16097	DLCA6500: DLCA Is Not Exiting Properly during Warm Start (ALM License key change)	4A - Product Improvement	DLNK DLCA6500 5.0.5
DLSS-16072	DLCA6500: ADS & CPDLC Connections gets disconnected when stale data is received for ICAO Address	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.5
DLSS-15645	DLCA-6500: AFD-3200 Top Level Menu Page Tabs/Dropdowns Missing, when CPDLC BUTTON Event is received	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.4
DLSS-15889	DLCA-6500 - When SEND LOGON FUNCTION is selected, manual entry capability to FLIGHT_ID_ENTRY is not disabled(FANS Only).	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.5

Software Accomplishment Summary (SAS) for Data Link Communication Application (DLCA-6500)

Work Package #	Summary	Criticality	Build
DLSS-15934	DLCA-6500: CM logon failure do not send downlink error messages	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.5
DLSS-15933	DLCA6500: ADS Connection gets Disconnected when the ATN CDA establishes for the first time	2 - No Operational Effect	DLNK DLCA6500 5.0.5
DLSS-15509	DLCA-6500: Update DLCA for DLCA-LOGON/STATUS Page Changes related to Manual Logon	4A - Product Improvement	DLNK DLCA6500 5.0.4
DLSS-15733	DLCA-6500: AFD-3200 MSG overlay issue when "ATC MSG" control is selected	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.5
DLSS-15709	DLCA-6500 : Update the DLCA(ATN Only) Ability to Defer the End Service Msg in Multi-Element uplink until all other messages in it are responded	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.5
DLSS-15707	DLCA6500- DLDM- Large Flight Plan load from DLCA while in takeoff will return END of Flight	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.5
DLSS-15417	DLCA-6500: Label 272, Bit 17and Bit 21 is Not Working Properly On Dual DLCA	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.4
DLSS-17612	DLCA-6500: IPS Build 5.0.7 EMOD01 (Red Label2)	4A - Product Improvement	DLNK DLCA6500 5.0.7
DLSS-17143	DLCA-6500: Update to Support EUR NSAP Address Registry Version 11.0	4A - Product Improvement	DLNK DLCA6500 5.0.7
DLSS-17281	DLCA6500: Remove the ATN Address LPPO & ENOB from the ATN XML Configuration File	4A - Product Improvement	DLNK DLCA6500 5.0.7

Software Accomplishment Summary (SAS) for Data Link Communication Application (DLCA-6500)

Work Package #	Summary	Criticality	Build
DLSS-17219	DLCA-6500: Accessing CPDLC with no advisories does not return crew to last open page	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.7
DLSS-17191	DLCA-6500: Message Review page widgets unavailable following display power cycle	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.7
DLSS-17453	DLCA6500 - Check for Invalid Characters in Route Clearance	2 - No Operational Effect	DLNK DLCA6500 5.0.7
DLSS-17452	DLCA-6500 - SCA Uncovered Code - AsnFmtFans.cpp	2 - No Operational Effect	DLNK DLCA6500 5.0.7
DLSS-17451	DLCA-6500 - Update AFN Code to limit Number of Debug Printouts	4A - Product Improvement	DLNK DLCA6500 5.0.7
DLSS-17450	DLCA-6500 - SCA Unused Code - "Calloc" Method	3A - Significant Process Deviation	DLNK DLCA6500 5.0.7
DLSS-16987	DLCA6500 : Build 5.0.3 SCA Def-Implementation	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.6
DLSS-16986	DLCA6500: Build 5.0.3/5.0.5 SCA Dead Code Removal Set-4	2 - No Operational Effect	DLNK DLCA6500 5.0.6
DLSS-16988	DLCA-6500: "Out of Memory" Severity used When Reporting to Health Monitor (HM) API	4A - Product Improvement	DLNK DLCA6500 5.0.6
DLSS-16955	DLCA6500: Build 5.0.3 SCA Dead Code Removal Set-3	2 - No Operational Effect	DLNK DLCA6500 5.0.6

Software Accomplishment Summary (SAS) for Data Link Communication Application (DLCA-6500)

Work Package #	Summary	Criticality	Build
DLSS-15412	DLCA6500: Responding standby to ATN/FANS message [UM117/UM120] + End Service causes CDA & NDA termination	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.4
DLSS-15382	DLCA-6500: Destructor code not covered during SCA Analysis (Host Only)	2 - No Operational Effect	DLNK DLCA6500 5.0.4
DLSS-15405	DLCA-6500: IPS Dropdown Menu's when CDPLC connection is terminated.	2 - No Operational Effect	DLNK DLCA6500 5.0.4
DLSS-15045	DLCA6500: CVR Data records DLCA X INOP Alert bit state incorrectly(Dual DLCA only)	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.3
DLSS-14461	DLCA6500: Last attempted logon facility designator is not stored in Persistent Storage.	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.3
DLSS-14769	DLCA6500: RESET when ACCEPT Button on Msg Review page is selected on both AFDs simultaneously	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.3
DLSS-14629	DLCA6500 : Issues with "SetChild" A661 property for Non Config Inbox	4A - Product Improvement	DLNK DLCA6500 5.0.3
DLSS-14122	DLCA-6500 - Issue with Flight ID change in FANS network for Logon status "ACQUIRING POS DATA"/"CONTACTING XXXX"	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.4
DLSS-14042	DLCA6500: Incorrect CVR Data when the Logon state is changed to LOGON REQUIRED.	2 - No Operational Effect	DLNK DLCA6500 5.0.3

Software Accomplishment Summary (SAS) for Data Link Communication Application (DLCA-6500)

Work Package #	Summary	Criticality	Build
DLSS-13892	DLCA-6500 – FANS Transmitting CPDLC Disconnect Request (IMI=DR1) before the WILCO (dm0) in Response to END SERVICE (um161)	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.3
DLSS-13891	DLCA-6500: IPS Build 5.0.2 EMOD00 (Red Label1)-Set2	4A - Product Improvement	DLNK DLCA6500 5.0.2
DLSS-13520	DLCA-6500 - ALTITUDE REQ, OFFSET REQ, ROUTE REQ, and SPEED REQ Pages Data Not Updating when Network Type (FANS/ATN) Changes	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.2
DLSS-13308	DLCA6500: Inconsistent Implementation of Space Padding in MRA	2 - No Operational Effect	DLNK DLCA6500 5.0.3
DLSS-13509	DLCA-6500: Uplinking uM163 message results in AIRCREW HAS INHIBITED CPDLC error message	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.2
DLSS-13483	DLCA-6500: Issues related to Alerting requirements	4A - Product Improvement	DLNK DLCA6500 5.0.4
DLSS-16412	DLCA-6500: RESPONSE HISTORY empty for messages that are closed CONN ENDED	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.6
DLSS-16504	DLCA-6500 - Logon/status page goes Blank after Power-Cycle of the Display	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.6
DLSS-16503	DLCA-6500 - Reset after toggling MSG LOG filter	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.6
DLSS-16792	DLCA-6500: ACCEPT FUNCTION & REJECT FUNCTIONs are not disabled on VCI/TOC Page when Inactive Advisory	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.6

Software Accomplishment Summary (SAS) for Data Link Communication Application (DLCA-6500)

Work Package #	Summary	Criticality	Build
DLSS-16673	DLCA-6500: Logon entry value is cleared when FLIGHT ID ENTRY is disabled	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.6
DLSS-16529	DLCA-6500: DLCA Resets when ATN Debug bit is Enabled and CPDLC is Disabled during CM logon	2 - No Operational Effect	DLNK DLCA6500 5.0.6
DLSS-14960	DLCA-6500: Update DLCA for DLCA-LOGON/STATUS Page Changes	4A - Product Improvement	DLNK DLCA6500 5.0.4
DLSS-15081	DLCA-6500 : Update DLCA6500 - Application downlinks InvalidVHF error code When valid VHF received	3B - Non-Significant Process Deviation	DLNK DLCA6500 5.0.4
DLSS-15040	DLCA-6500 - New Requirement for CPDLC Cursor Control Features	4A - Product Improvement	DLNK DLCA6500 5.0.3
DLSS-14991	DLCA-6500 - Update DLCA for DLCA - Enabling ACCEPT and STANDBY Buttons after Load Failed	4A - Product Improvement	DLNK DLCA6500 5.0.3
DLSS-14948	DLCA6500 - Issue with Emergency page Free Text downlinks using dM67 instead of dM68	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.3
DLSS-14180	DLCA6500: Application Resets, When Page Response History page is Deactivated, after responding to large uplink uM80	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.3
DLSS-14207	DLCA-6500 - CNS Key displaying incorrect DLCA application pages	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.3

Software Accomplishment Summary (SAS) for Data Link Communication Application (DLCA-6500)

Work Package #	Summary	Criticality	Build
DLSS-13861	DLCA-6500 Non-Configurable Inbox Not Allow Reports of 'R' type to be Responded too	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.2
DLSS-13576	DLCA-6500 - Refresh QAK does not clear inbox when there are multiple TIMEDOUT messages	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.2
DLSS-13574	DLCA-6500: DLCA Notification word (Label 272 bit 17) Alert Not Triggered	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.2
DLSS-13570	DLCA6500: Unable to Build Codec Tester Executable (bmsclienthelpers.cpp is not part of MSGLIB)	2 - No Operational Effect	DLNK DLCA6500 5.0.2
DLSS-13565	DLCA-6500 - Issue with NDO 2771300 (DLCADDataAuthority) being Outputted by both Left and Right DLCA	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.2
DLSS-11223	DLCA6500: Dual DLCA / DLCA XSIDE Not working on PL Rig	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.1
DLSS-12611	DLCA-6500: Reset After Message Log Purge and UTC time issue on MSG_LOG	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.2
DLSS-12628	DLCA-6500 - Application Down-links ERROR UNEXPECTED DATA instead of ERROR INVALID DATA.	2 - No Operational Effect	DLNK DLCA6500 5.0.2
DLSS-12552	DLCA-6500: Tabbed Menu Issues	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.2

Software Accomplishment Summary (SAS) for Data Link Communication Application (DLCA-6500)

Work Package #	Summary	Criticality	Build
DLSS-12096	DLCA-6500: Pre-Departure Clearance Header needs to be included.	4A - Product Improvement	DLNK DLCA6500 5.0.2
DLSS-11704	DLCA6500: Message Removed from Non-Configurable Inbox With Selection of Accept / Reject	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.2
DLSS-11705	DLCA6500: FMS Mod insertion from Uplink Message has incorrect DLCA timer	4A - Product Improvement	DLNK DLCA6500 5.0.2
DLSS-11796	DLCA-6500 : Update DLCA for A220-Update Platform software to -005	4A - Product Improvement	DLNK DLCA6500 5.0.2
DLSS-11803	DLCA6500: HMI MESSAGE Review Page's Response History Momentarily Showing Previous Msg History on Display	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.2
DLSS-11806	DLCA6500 : Add Complex Uplink Messages to the Non-Configurable Inbox	4C - New Feature	DLNK DLCA6500 5.0.2
DLSS-15383	DLCA-6500: Disable Ground Initiated CAS/Advisory when Logon Timeout	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.4
DLSS-11895	DLCA6500: Update DLCA for CPDLC ACCEPT / REJECT Operation Inconsistency	4A - Product Improvement	DLNK DLCA6500 5.0.2
DLSS-11897	DLCA-6500: Merge 5.0.1 and 5.0.2 to PL5 Trunk	4A - Product Improvement	DLNK DLCA6500 5.0.3
DLSS-11890	DLCA-6500 : CPDLC Button Event is not functioning as per requirement	2 - No Operational Effect	DLNK DLCA6500 5.0.2

Software Accomplishment Summary (SAS) for Data Link Communication Application (DLCA-6500)

Work Package #	Summary	Criticality	Build
DLSS-11100	DLCA-6500 : Update DLCA for FUSNPL - Datalink Chime and CAS message when sending a FANS message	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.1
DLSS-11085	DLCA-6500 - Improve Readability of Messages Containing [predepartureclearance]	4A - Product Improvement	DLNK DLCA6500 5.0.1
DLSS-11263	DLCA6500 -ATN Route Clearance message is not displaying Destination Airport in the Order Defined (ATN Only Issue)	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.1
DLSS-12094	DLCA-6500 : DLCA Display Blinks when the CPDLC after 75 messages count is reached	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.2
DLSS-12093	DLCA-6500 : Reset issue when responding to uplink containing a ACCEPT/REJECT+Confirm Message	1A - Significant Operational Effect	DLNK DLCA6500 5.0.2
DLSS-12095	DLCA-6500: FANS/ HMI VOICE REQUEST SET button is active when mandatory data is not entered	4A - Product Improvement	DLNK DLCA6500 5.0.2
DLSS-11950	DLCA-6500: Source Selection not implemented correctly for the ICAO A/C ADDRESS	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.2
DLSS-11356	DLCA6500 : INVALID ENTRY DEED message on LOGON TO ENTRY	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.2
DLSS-11391	DLCA-6500: Update to Support EUR NSAP Address Registry Version 10.0	4A - Product Improvement	DLNK DLCA6500 5.0.3
DLSS-11635	DLCA-6500: DLCA IOCF Documentation Issue	2 - No Operational Effect	DLNK DLCA6500 5.0.2

Software Accomplishment Summary (SAS) for Data Link Communication Application (DLCA-6500)

Work Package #	Summary	Criticality	Build
DLSS-12524	DLCA6500: ATC COMM STATUS bit Issue for a Logon Data Mismatch Advisory	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.2
DLSS-12840	DLCA6500: Remove DM26 Message functionality on the CPDLC Page	4A - Product Improvement	DLNK DLCA6500 5.0.2
DLSS-10032	DLCA-6500 - No ATC Comm- Label 272, Bit 21 Not Working Properly On Initial Start Up	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.1
DLSS-10036	DLCA-6500 - Improve Readability of Uplink messages Containing [routeClearance] and/or are Loadable	4A - Product Improvement	DLNK DLCA6500 5.0.1
DLSS-8478	DLCA-6500: Issue with 75 UPLINK messages in message repository	1A - Significant Operational Effect	DLNK DLCA6500 5.0.1
DLSS-7142	DLCA-6500: Rejecting Uplink Messages that Contain a Valid VHF 8.33 Frequency	1B - No Significant Operational Effect	DLNK DLCA6500 4.0.1
DLSS-7980	DLCA6500: Identify Numeric, Altitude and Transponder Data Entry Fields for Correct Keypad	4C - New Feature	DLNK DLCA6500 5.0.0
DLSS-7995	DLCA-6500 - Update Flow name in IOCF to support Dual DLCA	4A - Product Improvement	DLNK DLCA6500 5.0.0
DLSS-7708	DLCA-6500: DLCA reports PM CIO_Create_Client_Connection fault	2 - No Operational Effect	DLNK DLCA6500 5.0.0
DLSS-7633	DLCA-6500 - Remove Top Level CPN from the SYSTEM INFO page	4A - Product Improvement	DLNK DLCA6500 5.0.1

Software Accomplishment Summary (SAS) for Data Link Communication Application (DLCA-6500)

Work Package #	Summary	Criticality	Build
DLSS-7731	DLCA-6500- ATN CPDLC Reject of uM183 Message Concatenation with VCI Uplink	4A - Product Improvement	DLNK DLCA6500 4.0.2
DLSS-7730	DLCA-6500 -VOICE REQUEST the frequency selection displayed NONE since NDO rates not match the producer	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.2
DLSS-7624	DLCA6500: DLCA Sends incorrect state at initial logon & Flight ID changes:	2 - No Operational Effect	DLNK DLCA6500 4.0.2
DLSS-7625	DLCA-6500 - Add CPDLC New and Open Message Counts to NDO	4A - Product Improvement	DLNK DLCA6500 5.0.0
DLSS-7858	DLCA-6500: Merge 4.0.1 to PL4 Trunk	4A - Product Improvement	DLNK DLCA6500 4.0.2
DLSS-7769	DLCA-6500 - Update ATN Current Data Authority (CDA) Logic When Missing um227(LACK)	4A - Product Improvement	DLNK DLCA6500 4.0.2
DLSS-7876	DLCA-6500: Create PL5.0 Trunk and Dev Branch 5.0.0	4A - Product Improvement	DLNK DLCA6500 5.0.0
DLSS-8206	DLCA-6500 - Conflicting FANS Uplink requirements for the IMI=DR1	1B - No Significant Operational Effect	DLNK DLCA6500 4.0.2
DLSS-8088	DLCA-6500: Operational configuration is not printed in Trace tool for few scenarios on License/straps update	3A - Significant Process Deviation	DLNK DLCA6500 5.0.0
DLSS-13140	DLCA-6500: Update ATC COMM STATUS Alert's (Label 276, Bit 12) CPDLC Connection Established Advisory Behavior	4A - Product Improvement	DLNK DLCA6500 5.0.2

Software Accomplishment Summary (SAS) for Data Link Communication Application (DLCA-6500)

Work Package #	Summary	Criticality	Build
DLSS-13177	DLCA6500 : Multi-VCI uplink message does not get set default state on CANCEL/CLEAR	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.2
DLSS-13212	DLCA-6500 – FANS Transmitting CPDLC Disconnect Request (IMI=DR1) before the WILCO (dm0) in Response to END SERVICE (um161)	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.2
DLSS-12909	DLCA-6500- uplink of a Comma at the end of free text may cause display errors in other pages	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.4
DLSS-13022	DLCA-6500: IPS Build 5.0.2 EMOD00 (Red Label1)	4A - Product Improvement	DLNK DLCA6500 5.0.2
DLSS-13009	DLCA-6500 - Requirements Issue Collector for CPDLC and Database Management Tabbing/Cursor Control Features	4A - Product Improvement	DLNK DLCA6500 5.0.3
DLSS-13090	DLCA-6500: End of Flight contract does not get established after a LOGON DATA CHANGED occurs and a new CPDLC Connection is Established	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.2
DLSS-13144	DLCA-6500: ATC COMM STATUS Alert's (Label 276, Bit 12) ATN Unexpected Disconnect Advisory Not Triggering when dm99(CDA) Not Responded To	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.2
DLSS-12811	DLCA6500: NDA uplink (um160) triggering ATC COMM MED bit (Label 276, Bit 13)	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.2
DLSS-12751	DLCA-6500 : Message Review Area Enabling ACCEPT and STANDBY Buttons When There Are Options Selected or Remarks text Present	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.2

Software Accomplishment Summary (SAS) for Data Link Communication Application (DLCA-6500)

Work Package #	Summary	Criticality	Build
DLSS-12135	DLCA-6500: - FANS CPDLC Free Texts have no space between lines(All pages)	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.2
DLSS-12716	DLCA-6500: EMERGENCY Page Resets when Trying to Compose dm59 on 2 Displays at the Same Time	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.2
DLSS-12687	DLCA-6500 - "Logon data has changed" Requirements Conflict Causing Label 272 alert bit 13 and 14 Alerting Issues	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.2
DLSS-12243	DLCA-6500: EDS Tabbed Menu Issue with Tabs Incorrectly Enabled based on License Keys	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.2
DLSS-12217	DLCA6500 - IPS ATN Logon Data Changed Event Enables hidden controls	1A - Significant Operational Effect	DLNK DLCA6500 5.0.2
DLSS-12948	DLCA-6500: LOGON/STATUS Displays Incorrect Logon Status for TIMED OUT condition	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.2
DLSS-10781	DLCA6500 : Update DLCA to Comply with ED-120 Change 3 that Removes use of Monitoring Downlink (Dm89/dm67aa) with VCI/TOC Transfers	4A - Product Improvement	DLNK DLCA6500 5.0.3
DLSS-10709	DLCA-6500: - FANS CPDLC Free Texts have no space between lines	4A - Product Improvement	DLNK DLCA6500 5.0.1
DLSS-10521	DLCA-6500 - CAS and Fault Messaging for Dual DLCA	4A - Product Improvement	DLNK DLCA6500 5.0.1

Work Package #	Summary	Criticality	Build
DLSS-10234	DLCA-6500: Facility Select List is not listing RADIO option in the Monitoring Page (EDS Only)	4A - Product Improvement	DLNK DLCA6500 5.0.1
DLSS-9649	DLCA-6500 : Update DLCA for FUSNPL - AFD-3200 - Multiple Media/Load Set Support	4A - Product Improvement	DLNK DLCA6500 5.0.1
DLSS-9150	DLCA-6500 - Update to Support EUR NSAP Address Registry Version 9.0	4A - Product Improvement	DLNK DLCA6500 5.0.1
DLSS-9837	DLCA-6500: "CPDLC NOT AVAILABLE" when NVM cleared on rig	1A - Significant Operational Effect	DLNK DLCA6500 5.0.0
DLSS-9694	DLCA6500: : Inconsistent Implementation of Space Padding.	4A - Product Improvement	DLNK DLCA6500 5.0.1
DLSS-9693	DLCA6500 : Inconsistent Implementation of A661 parameters and Widgets.	4A - Product Improvement	DLNK DLCA6500 5.0.1
DLSS-9035	DLCA-6500: Merge all the WPs in 4.0.2, 4.0.3 to the 5.0.0 Branch	4A - Product Improvement	DLNK DLCA6500 5.0.0
DLSS-9544	DLCA-6500: Seamless Transfer ATN->FANS um120+ End Service	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.2
DLSS-6707	DLCA-6500 - Rejecting ATN CPDLC Start Request with Provider Abort - Invalid PDU	1A - Significant Operational Effect	DLNK DLCA6500 4.0.1
DLSS-6650	DLCA-6500: Issue related to CURRENT MSG LABEL greater than TOTAL MSG LABEL in Configurable inbox	1B - No Significant Operational Effect	DLNK DLCA6500 4.0.1

Software Accomplishment Summary (SAS) for Data Link Communication Application (DLCA-6500)

Work Package #	Summary	Criticality	Build
DLSS-6064	DLCA6500- Issue with SEND LOGON, when LOGON DATA CHANGED	1B - No Significant Operational Effect	DLNK_DLCA6500_4.0.0
DLSS-6061	DLCA-6500: Cursor Not Automatically Placed on Scroll Bar in the VERIFY MESSAGE AREA	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.0
DLSS-5480	DLCA-6500 : Label 271 and Label 276 bits getting retained whenever ATC DL is transitioned to ENABLED from DISABLED	1B - No Significant Operational Effect	DLNK DLCA6500 4.0.1
DLSS-5409	DLCA-6500 : Systems/DLCS: "CPDLC INHIBITED", "RESPONSE NOT SUPPORTED" is displayed in the CPDLC Inbox Message Review Status Are	1B - No Significant Operational Effect	DLNK_DLCA6500_4.0.0
DLSS-2002	DLCA-6500 - FANS Loadable Uplink Message Displaying FMS Text on Message Review Page	1B - No Significant Operational Effect	DLNK_DLCA6500_4.0.0
DLSS-2605	DLCA-6500: Label 276 bit 12 getting retained whenever ATC DL is transitioned to ENABLED from DISABLED	1B - No Significant Operational Effect	DLNK_DLCA6500_4.0.0
DLSS-1234	DLCA-6500: FANS SYSTEM INFO page shows incorrect logon status	2 - No Operational Effect	DLNK DLCA6500 5.0.1
DLSS-1218	DLCA6500 - Issue with trace data	3B - Non-Significant Process Deviation	DLNK_DLCA6500_4.0.0
DLSS-1215	DLCA6500- Issue with SEND LOGON	1B - No Significant Operational Effect	DLNK_DLCA6500_4.0.0

Software Accomplishment Summary (SAS) for Data Link Communication Application (DLCA-6500)

Work Package #	Summary	Criticality	Build
DLSS-1213	DLCA6500 - Messages with a status of CONN ENDED or ERROR are not being recorded by the CVR	2 - No Operational Effect	DLNK_DLCA6500_4.0.0
DLSS-1211	DLCA6500 - CVR logging issue for Acquiring pos data	2 - No Operational Effect	DLNK_DLCA6500_4.0.0
DLSS-1200	DLCA6500 - Issue with detecting stale data for vhf, hf, satcom	1B - No Significant Operational Effect	DLNK DLCA6500 4.0.1
DLSS-1186	DLCA6500 - End of Flight contract related	1B - No Significant Operational Effect	DLNK_DLCA6500_4.0.0
DLSS-1169	DLCA6500 - Invalid Entry shown with DELETE command on Confirm pages	1B - No Significant Operational Effect	DLNK_DLCA6500_4.0.0
DLSS-1268	DLCA-6500 : Issues with the ORIG, DEST and FLIGHT ID from DM	1B - No Significant Operational Effect	DLNK_DLCA6500_4.0.0
DLSS-1249	DLCA6500 - ATN/FANS Facility Designator Not Pre-Populated Dual DLCA	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.0
DLSS-1241	DLCA6500 - CPDLC Behavior When Exiting Application and Returning to Application	1B - No Significant Operational Effect	DLNK_DLCA6500_4.0.0
DLSS-1144	DLCA6500 BL1.14 - SCA - DEF-Req - Health Monitor CIO Connection Status	2 - No Operational Effect	DLNK DLCA6500 5.0.0
DLSS-1129	DLCA6500- SW issues	1B - No Significant Operational Effect	DLNK_DLCA6500_4.0.0

Software Accomplishment Summary (SAS) for Data Link Communication Application (DLCA-6500)

Work Package #	Summary	Criticality	Build
DLSS-1125	DLCA6500 - SEND LOGON, REPORT FUNCTION, FLIGHT ID Issues	1B - No Significant Operational Effect	DLNK_DLCA6500_4.0.0
DLSS-1123	DLCA6500: Xml parsing related issues	2 - No Operational Effect	DLNK DLCA6500 5.0.0
DLSS-1121	DLCA6500 - Dual DLCA issues	1B - No Significant Operational Effect	DLNK DLCA6500 4.0.1
DLSS-1118	DLCA6500: Logon Required message not shown on Logon Status page after manual Logoff	1B - No Significant Operational Effect	DLNK_DLCA6500_4.0.0
DLSS-1115	DLCA6500 - ACF related issues	1B - No Significant Operational Effect	DLNK_DLCA6500_4.0.0
DLSS-1114	DLCA6500 - Configurable Inbox issues related to displaying closed messages, current msg label, dash label and others	1B - No Significant Operational Effect	DLNK_DLCA6500_4.0.0
DLSS-1092	DLCA6500 BL1.13.1 - SCA - DEF-Implementation - UperEncodingRules.cpp	2 - No Operational Effect	DLNK_DLCA6500_4.0.0
DLSS-1090	DLCA6500 BL1.13.1 - SCA Change Issues for Codec - DEF Requirements - Set 1	2 - No Operational Effect	DLNK_DLCA6500_4.0.0
DLSS-1068	DLCA6500 BL1.13 - SCA Change Issues - DEF Implementation - Set 8	2 - No Operational Effect	DLNK DLCA6500 4.0.1
DLSS-1043	DLCA-6500 : BL1.13 - SCA Analysis - Implementation Issues.	2 - No Operational Effect	DLNK DLCA6500 5.0.0

Work Package #	Summary	Criticality	Build
DLSS-1038	DLCA-6500 Unusable Must-Enter Field Displayed	4A - Product Improvement	DLNK DLCA6500 5.0.2
DLSS-1030	DLCA-6500 : Issue with the Message Statuses.	1B - No Significant Operational Effect	DLNK_DLCA6500_4.0.0
DLSS-1026	DLCA-6500 - Cursor is not automatically positioning on the top most message of the Message Log Page.	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.1
DLSS-1023	DLCA-6500 - Code Inspection issues	2 - No Operational Effect	DLNK DLCA6500 4.0.1
DLSS-1022	DLCA-6500 - EOF is getting cancelled after sending UM161 and CPDLC connection issue	2 - No Operational Effect	DLNK DLCA6500 4.0.1
DLSS-1004	DLCA-6500 : Multiple pages not Clearing old values	1B - No Significant Operational Effect	DLNK_DLCA6500_4.0.0
DLSS-1000	DLCA6500: Logon Update requirement is incorrect and doesn't fully implement HLR	1B - No Significant Operational Effect	DLNK DLCA6500 4.0.1
DLSS-990	DLCA-6500 - Contradictory Uplink Elements requirement and code need to be modified.	1B - No Significant Operational Effect	DLNK_DLCA6500_4.0.0
DLSS-983	DLCA6500: Altitude Entry on response page not allowing full allowable altitude range to be entered	1B - No Significant Operational Effect	DLNK_DLCA6500_4.0.0
DLSS-964	DLCA-6500 - modified DM fetching logic	2 - No Operational Effect	DLNK DLCA6500 4.0.1

Software Accomplishment Summary (SAS) for Data Link Communication Application (DLCA-6500)

Work Package #	Summary	Criticality	Build
DLSS-962	DLCA-6500 - Report due to page displays more than 25 un-actioned report elements and application does not send error message	2 - No Operational Effect	DLNK DLCA6500 4.0.1
DLSS-943	DCLA-6500 Code Update - AsnStorage.h/.cpp	2 - No Operational Effect	DLNK_DLCA6500_4.0.0
DLSS-938	DLCA-6500 - Position Data Reset Issue	1B - No Significant Operational Effect	DLNK_DLCA6500_4.0.0
DLSS-932	DLCA-6500 - Print statements for CM connection termination, tts, ttr timer expired are not printing and XML file issues.	2 - No Operational Effect	DLNK DLCA6500 5.0.0
DLSS-915	DLCA6500: ATN Not Available status not being sent to CVR	1B - No Significant Operational Effect	DLNK_DLCA6500_4.0.0
DLSS-3968	DLCA-6500 LOGON/STATUS page being displayed when Network type changes after End of Flight	1B - No Significant Operational Effect	DLNK_DLCA6500_4.0.0
DLSS-3943	DLCA-6500 - New Debug Statement to Print Element ID(s)	4A - Product Improvement	DLNK_DLCA6500_4.0.0
DLSS-3631	DLCA6500 : FANS Dm67(MONITORING) message is not getting downlinked to CDA when NDA does not exist	1B - No Significant Operational Effect	DLNK_DLCA6500_4.0.0
DLSS-3661	DLCA-6500: DLCA sends incorrect error response to an invalid character	2 - No Operational Effect	DLNK DLCA6500 5.0.1

Work Package #	Summary	Criticality	Build
DLSS-3509	DLCA-6500 - FANS Uplink Message Being Rejected when Concatenated with Wilco/Unable Element + End Service Element	1B - No Significant Operational Effect	DLNK_DLCA6500_4.0.0
DLSS-3742	DLCA6500 : Missing AFN Trace after Seamless Transfer Implementation	2 - No Operational Effect	DLNK_DLCA6500_4.0.0
DLSS-3733	DLCA-6500- OFFSET REQUEST page DUE TO WX OPTION to Remains Selected When the Network Type Changes	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.3
DLSS-5271	DLCA-6500 Issue with ATC COMM STATUS bit	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.0
DLSS-5202	DLCA6500 – CVR functionality Issues with Network Type & ATC Facility Name	1B - No Significant Operational Effect	DLNK_DLCA6500_4.0.0
DLSS-5244	DLCA-6500 - Update DLCA-6500 to Enable Scroll by Touch on CPDLC Format	4A - Product Improvement	DLNK_DLCA6500_4.0.0
DLSS-4519	DLCA-6500 - LOGON STATUS LABEL Issue when on Multiple AFDs	1B - No Significant Operational Effect	DLNK_DLCA6500_4.0.0
DLSS-4302	DLCA-6500 Create 4.0 Trunk and Branch and Merge 3.0 Trunk to 4.0 Trunk	4A - Product Improvement	DLNK_DLCA6500_4.0.0
DLSS-5790	DLCA-6500: Reports Out of Memory, when trace output rate is by environment variable "TRACE_OUTRATE_MS"	2 - No Operational Effect	DLNK DLCA6500 5.0.6

Software Accomplishment Summary (SAS) for Data Link Communication Application (DLCA-6500)

Work Package #	Summary	Criticality	Build
DLSS-5614	DLCA-6500: Change response to Uplink Delay	1B - No Significant Operational Effect	DLNK_DLCA6500_4.0.0
DLSS-5656	DLCA-6500 - Host Cleanup Sequence Needs to be Re-factor	4A - Product Improvement	DLNK_DLCA6500_4.0.0
DLSS-5660	DLCA-6500: LOGON STATUS LABEL doesn't display correct status after rejecting an AFN logon	1B - No Significant Operational Effect	DLNK_DLCA6500_4.0.0
DLSS-5870	DLCA-6500 - ATN Uplink Message Being Rejected when CPDLC-End indication is received with A/N, R , N, Y Elements.	1B - No Significant Operational Effect	DLNK_DLCA6500_4.0.0
DLSS-5807	DLCA-6500: Issues with the LOGON TO Entry	1B - No Significant Operational Effect	DLNK_DLCA6500_4.0.0
DLSS-5555	DLCA-6500: DLCA doesn't enter into discovery period on receiving invalid operational configuration	2 - No Operational Effect	DLNK DLCA6500 4.0.1
DLSS-6214	DLCA-6500: SYSTEM INFO Page Add Additional Info	4A - Product Improvement	DLNK DLCA6500 5.0.1
DLSS-6207	DLCA-6500 - Integrate AFD-3200 into Fusion Product Line - CDA/NDA, NO COMM Data Displayed	4A - Product Improvement	DLNK DLCA6500 5.0.0
DLSS-6147	DLCA-6500 - HMI Harmonization and CPDLC HMI changes	4A - Product Improvement	DLNK DLCA6500 5.0.1
DLSS-6146	DLCA-6500: Update DLCA Architecture C - Dual DLCA support	4A - Product Improvement	DLNK DLCA6500 5.0.0

Software Accomplishment Summary (SAS) for Data Link Communication Application (DLCA-6500)

Work Package #	Summary	Criticality	Build
DLSS-6106	DLCA-6500: Lean the Simulation Folders Down to Remove Duplicate Files/Folders	4A - Product Improvement	DLNK DLCA6500 5.0.0
DLSS-6623	DLCA-6500 - Resetting When CANCEL is Selected and Uplink Message is Displayed on a 2nd Display	1B - No Significant Operational Effect	DLNK DLCA6500 4.0.1
DLSS-6373	DLCA-6500 - Add Data Link Off Feature to Product Line DLCA Application	4A - Product Improvement	DLNK_DLCA6500_4.0.0
DLSS-4903	DLCA-6500 "SIDESTRAP" and "SIDESTRAP_OVERRIDE" Environment Variable Value of '3'(Center) Causing Reset On Initial Power-up	2 - No Operational Effect	DLNK_DLCA6500_4.0.0
DLSS-4634	DLCA-6500 - Simultaneous Display of LOGON/STATUS page Resulting in Status Mismatch	1B - No Significant Operational Effect	DLNK_DLCA6500_4.0.0
DLSS-4798	DLCA-6500: Update facility listing in DLCA_AtnAppData.xml	4A - Product Improvement	DLNK_DLCA6500_4.0.0
DLSS-4810	DLCA-6500 : Update DLCA-6500 for Systems - DLCA-6500 Printer Installed Logic	1B - No Significant Operational Effect	DLNK DLCA6500 4.0.2
DLSS-5098	DLCA-6500: Issue with the CLEAR FUNCTION on POSITION REPORT PAGE	1B - No Significant Operational Effect	DLNK_DLCA6500_4.0.0
DLSS-5009	DLCA-6500 Codec : Position Report - GS Formatting Issue	2 - No Operational Effect	DLNK_DLCA6500_4.0.0
DLSS-6036	DLCA-6500: CLB/DES Issue with Request Altitude Page on FANS/ATN Network	1B - No Significant Operational Effect	DLNK_DLCA6500_4.0.0

Software Accomplishment Summary (SAS) for Data Link Communication Application (DLCA-6500)

Work Package #	Summary	Criticality	Build
DLSS-5899	DLCA-6500 - Invalid alert in FANS mode	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.0
DLSS-1298	DLCA6500 : Logon Established Alert (Label 272, Bit 16) cleared before CM/AFN connection is terminated	1B - No Significant Operational Effect	DLNK_DLCA6500_4.0.0
DLSS-1289	DLCA6500 : Alerting Requirements Updates	3B - Non-Significant Process Deviation	DLNK_DLCA6500_4.0.0
DLSS-1275	DLCA6500 - SCA Change Issues - DEF Requirements - System Info Page	3B - Non-Significant Process Deviation	DLNK_DLCA6500_4.0.0
DLSS-3204	DLCA-6500 : Alerting requirement issue with End of Flight (EOF) event	2 - No Operational Effect	DLNK_DLCA6500_4.0.0
DLSS-3407	DLCA-6500 : "LOGGED ON TO" Status Issue during Seamless Transfer.	1B - No Significant Operational Effect	DLNK_DLCA6500_4.0.0
DLSS-2822	DLCA6500: Position select list not cleared to 'None' on confirm pages when FMS data not available	1B - No Significant Operational Effect	DLNK_DLCA6500_4.0.0
DLSS-2908	DLCA6500: Reason for FANS Logon failure not sent to CVR	1B - No Significant Operational Effect	DLNK_DLCA6500_4.0.0
DLSS-2909	DLCA6500: Inactive Advisory change not sent to CVR	1B - No Significant Operational Effect	DLNK_DLCA6500_4.0.0
DLSS-2915	DLCA6500: CVR data not showing full message state	1B - No Significant Operational Effect	DLNK_DLCA6500_4.0.0

Software Accomplishment Summary (SAS) for Data Link Communication Application (DLCA-6500)

Work Package #	Summary	Criticality	Build
DLSS-2913	DLCA6500: Text 'Degree' and degree symbol mismatch	1B - No Significant Operational Effect	DLNK DLCA6500 4.0.1
DLSS-2969	DLCA6500 : ATN CM Contact Request Issue with 8 Characters Test Facility Names	2 - No Operational Effect	DLNK DLCA6500 5.0.2
DLSS-2912	DLCA6500: CM and AFN Logon states to send to CVR not documented	1B - No Significant Operational Effect	DLNK_DLCA6500_4.0.0
DLSS-2910	DLCA6500: Incorrect 'source' code documented in CVR requirement	3B - Non-Significant Process Deviation	DLNK_DLCA6500_4.0.0
DLSS-2900	DLCA6500: CVR data not showing Logon Required on DLCA powerup	1B - No Significant Operational Effect	DLNK_DLCA6500_4.0.0
DLSS-3587	DLCA6500 : LOGON STATUS LABEL Issue during Seamless Transfer	1B - No Significant Operational Effect	DLNK_DLCA6500_4.0.0
DLSS-14131	DLCA-6500 - Reset Occurring when FMS Mastership Source Changes and there are Open Contracts between DLCA and FMS	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.3
DLSS-1250	DLCA-6500 - ATN is not Downlinking a CPDLC Provider Abort [invalid-QOS-parameter] when a Bad QOS is Received	2 - No Operational Effect	DLNK DLCA6500 5.0.3
DLSS-2906	DLCA6500: Manually entered Flight IDs with spaces not accepted by DLCA	1B - No Significant Operational Effect	DLNK DLCA6500 4.0.1

Work Package #	Summary	Criticality	Build
DLSS-2897	DLCA6500: CVR data logged as 'Logon Data Changed' rather than 'Clear'	1B - No Significant Operational Effect	DLNK DLCA6500 4.0.0
DLSS-2748	DLCA6500: SPEED values on WHEN CAN WE page not rounded	1B - No Significant Operational Effect	DLNK DLCA6500 4.0.1

C.2 DLCA-6500 Implemented Work Packages for A220 5.0.9 and 5.0.10 Builds

Work Package #	Summary	Criticality	Build
DLSS-18678	DLCA-6500 -Network Type, Label 272 bit 12 is getting cleared.	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.9
DLSS-18220	DLCA6500 : NO ROUTE INFO PROVIDED when Multiple instances of EMERGENCY PAGE open	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.9
DLSS-19769	DLCA-6500 - EMERGENCY page's VMA Contents Can Contain Another Pages Downlink Message	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.10
DLSS-19716	DLCA6500: Update the LOGON/STATUS page to display LOGGED ON status message	4A - Product Improvement	DLNK DLCA6500 5.0.10
DLSS-20134	DLCA-6500: IPS Build 5.0.10 EMOD02 (Red Label3)	4A - Product Improvement	DLNK DLCA6500 5.0.10
DLSS-19973	DLCA6500 : Continuous contracts being issued when Periodic contract is set to unable to comply	1B - No Significant Operational Effect	DLNK DLCA6500 5.0.10

Note: 5.0.8 build is not applicable for A220 Program.

C.3 DLCA-6500 Implemented Work Packages for A220 5.0.11 Build

Work Package #	Summary	Criticality	Build
DLSS-20507	DLCA-6500 - Update to Support EUR NSAP Address Registry Version 12.0 and to remove ATN addresses	4A - Product Improvement	DLNK DLCA6500 5.0.11

C.4 DLCA-6500 Non-Functional Work Packages Implemented for Build 5.0

Work Package #	Summary	Criticality	Build
DLSS-13696	DLCA6500: Perform Link Analysis on the Black Label Build & document the result in SVPR	3B - Non-Significant Process Deviation	DLNK DLCA6500 5 DOC Only
DLSS-13573	DLCA6500: Add User Include PN to the Dependent Components Table of SAS	4A - Product Improvement	DLNK DLCA6500 5 DOC Only
DLSS-16594	DLCA-6500 : Update DLCA for FUSNPL - V1.3 Feature Linking/Doc Only Requirement Alignment per Domain request	3A - Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-17016	Verif: DLCA6500 - 5.0.3 SCA Dryrun issues - DEF Test - Set 13	3B - Non-Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-17015	Verif: DLCA6500 - 5.0.3 SCA Dryrun issues - DEF Test - Set 12	3A - Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-17014	Verif: DLCA6500 - 5.0.3 SCA Dryrun issues - DEF Test - Set 11	3A - Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-17013	Verif: DLCA6500 - 5.0.3 SCA Dryrun issues - DEF Test - Set 10	3B - Non-Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-17012	Verif: DLCA6500 - 5.0.3 SCA Dryrun issues - DEF Test - Set 9	3A - Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-17011	Verif: DLCA6500 - 5.0.3 SCA Dryrun issues - DEF Test - Set 8	3A - Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-17009	Verif: DLCA6500 - 5.0.3 SCA Dryrun issues - DEF Test - Set 6	3A - Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST

Work Package #	Summary	Criticality	Build
DLSS-17008	Verif: DLCA6500 - 5.0.3 SCA Dryrun issues - DEF Test - Set 5	3A - Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-17007	Verif: DLCA6500 - Develop Testing Cases for Configurable Inbox Deactivated Code	4A - Product Improvement	DLNK DLCA6500 5-REQ/TEST
DLSS-17006	Verif: DLCA6500 - 5.0.3 SCA Dryrun issues - DEF Test - Set 3	3A - Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-17005	Verif: DLCA6500 - 5.0.5 SCA Delta Dryruns issues - DEF Test SET 1	3A - Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-17004	Verif: DLCA6500 - 5.0.3 SCA Dryrun issues - DEF Test - Set 1	3A - Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-16932	Verif: DLCA6500: Delete the Duplicate Requirements.	3A - Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-16828	Verif: DLCA-6500- Missing Test script Updates for VCI Requirement updates	3A - Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-15757	DLCA-6500: Update Requirements for DLCA-LOGON/STATUS "ATN AVAILABILITY LABEL"	3A - Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-15824	Verif: DLCA-6500: Update Requirements for DLCA-LOGON/STATUS "ATN AVAILABILITY LABEL"	3A - Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-16086	DLCA6500- VERIF : Update test for invalid cases of loadable uplinks	3B - Non-Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-15679	Verif: DLCA6500: Issue Collector for CPDLC HMI, ATN Requirements.	3B - Non-Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST

Work Package #	Summary	Criticality	Build
DLSS-15642	DLCA-6500 - ATC COMM STATUS bit Cleared when Logon Data Mismatch Advisory is Set and Flight ID changes back to previous value	3A - Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-15911	Verif: DLCA-6500: Requirement Clarification when SEND is Selected and Multiple Display Are Displaying the Same Page	3A - Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-15890	DLCA6500 : 5.0.3 SCA dryruns Scripts Failures Fixes.	3B - Non-Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-18374	Verif: DLCA6500: Display Format Requirements & Figure Name Updates	4B - Documentation Improvement	DLNK DLCA6500 5-REQ/TEST
DLSS-18283	DLCA6500: Display Format Requirements & Figure Name Updates	4B - Documentation Improvement	DLNK DLCA6500 5-REQ/TEST
DLSS-18888	Verif: DLCA-6500 DOORS attribute issues found in trace matrix	3B - Non-Significant Process Deviation	DLNK DLCA6500 5.0.9-REQ/TEST
DLSS-18871	DLCA-6500 - Safety Review of Derived Requirements 5.X Build	4B - Documentation Improvement	DLNK DLCA6500 5.0.9-REQ/TEST
DLSS-18832	DLCA-6500 DOORS attribute issues found in trace matrix	3B - Non-Significant Process Deviation	DLNK DLCA6500 5.0.9-REQ/TEST
DLSS-18652	Verif: DLCA6500: Update A220 Logon Page requirement as an IPS productline	4B - Documentation Improvement	DLNK DLCA6500 5-REQ/TEST
DLSS-18697	Verif: DLCA-6500 - Requirement Change Needed to Document Behavior when Messages Are Deleted from the Msg Respository	3A - Significant Process Deviation	DLNK DLCA6500 5.0.9-REQ/TEST

Work Package #	Summary	Criticality	Build
DLSS-18677	DLCA-6500 - Verif : Missing HLSRS Links for EDS All Requirements	3B - Non-Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-18068	DLCA6500: Update A220 Logon Page requirement as an IPS productline	4B - Documentation Improvement	DLNK DLCA6500 5-REQ/TEST
DLSS-17631	Verif: DLCA 6500 update automated scripts to manual for rig execution	3B - Non-Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-17806	VERIF: DLCA6500 : 5.0.7 IPS dryruns Scripts Failures Fixes.	3A - Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-17142	DLCA-6500 DLCA General Configuration XML for NonConfig Inbox and Inactive Inbox	3B - Non-Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-17418	DLCA-6500 - Missing HLSRS Links for EDS All Requirements	3B - Non-Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-17729	VERIF: DLCA-6500 - Create Manual Test to Cover A661 Bit Logic	4A - Product Improvement	DLNK DLCA6500 5-REQ/TEST
DLSS-17335	Verif: DLCA-6500 - XML Requirement Issues	3B - Non-Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-17279	DLCA-6500 - XML Requirement Issues	3B - Non-Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-17205	DLCA-6500: Systems Review of HLSRS & LLSRS Requirements of 4.X & 5.X Build	3B - Non-Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-17204	DLCA6500: HLR requirements Missing Links to the System Requirements	3B - Non-Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST

Work Package #	Summary	Criticality	Build
DLSS-17174	Verif: DLCA-6500 DLCA General Configuration XML for NonConfig Inbox and Inactive Inbox	3B - Non-Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-17170	Verif: DLCA-6500 - Update requirement text for the ATN SRS requirement ATN2049	3A - Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-17166	VERIF: DLCA6500: Delta Code Analysis Updates for 5.0.4, 5.0.5 and 5.0.6	4B - Documentation Improvement	DLNK DLCA6500 5-REQ/TEST
DLSS-16907	DLCA6500: Delete the Duplicate Requirements.	3A - Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-19645	VERIF: DLCA6500: 5.x RFS Scripts Related Failures	3B - Non-Significant Process Deviation	DLNK DLCA6500 5.0.9-REQ/TEST
DLSS-19489	DLCA6500 - DLCA compliance Matrix: Update Disposition/Exception column	4B - Documentation Improvement	DLNK DLCA6500 5.0.9-REQ/TEST
DLSS-15395	DLCA6500 - Requirements Issue Collector for Automated Configuration Management and CPDLC Features	4A - Product Improvement	DLNK DLCA6500 5-REQ/TEST
DLSS-15404	DLCA-6500: Requirement Clarification when SEND is Selected and Multiple Display Are Displaying the Same Page	3A - Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-15381	DLCA6500: Issue Collector for CPDLC HMI, ATN Requirements.	3A - Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-14997	Verif: DLCA-6500 : Update Requirements for FANS CPDLC Start Request (um163) for Dual Capable NAT facilities	4B - Documentation Improvement	DLNK DLCA6500 5-REQ/TEST

Work Package #	Summary	Criticality	Build
DLSS-15097	Verif: DLCA6500 : DLCA Low Level Requirements Issues.	3A - Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-15044	DLCA6500: Page Display Format & Code Analysis Scripts Updates	4B - Documentation Improvement	DLNK DLCA6500 5-REQ/TEST
DLSS-14506	Verif: DLCA Trace Tool is stopped working, When clearing the trace.	3B - Non-Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-14317	Verif: DLCA6500 : Requirement Issue with Frequency Select List.	3A - Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-14314	DLCA6500 : Requirement Issue with Frequency Select List.	3A - Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-14328	DLCA-6500: Update needed to Loadable Requirements and Invalid value for uM163 Requirement	3B - Non-Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-14055	Verif: DLCA6500: HLR requirement not updated for dM68 Message in DLSS-2056	3B - Non-Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-14046	DLCA6500: HLR requirement not updated for dM68 Message in DLSS-2056	3B - Non-Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-13490	Verif: DLCA-6500 Requirement Update	3B - Non-Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-13530	Verif: DLCA6500: Conversion to Manual Tests using Wireshark.	4B - Documentation Improvement	DLNK DLCA6500 5-REQ/TEST

Work Package #	Summary	Criticality	Build
DLSS-13529	Verif: DLCA-6500 : ICAO test case failure	3A - Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-13528	DLCA6500: Verif: Missing Trace Statements in DLCA Trace Tool (IPS Target Only)	3B - Non-Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-13527	Verif: DLCA-6500 : Sending and Receiving Large Uplinks and Downlinks are not working on IPS Targets	3B - Non-Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-13454	DLCA-6500 Requirement Update	3B - Non-Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-13353	DLCA-6500 : DSI Test Script Updates to Handle the Retransmission of DSI Primitives.	4B - Documentation Improvement	DLNK DLCA6500 5-REQ/TEST
DLSS-13350	DLCA6500 : Dual DLCA Requirement Issue with Most recent logon station identification data in Cross Talk Data	3A - Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-13485	DLCA-6500: Timing related issues found on BCAST Test Procedures	4A - Product Improvement	DLNK DLCA6500 5-REQ/TEST
DLSS-13446	DLCA-6500: DLCA outputs the DM msgs data periodically	4A - Product Improvement	DLNK DLCA6500 5-REQ/TEST
DLSS-16447	DLCA6500: Missing PAUSE & RESUME functions on the ODEBUG HMI EDS VAPS.	3A - Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-16463	Verif: DLCA6500: Missing PAUSE & RESUME functions on the ODEBUG HMI EDS VAPS.	3A - Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST

Work Package #	Summary	Criticality	Build
DLSS-16667	DLCA-6500: Alerting test script failure due to incorrect delay	3B - Non-Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-16666	DLCA6500: Timing Related Requirement Update .	4B - Documentation Improvement	DLNK DLCA6500 5-REQ/TEST
DLSS-16689	Verif: DLCA6500: DLCA is not reading the valid sidestrap_override values from cpk files	3B - Non-Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-16804	Verif: DLCA6500: ATN8942 Requirement is conflicting with the Note.	3A - Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-16794	Verif: DLCA-6500 - HLR/LLR/STP DOORS Attribute Conflicts and Requirement/Code/Test Procedure Linking Issues - SET 2	3B - Non-Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-16793	DLCA6500: Requirement Updates	3A - Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-16770	DLCA-6500 - Update requirement text for the ATN SRS requirement ATN2049	3A - Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-16713	Verif: DLCA-6500: Alerting test script failure due to incorrect delay	3B - Non-Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-16708	Verif: DLCA6500: Timing Related Requirement Update .	4B - Documentation Improvement	DLNK DLCA6500 5-REQ/TEST
DLSS-16741	DLCA-6500 - HLR/LLR/STP DOORS Attribute Conflicts and Requirement/Code/Test Procedure Linking Issues - SET 2	3B - Non-Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST

Work Package #	Summary	Criticality	Build
DLSS-16364	DLCA-6500: Missing Trace to FUSNPL System Requirements	4B - Documentation Improvement	DLNK DLCA6500 5-REQ/TEST
DLSS-16266	DLCA-6500 - ATN SRS Incorrect Citation of EUR DOC 028 - EUR NSAP ADDRESS REGISTRY	3B - Non-Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-16244	Verif: DLCA-6500 - ATC COMM STATUS bit Cleared when Logon Data Mismatch Advisory is Set and Flight ID changes back to previous value	3A - Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-20760	DLCA-6500 - Safety Review of Derived Requirements 5.0.9 & 5.0.10 Builds	3B - Non-Significant Process Deviation	DLNK DLCA6500 5.0.9-REQ/TEST
DLSS-20050	DLCA6500 : 5.0.7 SCA Coverage DEF Test - SET 2	3A - Significant Process Deviation	DLNK DLCA6500 5.0.9-REQ/TEST
DLSS-19995	DLCA6500 : 5.0.7 SCA Coverage DEF Test - SET 1	3A - Significant Process Deviation	DLNK DLCA6500 5.0.9-REQ/TEST
DLSS-14927	Verif: DLCA-6500 - Link HLR requirements to L1 System requirements using of link by Attribute	4B - Documentation Improvement	DLNK DLCA6500 5-REQ/TEST
DLSS-14917	DLCA6500 : DLCA Low Level Requirements Issues.	3A - Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-15305	DLCA-6500 - Safety Review of Derived Requirements 4.X & 5.X Build	4B - Documentation Improvement	DLNK DLCA6500 5-REQ/TEST
DLSS-14900	Verif: DLCA-6500: HLR, LLR & SDD requirements Issue	4B - Documentation Improvement	DLNK DLCA6500 5-REQ/TEST

Work Package #	Summary	Criticality	Build
DLSS-14141	DLCA-6500 - Inclusion of Data Link Industry Document ED-120 Change 3	4B - Documentation Improvement	DLNK DLCA6500 5-REQ/TEST
DLSS-13634	DLCa-6500 - Add Industry document linking to ED-110B to Requirements	4A - Product Improvement	DLNK DLCA6500 5 DOC Only
DLSS-13597	Verif: DLCA-6500 - Main Application Requirement Conflicts when "Logon data has changed"	3B - Non-Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-13594	Verif: DLCA6500 : Migrate the Non Config Inbox Requirements and Tests Scripts support A661 parser based utilities	4A - Product Improvement	DLNK DLCA6500 5-REQ/TEST
DLSS-13870	Verif: DLCA-6500: DLCA outputs the DM msgs data periodically	4A - Product Improvement	DLNK DLCA6500 5-REQ/TEST
DLSS-13867	Verif: DLCA6500 : Dual DLCA Requirement Issue with Most recent logon station identification data in Cross Talk Data	3A - Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-13542	DLCA-6500 - Main Application Requirement Conflicts when "Logon data has changed"	3B - Non-Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-13541	DLCA6500 : Migrate the Non Config Inbox Requirements and Tests Scripts support A661 parser based utilities	4A - Product Improvement	DLNK DLCA6500 5-REQ/TEST
DLSS-14649	DLCA-6500 : Update Requirements for FANS CPDLC Start Request (um163) for Dual Capable NAT facilities	4A - Product Improvement	DLNK DLCA6500 5-REQ/TEST

Work Package #	Summary	Criticality	Build
DLSS-14175	VERIF: DLCA-6500: The IOCF is not matching to the requirements document for NDO ID: 2767296	3A - Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-14399	DLCA-6500: HLR, LLR & SDD requirements Issue	4A - Product Improvement	DLNK DLCA6500 5-REQ/TEST
DLSS-14356	Verif: DLCA-6500: Update needed to Loadable Requirements and Invalid value for uM163 Requirement	3B - Non-Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-14236	Verif: DLCA-6500 - HLR/LLR/STP DOORS Attribute Conflicts and Requirement/Code/Test Procedure Linking Issues	3B - Non-Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-14181	DLCA-6500 - HLR/LLR/STP DOORS Attribute Conflicts and Requirement/Code/Test Procedure Linking Issues	3B - Non-Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-11221	DLCA-6500: State30 Release of -470 T/L Part Number	4B - Documentation Improvement	DLNK DLCA6500 5 DOC Only
DLSS-12553	DLCA-6500: Missing Links to the FUSNPL - SyRD Requirements	3B - Non-Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-15418	DLCA-6500: Verification support Artifact (TDF/BDF for EDS Productline)	4B - Documentation Improvement	DLNK DLCA6500 5-REQ/TEST
DLSS-11077	Verif: DLCA 6500- Test Procedure ATN_CPDLC_042 Needs Updating	3B - Non-Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-11948	DLCA-6500 : Update Cursor Requirements for EDS Environment on Automated Cursor Placement	3B - Non-Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST

Work Package #	Summary	Criticality	Build
DLSS-10884	DLCA-6500: DLNK_A661_TP/Utilites ALERTING Scripts Update the utility getDatafrom_Trace() and the respective scripts	4A - Product Improvement	DLNK DLCA6500 5-REQ/TEST
DLSS-10034	DLCA6500 : Migrate Existing TC/TPs to A661 Parser Based Utilites	4B - Documentation Improvement	DLNK DLCA6500 5-REQ/TEST
DLSS-10033	DLCA6500: Migrate Verification Env to A661 Parser Framework & Update Related Utilities	4A - Product Improvement	DLNK DLCA6500 5-REQ/TEST
DLSS-9288	DLCA-6500 - Safety Attribute Mismatch	3B - Non-Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-8840	Verif: DLCA-6500-UM143 Behavior when cancel is selected	3B - Non-Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-8832	Verif: DLCA-6500: Update DM89 Precondition for downlink	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-8814	DLCA-6500 - Requirement Issue with UM143 (CONFIRM REQUEST) Behavior when Cancel is selected	3B - Non-Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-8813	DLCA-6500: Update DM89 Precondition for downlink	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-8706	DLCA-6500: Link High level to SARD Allocation	4A - Product Improvement	DLNK DLCA6500 5-REQ/TEST
DLSS-10018	DLCA6500: Update Requirement linking to System	4B - Documentation Improvement	DLNK DLCA6500 5-REQ/TEST

Work Package #	Summary	Criticality	Build
DLSS-9497	Verif: DLCA6500 :Manual TPs in 4.x need to be converted to Automated TPs	4B - Documentation Improvement	DLNK DLCA6500 5-REQ/TEST
DLSS-8567	Verif: DLCA-6500 - EDS Environment Requirements Update	4A - Product Improvement	DLNK DLCA6500 5-REQ/TEST
DLSS-8481	DLCA-6500 - EDS Environment Requirements Update	4A - Product Improvement	DLNK DLCA6500 5-REQ/TEST
DLSS-8142	DLCA-6500: The IOCF is not matching to the requirements document for NDO ID: 2767296	3A - Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-7303	DLCA-6500 - Update Requirements for IPS/EDS Specific Clarification	4A - Product Improvement	DLNK DLCA6500 5-REQ/TEST
DLSS-7308	Verif: DLCA-6500 - Update Requirements for IPS/EDS Specific Clarification	4A - Product Improvement	DLNK DLCA6500 5-REQ/TEST
DLSS-8357	DLCA-6500 Update Compliance Matrix to Correct Compliance	4B - Documentation Improvement	DLNK DLCA6500 5-REQ/TEST
DLSS-7594	Verif: DLCA-6500 - Frame work-updates	4A - Product Improvement	DLNK DLCA6500 5-REQ/TEST
DLSS-13139	DLCA-6500: Requirement Clarification for ATC COMM STATUS Alert's (Label 276, Bit 12) Advisory Conditions	3A - Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-13205	Verif: DLCA-6500: Requirement Clarification for ATC COMM STATUS Alert's (Label 276, Bit 12) Advisory Conditions	3A - Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST

Work Package #	Summary	Criticality	Build
DLSS-12728	Verif: DLCA-6500: Remove requirements levied against the RIU from DLCA documentation.	3B - Non-Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-12494	Verif: DLCA 6500: EDS Automated Cursor Placement Issue on VMA when large downlink message is created.	3B - Non-Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-12969	Verif: DLCA6500: Delays in Alerting	3B - Non-Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-10718	DLCA-6500 - Update DLCA Compliance Matrix to include A758-3	4A - Product Improvement	DLNK DLCA6500 5-REQ/TEST
DLSS-10519	DLCA-6500 : Capture Implemented CR's from ClearQuest Database for V2 and V3	4B - Documentation Improvement	DLNK DLCA6500 5-REQ/TEST
DLSS-10212	Verif: DLCA-6500: Update for FANS Performance Should Include Both Directions	4B - Documentation Improvement	DLNK DLCA6500 5-REQ/TEST
DLSS-10505	DLCA-6500: SW CPU & Memory Utilization Process Creation	4A - Product Improvement	DLNK DLCA6500 4 Doc
DLSS-9654	DLCA-6500: SDD update for the Datalink Off functionality (GS Program)	4A - Product Improvement	DLNK DLCA6500 4 REQ/TEST
DLSS-9652	DLCA6500: Create a Doors Branch for the 4.X Development.	4A - Product Improvement	DLNK DLCA6500 4 REQ/TEST
DLSS-9565	DLCA-6500 VERIF: STP linking to non-requirement	3B - Non-Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST

Work Package #	Summary	Criticality	Build
DLSS-6489	Verif: DLCA6500 - Configurable Inbox issues related to Active/Inactive indication of CURRENT MSG LABEL, SEPERATOR LABEL and TOTAL MSG LABEL	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-6734	Verif: DLCA-6500: DataLinkOff Inbox Testability issue	2 - No Operational Effect	DLNK DLCA6500 4 REQ/TEST
DLSS-5500	DLCA-6500 - HLSRS Linking to CL-604 SARD/FDOR	4B - Documentation Improvement	DLNK DLCA6500 4 REQ/TEST
DLSS-5490	DLCA-6500: Position Report Page multiple display requirement update	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-5327	DLCA-6500 Update ONBOARD DEBUG Page Requirements	4A - Product Improvement	DLNK DLCA6500 4 REQ/TEST
DLSS-5460	Verif: DLCA-6500 Performance Allocations Need to be Updated	4B - Documentation Improvement	DLNK DLCA6500 4 REQ/TEST
DLSS-5419	DLCA-6500 Performance Allocations Need to be Updated	4B - Documentation Improvement	DLNK DLCA6500 4 REQ/TEST
DLSS-2658	DLCA-6500 - Codec Error precedences not specified	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-2657	DLCA6500 - Configurable Horizontal Inbox issue - New message state not verifiable	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-4881	DLCA-6500 : Systems/DLCA - CPDLC MFDD/FDOR updates per ECM 302557.	4B - Documentation Improvement	DLNK DLCA6500 4 REQ/TEST

Work Package #	Summary	Criticality	Build
DLSS-1230	DLCA6500: Vertical Configurable Inbox Msg Log Issue	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-1209	DLCA6500 - Inbox sorting related issue	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-1208	DLCA6500 - issue with indicators when cpdlc is inhibited	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-1185	DLCA-6500 - Health Monitor Cycle Slip Requirement update	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-838	DLCA-6500 - Automated cursor placement for large messages and debug page requirement clean-up	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-803	DLCA-6500 - Operational configuration table not correct and complete	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-1242	DLCA6500 : Configurable Inbox Related Issues.	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-1239	DLCA-6500 HLSRS Mailbox Requirement Rephrase	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-1146	DLCA6500 BL1.14 - SCA Change Issues - DEF Requirements - CSS	2 - No Operational Effect	DLNK DLCA6500 4 REQ/TEST
DLSS-1145	DLCA6500 BL1.14 - SCA Change Issues - DEF Test - Set 2	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-1132	DLCA6500 - Utility related updates	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST

Work Package #	Summary	Criticality	Build
DLSS-1126	DLCA6500 - Core related issues - 3	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-1113	DLCA-6500 : Codec Requirement update for CMContactResponse	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-1112	DLCA6500 : Inconsistency with output rate of DLCA Cross Talk Data.	2 - No Operational Effect	DLNK DLCA6500 4 REQ/TEST
DLSS-1096	DLCA6500 BL1.13.1 - SCA Change Issues for Codec - DEF Test - Set 6	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-1095	DLCA6500 BL1.13.1 - SCA Change Issues for Codec - DEF Test - Set 5	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-1093	DLCA6500 BL1.13.1 - SCA Change Issues for Codec - DEF Test - Set 4	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-1091	DLCA6500 BL1.13.1 - SCA Change Issues for Codec - DEF Test - Set 3	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-1089	DLCA6500 BL1.13.1 - SCA Change Issues for Codec - DEF Test - Set 2	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-1087	DLCA6500 BL1.13.1 - SCA Change Issues for Codec - DEF Test - Set 1	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-1074	DLCA6500 BL1.13 - SCA Change Issues - DEF Test - Set 6	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-1071	DLCA6500 BL1.13 - SCA Change Issues - DEF Requirements / Implementation - Set 5	2 - No Operational Effect	DLNK DLCA6500 4 REQ/TEST

Work Package #	Summary	Criticality	Build
DLSS-1055	DLCA6500 BL1.13 - SCA Change Issues - DEF Test - Set 5	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-1054	DLCA6500 BL1.13 - SCA Change Issues - DEF Test - Set 4	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-1053	DLCA6500 BL1.13 - SCA Change Issues - DEF Test - Set 3	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-1052	DLCA6500 BL1.13 - SCA Change Issues - DEF Test - Set 2	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-1050	DLCA6500 BL1.13 - SCA Change Issues - DEF Requirements - Set 4	2 - No Operational Effect	DLNK DLCA6500 4 REQ/TEST
DLSS-1047	DLCA6500 BL1.13 - SCA Change Issues - DEF Requirements - Set 1	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-1033	DLCA-6500 - Dual DLCA issues	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-1032	DLCA-6500 - Test is expecting Connection to terminate when um160 is received older than a previously received um160 and CPDLC service issues	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-1029	DLCA-6500 - Codec related issues- SET3	2 - No Operational Effect	DLNK DLCA6500 4 REQ/TEST
DLSS-1027	DLCA-6500 - BL1.13 - SCA Change Issues Set 3	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST

Work Package #	Summary	Criticality	Build
DLSS-1025	DLCA-6500 : Update Artifacts to read "FANS 1/A+" instead of "FANS 1/A"	1B - No Significant Operational Effect	DLNK DLCA6500 4 REQ/TEST
DLSS-1015	DLCA-6500 - Codec and HMI requirement modifications.	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-1007	DLCA-6500 - HLSRS, ATN, Common SRS updates to requirements	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-996	DLCA-6500 - Update to Free text requirement in SRS for ATN	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-993	DLCA6500 - Flight ID processing requirement (figure) update	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-991	DLCA-6500 - HMIC, FANS, ATN, CSS requirements and SDD linking issues.	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-989	DLCA-6500 - Requirement Change Needed to Document Behavior when Messages Are Deleted from the Msg Respository	3A - Significant Process Deviation	DLNK DLCA6500 5.0.9-REQ/TEST
DLSS-987	DLCA-6500 - Printer and CVR log is not displaying messages of size greater than 3296 characters.	2 - No Operational Effect	DLNK DLCA6500 4 REQ/TEST
DLSS-986	DLCA-6500 - HMI requirement needs to be modified.	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-985	DLCA-6500 - Page Independence is not working for Position report and Foot Print pages & Seamless Transfer Reqs	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST

Work Package #	Summary	Criticality	Build
DLSS-982	DLCA-6500 - CVR, Foot Print, WHEN CAN WE, SET function and core related requirement issues	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-972	DLCA-6500 - ATN UM159 ERROR Message display format and Frequency resolution requirement updates	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-969	DLCA-6500 - Requirements versus implementation mismatch	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-968	DLCA-6500 - LOGON STATUS, MESSAGE LOG, TIMERS, Ground App and Frequency page entry requirement issues.	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-926	DLCA-6500 - Issue with debug filters trace getting printed in console	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-3597	DLCA-6500: HEX Edit page requirement incorrectly requires use of message header	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-4014	DLCA6500 : Test Procedure Update for Sequence Number	3A - Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-4013	DLCA-6500: Test Procedure Update - TC_ATN_CPDLC_050-01 (Target only)	3A - Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-4012	DLCA6500: Minor TP update for time evaluation failures	2 - No Operational Effect	DLNK DLCA6500 4 REQ/TEST
DLSS-4011	DLCA-6500: Minor Verification Script Updates Due To Broadcast Data Delay	3A - Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST

Work Package #	Summary	Criticality	Build
DLSS-4010	DLCA-6500: Test Procedure Update - TC_CPDLC_HMI_146-01	4A - Product Improvement	DLNK DLCA6500 4 REQ/TEST
DLSS-4009	DLCA-6500: Test Procedure Update - TC_DMGR_003-01	3A - Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-4008	DLCA-6500: Test Procedure Update - TP_CSS_038	3A - Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-4007	DLCA-6500: Test Procedure Update - TP_INBOX_035	3A - Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-4006	DLCA-6500: Test Procedure Update - TP_VERTICAL_INBOX_053	3A - Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-3947	DLCA6500 : Test Procedure Update - TP_CM_019	3A - Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-3944	DLCA6500: Test Script Update for Alerting Change.	3A - Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-3945	DLCA6500: Minor TP update for to remove duplicate MIN(s)	3A - Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-3915	DLCA-6500 - DM tester does not allow to add spaces for ORIG and DEST values	3A - Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-3561	DLCA6500 : Seamless Transfer Requirements Updates.	2 - No Operational Effect	DLNK DLCA6500 4 REQ/TEST
DLSS-3558	DLCA-6500: PersistentFD.cpp SCA DEF-Test - NVM Facility Version Number Conflict	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST

Work Package #	Summary	Criticality	Build
DLSS-3557	DLCA-6500: debug.cpp SCA DEF-Test V3.6	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-3554	DLCA-6500: Missing Test Case for FANS Uplinks that Do No Contain Enough Bits	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-3650	DLCA-6500 : Update test to account for ATC Ground Station reusing the MIN for LACK	3A - Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-3596	DLCA-6500: AFN State Transition Diagram and Test Case Update	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-3529	DLCA-6500: Footprint page requirements should prohibit independence	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-3910	DLCA6500: Issue with Position Report & Confirm POS Report Test.	3A - Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-4761	Verif: DLCA6500 - issue with indicators when cpdlc is inhibited	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-4752	Verif: DLCA - Operational configuration table not correct and complete	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-4748	Verif: DLCA6500 - Core related issues - 3	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-4792	Verif: DLCA6500: Configurable Inbox Common System Services requirement conflicts with HMI requirement	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST

Work Package #	Summary	Criticality	Build
DLSS-4788	Verif: DLCA6500: MESSAGE X LABEL requirements need to be updated to allow automated verification testing	2 - No Operational Effect	DLNK DLCA6500 4 REQ/TEST
DLSS-4785	Verif: DLCA - Codec Error precedences not specified	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-4782	Verif: DLCA6500 - Configurable Horizontal Inbox issue - New message state not verifiable	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-4779	Verif: DLCA6500 - SCA Change Issues - DEF Requirements Configurable Inbox.cpp	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-4767	Verif: DLCA6500: Vertical Configurable Inbox Msg Log Issue	2 - No Operational Effect	DLNK DLCA6500 4 REQ/TEST
DLSS-4776	Verif: DLCA6500 - SCA Change Issues - DEF Requirements - SystemInfo	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-4773	Verif: DLCA6500 : Configurable Inbox Related Issues.	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-4395	Verif: DLCA - Codec and HMI requirement modifications.	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-4421	Verif: DLCA6500 - Flight ID processing requirement (figure) update	2 - No Operational Effect	DLNK DLCA6500 4 REQ/TEST
DLSS-4417	Verif: DLCA-6500: HEX Edit page requirement incorrectly requires use of message header	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST

Software Accomplishment Summary (SAS) for Data Link Communication Application (DLCA-6500)

Work Package #	Summary	Criticality	Build
DLSS-4414	Verif: DLCA-6500: Footprint page requirements should prohibit independence	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-4410	Verif: DLCA-6500: Clear not disabled after page data reset	1B - No Significant Operational Effect	DLNK DLCA6500 4 REQ/TEST
DLSS-4405	Verif: DLCA-6500 - Missing Requirement for ATC COMM STATUS Alert, Label 276, bit 12	2 - No Operational Effect	DLNK DLCA6500 4 REQ/TEST
DLSS-4400	Verif: DLCA-6500 - ADS contracts not getting cancelled upon uplinking END SERVICE(uM161)	2 - No Operational Effect	DLNK DLCA6500 4 REQ/TEST
DLSS-4425	Verif: DLCA6500 : Seamless Transfer Requirements Updates.	2 - No Operational Effect	DLNK DLCA6500 4 REQ/TEST
DLSS-4448	Verif: DLCA6500: Missing requirements documenting when data is sent to CVR	2 - No Operational Effect	DLNK DLCA6500 4 REQ/TEST
DLSS-4495	Verif: DLCA6500: REPORT FUNCTION remains enabled in ATN mode	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-4526	Verif: DLCA-6500: AFN State Transition Diagram and Test Case Update	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-4217	DLCA-6500 - Updating Test Stations to Latest Platform Software	4A - Product Improvement	DLNK DLCA6500 4 REQ/TEST
DLSS-4221	Verif: DLCA-6500 - Updating Test Stations to Latest Platform Software	4A - Product Improvement	DLNK DLCA6500 4 REQ/TEST
DLSS-4134	DLCA6500 : Display Format Script Updates for Auto Logon Fix	3A - Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST

Work Package #	Summary	Criticality	Build
DLSS-4136	DLCA-6500 SCA DEF-Test Lines 29:16-29:17 V3.4 afnapp.cpp	2 - No Operational Effect	DLNK DLCA6500 4 REQ/TEST
DLSS-4132	DLCA6500 : Display Format Script Updates for Flight ID	3A - Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-4431	Verif: DLCA6500 BL1.13 - SCA Change Issues - DEF Requirements - Set 4	2 - No Operational Effect	DLNK DLCA6500 4 REQ/TEST
DLSS-4444	Verif: DLCA6500: Emergency Page data update not supported by requirements	2 - No Operational Effect	DLNK DLCA6500 4 REQ/TEST
DLSS-4439	Verif: DLCA6500 BL1.14 - SCA Change Issues - DEF Requirements - CSS	2 - No Operational Effect	DLNK DLCA6500 4 REQ/TEST
DLSS-4452	Verif: Stale ICAO Address is not being cleared.	2 - No Operational Effect	DLNK DLCA6500 4 REQ/TEST
DLSS-4435	Verif: DLCA6500 BL1.13 - SCA Change Issues - DEF Requirements - Set 1	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-4164	DLCA-6500 - Missing Test Case for ATN CM Update	3A - Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-5618	DLCA-6500:Incorrect Link from HLSRS to Global SARD	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-5608	DLCA-6500 SRS for Common System Services Attributes Clean-up	4A - Product Improvement	DLNK DLCA6500 4 REQ/TEST
DLSS-5598	Verif: DLCA-6500: Position Report Page multiple display requirement update	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST

Work Package #	Summary	Criticality	Build
DLSS-6212	DLCA-6500 : Update AC20-140C mandate compliance matrix	4B - Documentation Improvement	DLNK DLCA6500 5-REQ/TEST
DLSS-6239	DLCA6500 - Incorrect/missing SDD links	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-6132	DLCA-6500: FANS/ATN Compliance Matrix Incorrectly Identifying Partial Compliance to OID# 5224	3B - Non-Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-6200	Verif: DLCA - HMI requirement needs to be modified.	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-6458	DLCA6500 - Configurable Inbox issues related to Active/Inactive indication of CURRENT MSG LABEL, SEPERATOR LABEL and TOTAL MSG LABEL	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-4624	Verif: DLCA6500 : Alerting Requirements Updates	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-4745	Verif: Codec Requirement update for CMContactResponse	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-4732	Verif: DLCA6500-Codec related issues- SET3	2 - No Operational Effect	DLNK DLCA6500 4 REQ/TEST
DLSS-4729	Verif: DLCA - HLSRS, ATN, Common SRS updates to requirements	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-4723	Verif: DLCA6500: Logon Update requirement is incorrect and doesn't fully implement HLR	1B - No Significant Operational Effect	DLNK DLCA6500 4 REQ/TEST

Work Package #	Summary	Criticality	Build
DLSS-4720	Verif: DLCA - Contradictory Uplink Elements requirement and code needs to be modified.	1B - No Significant Operational Effect	DLNK DLCA6500 4 REQ/TEST
DLSS-4717	Verif: DLCA - CVR, Foot Print, WHEN CAN WE, SET function and core related requirement issues	2 - No Operational Effect	DLNK DLCA6500 4 REQ/TEST
DLSS-4713	Verif: DLCA - ATN UM159 ERROR Message display format and Frequency resolution requirement updates	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-4709	Verif: DLCA - Requirements versus implementation mismatch	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-4705	Verif: DLCA - LOGON STATUS, MESSAGE LOG, TIMERS, Ground App and Frequency page entry requirement issues.	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-4959	DLCA6500 - Update Test TP_FANS_CPDLC_CA_034.py Analysis	2 - No Operational Effect	DLNK DLCA6500 4 REQ/TEST
DLSS-5166	DLCA-6500 - Updating Test Stations to Latest Platform Software	4B - Documentation Improvement	DLNK DLCA6500 5-REQ/TEST
DLSS-4907	DLCA-6500 : "Growth" Requirements in the HLSRS Being Linked To Incorrectly	2 - No Operational Effect	DLNK DLCA6500 4 REQ/TEST
DLSS-5014	DLCA-6500 PSAC update	4B - Documentation Improvement	DLNK DLCA6500 5-REQ/TEST
DLSS-5349	Verif: DLCA-6500 Update ONBOARD DEBUG Page Requirements	4A - Product Improvement	DLNK DLCA6500 4 REQ/TEST

Software Accomplishment Summary (SAS) for Data Link Communication Application (DLCA-6500)

Work Package #	Summary	Criticality	Build
DLSS-5330	Verif: DLCA - Automated cursor placement for large messages and debug page requirement clean-up	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-6671	DLCA-6500: DataLinkOff Inbox Testability issue	2 - No Operational Effect	DLNK DLCA6500 4 REQ/TEST
DLSS-6653	Verif: DLCA-6500: Lean the Simulation Folders Down to Remove Duplicate Files/Folders	4B - Documentation Improvement	DLNK DLCA6500 5-REQ/TEST
DLSS-3877	DLCA-6500 SCA DEF-Test Lines 17:6-17:9 V3.4 afnapp.cpp	3A - Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-3993	DLCA6500 : Test Procedure Update - TP_FANS_CPDLC_039	3A - Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-3992	DLCA6500 : Test Procedure Update - TP_CM_001	3A - Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-3991	DLCA6500 : Test Procedure Update - TP_FANS_CPDLC_045	3A - Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-3990	DLCA-6500: Minor Verification Script Update to accommodate ATC Ground Sim changes	3A - Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-4020	DLCA-6500: VISION tool issues require use of image comparison	3A - Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-4021	DLCA6500 : Test Procedure Update - TP_CPDLC_HMI_914	3A - Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-4004	DLCA6500 : Test Procedure Update - TP_CPDLC_HMI_332	3A - Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST

Software Accomplishment Summary (SAS) for Data Link Communication Application (DLCA-6500)

Work Package #	Summary	Criticality	Build
DLSS-4003	DLCA-6500: Minor TP Update to retrieve DLCA CFG and TLCPN Part Numbers	3A - Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-4002	DLCA6500: Minor TP update for ARM STATUS and REPORT STATUS	3A - Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-4001	DLCA6500: Minor TP update for MSG LOG cleared by End Of Flight	3A - Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-4000	DLCA6500: Minor TP update for valid ATN VHF frequency	3A - Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-4005	DLCA6500 : Test Procedure Update - TP_CPDLC_HMI_062 & TP_CPDLC_HMI_400	3A - Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-3972	DLCA6500 : Test Procedure Update - TP_CM_012	3A - Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-3849	DLCA-6500 SCA DEF-Test Lines 16:23, 16:40, 16:33-34, 16:38-39 V3.4 cmasedialogue.cpp	2 - No Operational Effect	DLNK DLCA6500 4 REQ/TEST
DLSS-3848	DLCA-6500 SCA DEF-Test Lines 10:33 - 10:38 V3.4 cmasedialogue.cpp	3A - Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-3846	DLCA-6500 SCA DEF-Test Lines 21:24 - 21:26 - V3.4 WDI_CpdlcTransferResponseInterface.cpp	3A - Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-1611	DLCA-6500 - Missing Requirement for ATC COMM STATUS Alert, Label 276, bit 12	2 - No Operational Effect	DLNK DLCA6500 4 REQ/TEST
DLSS-2581	Verif: DLCA - Page Independence is not working for Position report and Foot Print pages	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST

Software Accomplishment Summary (SAS) for Data Link Communication Application (DLCA-6500)

Work Package #	Summary	Criticality	Build
DLSS-2578	Verif: DLCA - Update to Free text requirement in SRS for ATN	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-2564	Verif: DLCA6500 BL1.13 - SCA Change Issues - DEF Requirements / Implementation - Set 5	2 - No Operational Effect	DLNK DLCA6500 5.0.9-REQ/TEST
DLSS-1724	Verif: DLCA6500 : Inconsistency with output rate of DLCA Cross Talk Data.	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-1832	Verif: DLCA - HMIC, FANS, ATN, CSS requirements and SDD linking issues.	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-1276	DLCA6500 - SCA Change Issues - DEF Requirements Configurable Inbox.cpp	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-3365	Verif: Alerting issues after End of Flight (EOF) event	2 - No Operational Effect	DLNK DLCA6500 4 REQ/TEST
DLSS-3507	DLCA-6500- Test Procedure Update Needed for Active/Standby Testing	3A - Significant Process Deviation	DLNK DLCA6500 5-REQ/TEST
DLSS-3487	DLCA-6500 Stale ICAO Address is not being cleared.	2 - No Operational Effect	DLNK DLCA6500 4 REQ/TEST
DLSS-3460	DLCA-6500: Update for FANS Performance Should Include Both Directions	4B - Documentation Improvement	DLNK DLCA6500 5-REQ/TEST
DLSS-3165	DLCA6500: Configurable Inbox Common System Services requirement conflicts with HMI requirement	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST

Work Package #	Summary	Criticality	Build
DLSS-2707	DLCA-6500 - ADS contracts not getting cancelled upon uplinking END SERVICE(uM161)	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-2799	DLCA6500: MESSAGE X LABEL requirements need to be updated to allow automated verification testing	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-2798	DLCA6500: Emergency Page data update not supported by requirements	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-2747	DLCA-6500: Clear not disabled after page data reset	1B - No Significant Operational Effect	DLNK DLCA6500 4 REQ/TEST
DLSS-2731	DLCA6500: REPORT FUNCTION remains enabled in ATN mode	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-2914	Verif - DLCA6500: License and strapping information missing from debug trace port	2 - No Operational Effect	DLNK DLCA6500 4 REQ/TEST
DLSS-2911	DLCA6500: Missing requirements documenting when data is sent to CVR	3B - Non-Significant Process Deviation	DLNK DLCA6500 4 REQ/TEST
DLSS-20784	Verif: DLCA-6500 - Safety Review of Derived Requirements 5.0.9 & 5.0.10 Builds	3B - Non-Significant Process Deviation	DLNK DLCA6500 5.0.9-REQ/TEST
DLSS-15316	Update DLCA-6500 Verification user guide as per A661 implementation	4B - Documentation Improvement	DLNK DLCA6500 5 DOC Only
DLSS-21155	VERIF: DLCA6500: 5.2 RFS Scripts Related Failures	3B - Non-Significant Process Deviation	DLNK DLCA6500 5.0.11-REQ/TEST
DLSS-21841	Verif: DLCA6500: Missing Requirements for Concatenation ERROR Downlink in ATN Network	3B - Non-Significant Process Deviation	DLNK DLCA6500 5.0.11-REQ/TEST

Work Package #	Summary	Criticality	Build
DLSS-10506	DLCA-6500 - Link HLR requirements to L1 System requirements using of link by Attribute	4A - Product Improvement	DLNK DLCA6500 5-REQ/TEST
DLSS-21803	DLCA6500: Missing Requirements for Concatenation ERROR Downlink in ATN Network	3B - Non-Significant Process Deviation	DLNK DLCA6500 5.0.11-REQ/TEST

Appendix D DLCA-6500 Open Work Packages

D.1 DLCA-6500 Open Work Packages

WP #	Summary	Criticality	Plain English Description	Operational Impact	Cert/Safety Justification
DLSS-14312	DLCA6500: Foot Print HMI Issues, When Inactive Advisory "NO RIU CONN" or "NO COMM" is enabled.	2 - No Operational Effect	<p>DLCA is partially violating the requirements HMIC26715. As per requirement when Inactive Advisory "NO RIU CONN" or "NO COMM" is enabled (i.e No RIU Connection or No Communication) then DLCA shall stop downlinking the messages and the following buttons need to be disabled/enabled as below in the FootPrint Calculation page.</p> <p>MEM TEST START FUNCTION Button - Enabled</p> <p>MEM TEST PAUSE FUNCTION - Disabled</p> <p>MEM TEST STOP FUNCTION - Disabled</p> <p>Currently the DLCA stop downlinking the messages but the START button is disabled and the PAUSE & STOP buttons are enabled which is against the requirement.</p> <p>The Requirement and Code need to be updated to disable all the buttons (START,PAUSE & STOP) when there is "NO RIU CONN" or "NO COMM".</p> <p>Note: This page is password protected page and for maintenance purpose only. Pilot don't</p>	<p>Flight Deck Effect: No FDE as this page is password protected and only accessed for Maintenance purpose.</p> <p>Flight Deck Workaround: None.</p>	<p>Safety Effect: No Safety Effect.</p> <p>Rationale: This page is password protected page and for Maintenance purpose only. No flight operation impact or crew actions affected by this issue.</p>

Software Accomplishment Summary (SAS) for Data Link Communication Application (DLCA-6500)

WP #	Summary	Criticality	Plain English Description	Operational Impact	Cert/Safety Justification
			have access to this page. This page supports the Footprint calculation and there is no issue as the footprint data is captured only when there is RIU or COMM Connection.		
DLSS-3647	DLCA6500: Unrecognized MRN Issue	3A - Significant Process Deviation	This is an issue with the ATC Ground Station Tool when operating in ATN mode only. When an uplink message is responded to with multiple responses (e.g STANDBY & ACCEPT) and then if the same responses (e.g. STANDBY & ACCEPT) occur for another simple response uplink message, then the ATC Tool sends a um159 uplink instead an Acknowledgement (ACK). The ATC Ground Station Tool should send an ACK in this case.	Flight Deck Effect: No Flight Deck Effect Flight Deck Workaround: None	Safety Effect: No Safety Effect. Rationale: This issue is for the programs which are having vertical Inbox. The functionality of the vertical inbox features is locked behind configuration files and have been tested to not be accessible in any other way. Hence this work package is not applicable for this program.
DLSS-1232	DLCA6500 - Configurable Vertical Inbox issue related to CDA, NDA, inactive advisory label	3B - Non-Significant Process Deviation	In contradiction to requirement HMIC27283, the CDA DISPLAY LABEL, NDA DISPLAY LABEL, INACTIVE ADVISORY LABEL are getting displayed even when active text for Inbox_lblCDADisplay and Inbox_lblNDADisplay, Inbox_clblAdvisory is changed to FALSE in DLCA_cfg.xml file	Flight Deck Effect: When the configuration is updated to false, the old data still gets displayed on the inbox window Flight Deck Workaround: Refer to main application for the actual status	Safety Effect: No safety effect. Rationale: This issue is for the programs which are using vertical Inbox. The functionality of the configurable inbox features is locked behind configuration files and have been tested to not be accessible in any other way. Hence this work package is not applicable for this program and is not affected by this issue.

WP #	Summary	Criticality	Plain English Description	Operational Impact	Cert/Safety Justification
DLSS-9293	DLCA-6500 - V3.1 DOORS - Linking & Safety Attribute Mismatch Issues	3B - Non-Significant Process Deviation	<p>The issue is that high-level requirement HLSRS4186 is not a safety requirement but inlink from low level requirement HMIC25572 is marked as a safety requirement.</p> <p>This Low-level requirement HMIC25572 talks about the displaying format, so this requirement needs to be changed as a non-safety requirement.</p> <p>The other issue is that the CSS30719 , HMIC27703 has improper links which need to be removed.</p>	<p>Flight Deck Effect: No FDE</p> <p>Flight Deck Workaround: N/A</p>	<p>Safety Effect: No Safety Effect.</p> <p>Rationale: This issue is a documentation issue, exist only in the DOORS 3.1 branch and is applicable for the programs which uses DOORS3.1 branch. This program uses DOORS other than 3.1 branch. Hence this work package is not applicable for this program.</p>
DLSS-18165	Verif : DLCA-6500 - Dlca I/O Configuration XML Requirements updates	3B - Non-Significant Process Deviation	<p>Dlca I/O configuration xml file needs to be tested for all the applicable data elements w.r.t the program i/o configuration xml file as per the requirement CSS30642. Verification is not completed.</p>	<p>Flight Deck Effect: NO FDE</p> <p>Flight Deck Workaround: None</p>	<p>Safety Effect: No safety effect</p> <p>Rationale: This work package is for DLCA I/O Configuration XML file verification. The functionality of the I/O Configuration XML file is verified for this program. Hence this work package is not applicable for this program and is not affected by this issue.</p>

Software Accomplishment Summary (SAS) for Data Link Communication Application (DLCA-6500)

WP #	Summary	Criticality	Plain English Description	Operational Impact	Cert/Safety Justification
DLSS-18259	Verif : DLCA-6500 - Dlca I/O Configuration XML Requirements updates	3B - Non-Significant Process Deviation	Dlca I/O configuration xml file needs to be tested for all the applicable data elements w.r.t the program i/o configuration xml file as per the requirement CSS30642. Verification is not completed.	Flight Deck Effect: No FDE Flight Deck Workaround: None	Safety Effect: No safety effect Rationale: This work package is for EDS(Embedded Display System) Dual DLCA I/O Configuration XML file verification. This program is not an EDS Dual DLCA environment. The functionality of the I/O Configuration XML file is specific to program and have been tested to not be accessible in any other way. Hence this work package is not applicable for this program and is not affected by this issue.
DLSS-20720	VERIF: DLCA6500: Test Deficiency due to ATC Ground Sim Issues on EDS Dual AFD Environment.	3B - Non-Significant Process Deviation	This issue is with the EDS Dual DLCA test environment that requires sending 75 uplink messages to ensure that when message being viewed on AFD3200 is deleted then MSGLOG page is automatically displayed. But due to the limitation of simulation environment the ATC Ground Sim Tool is resets when 42 messages are sent. This is preventing the obtaining the coverage for the line MenuPage.cpp 8:40. This	Flight Deck Effect: No FDE Flight Deck Workaround: None	Safety Effect: No Safety Effect. Rationale: This work package is only for EDS Dual DLCA program. This program is not an EDS Dual environment program. Hence this issue is not Applicable for all IPS (Integrated Processing System) programs and EDS (Embedded Display System) Single DLCA. There is no significant operational effect as a

WP #	Summary	Criticality	Plain English Description	Operational Impact	Cert/Safety Justification
			is a inconsistent issue with ATC Ground Sim Tool the DLCA is working as expected when 75 messages limit is reached.		result of this issue.
DLSS-17158	DLCA-6500 DLCA General Configuration XML for EDS programs	2 - No Operational Effect	<p>DLCA is partially violating the requirements HMIC27716 and HMIC27259.</p> <p>1. The requirement HMIC27716 says the inbox type is to be set as Inactive and the EDS programs CL604 and C295 which do not support any inbox are currently not tagged to this requirement. Instead EDS programs CL604 and C295 are tagged incorrectly to HMIC27259.</p> <p>2. So for the EDS programs CL604 and C295, The general dlca configuration xml code (DLCA_cfg.xml) needs to be fixed to say the inbox is inactive (Inbox type="Inactive") as per HMIC27716, instead of implementing incorrect inbox type as Inbox type="Inbox" per the req HMIC27259</p> <p>This issue does not have cockpit effect.</p>	<p>Flight Deck Effect: No FDE. The inbox will not be active and there is no interaction between the CPDLC application and Inbox. All the messages can be viewed from and responded to in the main CPDLC Msg Log page</p> <p>Flight Deck Workaround: None</p>	<p>Safety Effect: No safety effect.</p> <p>Rationale: This issue is not applicable for the IPS (Integrated Processing System) programs. This work package is for EDS (Embedded Display System) DLCA General Configuration XML file. The functionality of the General configuration XML file is specific to program and have been tested to not be accessible in any other way.</p>

WP #	Summary	Criticality	Plain English Description	Operational Impact	Cert/Safety Justification
DLSS-16915	DLCA-6500: Reject Rationale Checkbox state Maintained from previous message when New Message Is Not Fully Viewed	1B - No Significant Operational Effect	DLCA is partially violating requirement HMIC10695 and HMIC26796 in a specific scenario. When a FANS or ATN simple response uplink is received and responded to with Reject and a reason such as "DUE TO A/C", if the next uplink received is a simple response or loadable simple response uplink that requires use of the scroll bar to view the entire uplink. When this occurs, the Reject reasons, such as "Due to WX", "Due to A/C Perf" and "Unloadable", are grey and disabled, which is correct. The issue is that they are incorrectly showing the previous uplinks selections. These values should instead be unchecked for this new uplink message. The system is designed to prevent the pilot from responding to an uplink until the entire message is viewed. Until this time, all controls to downlink are responded to are disabled. When the entire message is viewed, the "Due to WX", "Due to A/C Perf" and "Unloadable" become enabled and correctly show all options unchecked. . This issue only occurs when the message is not entirely viewed and all controls are disabled.	Flight Deck Effect: On the Message Review page, when a simple response or loadable simple response uplink is displayed that requires a scroll bar to fully view; the reject reasons such as, as "Due to WX", "Due to A/C Perf" and "Unloadable", are disabled and possibly checked until the new uplink message is fully viewed. Flight Deck Workaround: The pilot cannot respond to an uplink until the entire message is viewed. Until this time, all controls to downlink are responded to are disabled. When the entire message is viewed, the "Due to WX", "Due to A/C Perf" and "Unloadable" become enabled and correctly show all options unchecked.	Safety Effect: No Safety effect. Rationale: This is a cosmetic issue with an Flight Deck Workaround(FDW).The issue is checkboxes "Due to WX", "Due to A/C Perf" and "Unloadable" are showing the previous uplink selections instead of unchecked, when DLCA gets new message. Until the entire uplink message is viewed, all controls to respond to downlink are disabled. When the entire message is viewed, then the checkboxes "Due to WX", "Due to A/C Perf" and "Unloadable" become enabled and correctly show all options unchecked. Consequently, there is no significant operational impact from the grayed out checkboxes, these grayed out checkboxes have a "stale" checkmark.
DLSS-17545	DLCA6500 - Update Test to Validate Invalid XML file when Tx/Rx port	3B - Non-Significant Process Deviation	The test method for test procedure,TP_CSS_200.py, needs to be changed from "test" to "code inspection". Test, TP_CSS_200.py, is used to validate requirement CSS30401. A portion of the test is unable to receive the necessary output to confirm DLCA is working properly. This portion	Flight Deck Effect: N/A Flight Deck Workaround: N/A	Safety Effect: No Safety Effect Rationale: This is a test method update only. Code inspection by a DLCA engineer has confirmed the code is correct and successful

WP #	Summary	Criticality	Plain English Description	Operational Impact	Cert/Safety Justification
	attributes are not available		<p>needs to be changed to Code Inspection and the test method for requirement CSS30401 updated to include "Code Inspection" as the test method.</p> <p>When a DLCA_cfg.xml file with a missing RxPort or TxPort is loaded, that DLCA is exiting and outputting to Health Monitor a fault with the text "Raised fault: 18, Corrupt/Invalid DLCA General config". DLCA is working properly by exiting and outputting the fault, however on the target test station the test procedure is not able to confirm the presence of the text "Raised fault: 18, Corrupt/Invalid DLCA General config". The text is being seen on the host simulation and is present in the DLCA code. Automated test procedure, TP_CSS_200.py, needs to modify the portion that validates the text "Raised fault: 18, Corrupt/Invalid DLCA General config" as a code inspection.</p>		<p>testing on the host has also validated this. Further, this issue will never be seen in operation. DLCA validates all XML files prior to delivery, therefore an XML file with an error such as this will not occur. If it did occur, DLCA is behaving correctly by exiting and raising an error to Health Monitor.</p>
DLSS-12641	DLCA-6500: Message Review Page Flashing When Viewing Large Flight Plan (IPS Only)	1B - No Significant Operational Effect	As per the Requirement HMIC25785, The Message Review page allows the user to view the contents of a uplink or downlink messages in the Message Review Block but when the for large route clearance uplinks & downlinks containing more than 114 waypoint is viewed on the Message Review Area causes the flashing of HMI.	<p>Flight Deck Effect: When pilot selects large downlinks and uplinks from MSG_LOG page, the display will blink which is inconvenient to pilot.</p> <p>Flight Deck Workaround: Do not select large Uplink & downlink message that contain more 114 waypoints from MSG_LOG page.</p>	<p>Safety Effect: No Safety Effect.</p> <p>Rationale: This is a corner case which would require the FMS to have more than 114 waypoint by waypoint flight plan to be downlinked.</p>

WP #	Summary	Criticality	Plain English Description	Operational Impact	Cert/Safety Justification
DLSS-11392	DLCA-6500: ADS-C EMER SELECT LIST Not Defaulting to "Off" State	1B - No Significant Operational Effect	The issue is that DLCA is partially violating requirement HMIC22754, HMIC27705, CSS30476 and HMIC22877 with regard to the ADS-C EMER SELECT LIST. As per the requirement, ADS-C EMER SELECT LIST widget should display the Select list with default "OFF" state after a flight id change (which caused the LOGON UPDATE to appear on the LOGON/STATUS page) or after ATC DL SELECT LIST selection index is modified from ENABLED/Enabled(1) to DISABLED/Disabled(2) or after Data Link Off Mode enabled or after the End of Flight occurs. but the ADS-C EMER SELECT LIST instead displays the previous selected state. This issue will only occur if the ADS-C EMER SELECT LIST is already set to "ON", which will place ADS into emergency mode.	Flight Deck Effect: ADS-C EMER SELECT LIST is not reverted back to OFF state after flight id change or after ATC DL SELECT LIST selection index is modified from ENABLED/Enabled(1) to DISABLED/Disabled(2) or after Data Link Off Mode enabled or End of Flight occurs.. Flight Deck Workaround: Manually select ADS-C EMER SELECT LIST to OFF State.	Safety Effect: Minor safety effect. Slight increase in crew workload. Rationale: ADS-C EMER SELECT LIST is not reverted back to OFF state after flight id change or after ATC DL SELECT LIST selection index is modified from ENABLED/Enabled(1) to DISABLED/Disabled(2) or after Data Link Off Mode enabled or after end of flight occurs. So Pilot has to Manually select ADS-C EMER SELECT LIST to OFF State.
DLSS-4879	DLCA-6500 : Update DLCA for CPLDC Position Report Scroll behavior is not per requirements	1B - No Significant Operational Effect	This issue affects only IPS environment. When a CPDLC Position report page is displayed and using the Outer knob on the DSK to scroll the DLCA application will perform the Page scroll but when using Inner Knob on the DSK there shouldn't be any effect on the CPDLC paging. It is observed that while using the Inner Knob DLCA application performs a page scroll which is similar to outer DSK scroll. HMI26404 correctly states when Inner knob is turned the application will scroll down one line of text. Code need to be fixed to match the behavior this scrolling requirement.	Flight Deck Effect: CPLDC Position Report performs Page Scroll with the Inner Knob on the DSK Flight Deck Workaround: Use only Outer Knob on the DSK for paging	Safety Effect: There is no safety impact. Rationale: There is no Safety impact since scrolling will happen with either knob. Note: This issue affects only IPS environment.
DLSS-18857	DLCA6500: NonConfig Inbox Refresh Key Showing Enabled	1B - No Significant Operational Effect	DLCA is violating the requirements HMIC27902, HMIC26447, HMIC27869, HMIC26445 for both IPS and EDS programs. While complex message and simple response message are concatenated and received from	Flight Deck Effect: When a complex message and simple response message are concatenated and received from ground; If the pilot	Safety Effect: Minor safety effect. Slight increase in crew workload to clear inbox.

WP #	Summary	Criticality	Plain English Description	Operational Impact	Cert/Safety Justification
	(Cyan) Color Instead of Disabled (White) Color		ground. And the Pilot responded partially to the simple response message and not responded to the complex message from the MSG log page. Mean while another simple response message received and Pilot responded to the new message from the Msg log page. Now in the Inbox Page Current Message Number and Total message Number are same but still the REFRESH widget is Enabled. And No change in the Inbox page when pressing the REFRESH QAK key. Still the REFRESH key is displayed in Cyan color. Pilot has to respond to the partially responded message to clear the REFRESH Key in the Inbox page.	responds partially to the one message but does not respond to the other message from the MSG log page and at the same time another simple response message is received and pilot responded to the new message; the Inbox Page Current Message Number and Total message Number will be the same but the REFRESH widget would be Enabled. If the pilot clicks the REFRESH QAK key, the inbox would not be cleared. Flight Deck Workaround: Pilot need to respond to the partially responded message to clear the Inbox.	Rationale: The crew will assume the cyan refresh button is enabled and might attempt to clear the messages. When it fails to do so, it might cause some confusion as to why the button is not working, leading to a slight increase in crew workload. Compliance with objectives in the safety assessment is maintained. There is no significant operational effect as a result of this issue.
DLSS-13285	DLCA-6500 Multiple Displays Not Transitioning to LOGON/STATUS page when Events Occur	1B - No Significant Operational Effect	DLCA is partially violating requirements HMIC26186 for condition "CPDLC CDA connection terminated", when multiple AFD's are displaying same Page and CPDLC connection is terminated then only one of the AFD DLCA application transitioning to LOGON STATUS page intermittently. The issue is observed in below scripts: "TC_CPDLC_HMI_261, TC_CPDLC_HMI_277, TC_CPDLC_HMI_1088, TC_CPDLC_HMI_291, TC_CPDLC_HMI_880". The code need to be updated to fix this issue.	Flight Deck Effect: Multiple AFD's NOT transitioning to LONGSTATUS Page When "CPDLC CDA connection terminated" Flight Deck Workaround: Pilot Manually navigate to LOGON-STATUS page in other AFD.	Safety Effect: Minor safety effect. Improper transition in AFD slightly increases crew workload. Rationale: One of the AFD display is not transitioning to LOGON Page automatically. To correct this, the pilot has to manually navigate to LOGON-STATUS page on another AFD. Compliance is maintained with current safety assessment. No incorrect or misleading information is displayed on the CPDLC pages due to these deficiencies

WP #	Summary	Criticality	Plain English Description	Operational Impact	Cert/Safety Justification
DLSS-971	DLCA-6500 - TIMERS page is displayed in FANS, HEX MSG page is not displaying ERROR message in VMA when message is not decodable	2 - No Operational Effect	1: As per HMIC25864 and HMIC26285, TIMERS FUNCTION should display only when ATN license is present but in current software it is displayed even if ATN license is not present 2: As per HMIC25884, if input hex message is not decodable on selection set function should display error in verify message area	Flight Deck Effect: No Effect Flight Deck Workaround: N/A	Safety Effect: No Safety Effect. Rationale: 1: This is maintenance page only pilot cannot access this in air. Even if user is able to change the ATN timer values, which will not affect anything to software operations as there is no ATN license 2: Page is for engineering debug use only. Not used in flight. Application is not allowing to send not decodable message and user can go and correct the entered message even after selecting set
DLSS-879	DLCA-6500 - Flight ID stale data when all IOC's are not present and DLCA sends stale data after 7 seconds	2 - No Operational Effect	1A: This is a code issue relating to incorrect or not-present trace tool output for verification purposes. As per OID CSS11317, the application shall source select the Flight ID by selecting IOC LA/LB/RA/RB (IOC1/2/3/4) (in that order) if a valid, non-stale flight ID has been received in the preceding 3 seconds (+/- 250 milliseconds). However, DLCA is not sending stale data notification to the trace port when all the IOC's are killed. When checking the trace port using Ethernet on "TO_FT_DLCA_TESTPORT", DLCA is not sending stale data notification for Flight ID NDO IDs and the same is not printed in the tracetool when all the IOCs are killed. However, this stale data is shown on the L_DLCA console window in the host (test) environment. The ProcessGenericWord() function in the BroadcastInputProcessor.cpp file needs to be updated to correctly print to the traceport the stale data information at the correct time.	Flight Deck Effect: No Effect Flight Deck Workaround: N/A	Safety Effect: No Safety Effect. Rationale: 1A: The correct debug statements are printed to the console window, but are not sent to the traceport. The functionality is verified via the console window. 1B: Issue is only visible to verification during testing procedures. Issue does not affect functionality or performance. 2: Issue is only visible to verification during testing procedures. Issue does not affect functionality or performance. The functionality is verified via the console window and the software is behaving per the requirements.

WP #	Summary	Criticality	Plain English Description	Operational Impact	Cert/Safety Justification
			<p>1B: This is a code issue relating to incorrect or not-present trace tool output for verification purposes. When the transponder (TDR) is disabled, the stale statement for IOC4 is printed as shown below:</p> <p>DLCA:[INIT] Stale Data has been received for FLIGHTID_TDR_Word1_IOC4 from NDO: 0</p> <p>DLCA:[INIT] Stale Data has been received for FLIGHTID_TDR_Word2_IOC4 from NDO: 0</p> <p>DLCA:[INIT] Stale Data has been received for FLIGHTID_TDR_Word3_IOC4 from NDO: 0</p> <p>DLCA:[INIT] Stale Data has been received for FLIGHTID_TDR_Word4_IOC4 from NDO: 0</p> <p>and for IOC2 as shown below:</p> <p>DLCA:[INIT] Stale Data has been received for FLIGHTID_TDR_Word1_IOC2 from NDO: 11525880</p> <p>Notice that the NDO ID number is showing as ZERO for IOC4. This is incorrect. Per IOCF document, it should read as 11525880.</p> <p>Notice that the NDO ID number is showing as 11525880 for IOC2. This is incorrect. Per IOCF</p>		

WP #	Summary	Criticality	Plain English Description	Operational Impact	Cert/Safety Justification
			document, it should read as 11525856 The Printf statements are wrong in the code, which need to be updated in loProcInterface.cpp, function GetNDOld() to display the correct NDO ID. 2: This issue is a code issue that is not implementing the requirements correctly. Per CSS28980, the DLCA shall source select Flight ID from the IOCs, in order, provided non-stale data has been received in the previous three seconds. However, the DLCA only prints 'stale data received' after seven seconds. The ProcessGenericWord() function in the BroadcastInputProcessor.cpp file needs to be updated to correctly print to the traceport the stale data information at the correct time.		
DLSS-1017	DLCA-6500 - ASN.1 text space issue and format issues	2 - No Operational Effect	1: This is an implementation issue. Requirement CSS28565 states that there shall be only one space between two consecutive ASN.1 elements, however it was observed that when Place Bearing Distance (PBD) position type is used in Uplink message 46 or Route Request downlink an extra space is present between Bearing and Distance Parameters. Code needs to be updated to fix this issue. ..\Code\Msg\Codec\AsnFmtStr.cpp, function fmtDistance	Flight Deck Effect: None Flight Deck Workaround: N/A	Safety Effect: No Safety Effect. Rationale: 1: There is no Operational impact as this issue is cosmetic in nature. Having an extra space between the parameters does not alter the intention of the message and the pilot will still be able to comprehend the message correctly. 2: There is no Operational impact as this issue is cosmetic in nature. Not having a colon character at the end of "COMNAV EQUIP" does not alter the intention of the message and the pilot will still be able to comprehend the message correctly.

WP #	Summary	Criticality	Plain English Description	Operational Impact	Cert/Safety Justification
			<p>The format specifier used in this function for Nautical Mile distance type is mentioned as "%1f NM" with a leading space. This is causing the extra space character between Bearing and Distance parameter.</p> <p>Note: This extra space is also observed in tests that involve NM as the unit for distance</p> <p>2: This is an implementation issue. Requirement CSS28474 states that sub-parameter types shall display the title string followed by a colon ":", however it was observed that colon ":" was not displayed after sub-parameter type "COMNAV EQUIP". Code needs to be updated to fix this issue. No test update is needed as test TP_FANS_CODEEC_UM73 correctly looks for colon character.</p> <p>..\Code\Msg\Codec\AsnFmtFans.cpp, function fmtAircraftequipmentcode</p> <p>The title string in the function is mentioned as "COMNAV EQUIP" without a colon. This is resulting in display of title string "COMNAV EQUIP" without the colon.</p>		

Software Accomplishment Summary (SAS) for Data Link Communication Application (DLCA-6500)

WP #	Summary	Criticality	Plain English Description	Operational Impact	Cert/Safety Justification
DLSS-1102	DLCA-6500 - Codec - Incorrect error code returned	2 - No Operational Effect	The issue is that DLCA is failing requirements CSS29353 for the ""ElemNotInBounds"". A code update is required. The root cause that when the ASN.1 FANS Codec is building a downlink message and detects an error; the code returns to the caller of the type of error which occurred. The code is returning the wrong type of error, however it is detecting the error. To fix this issue, update class AsnCpdlcDecode, method decodeUplinkMsgData to return the ElemNotInBounds value.	Flight Deck Effect: No Effect Flight Deck Workaround: N/A	Safety Effect: No Safety Effect. Rationale: Operationally this will not occur. DLCA has tested all of its downlinks to confirm they are being correctly built. All DLCA pages that support downlink messages have been tested and passed.
DLSS-1149	DLCA6500 - Software issue	2 - No Operational Effect	When the application receives uplink message um160, the text displayed by the application includes one extra space at the end of the message. The following code needs to be updated to correct this: File: AsnFmtStr.cpp Function: AsnFmtStr::validateMessageCharacterSet	Flight Deck Effect: No Effect Flight Deck Workaround: N/A	Safety Effect: No Safety Effect. Rationale: The pilot is unable to see the extra space on the flight deck. Only the verification tool can pick up this error. This is a cosmetic issue that does not affect the integrity of the message in anyway.
DLSS-1194	DLCA6500 - Issue with legtype data in flight plan downlink	2 - No Operational Effect	DLCA is violating requirement CSS28471 and CSS29788 when an active, modified or secondary flight plan data is received from the FMS that contains Route Info Additional->HoldAtWaypoint->Leg Type information. DLCA is not including the Route Info Additional->HoldAtWaypoint->Leg Type information in the downlink message. All other HoldAtWaypoint information is being correctly added to downlink messages.	Flight Deck Effect: No Effect Flight Deck Workaround: N/A	Safety Effect: No Safety Effect. Rationale: This will never occur in the field and can only be created in a simulation environment. The FMS that DLCA interacts with does not support Route Info Additional and therefore will never provide to Route Info Additional->HoldAtWaypoint->Leg Type information.

WP #	Summary	Criticality	Plain English Description	Operational Impact	Cert/Safety Justification
			Code: The function render(Holdatwaypoint&holdAtWaypoint, uint32_t known_length) in DMWalker.cpp needs to be updated to use correct bitmask value while decoding the flight plan from FMS.		
DLSS-1205	DLCA6500 - Issue with error reporting for Invalid CPN values	2 - No Operational Effect	As stated in OIDs CSS30401, CSS30418 and CSS30532, the CPN (part number) label can display a maximum of 13 alphanumeric characters, and as per OID CSS30401, when a tag/attribute/value in the XML where the CPN is configured is invalid, then the application logs an error with Health Monitor. In the current software, when more than 13 characters are entered an error is not triggered. Similarly, when non-alphanumeric characters (such as 980-1@35-*4545) are entered, no error is thrown.	Flight Deck Effect: None Flight Deck Workaround: N/A	Safety Effect: No Safety Effect. Rationale: The entry of the part numbers in the XML is created and controlled by the DLCA team. This is not a customer-modified document. Any changes/updates are required to be peer-reviewed for the correctness of the data. It is not expected, therefore, for non-actual part numbers to be used here. This is a robustness case meant to protect against a user inputting bad and/or misformed data.
DLSS-1214	DLCA6500 - Configurable Inbox - STBY'ed Loadable message causes next messages to be unable to be responded to	1B - No Significant Operational Effect	This issue applies to the Configurable Inbox only. This is also a FANS only issue. When attempting to respond to messages on the Configurable Inbox, if a loadable uplink, such as a um46 (CROSS [position] AT [ALTITUDE]) is received and a separate uplink message containing a report, such as um145(REPORT HEADING), is received; if the pilot does responds to the loadable uplink (um46) with STANDBY and then never selects ACCEPT or REJECT, the pilot will be unable to downlink via the Configurable Inbox a response to the other report uplink message (um145).	Flight Deck Effect: For programs that use the Configurable Inbox, In this situation, the operator will not be able to respond to the other messages in the Inbox. The operator will have to use the DLCA Message Log to respond to the messages. For programs that do not use the Configurable Inbox, no FDE. Flight Deck Workaround: Use	Safety Effect: No safety effect Rationale: This issue is for the programs which are having Configurable Inbox. The functionality of the configurable inbox features are locked behind configuration files and have been tested to not be accessible in any other way. This program not uses the configurable inbox and is not affected by this issue.

Software Accomplishment Summary (SAS) for Data Link Communication Application (DLCA-6500)

WP #	Summary	Criticality	Plain English Description	Operational Impact	Cert/Safety Justification
			<p>This issue does not impact simple response uplinks.</p> <p>All messages can be responded to via the Main application.</p>	main application to respond to messages.	
DLSS-1099	DLCA-6500 - License information	1B - No Significant Operational Effect	<p>When the DLCA application is in an invalid license configuration (for example, licensed for dual DLCA operation, but no license for ATN or FANS functionality) the application will still run and will attempt to draw to the display. Per Requirement OIDS CSS29383 and CSS29377 the application should read the license information supplied by ALM to determine what needs to be enabled.</p> <p>When DLCA is in the aircraft and the licenses are not available, the Window Manager would not allow the DLCA layer to be activated without a valid license. In order for this issue to occur on an aircraft the aircraft would need to have 1) an invalid license configuration installed, 2) Window Manager having a bug allowing an unlicensed application to draw to the display and 3) this issue in DLCA causing DLCA to attempt to draw to the display when</p>	<p>Flight Deck Effect: If all the fault conditions are present at the same time, the pilot will be able to view and access the DLCA application without a license.</p> <p>Flight Deck Workaround: None</p>	<p>Safety Effect: No safety effect. Viewing license information has no operational or crew impact.</p> <p>Rationale: The issue has a safety effect no more severe than Minor, no mitigation required. Compliance with the objectives of the safety assessment process is maintained.</p>

WP #	Summary	Criticality	Plain English Description	Operational Impact	Cert/Safety Justification
			not licensed. File: DLCAConfig.cPP Function: DlcaConfig::DlcaConfig		
DLSS-1078	DLCA-6500 ATN Algorithm Identifier Issue	2 - No Operational Effect	<p>The issue is that as per ATN3430, the application should discard the uplink and send an abort message when an uplink message is received with an algorithm identifier value other than the default checksum. However the application is currently not discarding the message and not sending the abort. This issue is causing test procedure TP_ATN_CPDLC_022 to fail.</p> <p>If an uplink is received with an Algorithm Identifier other than 1, DLCA will ignore the incorrect algorithm identifier value and display the message. A Fletcher checksum is still performed to ensure the message is valid. Invalid messages are discarded.</p> <p>The Default ATN Message Checksum algorithm is a 32 bit version of the Fletcher algorithm which will generates a 32 bit (4 octet) checksum. CAO Doc 9705, Edition 2, PDR M6050001 section 4.10.2 defines the default ATN message checksum algorithm.</p>	Flight Deck Effect: No Effect Flight Deck Workaround: N/A	<p>Safety Effect: No Safety Effect.</p> <p>Rationale: This issue will happen when in the ATN CPDLC Start request message, contains an algorithm identifier other than the default checksum is sent by the ground station. This is not expected in normal operation because there is a ground requirement to always send the algorithm identifier with the default checksum value. In the future, if industry standards introduce another algorithm identifier value, the code would need to be updated to handle the new checksum algorithm.</p> <p>If a ground station incorrectly uses an Algorithm Identifier other than 1, DLCA will ignore the incorrect algorithm identifier value and display the message. A Fletcher checksum is still performed to ensure the message is valid. Invalid messages are discarded.</p>
DLSS-1320	DLCA6500 : CM ASE D-START	2 - No Operational Effect	DLCA is violating requirement ATN3013. This is an ATN only issue. If a CM logon response is received with no user data and result	Flight Deck Effect: None Flight Deck Workaround: N/A	<p>Safety Effect: No Safety Effect.</p> <p>Rationale: Only ATN PM-CPDLC application is supported by DLCA that utilize CM logon</p>

WP #	Summary	Criticality	Plain English Description	Operational Impact	Cert/Safety Justification
	confirmation Error Reporting		parameter value as 'rejected permanent' and source parameter value as 'user' and valid user version number, logon will be successful instead of failing. DLCA's LOGON/STATUS page shows the logon was successful. Ground can then initiate the CPDLC and continue operation.		service. The intent of this requirement is to enforce the ground system to provide the aircraft with user data and specify what other services the ground supports. However in Link2000+ only CPDLC is supported. By default aircraft can only support ATN CPDLC baseline 1. When the aircraft initiates a logon request, it provides in the request the aircraft's CPDLC address to the ground. If the ground initiates the CPDLC connection, the aircraft will enable the CPDLC services and the crew can use it as normal. Failure of this requirement causes the logon to be successful and will allow the ground to initiate the CPDLC connection and exchange messages with the aircraft. Operationally this has no impact.
DLSS-1244	DLCA6500 : Issues with Invalid XML Config files - SET 1	2 - No Operational Effect	As per the requirement CSS30401, the application should log an error when DLCA General Configuration XML contains invalid tags This is code issue, DlcaXmlConfig class defined suppose to handle this while parsing the file different fields. Check in the code no error code is getting raised for the mention issues in the CR description. The code simply moves on with the invalid tag (dropping that tag from data retrieve) without raising the error.	Flight Deck Effect: No Effect Flight Deck Workaround: N/A	Safety Effect: No Safety Effect. Rationale: In actual operation the Config file should not have invalid XML file. This is an internal constraint on DLCA. The XML file is part of the DLCA deliverable and is not separately loadable, so the XML is verified along with the software."
DLSS-1180	DLCA-6500 - Health and Status Error issues	2 - No Operational Effect	As per the currents requirement (CSS11279) DLCA should wait for 60 +/-2 seconds after powerup before reporting any faults to health monitor. But as per the current implementation DLCA is reporting the fault immediately instead of waiting 58-62 seconds.	Flight Deck Effect: No Effect Flight Deck Workaround: N/A	Safety Effect: No Safety Effect. Rationale: DLCA uses XML configuration files for configuring the code, Inputs, Outputs etc. During Initialization the DLCA code will read these XML configuration files and configure

Software Accomplishment Summary (SAS) for Data Link Communication Application (DLCA-6500)

WP #	Summary	Criticality	Plain English Description	Operational Impact	Cert/Safety Justification
					itself and run the code accordingly. If any error in the XML configuration is detected it will report an error to the Health Monitor. But the chances of getting this error is unusual. Because the delivered software is tested in the rig before delivery. So the possibility of generating this error is not possible. In such a case if the DLCA reports the error to health monitor immediately will not have any safety issue. As a result, the issue will realistically only be present during testing procedures and it will not have operational impact during flight.
DLSS-1024	DLCA6500 - Application starts responding slowly when multiple debug bits are selected in Onboard Debug page	2 - No Operational Effect	<p>Test procedures TP_DMGR_023 and TP_FANS_CPDLC_050 are failing due to requirement HMIC25897. This requirement identified debug bits which can be set to provide debug information on the DLCA TRACE Console. The test procedure TP_DMGR_023 is failing when the tests turn on DLCA On Board Debug (ODEBUG) bits. When DLCA outputs a large amount of debug data all at the same time it causes portion of the debug data to omitted or be delayed appearing on the DLCA TRACE Console. The test procedure is looking for this data as part of the test procedure and when its is not present TP_DMGR_023 is failing. The large amount of data being displayed caused the application to lag. The Lag caused TP_FANS_CPDLC_050-01 to fail because the proper widgets were not being selected in time.</p> <p>The DLCA code needs to be updated to limit the amount of debug data it is outputting to the DLCA TRACE Console so that a normal flow of data and not a huge burst is given to the console at once. This will resolve the issue with</p>	Flight Deck Effect: No Effect Flight Deck Workaround: N/A	<p>Safety Effect: No Safety Effect. Rationale: The pilots are not expected to access this page and turn on debug bits during normal operation. The DLCA On Board Debug (ODEBUG) allows engineering to troubleshoot issues and analyze code for various functions. The debug bits are turned off by default and can only be turned on manually via a password protected page.</p>

WP #	Summary	Criticality	Plain English Description	Operational Impact	Cert/Safety Justification
			the test procedures which are failing. The DLCA TRACE Console page is a Maintenance page that is only visible via a Password protected page.		
DLSS-1236	DLCA6500 - Issues with XML file validation.	2 - No Operational Effect	The issue is that the code is violating requirement CSS30452 and causing test script TP_CSS_026.py to fail. As per the requirement CSS30452, the application should accept the XML file with a parameter nesting depth of up to 6 and should raise an error if the depth exceeds 6. However, the code is incorrectly raising an error when the DLCA_AtnAppData.xml and/or DLCA_iocfg.xml have a depth of 4. In this scenario, no error should be raised. The code is incorrectly failing to raise an error when the DLCA_cfg.xml has a depth of greater than 6. In this scenario, an error should be raised and it is not being raised. The code needs to be updated to fix this implementation issue.	Flight Deck Effect: No Effect Flight Deck Workaround: N/A	Safety Effect: No Safety Effect. Rationale: The Depth of nesting of the XML config files are DLCA_cfg.xml is 4, DLCA_iocfg.xml is 3, DLCA_ATNAppData.xml is 3. The XML Config file will not have depth more than 6 because all XML files used by DLCA are generated by DLCA engineers and formally peer reviewed. The limitation of a nesting depth of 6 is an internal constraint on DLCA. The XML file is part of the DLCA deliverable and is not separately loadable. All XML files follow the DAL C processes with include formal verification.
DLSS-1198	DLCA-6500-Configurable Inbox next indicator issue with large messages	1B - No Significant Operational Effect	This issue applies to the Configurable Inbox only. Per design, DLCA will not allow a response to a large uplink to be sent until the entire uplink message has been viewed. The response capabilities of the DLCA user interface remain disabled until this occurs. This ensures that the uplink message has been completely reviewed by pilot before sending any response. The Inbox HMI has a limited amount of text (43 characters per line * 4 lines) that can be displayed which means uplink	Flight Deck Effect: Pilot will not be able to respond to additional uplink messages via Inbox if a previous large uplink message has not been completely viewed on the main application. Flight Deck Workaround: Go to main application and view	Safety Effect: Slight increase in crew workload if a large uplink message has been received. Rationale: This issue is applicable only for the programs which uses configurable inbox. The functionality of the configurable inbox features is locked behind configuration files and have been tested to not be accessible in any other

WP #	Summary	Criticality	Plain English Description	Operational Impact	Cert/Safety Justification
			messages larger than this cannot be viewed via the inbox. A large uplink message can only be viewed on the main application display. The Inbox includes a message indicating that the large uplink message is not supported which would cue the pilot to view the message on the main application display. If another message, which is viewable in the inbox is present, a bug in the code is preventing navigation to this next message on the Inbox unless the entire previous large uplink message has been viewed by the pilot via the main application.	the message and respond to it.	way. Hence this work package is not applicable for this program and is not affected by this issue.
DLSS-1238	DLCA-6500 - Configurable Mailbox/Inbox Message Numbering Issue	1B - No Significant Operational Effect	The CURRENT MSG LABEL (HMIC26762) and TOTAL MSG LABEL (HMIC26763) (XX of YY) in the Vertical Inbox are not being updated per HMIC26764 when a message has been viewed or immediately when a message is responded to.	Flight Deck Effect: For programs using the configurable inbox, the Mailbox/Inbox message numbering, "XX/YY", where XX is the current message and YY is the total number of messages sometimes does not show the correct number For programs using the non-configurable inbox, no flight deck effect Flight Deck Workaround: Ignore message numbering	Safety Effect: No safety effect. Rationale: This is not an issue for this program. This issue only impacts programs utilize a vertical configurable inbox. This feature has been turned off via the General Config XML file for this program. There is no operational impact for this program.
DLSS-1138	DLCA6500 - DLCA Not Reporting Error with Invalid General Configuration XML files	2 - No Operational Effect	DLCA is not reporting an error to Health Monitor when an invalid XML file is loaded. DLCA is failing requirement CSS30401 when a "DLCA General Configuration XML" is loaded that contains corrupt or bad values. DLCA should log an error to Health Monitor, instead DLCA is resetting."	Flight Deck Effect: No Effect Flight Deck Workaround: N/A	Safety Effect: No Safety Effect. Rationale: DLCA works as per requirement HMIC27241, CSS30401 and CSS30418 for valid cases of tags and attributes values. These values are specific to each program. The scenarios mentioned in this CR are robustness cases when these values will be invalid. As only valid config values will used

WP #	Summary	Criticality	Plain English Description	Operational Impact	Cert/Safety Justification
					for deliverable for each program. These config files are used by DLCA for initialization at start up, So once the DLCA starts up properly it should not affect the functionality of DLCA as the content of these XML files does not change.
DLSS-1221	DLCA6500 - Issue with Data Manager (DM) Reset Message	2 - No Operational Effect	As per requirement CSS29537 DLCA should perform following activities whenever it receives a reset message from the FMS with incorrect PDU, Protocol version, contract number, or priority values. 1) send a resetNak 2) cancel all the existing DM contracts and 3) transition into DM Client/Server Connection does not exist mode. But in the current implementation DLCA only checks for incorrect PDU version and protocol version for sending the ResetNak. Hence DLCA sends ResetAck Msg instead of ResetNak Msg and then it then it cancels all the existing DM contracts but tries to reestablish the connection with FMS.	Flight Deck Effect: No Effect Flight Deck Workaround: N/A	Safety Effect: No Safety Effect. Rationale: No functional effect to safety as FMS is a Level B application, so it should not be sending a reset message with incorrect contract number or priority. If this does happen the DLCA will cancel all the existing contracts with FMS and reestablishes the connection with Data Manager/FMS.
DLSS-1190	DLCA6500: CODEC Issues	2 - No Operational Effect	DLCA's Message Tester tool can encode any FANS or ATN message, even those messages that have not been implemented by DLCA. The codec code at issue here is intended to cover the entire range of messages, even those that haven't been implemented in the industry so that this same codec code will be useful without change now and in the future. The issue here is one of these unsupported messages (one that DLCA is not capable of generating), when sent to the codec code by the Message Tester tool is causing the codec code to assert (reset). Since by design the DLCA HMI is not capable of creating this downlink, this issue has no effect in the field.	Flight Deck Effect: No Effect Flight Deck Workaround: N/A	Safety Effect: No Safety Effect. Rationale: The DLCA HMI does not allow unsupported downlink messages to be composed. The encode/decode functionality for the all supported downlink message have been verified.

Software Accomplishment Summary (SAS) for Data Link Communication Application (DLCA-6500)

WP #	Summary	Criticality	Plain English Description	Operational Impact	Cert/Safety Justification
			As per the existing requirements ATN349 and FANS19374 the DLCA HMI supports only subset of downlink elements that are supported by the ground systems and can be composed using the CPDLC HMI. These downlinks have been tested and work as expected. The observed issue involves using the Message Tester tool to encode/decode a downlink element that is not supported by DLCA when the Codec used by DLCA was tested.		
DLSS-1245	DLCA6500 : Issues with Invalid XML Config files - SET 2	2 - No Operational Effect	As per the requirement CSS30401, the application should log an error when DLCA General Configuration XML contains invalid tags. This is code issue, DlcaXmlConfig class defined suppose to handle this while parsing the file different fields. Check in the code no error code is getting raised for the mention issues in the CR description. The code simply moves on with the invalid tag (dropping that tag from data retrieve) without raising the error.	Flight Deck Effect: No Effect Flight Deck Workaround: N/A	Safety Effect: No Safety Effect. Rationale: In actual operation the Config file should not have invalid XML file. This is an internal constraint on DLCA. The XML file is part of the DLCA deliverable and is not separately loadable, so the XML is verified along with the software."
DLSS-1009	DLCA-6500 - Codec related issues- SET2	2 - No Operational Effect	1: All Errors returned by the message library are not listed in CSS29353. Example: AsnErrEnum, AsnStatus_Constraintviolated, AsStatus_ElemOutOfBounds etc. 2: Even if we have valid values for aircraftflightidentification in DM PDU->outputmessage, Message library is returning errortranslatingoutputelem instead of success	Flight Deck Effect: No Effect Flight Deck Workaround: N/A	Safety Effect: No Safety Effect. Rationale: 1. These requirements are required for independent testing of message library and software is working as expected per requirements. Document updates will not affect anything to software. We can get these errors only thru independent testing of the DLCA message library. 2: Application will never use Message library to request/receive aircraftflightidentification

WP #	Summary	Criticality	Plain English Description	Operational Impact	Cert/Safety Justification
			<p>while encoding/decoding</p> <p>3: As per CSS28471, Frequencysatchannel is not supported for ATN but when trying to decode uM157 using message library, it is able to decode successfully without any error.</p> <p>4: As per ICAO 9705, ranges for VeriticalRateEnglish: 0 to 30000 and verticalRateMetric: 0 to 10000 but CSS28450 is mentioned as VeriticalRateEnglish: 0 to 3000 and verticalRateMetric: 0 to 1000, whereas software is working per ICAO 9705. Update to CSS28450 is needed.</p> <p>5: There is no validation happening for IA5String values from FMS, while encoding or decoding, except the length of the string. As per CSS28328, validation will be done only for manually entered data, so the software is working fine. Only the following test needs to be updated: TP_DMGR_CODEEC_INPUT_PROCNAME.txt.</p> <p>6: As per ATN2403 and ATN2404, If DLCA receives any unsupported messages then it should respond with dM62 with error reason invalidMessageElement, but while doing Message Library verification, Message Library is not returning any error while</p>		<p>from FMS, instead it will be receiving the same data from RTSA. So updating Message library to fix the issue will not affect anything to the application behavior. We can get this issue only thru independent testing of the DLCA message library</p> <p>3: Application uses harmonized message library as per requirements this is not an issue with requirements or software. Software is working as per CSS28471 and only a test script update is required.</p> <p>4: Requirement update will not affect anything to software behavior and software is already accepting the ranges per ICAO 9705.</p> <p>5: Software is working as per requirements and no updates required except to test scripts. The DM IA5String value is obtained from a higher DO-178b Level (B) source than DLCA, and for that reason the validation is not performed here. Also it acts as a pass-through of the IA5String and the validation will be performed in CPDLC level when encoding/decoding the value.</p> <p>6: Application is behaving as per mentioned requirements and no updates required except to tests. Handling unsupported message is properly implemented at application level, not in Message Library, and Message library is implemented as per standard ICAO 9705 so it will support encoding/decoding of all messages mentioned in standard.</p> <p>7: The code works correctly. Updating requirement will not affect anything in software</p>

WP #	Summary	Criticality	Plain English Description	Operational Impact	Cert/Safety Justification
			<p>encoding/decoding. This is not an implementation issue--only test scripts need to be corrected. Handling an unsupported message is implemented at the application level, not in Message Library, and Message library is implemented as per standard ICAO 9705 so it will support encoding/decoding of all messages mentioned in standard.</p> <p>7: Error codes "publdNotBefore" and "publd_ATS_NotAfter" listed in CSS29354 are not required so should be removed from the requirement.</p> <p>8: The issue is that requirement CSS29790 incorrectly lists message elements which are not supported. "um83" and "dm24" need to be deleted from requirement CSS29790</p> <p>Requirement CSS2970 should be modified to say: "The application shall append "[Route Clearance:" text followed by all the route clearance data and then append with "]" when constrained data is received along with uplink messages except for uM79 and uM80 messages.</p> <p>Note: The route clearance data is included as constraint data in the uplink message.</p>		<p>behavior.</p> <p>8: umM83 and dM24 are invalid messages and not supported by DLCA. In the ATN SRS, requirement ATN8197 and ATN928 list the complete set of supported uplink and downlink message elements. The software is working properly. No software change is required.</p> <p>9: As per CSS29354, when ATS route is present in route-clearance and it is valid as per ATN3486 and ATN3487, message library should return the error code as "ATSRouteDesPresent" so application is behaving as mentioned, only test needs to be updated. Updating tests will not affect anything to software behavior.</p>

WP #	Summary	Criticality	Plain English Description	Operational Impact	Cert/Safety Justification
			Currently, uM83 and dM24 are listed along with uM 79 and uM80 in the requirement. 9: As per ATN3486 and ATN3487, application should support ATS routes in route-clearance, but message library is returning error code as "ATSRoutesDesPresent" instead of "Success"		
DLSS-3191	DLCA6500: Configurable Inbox doesn't remove colon from time when option set	2 - No Operational Effect	DLCA is violating requirement HMIC27180 on the configurable vertical inbox's message log. Using the DLCCA Config XML if ""Inbox_clbTime"" is set to ""WITH_OUT_COLON"" the time on the configurable vertical inbox's message log should display the message time without a colon ""HHMM"", it instead is displaying it with the colon ""HH:MM"".	Flight Deck Effect: On the configurable vertical inbox message log, the message time will be displayed as ""HH:MM"" instead of ""HHMM"" even though based on the XML configuration it should not be displayed. Flight Deck Workaround: None	Safety Effect: No Safety Effect. Rationale: This issue is applicable only for the programs which uses configurable inbox. The functionality of the configurable inbox features is locked behind configuration files and have been tested to not be accessible in any other way. This program not uses the configurable inbox and is not affected by this issue.
DLSS-17454	DLCA-6500: NDA Value is not cleared, When Data Link Timer is expired and CPDLC Connection Terminated.	1B - No Significant Operational Effect	DLCA is partially violating the requirements FANS13874. As per the requirement, FANS13874 DLCA has to clear the NDA value when there is no CPDLC connection established with NDA and the "Data Link Media Unavailability" Timer expires. Currently, when the timer expires DLCA will correctly set the ATCCOMM STATUS Alert bit and display the "CONNECTION TERMINATED" on the LOGON/STATUS page, which will help the pilot to understand the connection is terminated with DLCA. It is not clearing the NDA value on the LOGON/STATUS page. It is showing "NDA XXXX", where XXXX represents the former NDA. It should instead show "NDA -----". The NDA is correctly terminated. This is a	Flight Deck Effect: The LOGON/STATUS page displays "NDA XXXX", where XXXX represents the former NDA. It should instead show "NDA -----". Flight Deck Workaround: Ignore the display of NDA value.	Safety Effect: No Safety Effect. Rationale: This is a cosmetic issue on the LOGON/STATUS page.. The NDA value is not getting cleared on the LOGON/STATUS page when the NDA connection gets terminated. DLCA correctly sets the alert bit and displays "CONNECTION TERMINATED" to the pilot to indicate that the CDA and NDA have been terminated.

WP #	Summary	Criticality	Plain English Description	Operational Impact	Cert/Safety Justification
			cosmetic issue only. This issue is not affecting any functionality it is only the display issue.		
DLSS-3780	DLCA-6500 When all FANS MIN's are Exhausted and an NDA connection exists the Logon/Status page Shows an NDA connection	1B - No Significant Operational Effect	<p>This WP is for a new requirement and a code update.</p> <p>When there is a FANS CDA and an ATN NDA, if there are 63 downlink messages in the Open state (i.e. the ground has not responded to any of the downlinks) when the 64th downlink message is sent the CPDLC connection is being terminated, an error message is downlinked to the CDA, and the ATN NDA is being promoted to the CDA.</p> <p>The NDA should not automatically be promoted to the CDA without the original CDA terminating the connection. Additionally, an error message should not be downlinked to the NDA, instead a Disconnect Request (DR1) should be issued.</p> <p>This scenario is not expected to occur in normal operation. It is not normal procedure for a pilot or the ground to continue to uplink and downlink messages without responding to messages that have already been received. It is expected for the pilot as well as the ground to respond to message and not ignore them.</p>	<p>Flight Deck Effect: When there are 63 open downlink messages such as a "REQUEST SPEED" that are unresponded to by the ground and considered "Open", when a 64th downlink message is sent, the former NDA value will appear on the LOGON/STATUS page as the CDA value instead of being cleared. When the CDA is terminated for any reason including this one, all of the messages in the MSG LOG go to "CONN ENDED".</p> <p>Flight Deck Workaround: The pilot can go to the LOGON/STATUS page and initiate a new logon or the ground can initiate the re-establishment of the CDA and NDA connection without a new logon from the pilot.</p>	<p>Safety Effect: Minor. Slight increase in crew workload to log off and log back on. It is unusual to have 63 OPEN downlink messages, as the ground will usually reply to OPEN messages in a timely fashion, well before the 64 downlink message limit..</p> <p>Rationale: Compliance with the objectives of the safety assessment process is maintained.</p>
DLSS-9519	DLCA-6500: Reset	1A - Significant	When DLCA is configured to use configurable inbox and the user tries to resend a confirm	Flight Deck Effect: CPDLC NOT AVAILABLE is displayed	Safety Effect: No Safety effect

WP #	Summary	Criticality	Plain English Description	Operational Impact	Cert/Safety Justification
	observed on Configurable Inbox - uM143 CONFIRM REQUEST Uplink.	Operational Effect	request downlink message that is currently being displayed as a unviewed message in the inbox, then the DLCA application will reset.	when trying to resend a confirm request to downlink message that is currently being displayed as a unviewed message on configurable inbox Flight Deck Workaround: Before resending a downlink messages using the confirm message ensure that the downlink message is not being displayed on the configurable inbox.	Rationale: This issue is applicable only for the programs which uses configurable inbox. The functionality of the configurable inbox features is locked behind configuration files and have been tested to not be accessible in any other way. Hence this work package is not applicable for this program and is not affected by this issue.
DLSS-17546	DLCA-6500 : Incorrectly Accepting of Free Text Uplinks(FANS, ATN) that contain the Colon(:) Character	1B - No Significant Operational Effect	DLCA is partially violating the requirement CSS28498. As per the requirement CSS28498 colon (":") is an invalid IA5string character. Per ED-110 and DO-258, which define the IA5string characters, if an "free text" uplink messages contain characters that are not in the IA5String the uplink should be rejected. A colon is not part of the defined IA5string characters. This issue is limited to ATN free text uplinks uM196, uM203, uM205,uM183 and FANS free text Uplinks uM169 or uM170. When any free text uplink such as a uM 169 or um170 is received containing a ":", the correct behavior is to reject the downlink and send a dM62 + dM67 to the ground for FANS and When any free text uplink such as a uM196, uM203, uM205, uM183 is received containing a ":", the correct behavior is to reject the downlink and send a dM62 + dM98 to the ground for for ATN. This is not the current behavior, in both FANS and ATN the uplink is being accepted and displayed to the pilot.	Flight Deck Effect: If an uplink is sent containing a ":", it is displayed to the pilot. The correct behavior, which is not occurring, is for DLCA to reject the uplink and send a downlink to the ground. The pilot should not see the uplink containing an unsupported character, such as the ":" per the industry requirements. Flight Deck Workaround: Ignore the ":" if it is displayed, this will only be possibly in free text uplinks from the ground.	Safety Effect: No safety effect Rationale: There is NO safety impact, because DLCA allowing invalid character colon to display on AFD, only when Ground is allowed to send in the uplink, this will never happen in real scenario, minor issue to be fixed.

Software Accomplishment Summary (SAS) for Data Link Communication Application (DLCA-6500)

WP #	Summary	Criticality	Plain English Description	Operational Impact	Cert/Safety Justification
			The current requirement(s) are not clearly listing the unsupported IA5characters. New requirement need to be added to list the unsupported IA5characters and test cases need to be added as per the requirement updates.		
DLSS-6423	DLCA-6500 : CPDLC Configurable Inbox: Message Review Status Incorrectly Displayed	1B - No Significant Operationa l Effect	<p>This issue applies to users of the Configurable Inbox only.</p> <p>Issue 1: The issue is that DLCA is missing a requirement to display just "SEE CPDLC FORMAT" in the Inbox when CPDLC Inhibited State is caused by "VCI/TOC is in progress". The suggested new requirement is:</p> <p>"When operating in FANS and ATN mode, the Inbox shall display "SEE CPDLC FORMAT" when the following conditions are true:</p> <ul style="list-style-type: none"> The communication has been inhibited by a VCI/TOC message VCI or TOC message is displayed in Inbox The main application is not open" 	<p>Flight Deck Effect:</p> <p>Issue 1: Message status of "CPDLC INHIBITED" "SEE CPDLC FORMAT" is displayed, instead of just "SEE CPDLC FORMAT".</p> <p>Issue 2: A chime does occur when the CPDLC logon Flight ID is changed, but there is no indication on the DLCA Inbox when the CPDLC format is not displayed.</p>	<p>Safety Effect: No safety effect</p> <p>Rationale: This work package is applicable only for the programs which uses configurable inbox. The functionality of the configurable inbox features is locked behind configuration files and have been tested to not be accessible in any other way. This program does not use the configurable inbox and is not affected by this issue.</p>

WP #	Summary	Criticality	Plain English Description	Operational Impact	Cert/Safety Justification
			<p>Issue 2: The issue is that DLCA is violating HMIC26753 by not displaying "CPDLC INHIBITED" "SEE CPDLC FORMAT" in the Inbox when the Fight ID used for CPDLC logon is changed.</p> <p>Note: This WP is not applicable to programs that do not use inbox including EDS programs.</p>	<p>Flight Deck Workaround:</p> <p>Issue 1: None</p> <p>Issue 2: Select the CPDLC application for display on an AFD. The LOGON UPDATE pop-up will be displayed on the LOGON STATUS page.</p>	
DLSS-1260	DLCA6500 : DUAL DLCA Environment Update to Support Right RIU.	3B - Non-Significant Process Deviation	The issue is test procedure TP_BCAST_025 is failing because the current DUAL DLCA Target environment does not support a Right RIU. On the host environment and in the systems rig it was tested that the DLCA was working as expected when Right RIU was active.	<p>Flight Deck Effect: No Flight Deck Effect</p> <p>Flight Deck Workaround: No Flight Deck Workaround</p>	<p>Safety Effect: No Safety Effect.</p> <p>Rationale: This work package is specific to dual DLCA environment. This program is not in dual DLCA environment. Hence this work package is not applicable for this program and is not affected by this issue.</p>
DLSS-5644	DLCA-6500 : DLCA Allocation needs to be removed	3B - Non-Significant Process Deviation	High Level(L1) System Architecture requirement OldD 53909 "The datalink system shall perform ACARS communication with ACARS ground stations using the POA (Plain Old ACARS) or AOA (ACARS Over Aviation VHF Link Control) physical layer and the ACARS protocol." is allocated to DLCA and	<p>Flight Deck Effect: No FDE</p> <p>Flight Deck Workaround: None</p>	<p>Safety Effect: No safety effect.</p> <p>Rationale: This issue is related to SARD53909, which is incorrectly allocated to DLCA. SARD53909 is not part of this program. Hence this work package is not applicable for this program.</p>

Software Accomplishment Summary (SAS) for Data Link Communication Application (DLCA-6500)

WP #	Summary	Criticality	Plain English Description	Operational Impact	Cert/Safety Justification
			currently DLCA HLSRS provides DOORS tracing to this L1 requirement for traceability purposes. But for this L1 requirement DLCA allocation is incorrect and the System architecture requirement document is updated to remove allocation to DLCA. This work package is written to delete the tracing of requirement in DLCA HLSRS module to the L1 requirements document in DOORS.		
DLSS-930	DLCA-6500 - Issues with Hex Message Page	2 - No Operational Effect	<p>1: The issue is that HEX MESSAGE page is causing a reset of DLCA when the SET button is depressed after an invalid hex message string is entered on the page. It should display 'ERROR BUILDING MESSAGE' instead of resetting. This is a violation of requirements HMIC25883, HMIC25884, Code: AgentHexMessage::GenerateVerifyText</p> <p>2: The issue is that the HEX MESSAGE page, a maintenance debug page which is not used in flight by the pilots, is mirroring the contents of its page when it is displayed on two displays at the same time. Per the requirement all pages should be acting independently. HMIC14980 says "The application shall allow individual pages to be independently displayed on multiple displays." This requirement was intended for pages which are used by the pilot. The HEX MESSAGE page does not need to support page independence on multiple displays. It is a page that will not be used in operation by the pilots and is used by the DLCA engineering team only. A new requirement should be written that says "The HEX MESSAGE page shall prohibit page</p>	<p>Flight Deck Effect: No Effect</p> <p>Flight Deck Workaround: N/A</p>	<p>Safety Effect: No Safety Effect. Rationale: 1: The HEX MESSAGE page is a password protected page which is used by DLCA engineering only.</p> <p>2: The HEX MESSAGE page is a debug page that is for debug purposes only. It does not require the use of page independence to operate. It will never be used on two displays during operational flight.</p>

WP #	Summary	Criticality	Plain English Description	Operational Impact	Cert/Safety Justification
			independence on multiple displays". This is a violation of requirement(s) HMIC14980		
DLSS-1019	DLCA-6500 - CSS, FANS requirement issues.	3B - Non-Significant Process Deviation	<p>3: As per the requirement FANS567 the ADS uses the default values as specified in the Table: Quantitative Default values for "ICAOAddress" etc whenever the required data is not available. As per the current implementation the DLCA uses the ICAO ID values immediately and it does not wait for 10 seconds before sending the defaults values as the note in FANS567 states. Hence the requirement needs to be updated to remove the additional note.</p> <p>5: As per the requirement FANS363 Aeronautical Facilities Notification Application (AFN) should discard the request to initiate downlink messages when the application is in the standby mode. But as per the CSS29235 the application uses the Protocol Manager interface to transmit the FANS Logon related Messages of AFN App. Hence as per the requirement CSS1041 when in the standby state application is inhibited from transmission of downlink messages by Protocol Manager.</p> <p>7: The dlca uses xml config files to configure ATN addresses and IO configurations. As per the requirement CSS29362 the dlca should raise an error 18 with health monitor if the configuration xml file contains any undefined elements. But these undefined elements are not properly defined. As per the current</p>	Flight Deck Effect: No Effect Flight Deck Workaround: N/A	<p>Safety Effect: No Safety Effect. Rationale: 3: As per the existing requirement ATN8850 the DLCA application saves and retrieves the 24 bit ICAO address from the non-volatile memory, so the DLCA will be using this ICAO for transmitting through ADS downlink message until the ICAO values gets cleared from non-volatile memory. once the non-volatile memory is cleared the DLCA will be transmitting the default values as specified in the Table: Non Quantitative Default values. so the note mentioned in the requirement FANS567 is no longer applicable and needs to be removed.</p> <p>This scenario is tested manually and once the requirement is updated the TP_ADS_025.py needs to be update accordingly.</p> <p>5: As per the current implementation the Protocol Manager does not allow the standby DLCA to send downlink messages and this scenario is not used by Aeronautical Facilities Notification Application. Hence the requirement FANS363 needs to be deleted. The DLCA works as expected.</p> <p>7: These config files are used by DLCA for initialization at start up and if config file is found to be Corrupt/Invalid the error 18 is reported to the health monitor. So once the DLCA starts up properly it should not affect the functionality of DLCA as the content of these xml files does not change.</p>

WP #	Summary	Criticality	Plain English Description	Operational Impact	Cert/Safety Justification
			implementation the valid element set for IO configurations like IoConfigDefinition, BdiOutputFieldDefinition, etc are defined in file IoProcInterface.cpp and valid set for ATN addresses configurations like GndAppConfigDataDefinition, ConfigDef, etc are defined in file MibInterface.cpp. Hence the requirements needs to be updated to specify the valid and invalid set of elements.		Related Functions in IoProcInterface.cpp is : 1) Initializelo() 2) ReadXmlInput() Related Functions in MibInterface.cpp is : 1) Initialize() 2) LoadXmlConfig()
DLSS-1207	DLCA6500 - Configurable inbox - Issue with status text when cpdlc is inhibited due to pending network acknowledgem ent	1B - No Significant Operational Effect	As per requirement HMIC27237 the DLCA should display the status message as "CPDLC INHIBITED" when the application has a FANS message waiting to receive a Network Acknowledgement from MU. But as per the current implementation the DLCA is displaying the status message as "CPDLC INHIBITED - SEE CPDLC FORMAT" instead of "CPDLC INHIBITED". Because of this issue there is structural coverage gap in source file InboxPage.cpp at lines 19:52- 19:57. In addition, the requirements (HMIC27237, HMIC27238, HMIC27236, HMIC26753, HLSRS6312) need to be clarified to document that the 'SEE CPDLC FORMAT' only be displayed when that is the intent. Note : This issue is only applicable to Horizontal Inbox only.	Flight Deck Effect: For programs that use the Configurable Inbox, when the application has a FANS message waiting to receive a Network Acknowledgement from MU, the DLCA displays the status message as "CPDLC INHIBITED - SEE CPDLC FORMAT" instead of "CPDLC INHIBITED" For programs that do not use the Configurable Inbox, No FDE Flight Deck Workaround: None. Cosmetic issue.	Safety Effect: No safety effect. Rationale: This issue is applicable only for the programs which uses configurable inbox. The functionality of the configurable inbox features is locked behind configuration files and have been tested to not be accessible in any other way. Hence this work package is not applicable for this program.
DLSS-899	DLCA-6500 - Requirement update to Soul Entry, ERROR message for FANS and CM connection when ATN	3B - Non-Significant Process Deviation	1: Currently requirement OID CSS 28489 and requirement OID HMIC 4448 conflict with each other. CSS 28489 states "Souls shall be manually entered and displayed in the following format" while HMIC4448 states "Display the values received from FMS for Fuel Remaining and Souls On Board values, if available and no manual data is available". Currently the code	Flight Deck Effect: No Effect Flight Deck Workaround: N/A	Safety Effect: No Safety Effect. Rationale: 1: Updating requirements so they are not conflicting with one another does not affect the functionality of DLCA. 3: Deleting a duplicate requirement does not affect the functionality of DLCA.

WP #	Summary	Criticality	Plain English Description	Operational Impact	Cert/Safety Justification
	address is changed issues		<p>matches the implementation of HMIC4448. The planned update is to rewrite CSS28479 to accept both manually entered data and FMS fetched data for Souls entry.</p> <p>3: Currently requirement OID CSS29353 and requirement OID ATN3080 are duplicates of each other and one of them should be deleted.</p> <p>8: Per ATN8765: "When an ATN router reset indication is detected via a dialogue service synchronization event, the application shall revert to a CPDLC inhibited state and notify the air user of the status change." However, there are no requirements for the CM (Context Management) when the connection gets terminated. A requirement needs to be added for the current implemented behavior. New requirement would read When an ATN router reset indication is detected via a dialogue service synchronization event, the application shall terminate the CM connection.</p> <p>There is no code update since this functionality is already present there just was not a requirement the CM functionality.</p> <p>The test steps used to test this requirement are as followed:</p> <p>1. Perform Logon to EDYY on ATN Network.</p>		<p>8: Adding a requirement to match the implementation of the code does not affect the functionality of DLCA.</p> <p>Note: Issues 2,4,5,6,7 are no more issues, so deleted.</p>

WP #	Summary	Criticality	Plain English Description	Operational Impact	Cert/Safety Justification
			<p>2. Ensure 'EDYY' is displayed in CDA VALUE LABEL on LOGON STATUS page</p> <p>3. Send uM[160] NDA with Facility designation as 'EDY2'.</p> <p>4. Select the Current facility as EDY2 in ATN CPDLC of ATC.</p> <p>5. Click on START CPDLC button.</p> <p>6. Ensure that NDA connection is established</p> <p>7. Ensure that EDYY is displayed as CDA and EDY2 as NDA on logon status page.</p> <p>8. Clear the trace tool.</p> <p>9. Set the Aircraft Address in AGPS</p> <p>10. Ensure that D-sync is received from provider in trace tool.</p> <p>Note: Issues 2,4,5,6,7 are no more issues. So they all deleted.</p>		
DLSS-6893	DLCA-6500: Add Electronic Nameplate Requirement to Link to SARD	3B - Non-Significant Process Deviation	Requirement updates. Requirements related to Electronic nameplate and creating load set needs to be written in HLR and LLR. Once the requirement is written need to link the HLR to NSARD OIDs NSARD 86020 & NSARD 86025. This issue only affects DLCA version V3 EDS.	Flight Deck Effect: No FDE Flight Deck Workaround: None	Safety Effect: No Safety Effect. Rationale: This is a requirement update, no impact to flight operation.
DLSS-1133	DLCA6500 - Horizontal Inbox issue -	3B - Non-Significant	As per the current behavior the DLCA does not separate the active indicators with dotted lines and only inactive indicators are separated by	Flight Deck Effect: No Effect Flight Deck Workaround: N/A	Safety Effect: No Safety Effect. Rationale: The DLCA is working as per the HMI Design. The figures need to be updated

WP #	Summary	Criticality	Plain English Description	Operational Impact	Cert/Safety Justification
	Requirement change to require lines rather than dashes for separators	Process Deviation	dashed lines but in the requirement HMIC27049 the figures are using the dotted lines for active indicators also. Therefore new figures need to be added without the dotted lines. Related Requirements: HMIC27049 needs to be updated with new figures for inbox.		to reflect actual (and expected) implementation. Figures are for reference only.
DLSS-9282	DLCA-6500: CONFIRM REQUEST's RESEND Functionality Needs to Use a Unique MIN	1B - No Significant Operational Effect	<p>The issue is that HMIC26357, bullet 3 is in conflict with FANS6181. When a um143 (CONFIRM REQUEST) is received and the CONFIRM REQUEST page is displayed, if a 'Closed' downlink is resent to the ground via the CONFIRM REQUEST page. An issue can occur where the ground can respond to a Closed downlink message.</p> <p>HMIC26357:</p> <p>Selecting the CANCEL FUNCTION or the RESEND FUNCTION shall perform the following actions:</p> <ol style="list-style-type: none"> 1. Initiate a downlink message as mentioned in Table: Confirm Request Downlink. 2. Identifies the next active element, if any and updates the Message Review Page based on the active element or displays the RESPONSE HISTORY BLOCK, if the uM143 is the last active element to be processed. 3. Resending the same message using 	<p>Flight Deck Effect: When a 'Closed' downlink is resent via the CONFIRM REQUEST page, if the ground responds to the 'Closed' downlink the DLCA will show the 2nd response to the message even though it is 'Closed'. The responses are displayed in the Response History's lower portion of the screen from oldest to newest if there are multiple responses.</p> <p>The downlink will always reflect the latest messages status. For example, if the downlink was previously 'ACCEPTED' but then after the um143 (CONFIRM REQUEST) was received and the downlink was resent. If the ground responded with Reject, the message status would display 'REJECTED'.</p>	<p>Safety Effect: No safety effect. Flight crew can ignore the issue without operational impact.</p> <p>Rationale: The issue has a safety effect no more severe than Minor, no mitigation required. Compliance with the objectives of the safety assessment process is maintained.</p>

WP #	Summary	Criticality	Plain English Description	Operational Impact	Cert/Safety Justification
			<p>RESEND FUNCTION will use the same MIN and MRN as in original message.</p> <p>FANS6181:</p> <p>Message Identification Numbers (MIN) should be defined uniquely, if at all possible. The MIN should be incremented for each subsequent message. A MIN should not be reused until all other available MINs have already been used.</p>	<p>Flight Deck Workaround: Ignore additional responses to a downlink message that is in a "Closed" state.</p>	
DLSS-1227	DLCA-6500 Configurable Inbox - Simultaneous Display the same message on the MESSAGE REVIEW Half page and MAILBOX	2 - No Operational Effect	<p>There exists configurability requirements for the Inbox to either display messages with the main application open, or to not do so. These requirements include the DLCA General Configuration XML table (CSS30418) and HMIC27239, which lists the configurations to be delivered. Currently, the only configuration delivered has been to disable the Inbox when the main application is open elsewhere. This is described by HMIC26746, HMIC26809, HMIC27283 and HMIC27286. There are some requirements that are written to support the enabling of the Inbox and main application simultaneously, as described in HMIC27220, however, many aspects of the behavior in this scenario are not documented in requirements. As an example, when the Inbox and main application are displayed, a message being viewed by both has the potential to never enable the SET button before being put in the Verify Message Area. This CR was written to address these requirement and functionality insufficiencies.</p>	<p>Flight Deck Effect: N/A.</p> <p>Flight Deck Workaround: None</p>	<p>Safety Effect: No Safety Effect.</p> <p>Rationale: This issue is applicable only for the programs which uses configurable inbox. The functionality of the configurable inbox features is locked behind configuration files and have been tested to not be accessible in any other way. Hence this work package is not applicable for this program.</p>
DLSS-3648	VERIF: ATC Ground Station Tool Sending	3B - Non-Significant	<p>This is issues with script TP_CM_017.py. While verifying ATN2975, the script is testing the ability of DLCA to handle multiple CM Contact</p>	<p>Flight Deck Effect: No Flight Deck Effect</p>	<p>Safety Effect: No safety Effect.</p> <p>Rationale: When the ATC Ground Station tool's Auto Logon Feature is disabled before</p>

WP #	Summary	Criticality	Plain English Description	Operational Impact	Cert/Safety Justification
	Abort on Wrong Port.	Process Deviation	Requests. When the script sends the logon request, this causes a connection between the ground and DLCA to be established. The ATC Ground Station tool has a built in feature that then automatically issues a Start CPDLC request once the logon is successful. This is causing DLCA to abort the connection as the ATC Ground Station tool automatically sends the Start CPDLC request on the facility that is the current CDA. This is expected behavior for DLCA (to abort the connection with the other facility) as DLCA is expected to communicate only with the Current Data Authority. Therefore scripts TP_CM_017.py & TP_CPDLC_HMI_194.py need to be updated to disable the ATC Auto Logon Feature before sending the CM Contact Requests.	Flight Deck Workaround: None	sending the CM Contact Requests, the test passes as expected. No impact to operation.
DLSS-3671	VERIF: DLCA-6500: dsstartindication.cpp SCA DEF-TEST	3B - Non-Significant Process Deviation	<p>This is an AGPS tool Issue. AGPS tool and tests needs to be updated to support below scenarios</p> <p>a) Sending start indication with Security Parameter/ICAO peer ID length more than message data present for all supported primitives</p> <p>b) Send Start Indication without Security length parameter and data. Because of this there is structural coverage gap in source file dsstartindication.cpp lines 3:68-69,3:76-77,3:85-86; and source file dsstartconfirmation.cpp lines 3:79-80.</p> <p>The class DsStartIndication and the class method "Extract" extracts DsStartIndication attributes from a parameterized Ds Interface start indication messages. The lines uncovered are used to check the data of the message before proceeding. The coverage was not</p>	<p>Flight Deck Effect: No Flight Deck Effect</p> <p>Flight Deck Workaround: None</p>	<p>Safety Effect: No safety effect.</p> <p>Rationale: The System Architect agreed that this is a deficiency in the test procedure. From code inspection, the Ds-Start primitive(s) are checked to determine the data integrity. The code in the if statement will be executed only if there is an invalid number of bits for the ICAO Peer ID per CSS28321. The code will return false in the Extract method and an error is enunciated to the trace port that will contain the received message ID and the associated error reason. The system/application will continue to operate and will notify, via the traceport, of the error of the Ds-Start primitive.</p>

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			<p>obtained was due to DEF-TEST (test deficiency).</p> <p>The class DsStartConfirmation and the class method "Extract" extracts DsStartConfirmation attributes from a parameterized Ds Interface start confirmation messages. The lines uncovered are used to check the data of the message before proceeding. The coverage was not obtained was due to DEF-TEST (test deficiency).</p> <p>AGPS tool and tests need to be updated, to resolve the structural coverage gap identified.</p>		
DLSS-1134	DLCA6500 Verif - Test Procedure Failure when DM Tool sends "DM Reset" message on Target	3B - Non-Significant Process Deviation	<p>This is a test procedure update. The issue is the DM Tester tool, which simulates the FMS, is issuing a "DM reset" when executing the test procedure on target test stand, causing failures in certain test scripts. The resolution is an update to the target NCT to accommodate this issue. In the NCT, DLCA and FMS are connected using an IVM flow since both DLCA and FMS are running in same CCM card. For our test stations, the DM Tester tool is used to simulate the FMS functionality and is executed on the Host PC, not the CCM card. In order to send the DM Tester data to DLCA (located on the CCM card), the actual NCT has to be edited to change the connection type to LAN instead of IVM. Since the connection type is changed to LAN, when more data is sent from DM to DLCA, the baud rate/latency values used in NCT are not able to send the complete data within the given time slot and DLCA believes FMS is un-available and it sends a reset message. This is as per requirement OIDs CSS29536, CSS29538 and CSS29539.</p>	<p>Flight Deck Effect: No Effect</p> <p>Flight Deck Workaround: N/A</p>	<p>Safety Effect: No Safety Effect.</p> <p>Rationale: This is an automated verification test procedure and DM Tool (Simulated FMS) interaction issue only. Manual testing of the scenario using the real FMS instead of the simulated FMS (DM tool) confirms DLCA is working properly. The test procedure and DM tool issue occurs when FMS and DLCA are operating on the same Common Computing Module (CCM) in the IMA environment.</p>

WP #	Summary	Criticality	Plain English Description	Operational Impact	Cert/Safety Justification
DLSS-1140	Verif: DLCA6500 - CODEC Script and Message Tester Tool updates	3B - Non- Significant Process Deviation	<p>Issue: A couple failures were identified in the CODEC Test Case and Procedure results that do not indicate a problem with the associated requirement. Upon further analysis of the logs it was determined there were errors in the actual test cases and procedures. Test cases and procedures need to be modified to align correctly with the requirements. The modifications to the TCs/TPs, described below, do not negatively impact the testing coverage of the requirements.</p> <p>Item 1: ATNDownlinkTestScript_DLCADM89: TC26, 27, and 28. The communication media needed for these TC/TP need to be changed to only use VHF Data Radios (VDRs). Further detail from the analysis showed an incorrect frequency was set that caused difference in the Expected Error (Bms_Success/AsnStatus_Success) and the Actual Error (Bms_invalidVHF).</p> <p>Item 2: TP_CM_CODEC_Logonresp_CMupdate: TC15, 16, 33, and 34. A couple failures occurred since the values used in the test to generate messages were unable to produce any results or output messages (PDUs). Removing these values will not negatively impact the coverage of the requirement and tests within the bounds of the CODEC.</p>	Flight Deck Effect: No Effect Flight Deck Workaround: N/A	Safety Effect: No Safety Effect. Rationale: Justification: Only updates will be made to the TC/TP scripts to either correct errors or remove erroneous test values. The current available valid CODEC tests were correct and describe the expected behavior of the CODEC according to the requirements.

WP #	Summary	Criticality	Plain English Description	Operational Impact	Cert/Safety Justification
			<p>Item 3: TP_FANS_CODEEC_UM68: TC38/40 is expected to result in "Do258_invalidData". The desired result was achieved, but the TP (script) needs to be updated to remove the extra space in the expected error result that was returned. Removing the extra space will allow the TP to compute the correct result of the test.</p> <p>Item 4: TP_FANS_CODEEC_UM91: A tool changes is needed to support an invalid FANS uplink (uM91) to allow further testing.</p> <p>Item 5: TP_FANS_CODEEC_UM97: (TC16) and TP_FANS_CODEEC_UM100 (TC43 and TC44) all need to be removed as they are not valid inputs to the CODEEC, thus unable to generate output to test.</p> <p>Item 6: TP_FANS_CODEEC_DM_POS (TC84) Contains a value that is not needed (-1) for the Degrees True and should be removed.</p>		
DLSS-4100	DLCA-6500 Verif: ATC Ground Station Needs Python Command To Access Raw Message Values	2 - No Operational Effect	<p>DLCA needs an automated method to fully test requirement ATN2375.</p> <p>The ATC Ground Station needs to be modified to provide a Python command which allows access to the Misc->Raw Message tab values. This is needed to test requirement ATN2375.</p>	<p>Flight Deck Effect: No flight deck effect</p> <p>Flight Deck Workaround: None</p>	<p>Safety Effect: No Safety Effect Rationale: DLCA is working properly. Manual examination of the Raw Message data was performed and found the values to be correct. No operational impact.</p>

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			The Raw Message tab provides a structural breakout of all uplinks and downlinks. See attachment. Currently, the raw text is displayed on the ATC Ground Station tool and can be manually analyzed but cannot be used for automated testing because there is no Python command available to access it. A number of automated test scripts (documented in the WP Description field) are citing failures due to this issue. These failures will be removed once the Python command is added to the ATC Ground Station.		
DLSS-6629	DLCA-6500: Configurable Inbox Navigation Issue from Main Application	1B - No Significant Operational Effect	<p>The issue is that DLCA is violating the requirement HMIC27000 for the Configurable INBOX. As per the requirement if multiple NEW messages have been received, the newest message (last received) should be on the Configurable INBOX, but instead the first message received is being displayed, which is the oldest message. As per requirement the Configurable INBOX should display the newest message (last received). This is only occurring with the first message received, all other messages are in the correct order.</p> <p>This issue is causing the following test scripts to fail: TP_INBOX_032, TP_INBOX_033, TP_INBOX_036, TP_INBOX_037</p>	<p>Flight Deck Effect: When viewing a message on the Configurable INBOX, if all the messages are NEW. The pilot will see the first message received upon initial viewing on the INBOX instead of the last message received (newest).</p> <p>Flight Deck Workaround: Press the NEXT FUNCTION on the INBOX until the first message comes up or use the main applications MSG LOG to select the correct message to view.</p>	<p>Safety Effect: No safety effect</p> <p>Rationale: This issue is applicable only for the programs which uses configurable inbox. The functionality of the configurable inbox features is locked behind configuration files and have been tested to not be accessible in any other way. This program does not use the configurable inbox and is not affected by this issue.</p>
DLSS-18729	DLCA6500 : Application Not Automatically Navigating to	1B - No Significant Operational Effect	DLCA is partially violating requirement CSS30242 and HMIC26186. When there all the ATN message ids have been used up (meaning there are 64 open ATN uplinks), the	Flight Deck Effect: The AFD is not always automatically transitioning to LOGON/STATUS Page when	Safety Effect: Minor safety effect. Improper transition in AFD slightly increases crew workload.

WP #	Summary	Criticality	Plain English Description	Operational Impact	Cert/Safety Justification
	Logon Status Page on MIN exhausted.(IP S Only)		DLCA application is supposed to terminate the ATN CPDLC connection, set an alert, and put all displays on the LOGON/STATUS page. DLCA is not always putting all displays on the LOGON/STATUS page. This is a robustness scenario, which is causing test procedure TP_CSS-197-01 to fail. It is not expected in normal operation the pilot will have 64 ATN open uplinks to respond to.	the CPDLC connection terminated due to the pilot not responding to 64 uplinks. Flight Deck Workaround: Pilot manually navigates to the LOGON/STATUS from the MSG LOG page.	Rationale: One of the AFD display is not transitioning to LOGON Page automatically. To correct this, the pilot has to manually navigate to LOGON/STATUS page on another AFD. Compliance is maintained with current safety assessment. No incorrect or misleading information is displayed on the CPDLC pages due to these deficiencies. Compliance with safety objectives is maintained.
DLSS-15929	DLCA-6500: SEND Button is not disabled and VMA is not cleared in one of the AFD on up-linking multi element messages	1B - No Significant Operational Effect	DLCA is partially violating the requirement HMIC26021 with regard to the SEND button and VMA area. As per the requirement HMIC26021, "The application shall show the results of a function associated with a button selection on the originating display and duplicate the results on all the applicable displays", however this is only occurring on the originating display and not the other displays. The issue is that when both pilots try to respond to the same ATN or FANS uplink message at the same time, when one user composes a response on the MESSAGE Review Area, upon selecting the SET button the Verify Message Area (VMA) populates on all displays. When the pilot selects the SEND button, only the display where the SEND button was selected does the VMA clear out and the SEND button become disabled. On the other displays, the VMA is not cleared and SEND button is not disabled. This behavior is incorrect.	Flight Deck Effect: When the same FANS or ATN uplink message is displayed on the MESSAGE Review Area of 2 or more displays and a downlink response is composed that is displayed in the Verify Message Area (VMA). If the pilot selects SEND on one display, the display where SEND was selected will cause the downlink response message to be sent, the SEND button disabled and the VMA is cleared. The other display will continue to display the previously composed downlink response with the SEND button enabled. Flight Deck Workaround: Exit the other display to not	Safety Effect: No Safety Effect. Rationale: This is a cosmetic issue which is not expected to occur in normal operation. It is not expected that the pilot and co-pilot will both be attempting to respond to the same uplink message at the same time. If they do, the downlink message is already sent when the SEND button is pressed in the first display. On pressing the SEND button on the other display will not send the down link again. So No safety Effect.

WP #	Summary	Criticality	Plain English Description	Operational Impact	Cert/Safety Justification
			This issue is only seen in the following conditions: when a FANS or ATN uplink requires a response (other just Accept/Reject/Standby), when the same uplink message is displayed on 2 or more displays at the same time, when the user is on the MESSAGE Review page and when only one message element is responded in a concatenated message. This issue does not impact uplinks that only requires a simple response (Accept/Reject/Standby). This issue is causing test procedure TP_CPDLC_HMI_964.py to fail.	display the same message at the same time. Note that pressing SEND on the other display will not trigger a second downlink message, it will instead move the display to the next message element to be responded to or if all are responded to it will display the RESPONSE HISTORY page.	
DLSS-17214	DLCA-6500: IOCF Documentation Update for APM Product Line Definition Change of NDO 862218, Bit 15	3B - Non-Significant Process Deviation	DLCA has NDO ID 862218, bit 15 (CM Option Data Word 18) bit incorrectly identified in the IOCF document (945-1474-001). This is a documentation issue only. DLCA is working properly. The IOCF needs to be updated to mark bit 15 as a spare or unused. Currently, in the IOCF document the bit identifies the "ATN Time Source" with 0=OS Time, 1=GPS Time. This should be removed from the document. Bit 15 is no longer used in V4 and newer software. This was previously used in V3 of DLCA when there was an issue with the EDS system not being able to maintain time. This was resolved and DLCA subsequently deleted all code and requirements related to use of GPS time.	Flight Deck Effect: N/A Flight Deck Workaround: N/A	Safety Effect: No safety effect. Rationale: This is a documentation issue only. DLCA is working properly.
DLSS-17069	DLCA6500: PAUSE function on the ODEBUD is not displaying	1B - No Significant Operational Effect	DLCA is violating requirements HMIC6698 for IPS programs only. EDS programs are not impacted. This is a cosmetic issue only. The issue is only present for the ONBOARD DEBUG Log page. The ONBOARD DEBUG	Flight Deck Effect: For IPS aircraft: When on the	Safety Effect: No Safety Effect Rationale: This is a cosmetic issue only that impacts IPS(Integrated Processing System) and not EDS(Embedded Display System)

WP #	Summary	Criticality	Plain English Description	Operational Impact	Cert/Safety Justification
	RESUME when selected in IPS		<p>Log page is a maintenance page that is not used by the crew. The purpose of the page is to provide debug information to engineering and is not for use in normal operation. This page is only accessible via a password entry on the SYSTEM INFO page.</p> <p>The issue on the page is when the PAUSE button is selected on the ONBOARD DEBUG Log page, the buttons texts should change to say "RESUME" and it should pause the scrolling of debug information. Instead, the text is remaining as "PAUSE" which is incorrect instead of "RESUME", but it is correctly pausing the scrolling of debug information.</p>	<p>maintenance, ONBOARD DEBUG Log page, and PAUSE is selected it is continuing to display PAUSE, it should change to RESUME.</p> <p>For EDS Aircraft: No FDE. Issue not present on EDS</p> <p>Flight Deck Workaround: Cosmetic issue. Ignore the PAUSE text and utilize the button as intended, pausing and resuming the display of debug information as desired.</p>	programs. This issue does not impact the operation of the aircraft. The issue is limited to a maintenance page that is not used by the pilot.
DLSS-4143	DLCA-6500 - Display format issues for CM messages.	2 - No Operational Effect	The issue is that the ATN Context Management (CM) code is storing a value for display text and it should not. There are no requirements for the CM function to display text and these messages are not displayed in the MSG LOG. Because text is being stored when the tests expect no value to be stored, the white box Codec texts for ATN CM are failing.	<p>Flight Deck Effect: No Flight Deck Effect</p> <p>Flight Deck Workaround: N/A</p>	Safety Effect: No Safety Effect. Rationale: The text being stored is not visible to the pilot and does not impact the operation of DLCA. This issue can only be seen at the white box testing level. No impact to operation or safety.
DLSS-977	DLCA6500: Scroll List not removed from Ground App	1B - No Significant Operational Effect	Per requirement OID HMIC26196: "The FACILITY SCROLL LIST shall be Scrollable when there are more than 17 Facility designators to be displayed.	Flight Deck Effect: Ground App page will show the scroll bar and allow the operator to scroll even though 17 facilities fit on one page.	Safety Effect: No safety effect. Crew can ignore scroll bar without any operational or functional impact.

WP #	Summary	Criticality	Plain English Description	Operational Impact	Cert/Safety Justification
	page when entry deleted		<p>Note: In the event of FACILITY SCROLL LIST displaying 17 or less than 17 Facility designators, the FACILITY SCROLL BAR will be invisible."</p> <p>In the current implementation If the user enters 18 facilities on the ground application page and then the users deletes one facility, the scroll bar is still present instead of being deactivated. At this point, the Facility Scroll List should directly get updated and display all the 17 entries (without the Scroll Bar being present)</p>	<p>Flight Deck Workaround: Ignore scroll bar when not needed</p>	<p>Rationale: The issue has a safety effect no more severe than Minor, no mitigation required. Compliance with the objectives of the safety assessment process is maintained.</p>
DLSS-2735	DLCA6500: Configurable Inbox SEND functionality issue with changing FMS mastership	1B - No Significant Operational Effect	<p>This is a Configurable Inbox issue only. When the master FMS has been disabled and then enabled the Send function on the inbox is not sending the message to the ground. The main application can send the message but the inbox cannot. This is in violation of the following requirement:</p> <p>OID HMIC27226 "When the ACCEPT SECONDARY INDICATOR is displayed as Active Indication with displayed text as 'SEND', as listed in Table: Color/Font Palette for Inbox, selection of the ACPT button shall cause all of the following actions to occur:</p> <ul style="list-style-type: none"> - Queue the processed response message - Display the ACCEPT SECONDARY INDICATOR as Selected Indication." 	<p>Flight Deck Effect: On the Mailbox, the selection of SEND does not result in a downlink response being sent to a uM133. A response should be sent when SEND is selected.</p> <p>Flight Deck Workaround: Send the downlink from the main application</p>	<p>Safety Effect: Slight reduction in in functional capabilities and slight increase in crew workload to send a downlink response from main application while on the MAILBOX.</p> <p>Rationale: The issue has a safety effect no more severe than Minor, no mitigation required. Compliance with the objectives of the safety assessment process is maintained.</p>

WP #	Summary	Criticality	Plain English Description	Operational Impact	Cert/Safety Justification
DLSS-18911	DLCA-6500: Implement handler for FANS um169"CONFIRM MAX UPLINK DELAY VALUE IS NOT SET"	1B - No Significant Operational Effect	DLCA is not meeting ICAO GOLD 2017, 4.2.1.9 that says when a FANS latency uplink message um169 is received with the text "CONFIRM MAX UPLINK DELAY VALUE IS NOT SET". When a dm3(ROGER) is downlinked, the FANS Latency timer should be turned off. Currently, if DLCA receives a um169 containing the text "CONFIRM MAX UPLINK DELAY VALUE IS NOT SET", it displays the uplink to the pilot. When the pilot responds with dm3(ROGER), the latency timer is not turned off. New requirements need to be added and traceability to the ICAO GOLD 2017 section 4.2.1.9.	Flight Deck Effect: When operating FANS, the pilot will view the um169 "CONFIRM MAX UPLINK DELAY VALUE IS NOT SET". When they respond with dm3(Roger), nothing will happen to turn off the FANS Latency Timer. The correct operation would be for the FANS Latency timer to be turned off when the pilots responds with dm3(Roger) Flight Deck Workaround: The ground can uplink a um169 "SET MAX UPLINK DELAY VALUE TO 0 SEC" instead of "CONFIRM MAX UPLINK DELAY VALUE IS NOT SET", this will automatically turn off the FANS Latency Timer.	Safety Effect: Minor safety effect. The issue causes a slight increase in crew workload, as the standard operation to remove the latency timer requires a workaround. Rationale: This issue has a work around. The latency timer is to limit how long the pilot has to respond to a message. If the timer remains on, it will automatically respond to the ground with a downlink indicating the timer expires and the uplink was not responded too. Compliance with the safety objectives is maintained.
DLSS-5486	DLCA-6500 Configurable Inbox Sorting Incorrect	1B - No Significant Operational Effect	This is a configurable inbox issue only. The issue is that DLCA is violating requirement HMIC27000 and HMIC27090. The messages on the inbox are not being sorted per HMIC27000 and HMIC27090. When the NEXT key is selected on the Inbox, the message that should be displayed is the most recent Open message per the sorting requirements. However, sometimes the second	Flight Deck Effect: When using the configurable Inbox and there are 3 or more messages, selection of the NEXT will sometimes result in a lower priority message being displayed before a higher priority message Flight Deck Workaround: Use the MSG LOG	Safety Effect: No safety effect Rationale: This issue is applicable only for the programs which uses configurable inbox. The functionality of the configurable inbox features is locked behind configuration files and have been tested to not be accessible in any other way. This program does not use the configurable inbox and is not affected by this issue.

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			<p>Open message is displayed instead. Selecting NEXT a second time will display the correct message.</p> <p>This issue is causing the following test procedures to fail:</p> <p>TP_INBOX_009</p> <p>TP_INBOX_019</p> <p>TP_VERTICAL_INBOX_043</p>		
DLSS-16025	DLCA6500-FANS VCI Page Behavior Issue	1B - No Significant Operational Effect	<p>The issue is that DLCA is partially violating the requirement HMIC27789, HMIC26228 and FANS19571. As per the requirement the "The LOADABLE CONTAINER shall be {visible} when the uplink contains at least one FANS message element contained in Table - FANS Loadable Elements". DLCA is correctly showing the LOADABLE CONTAINER and LOAD button when Loadable uplink messages are concatenated with uplink message elements uM135(CONFIRM ASSIGNED ALT)+uM120(MONITOR [icaounitname] [frequency]), however when DLCA receives the same uplink message (uM135(CONFIRM ASSIGNED ALT)+uM120(MONITOR [icaounitname] [frequency])) concatenated with a uM161 (END SERVICE); the LOADABLE CONTAINER and LOAD button are not showing. This is incorrect. DLCA should be showing the LOADABLE CONTAINER and LOAD button anytime there is a loadable uplink message contained in the uplink regardless if a uM161 (END SERVICE). This issue only</p>	<p>Flight Deck Effect: When an uplink containing a loadable uplink element is concatenated with uM120+uM135+u161 is received, the pilot will not be able to load the uplink via DLCA to the FMS because the LOAD prompt will not be displayed.</p> <p>Flight Deck Workaround: Accept the uplink and manually load the uplink values into the FMS, similar to how loadable ATN uplink messages are currently handled.</p>	<p>Safety Effect: Minor safety effect. Slight increase in crew workload to manually loading the uplink values into the FMS.</p> <p>Rationale: Compliance with objectives in the safety assessment is maintained.</p>

WP #	Summary	Criticality	Plain English Description	Operational Impact	Cert/Safety Justification
			impacts FANS. The requirement and code need to be updated to show the LOAD button on the HMI page when the ground sends the LOAD messages combining the uM135+uM120 along with the um161.		
DLSS-20032	DLCA-6500 - NE Uplink Messages Changing Status Before Entire Message Viewed	1B - No Significant Operational Effect	<p>DLCA requirement HMIC6640 need to be updated to clarify the CLOSED/UNVIEWED message status behavior in a specific scenario.</p> <p>When an ATN or FANS uplink is received that does not require a response (Type N or NE), the message status is set to 'CLOSED/UNVIEWED' and shown in the MSG LOG. When the message is viewed the status is automatically changed from 'CLOSED/UNVIEWED' ->'CLOSED'. The issue is that if the message requires a scroll bar to view in its entirety, meaning it is more than 5 lines long, it is changed to 'CLOSED' without requiring the pilot to scroll through the entire message.</p> <p>This issue is causing structural coverage gap in source code WDI_MessageHandle.cpp at lines 13:9.</p> <p>DLCA needs to update requirement HMIC6640 and associated code to require the pilot to scroll through and view the entire FANS or ATN 'no response required' uplink before marking it as 'CLOSED'.</p> <p>Response - NE indicates WILCO, UNABLE, AFFIRM, (NEGATIVE, ROGER, STANDBY are not enabled)</p> <p>Response - "N" indicates Response not required.</p>	<p>Flight Deck Effect: On the MESSAGE Review page, when a FANS or ATN uplink is displayed that it does not require a response, and that uplink is so long that it requires the display show the scroll bar to view it in its entirety; when the uplink message is displayed on the MESSAGE Review page, the uplink message's status is automatically changing from 'CLOSED/UNVIEWED' ->'CLOSED'. The correct behavior would be to stay at 'CLOSED/UNVIEWED' status until the pilot scrolls through the entire uplink and then change the status to 'CLOSED'.</p> <p>Flight Deck Workaround: Use the scroll bar to view the entire uplink message.</p>	<p>Safety Effect: No safety effect.</p> <p>Rationale: "No Response Required" messages are uncommon and since they do not require any action from the pilot, they are of less significance and importance. Nevertheless, the first 5 lines will have been viewed by the flight crew should they neglect to scroll through the entire message. In addition, flight crew are trained/instructed to view all uplinks entirety. There is no significant operational impact as a result of this issue.</p>

Software Accomplishment Summary (SAS) for Data Link Communication Application (DLCA-6500)

WP #	Summary	Criticality	Plain English Description	Operational Impact	Cert/Safety Justification
DLSS-1271	VERIF: DLCA6500 : DUAL DLCA Environment Update to Support CENTER FMS	3B - Non- Significant Process Deviation	The issue is that current target test setups do not support verification of requirements CSS348 and CSS350. The verification setup supports a left and right FMS but not a center FMS.	Flight Deck Effect: No Effect Flight Deck Workaround: N/A	Safety Effect: No safety Effect. Rationale: This work package is specific to Center FMS. This program is not using Center FMS. Hence this issue is not applicable for this program and there is no significant operational effect as a result of this issue.
DLSS-1184	DLCA6500: ATN Logon issues	2 - No Operationa l Effect	As per the current requirement (ATN3532) when DLCA receives a CM Logon Response from ground with new air initiated application that requires the application to register with ATN Router, DLCA should send a 'Register-MO-App' primitive to ATN Router. But as per the current implementation DLCA is not sending the request to register the new application. The operational scenario is that when performing a CM Logon, DLCA contacts the ground station using the address of the ground station stored in DLCA's database. If a ground station went through the process of getting a new address assigned (via ICAO, etc.) in this situation, the ground would respond with an updated address. DLCA should then use this updated address in the future. The issue here is that DLCA is not sending this updated address to the router (RIU) and the next time DLCA contacts that same ground station, the original address would be used. This would cause DLCA to be unable to log on to this ground station in the future unless the address was manually updated in DLCA.	Flight Deck Effect: None Flight Deck Workaround: N/A	Safety Effect: No Safety Effect. Rationale: There are only few applications that are air initiated and the chance of getting a request to register a new application that is not present in aircraft is very unlikely. This scenario is not likely to occur in an operational environment. If a ground station did have a change in address, it would be have to be clearly communicated to the aviation community and DLCA's internal data could be updated manually.
DLSS-17722	DLCA6500: A661 ERROR Messages	2 - No Operationa l Effect	DLCA is partially violating requirement CSS30906. The issue can only be seen in a lab environment with a debug bit set prior to	Flight Deck Effect: No FDE	Safety Effect: No Safety Effect.

WP #	Summary	Criticality	Plain English Description	Operational Impact	Cert/Safety Justification
	when DLCA is initialized with Debug Bit Enabled		turning DLCA on. The issue is that debug print statements are incorrectly being printed due to the number of widgets being loaded. The threshold on when to print the debug statements is incorrect and needs to be modified. This issue has no cockpit effect.	Flight Deck Workaround: None.	Rationale: This error message will be reported only when the A661 debug bit is enabled by the onboard debug page which is password protected page and for Maintenance purpose only. No flight operation impact or crew actions affected by this issue.
DLSS-7562	DLCA-6500-POSITION SELECT LIST Not Going to the Correct Default State when the Same Multi-Element Uplink Message is Displayed on a 2nd Display	1B - No Significant Operational Effect	<p>This is a FANS only issue. When the same multi-uplink message is being displayed on 2 or more displays and there is message data in the Verify Message Area (VMA); when CANCEL is selected the POSITION SELECT LIST should reset to display the most recent FMS data received. Sometimes, the POSITION SELECT LIST is instead displaying "NONE" and clearing out all FMS provided data, it should instead populate the select list with the FMS provided data.</p> <p>This issue is limited to uplink messages that contain 2 or more message elements. To induce this issue, both uplink message elements in the message must require FMS position data which is used in the downlink response message. This issue is limited to uplink messages that contain 2 or more of the following uplink message elements:</p> <ul style="list-style-type: none"> -um132 - REPORT POSITION -um139 - CONFIRM REPORTED WAYPOINT -um140 - CONFIRM NEXT WAYPOINT 	<p>Flight Deck Effect: The 2nd Display where the message is still being displayed is not populating the POSITION Select list with the provided FMS data. Instead, the POSITION Select List shows "NONE" and does not contain FMS provided data.</p> <p>Flight Deck Workaround: The pilot can exit the message and re-enter the message on a single display which will cause the FMS data to be correctly populated on the page.</p>	<p>Safety Effect: Slight reduction of functional capabilities by not correctly populating FMS data. Slight increase in crew workload in order after identifying the empty field (set to NONE) by exiting and re-entering the message.</p> <p>Rationale: The issue has a safety effect no more severe than Minor, no mitigation required. Compliance with the objectives of the safety assessment process is maintained.</p>

WP #	Summary	Criticality	Plain English Description	Operational Impact	Cert/Safety Justification
			um142 - CONFIRM ENSUING WAYPOINT um147 - REQUEST POSITION REPORT		
DLSS-16413	DLCA-6500 - REQUEST Pages Checkboxes Intermittently Toggle Upon Selection	1B - No Significant Operational Effect	DLCA is partially violating requirements HMIC27794, HMIC22539, HMIC22538, HMIC22557, HMIC22558, HMIC3726, HMIC21589, HMIC23663, HMIC3919, HMIC27329, and HMIC10695 with regard to the checkbox behavior. When selected, the checkbox should toggle back and forth based on it being selected or deselected. Instead, the checkbox is showing selected/deselected/selected momentarily before finally displaying the correct checkbox state. This is a cosmetic issue only.	Flight Deck Effect: The checkboxes on the ROUTE REQUEST, ALTITUDE REQUEST, OFFSET REQUEST, SPEED REQUEST, VMC DESCENT, and VOICE REQUEST pages can momentarily flicker/toggle in between a selected/deselected state when the pilot select them. This occurs for about 1 second and then the final correct state of the checkbox is seen. Flight Deck Workaround: None.	Safety Effect: No safety effect. Rationale: This is a cosmetic issue only. The flickering is not desired but the correct final state of the widget is shown after a momentary flicker.
DLSS-16885	DLCA-6500: Alerting Label 272, Bit 17 Not Set When CPDLC Connection Terminated and an NDA exists	1B - No Significant Operational Effect	DLCA is partially violating requirement CSS31038 and CSS30242 when there is a CDA and an NDA established. This issue only affects users of the Label 272 alerting. Label 272, bit 17 should be set when a CDA™s connection is terminated, this is not occurring in the following conditions; when an NDA exists and one or more of the following: 1)when an ATN CPDLC End Indication, 2) a FANS um161 (END SERVICE), 3) the 16 minute ACARS No	Flight Deck Effect: For aircraft using Label 272, bit 17 for alerting, there is not an alert when there is a CDA and an NDA and the CDA is terminated causing the NDA to be promoted to the CDA. The Label 276, bit 12 ATC COMM STATUS bit could be utilized as an	Safety Effect: Minor Safety Effect Rationale: The issue causes a slight reduction in safety margins and requires slight increase in crew workload. As a work around, the pilot can view the LOGON/STATUS page at any time to see the current state of the CPDLC Connection.

WP #	Summary	Criticality	Plain English Description	Operational Impact	Cert/Safety Justification
			Comm Timer expires, or 4) there are 63 open uplink messages causing the Message Identification Numbers (MIN) to be exhausted. If any of these conditions occur, it will cause the CDA to be terminated and the NDA to be promoted to the CDA The alert (Label 272, bit 17) indicating that the CDA was terminated is not being set. This is because immediately after CPDLC is being terminated a new CDA connection is established. The establishment of the new CDA is correct, however the alert should also be triggered per the requirements.	alternative. Flight Deck Workaround: Review the LOGON/STATUS page to view the current CDA and NDA.	
DLSS-17068	DLCA-6500: FMS Mastership Change Resulting In Armable Uplinks Not Re-Arming	1B - No Significant Operational Effect	<p>This is a FANS only issue. DLCA is partially violating requirement HMIC26010 in a specific scenario related to unarmable report um127 (REPORT BACK ON ROUTE) and um180(REPORT REACHING BLOCK [altitude] TO [altitude]), and/or armable report uM130 (REPORT PASSING [position]) . The requirement says, "The CPDLC application monitors and manages the DM contracts used for armable reports and will attempt to reestablish the contracts, if the event contracts are terminated pre-maturely." In the scenario where there is two or more report uplinks, and the most recent report cannot be armed, if the FMS mastership changes 2 or more times the armable reports fail to automatically rearm. This is the scenario it is violating the requirement.</p> <p>For example, if a uM130 (REPORT PASSING [position]) is received with a position that is in the FMS's current flight plan, such as KCID is received; this can be Armed and downlinked when that position is passed. If a second</p>	<p>Flight Deck Effect: A FANS Armable report will not automatically arm. On the REPORTS DUE page, the FANS Armable report will display the text "DISARMED"with the ARM and SEND buttons enabled.</p> <p>Flight Deck Workaround: Go to the REPORTS DUE page via the REPORT menu. Select the ARM button on the FANS Armable report to manually arm it, this will change the text from "DISARMED" to "ARMED" and will enabled the DISARM button.</p>	<p>Safety Effect: No safety effect.</p> <p>Rationale: This is a specific scenario that provides a work around.</p>

WP #	Summary	Criticality	Plain English Description	Operational Impact	Cert/Safety Justification
			um130 is received, with a position that is not in the FMS [™] s current flight plans , such as XXXX; this cannot be Armed because the FMS does not know when this position will be passed. In a scenario where you have one armable and one unarmable uplink; if the FMS master ship changes, the first um130 will arm and the second will not. This is expected. If the FMS mastership changes again, both um130s are not arming. This is incorrect. Regardless of how many times the FMS mastership changes, the reports that can arm should arm. The work around is to manually arm the report via the REPORTS DUE page. This same scenario can be created with a um127 or a um180 in place of the second um130.		
DLSS-17432	DLCA-6500 - IPS Only- "INVALID ENTRY" cutoff on POSITION REP and EMERGENCY pages	1B - No Significant Operational Effect	This is an IPS (Integrated Processing System) only issue. EDS (Embedded Display System) programs are not impacted. DLCA is partially violating the requirements HMIC26243. This is a cosmetic issue only, which is limited to the POSITION REPORT page and the EMERGENCY page. This issue will only occur when operating with FANS (the 2 pages identified are FANS only pages). As per requirement when an invalid value is entered in the Edit Box then the words "INVALID ENTRY" should be displayed on the display near the data entry box. Functionality wise the requirement is working fine, only issue is the "Invalid Entry" string is truncated by the display. The "INVALID ENTRY" text should be repositioned so that the entire text is visible.	Flight Deck Effect: IPS Programs: When using FANS, if an invalid entry is entered on the POSITION REPORT page or the EMERGENCY page, a few of the latter characters in "INVALID ENTRY" may be cutoff by the display boundary. EDS Programs: No FDE. Flight Deck Workaround: Reattempt the entry using a valid input, which will cause the value to be accepted instead of rejected.	Safety Effect: No Safety Effect. Rationale: A few of the latter characters in "INVALID ENTRY" may be cutoff by the display boundary. When the Invalid characters Entered into the Data Entry field of Position Report page and Emergency page then "INVALID ENTRY" string is displayed by truncating few characters at the end. Not having any safety related issue because of this issue.

WP #	Summary	Criticality	Plain English Description	Operational Impact	Cert/Safety Justification
DLSS-5081	DLCA-6500 : "No Route Info Provided" Issue with Large Flight Plans.	1B - No Significant Operational Effect	<p>When doing verification testing of a large flight plan using the host, the testing tool allows for flight plans that contain "route additional information" to test flight plans that exceed the ACARS network limit. When the limit is reached and there is a second attempt to downlink the emergency, the DLCA does not add a null/blank "route clearance" field as expected in generating the dm59. This is causing test script TP_CPDLC_HMI_354.py to fail. No flight plan would have downlinked due to the size. When operating correctly this would display something like ""DIVERTING TO AAAA VIA ROUTE CLEARANCE: NO ROUTE INFO PROVIDED". Instead the dm59 is not being generated and no text is displayed.</p> <p>This issue is limited to verification because the actual aircraft implementation will only allow for the basic flight plan (routeinformation) to be sent by the FMS without route additional information, therefore, it will never reach the ACARS network limit; thus making this issue never occur.</p>	<p>Flight Deck Effect: No Flight deck effect since the flight plan limit can not be reached in the aircraft.</p> <p>Flight Deck Workaround: None</p>	<p>Safety Effect: No safety effect.</p> <p>Rationale: Verification test issue. This issue cannot be generated in an aircraft, and is only possible to create this scenario in a lab environment.</p> <p>The aircraft implementation will only allow for the basic flight plan (routeinformation) to be sent by the FMS without route additional information, therefore, it will never reach the ACARS network limit.</p>
DLSS-7161	DLCA-6500: Configurable Inbox Not Triggering Alert for When the Inbox Is Empty and Inbox is Being Viewed	1B - No Significant Operational Effect	<p>This issue is that DLCA is violating requirement CSS28957. if an uplink messages is received while an empty Configurable Inbox is being displayed and the main DLCA application is not displayed, then the ATC COMM MED alert is not always being triggered as it should be.</p>	<p>Flight Deck Effect: This issue only occurs in the Configurable Inbox. When the Configurable INBOX is displayed and there are no messages in the Inbox, when a new message is received, the ATC COMM MED Alert is not always triggered for the first message received.</p>	<p>Safety Effect: This is not a safety issue.</p> <p>Rationale: This issue only occurs on the Configurable Inbox. The issue is limited to the scenario where the Inbox is empty and the</p>

Software Accomplishment Summary (SAS) for Data Link Communication Application (DLCA-6500)

WP #	Summary	Criticality	Plain English Description	Operational Impact	Cert/Safety Justification
				Flight Deck Workaround: View and respond to the message in the INBOX despite the lack of an alert for the first message	Inbox is being displayed when an uplink is received. The alert does not always chime, but the message is displayed to the pilot correctly and visible in the Inbox.
DLSS-4099	DLCA-6500 Verif: ATC Ground Station Needs Raw Message Values to Include ATN Protocol Data Unit(PDU) wrapper data	3A - Significant Process Deviation	DLCA needs an automated method to fully test requirements ATN3408 and ATN8757. The ATC Ground Station needs to be modified to provide the display of the ATN Protocol Data Unit (PDU) wrapper data and a Python command to access it. Currently the uplink/downlink raw message data is displayed in the Misc->Raw Message tab; however, the PDU data is missing. Test procedure TP_ATN_CPDLC_021 is citing failures due to this issue. These failures will be removed once the PDU wrapper data is added to the ATC Ground Station.	Flight Deck Effect: No Flight Deck Effect Flight Deck Workaround: None	Safety Effect: No Safety Effect. Rationale: DLCA has performed live testing with Eurocontrol and with independent test tools used by other companies. ATN messages were successfully decoded / encoded. This testing proves that the currently PDU wrapper data is correct. No impact to operation.
DLSS-2734	DLCA6500: HMI errors when LOGON/STAT US page's ATC DL is set to "Disabled"	1B - No Significant Operational Effect	On the LOGON/STATUS page, when the ATC DL dropdown is set to DISABLED the following issues occur (see attached figure & video): - The HEX MESSAGE page, a debug only page which is not used by the pilot will partially	Flight Deck Effect: No FDE as this page is password protected and only accessed for Maintenance purpose. Flight Deck Workaround: N/A	Safety Effect: No safety effect Rationale: This page is password protected page and for Maintenance purpose only. No flight operation impact or crew actions affected by this issue.

WP #	Summary	Criticality	Plain English Description	Operational Impact	Cert/Safety Justification
			reset the data. This violates requirement HMIC25871		
DLSS-15962	DLCA-6500: CPDLC Connection Terminated Label 272 bit 17 Alert issue (ATN Only).	1B - No Significant Operational Effect	The DLCA software violates the requirement CSS30242. As per the requirement the DLCA should set the label 272 bit 17 (Connection Termination Alert) when All Message Identification Numbers (MIN) are currently in use and the application attempts to send a CPDLC Message Downlink can cause Message Identification Numbers (MIN) to be exhausted. The label 272 bit 17 (connection termination alert) is not set when the MIN got exhausted, still this bit is set when the connection termination happens for the other reasons. When the Connection termination occurs (due to MIN exhausted), DLCA will set the ATC COMM STATUS alert bit (Label 276) and Also the DLCA displays the Connection Termination Label in the Logon Page. Which allows the pilot to navigate to Logon Page to see the Connection Termination. This will affect the programs that subscribes to the use of Label 272.	Flight Deck Effect: When Label 272 is used for alerting, The CPDLC connection termination alert will not be generated when the CPDLC connection is terminated due to MIN Exhausted. Flight Deck Workaround: Pilot still gets the ATC COMM Alert (Label 276). Crew to confirm CPDLC connection termination can navigate to Logon Status Page manually, check the CPDLC connection status on the Logon Status Page.	Safety Effect: No Safety Effect. Rationale: Label 272 bit 17 is for alerting the Connection Termination issue. But in this case still the pilot will get an ATC COMM STATUS alert whenever the connection termination happens and DLCA displays the Connection Termination Label in the Logon Page. Also this is a corner condition that all the MIN get exhausted.
DLSS-17767	DLCA-6500 Incorrect Text Sent to Health Monitor for Errors Raised	2 - No Operational Effect	DLCA is partially violating requirement CSS30469 causing test procedure TP_CSS_077.py to fail. The issue can only be seen when viewing the Health Monitor log and does not impact the operation of DLCA. When there is no communication with the AGS, the code is correctly setting error code 19 and sending it to Health Monitor. The issue is that the free text being sent with the error code 19 is "AGS Communication Error" instead of "No Communication to AGS". The code needs to be updated to send the free text as "No Communication to AGS" per the requirement.	Flight Deck Effect: N/A Flight Deck Workaround: N/A	Safety Effect: No safety effect. Rationale: This issue does not impact the operation of DLCA. It is a minor issue with the free text words. The correct error code is being sent. Compliance with safety objectives is maintained.

WP #	Summary	Criticality	Plain English Description	Operational Impact	Cert/Safety Justification
DLSS-997	DLCA-6500 - GND APP page , Footprint page, storage related issues	2 - No Operational Effect	<p>1: Per HMIC25538- "When the GND APP CONFIG Update Page is accessed from the GND APP CFG Page via EDIT FUNCTION, the SAVE FUNCTION shall be enabled when the below conditions are true:</p> <p>Any one of the fields in the Table: Required fields entry for Edit has been modified.</p> <p>A valid value is displayed for all the fields in the Table: Required fields entry for Edit "</p> <p>However, in the current implementation when the maintenance crew selects a facility on the ground app page and then selects the edit option the save function will be enabled even when the user hasn't modified any data.</p> <p>The following code needs to be updated to fix this issue:</p> <p>FILE:GndAppPage.cpp</p> <p>Function:GndAppPage::run() lines 379-380.</p> <p>2: Per HMIC26692 - When in FANS mode, selection of MEM TEST START FUNCTION shall automatically generate and send 128 downlink messages. However it is observed that the generation stops when the total messages in the repository reaches 75, causing structural coverage gap in source file FootprintPage.cpp at lines 9:6-9:7.</p>	Flight Deck Effect: No Effect Flight Deck Workaround: N/A	<p>Safety Effect: No Safety Effect. Rationale: 1: This is on the maintenance pages and the pilot will never view this. The maintenance crew should be cognizant enough to know when a change has been made vs. when the page has just been entered.</p> <p>2: This is on one of the Engineering pages and the pilot and maintenance will never view or use this.</p> <p>3: This is on one of the Engineering pages and the pilot and maintenance will never view or use this.</p>

WP #	Summary	Criticality	Plain English Description	Operational Impact	Cert/Safety Justification
			<p>The following code needs to be updated to fix this issue:</p> <p>File: FootprintPage.cpp</p> <p>Function: void FootprintPage::run()</p> <p>3: The third item is closely tied to the second item. After the stress test has run to the count of 75 downlink messages, the first uplink message received by the aircraft gets NAK'ed (Negative Acknowledge) with a reason code of insufficient storage capacity. A second uplink message is processed normally.</p> <p>The following code needs to be updated to fix this issue:</p> <p>File: FootprintPage.cpp</p> <p>Function:FootprintPage::run()</p>		
DLSS-3190	DLCA6500: Configurable Inbox option to not display inactive advisory not implemented	2 - No Operational Effect	DLCA is failing requirement HMIC27283 and CSS30502 for the ""INACTIVE ADVISORY LABEL"" and ""Inbox_clblAdvisory"" part of the requirements. If via the DLCA Config XML the ""Inbox_clblAdvisory"" is set to false, the configurable inbox should not display the inactive advisory. Currently, this feature is not implemented.	Flight Deck Effect: On the configurable inbox, the inactive advisory would display even though, based on the XML configuration, it should not be displayed Flight Deck Workaround: None	Safety Effect: No Safety Effect. Rationale: This work package is applicable only for the programs which uses configurable inbox. The functionality of the configurable inbox features is locked behind configuration files and have been tested to not be accessible in any other way. This program does not use the configurable inbox and is not affected by this issue.

WP #	Summary	Criticality	Plain English Description	Operational Impact	Cert/Safety Justification
			New methods need to be added to InboxPage.cpp		
DLSS-4900	Verif: DLCA-6500 - Re-Execute Test Coverage for AsnFansEncode.cpp - DEF-Test	3B - Non-Significant Process Deviation	<p>During formal testing, lines 6:3, 6:4, 6:5 in the file AsnFansEncode.cpp were not covered. A new test case needs to be added and also Harmonized Message Tester tool needs to be updated to support invalid values element id of uplink/downlink message in order to gain the additional coverage.</p> <p>The total number of message elements supported by FANS network as per the industry standards are dm0 to dm128. But as per the requirement FANS19370 the Codec DLCA6500 have only implemented downlink message elements from dm0 to dm80. These lines of code is to return an error condition when encoding the element id that exceeds the range of industry standards of dm0 to dm128. These lines are not covered as the above mentioned robust scenario was missed out and also the Harmonized Message Tester tool needs to be updated to support invalid values element id of uplink/downlink message.</p>	<p>Flight Deck Effect: No Flight deck Effect</p> <p>No Flight Deck Workaround Flight Deck Workaround: N/A.</p>	<p>Safety Effect: No Safety Effect. Rationale: This is a testing issue only. DLCA works as expected and has been tested. The additional steps required are: Filename # TP_DMGR_CODEEC_INPUT_POSROUTECL RNC.txt #positionroute clearance-TC01</p> <p>route clearance.routeinformationadditional.hold atwaypoint[0].bit_mask=legtype</p> <p>route clearance.routeinformationadditional.hold atwaypoint[0].legtype.choice=legdistance</p> <p>route clearance.routeinformationadditional.hold atwaypoint[0].legtype.legdistance.choice=legdistanceenglish</p> <p>route clearance.routeinformationadditional.hold atwaypoint[0].legtype.legdistance.legdistanceenglish=55</p> <p>route clearance.routeinformationadditional.hold atwaypoint[4].bit_mask=legtype</p> <p>route clearance.routeinformationadditional.hold atwaypoint[4].legtype.choice=legdistance</p> <p>route clearance.routeinformationadditional.hold atwaypoint[4].legtype.legdistance.choice=legdistancemetric</p>

WP #	Summary	Criticality	Plain English Description	Operational Impact	Cert/Safety Justification
					<p>route clearance. route information additional. hold at waypoint[4]. leg type. leg distance. leg distance metric=25</p> <p>....</p> <p>These test were run on Host Harmonized Message Tester for DLCA6500 Codec and the testing passed. Test Results are archived at: [http://asvn/csdlnkver-dlca-a661/Ad-HocTests/FUSN00443683]</p>
DLSS-17165	DLCA6500: Issue with fetching the Distance value with uM181	1B - No Significant Operational Effect	<p>This is a FANS only issue. Currently the DLCA software is working as per the requirement HMIC25775. As per the requirement HMIC25775, DLCA has to fetch the distance value from the FMS when there is no data in the Verify Message Area (VMA). The distance value is requirement to create the dM78(AT [time] [distance] [tofrom] [position]) response downlink. This is working as per the requirement when there is only uM181(REPORT DISTANCE [tofrom] [position]) is uplinked. However, if a UM181 is concatenated with any other message as a second or further element (other than first element), in that case the Verify message area is already filled with response, so the DLCA software is not fetch the Distance data from FMS. So the Requirement and Code need to be modified so that the DLCA software will fetch the Distance data from FMS always irrespective of the data in the VMA. Currently the pilot can manually enter the Distance data. This will slightly increase the pilot workload when he gets the UM181 as not the first element of the concatenated message.</p>	<p>Flight Deck Effect : When uplink uM181 is present in the location other than the first element of the concatenated message then DLCA will not be able to prefill the distance data from the FMS.</p> <p>Flight Deck Work Around: Manually enter the distance information and downlink the message.</p>	<p>Safety Effect: Minor safety effect. Issue requires crew action to manually enter the values. Slight increase in crew workload.</p> <p>Rationale: This is corner condition that the uplink uM181 will be concatenated as second or further element. Even if this concatenated up-link comes, the Pilot can still manually enter the values. This is a slight increase in crew workload. There is no significant operational effect as a result of this issue.</p>

WP #	Summary	Criticality	Plain English Description	Operational Impact	Cert/Safety Justification
DLSS-6981	DLCA-6500: Verif - Issue with large downlink in Dual DLCA environment.	3A - Significant Process Deviation	<p>This is the Verification environment issue. The Filter Driver needs to be updated to fix the Verification environment. Because of this Verification environment issue the following requirements HMIC13239, HMIC3336, HMIC26993 are unable to test completely. As per the requirements DLCA should be able to downlink flight plan using HMI, due to the Verification environment issue DLCA is not able to downlink the large flight plan on Dual DLCA IPS environment.</p> <p>The Large Flight plan scenario is tested in the IPS(Integrated platform systems) Dual DLCA RIG to confirm there is no issue in the code.</p>	Flight Deck Effect: No FDE. Flight Deck Workaround: N/A	<p>Safety Effect: No Safety Effect.</p> <p>Rationale: This scenario is working fine in the Rig. Because of the Verification environment issue its not possible to test it on the IPS Dual DLCA simulation environment.</p>
DLSS-1282	DLCA6500 : Font size Issue with Vertical Configurable Inbox Msg Log.	1B - No Significant Operational Effect	<p>This is requirement and code issue. Requirement (CSS30697) defines two possible 'InboxStyle fontSize values', small and medium. But the VAPS (graphics) only supports small and large font sizes. CSS30461 needs to be updated to replace the font size DLCA_ESC_SIZE_MEDIUM with DLCA_ESC_SIZE_LARGE and corresponding General Configuration XML file need to be updated. Because of this there is structural coverage gap in source file InboxMsgLogPage.cpp at lines 8:6.</p> <p>Requirements, code, and tests need to be updated, to resolve the structural coverage gap identified.</p> <p>This issue is observed only in the vertical configurable inbox, and not seen in the non configurable inbox.</p>	<p>Flight Deck Effect: The Inbox Msg Log header will be displayed in the small font format instead of large font format.</p> <p>Flight Deck Workaround: No Flight deck Work Around.</p>	<p>Safety Effect: No Safety Effect.</p> <p>Rationale: This is not an issue for this program. This issue only impacts programs utilize a vertical configurable inbox. This feature has been turned off via the General Configuration XML file for this program. There is no operational impact for this program due to this issue.</p>

WP #	Summary	Criticality	Plain English Description	Operational Impact	Cert/Safety Justification
DLSS-1931	Verif: DLCA6500 - ATC tool	3A - Significant Process Deviation	<p>1.This is a tool only issue regarding the ATC (Air traffic control) Tool. While executing TP_CPDLC_HMI_881 it was noticed that the ATC tool intermittently crashes after sending around 35 messages. On further analysis it is identified that there is no code issue.Once the tool issue is resolved the test procedure TP_CPDLC_HMI_881 need to be re-executed.</p> <p>2. This is a tool issue regarding the ATC (Air traffic control) Tool. While executing TP_CM_017/TP_DSI_009 it was realized that the contract requests sent from the ATC tool were not always being received by the AGPS tool and DLCA (DLCA receives contracts from AGPS tool). This is leading to structural coverage gap in source file cmcontroldialogue.cpp, line 5:22. On further analysis it is identified that there is no code issue.</p> <p>TP_DSI_009 should be re-executed when the WP is implemented for ATC tool, for coverage to be achieved.</p>	Flight Deck Effect: No Effect. Flight Deck Workaround: N/A	<p>1.Safety Effect: No Safety Effect.</p> <p>Rationale: TP_CPDLC_HMI_881 has been run on other host and target environments where the ATC tool can handle the test procedure. Therefore we know the Code has been tested and this is a tool issue. Hence no safety effect.</p> <p>2. Safety Effect: No Safety Effect.</p> <p>Rationale: Since DLCA was able to establish contracts with the ground station DLCA is behaving per ATN2975 and the code has been tested. Since the DLCA and AGPS were able to receive some contracts but other contracts would not be received which confirm it as tool issue with the tool sending the data. Hence no safety effect.</p>
DLSS-22845	DLCA-6500 - ATN Logon Incorrectly Being Attempted Using a Facility that is not in the GROUND APP CONFIG page or the ATN XML	1B - No Significant Operationa l Effect	<p>DLCA has is partially violating requirement ATN8723, which says: "When initiating an ATN logon request, DLCA shall store the last attempted logon facility designator in Persistent Storage." for a specific scenario.</p> <p>The issue is as follows. When Maintenance personnel access to the GROUND APP CONFIG page and manually add a new ATN facility (Example: EGGX), this new station is available for an ATN Logon. Note that the GROUND APP CONFIG page is only accessible when the aircraft is On Ground per</p>	<p>Flight Deck Effect: The pilot can perform an ATN logon to a facility that should be performed as a FANS logon.</p> <p>Flight Deck Workaround: When Maintenance personnel are deleting a facility from the GROUND APP CONFIG page, after deletion, they should go to the LOGON/STATUS and</p>	<p>Safety Effect: No safety effect.</p> <p>Rationale: There is no effect on crew workload due to a ATN facility being stored in persistent storage. Furthermore, the workaround involves the ground crew and not the flight crew.</p>

WP #	Summary	Criticality	Plain English Description	Operational Impact	Cert/Safety Justification
			<p>requirement HMIC27785.</p> <p>If the pilot performs a successful logon (i.e. the LOGON/STATUS page shows "Logged On") with the manually added facility (Example: EGGX)); DLCA is incorrectly storing the new ATN facility in Persistent Storage. It should not retain the value in Persistent Storage.</p> <p>If after a successful logon with the manually added facility (Example: EGGX)); the Maintenance personnel access to the GROUND APP CONFIG page and delete same ATN facility (Example: EGGX); the facility is correctly deleted from the GROUND APP CONFIG page but incorrectly exists in Persistent Storage.</p> <p>DLCA requirements indicate that DLCA will only allow ATN logons to facilities contained in the ATN XML file or those that are listed on the GROUND APP CONFIG page. The issues is if the previously deleted facility is used once again by the pilot to perform a new logon after it is deleted, DLCA will incorrectly allow it to be sent as an ATN logon. It should send it as a FANS logon, because it is no longer in the list of valid ATN facilities.</p> <p>This issue can only occur for the "last logged on" ATN facility. DLCA is incorrectly storing only one facility in Persistent storage. To make the issue occur, the same facility must be manually added to the GROUND APP CONFIG page, used for a successful logon by the pilot, deleted from the GROUND APP CONFIG page, and attempted for a new logon to occur. Any deviation from this sequence will not induce the issue.</p>	<p>complete a successful logon to a valid ATN facility (any facility including test facilities). After the logon, power cycle DLCA, this will correctly clear the deleted facility from the persistent storage/non-volatile memory (NVM) and make it unavailable for use, which is desired.</p> <p>If there is a left and right DLCA (Dual DLCA), this process needs to be repeated interpedently for both left and right DLCA.</p>	

D.2 Open WPs from Baseline SAS No Change/Duplicated

For the following WPs, status for resolution is identified as “no change” or “duplicate” by the CCB. CCB reviewed the comments in the Jira WP and agreed with decision for the status of resolution. Reason for no change/duplicate is listed in the Jira WP.

Work Package #	Resolution
DLSS-4141	No Change
DLSS-4103	No Change
DLSS-4101	No Change
DLSS-4098	Duplicate
DLSS-3651	No change
DLSS-3649	No Change
DLSS-3565	No Change
DLSS-3528	Duplicate
DLSS-3299	Duplicate
DLSS-2971	No Change
DLSS-2904	No Change
DLSS-2903	Duplicate
DLSS-2901	Duplicate
DLSS-2899	No Change
DLSS-2898	No Change
DLSS-2733	No Change
DLSS-2732	No Change

Work Package #	Resolution
DLSS-2659	No Change
DLSS-1286	No Change
DLSS-1274	No Change
DLSS-1255	No Change
DLSS-1237	Duplicate
DLSS-1225	No Change
DLSS-1216	Duplicate
DLSS-1212	Duplicate
DLSS-1210	No Change
DLSS-1206	No Change
DLSS-1203	No Change
DLSS-1199	No Change
DLSS-1196	No Change
DLSS-1192	No Change
DLSS-1187	No Change
DLSS-1179	No Change
DLSS-1177	No Change
DLSS-1176	Duplicate
DLSS-1173	No Change
DLSS-1171	Duplicate
DLSS-1170	No Change

Work Package #	Resolution
DLSS-1165	No Change
DLSS-1154	No Change
DLSS-1153	No Change
DLSS-1150	No Change
DLSS-1130	No Change
DLSS-1088	No Change
DLSS-1073	No Change
DLSS-1066	No Change
DLSS-1062	No Change
DLSS-1058	No Change
DLSS-1057	No Change
DLSS-1056	No Change
DLSS-1037	No Change
DLSS-1036	No Change
DLSS-1002	No Change
DLSS-994	No Change
DLSS-963	No Change
DLSS-944	No Change
DLSS-924	No Change
DLSS-919	No Change
DLSS-875	No Change

Work Package #	Resolution
DLSS-847	No Change
DLSS-834	No Change
DLSS-4102	No Change
DLSS-1008	No Change

Appendix E DLCA-6500 System CRs Assessment

E.1 Open LynxOS-178 Problem Reports

Affected SW Component	CR ID	CR Description	No Impact - Rationale
libkernel.a	CR 289	IPC_PSHM: Reference to shared memory discarded page causes a SIGSEGV signal.	DLCA don't use the libkernel.a library.
libc.a	CR 315	The %a conversion specifier does not modify the corresponding float variable, while sscanf() returns a value indicating the partial conversion.	DLCA Application don't use the sscanf() function.
libc.a	CR 316	The "hh" length modifier does not set a value into the corresponding signed/unsigned char variable as specified by POSIX, while sscanf() returns a value indicating the partial conversion.	DLCA Application don't use the sscanf() function.
libc.a	CR 317	The "j" length modifier does not set a value into the corresponding intmax_t/uintmax_t variable as specified by POSIX, while sscanf() returns a value indicating the partial conversion.	DLCA Application don't use the sscanf() function.
libc.a	CR 318	The "z" length modifier does not set a value into the corresponding size_t/unsigned integer variable as specified by POSIX, while sscanf() returns a value indicating the partial conversion.	DLCA Application don't use the sscanf() function.
libc.a	CR 319	The "t" length modifier does not set a value into the corresponding ptrdiff_t or unsigned integer variable as specified by POSIX, while sscanf() returns a value indicating the partial conversion.	DLCA Application don't use the sscanf() function.
libkernel.a	CR 320	A timer_settime() call for a per-process timer succeeds in a child process created across a fork().	DLCA don't use the libkernel.a library.
libkernel.a	CR 322	shm_open() fails to truncate a shared memory object to zero length when the O_TRUNC flag is used.	DLCA don't use the libkernel.a library.

Affected SW Component	CR ID	CR Description	No Impact - Rationale
libc.a	CR 323	IPC_FPREEMPT/fast_ada.c(1.9): _fast_sem_signal() can return OK on error.	DLCA don't use the _fast_sem_signal() function.
libc.a	CR 325	The function pthread_getschedparam() returns a wrong priority value.	DLCA don't use the pthread_getschedparam() function and the DLCA application does not relies on the value, returned by pthread_getschedparam()
libc.a	CR 326	Execl.c/execl() and execvp.c/execvp(): when the stack is full, alloca() function causes a SIGSEGV signal. If application programmers compile their C language applications with gcc using built-ins and alloca() is called when the application stack is full, a SIGSEGV signal will be generated which is VM fatal.	The DLCA Application don't use the gcc built-in alloca() function. It uses malloc() function.
libc.a	CR 329	Priority inheritance mutexes for application code is not working properly.	DLCA is a single threaded application. It does not use mutex related functionality.
libkernel.a	CR 332	execve() does not return to user if smart_load() fails	DLCA don't use the libkernel.a library.
libc.a	CR 353	When readdir() is called after the directory stream is closed with closedir(), the expected error EBADF is not reliably returned. This happens because closedir() leaves the memory pointed to by the directory stream pointer in an undefined state.	DLCA Application don't call the readdir() and closedir() functions in their code.
libkernel.a	CR 360	The function sysconf() does not support the functionalities of these passed arguments, _POSIX_ASYNCHRONOUS_IO, _POSIX_MEMLOCK, _POSIX_MEMLOCK_RANGE, _POSIX_PRIORITIZED_IO, _POSIX_THREAD_PROCESS_SHARED.	DLCA don't use the libkernel.a library.

Affected SW Component	CR ID	CR Description	No Impact - Rationale
libkernel.a	CR 368	kill(), sigwait(), _signotify() do not return the error code (EAGAIN) specified in POSIX.	DLCA don't use the libkernel.a library.
libkernel.a	CR 370	When a signal is delivered to the threads which do not register their own handlers, the default signal action will be performed.	DLCA don't use the libkernel.a library.
libkernel.a	CR 373	If the number of timers requested for a VM in the VCT is set to 0, the VM will fail to initialize at the startup process.	DLCA don't use the libkernel.a library.
libc.a	CR 374	A deadlock can occur if a user application invokes _name_server(_NS_OPEN,...) system call or _name_open() macro with O_LOCK flag directly. The deadlock is confined to only the VM making the calls.	DLCA don't use the _name_server() and _name_open functions.
libkernel.a	CR 375	An invalid handler address will not be detected until the system tries to deliver the signal and resulting in a VM fatal error.	DLCA don't use the libkernel.a library.
libc.a	CR 379	M is using priority inheritance and counting semaphore calls(_fast_sem_wait(), _fast_csem_wait(), and _fast_csem_signal()).	DLCA Application Don't use the following functions: _fast_sem_wait(), _fast_csem_wait(), _fast_csem_signal()
libkernel.a	CR 380	Deviations from POSIX in the mmap() system call.	DLCA don't use the libkernel.a library.
libkernel.a	CR 382	The function mmap() does not restore the previous state in case of insufficient memory.	DLCA don't use the libkernel.a library.
libkernel.a	CR 386	The function setuid() cannot set the real user ID. Functionality is POSIX non-compliant.	DLCA don't use the libkernel.a library.
libkernel.a	CR 388	User applications calling pthread_getschedparam() will get a bad thread priority if pthread_create() fails due to running out of memory.	DLCA don't use the libkernel.a library.

Affected SW Component	CR ID	CR Description	No Impact - Rationale
libkernel.a	CR 389	The mmap() functionality is POSIX noncompliant when memory allocation fails.	DLCA don't use the libkernel.a library.
libc.a	CR 393	Creating a new stream (using open(), fopen(), freopen() or fdopen()) or rewinding a stream (using fseek() or rewind()), and then making two or more calls to ungetc() results in a segfault when other stream functions are used afterwards.	DLCA Application don't use the ungetc() function.
libkernel.a	CR 399	get_resource_entry API user stack usage for main thread of a multi-threaded application reported incorrectly.	DLCA don't use the libkernel.a library.
libc.a	CR 404	Passing the mode string that is less than three characters can cause fopen_r() to create SIGSEGV situation.	DLCA Application don't use the fopen_r() function.
libkernel.a	CR 473	FOPEN_MAX is not correctly defined.	DLCA don't use the libkernel.a library.
libc.a	CR 495	ANSI.os/streamio/fflush test4 & 16 fail : fflush() calls with null pointer causes SIGSEGV	The DLCA calls the fflush() in the file VariableBlockSizeHeap.cpp->InitHeap() but it pass values to the function. Since it is not passing the Null pointer, there is no affect to DLCA.
libkernel.a	CR 496	The default actions for the SIGPOLL, SIGPROF, SIGXCPU, and SIGXFSZ signals do not conform to the POSIX specification.	DLCA don't use the libkernel.a library.
libc.a	CR 497	Reentrance resolutions for pname(), findpath(), and execvp() are not correct.	DLCA application don't use the pname(), findpath(), and execvp().
libkernel.a	CR 499	execve() does not return any error when the number of bytes used by the argument list and the environment list is	DLCA don't use the libkernel.a library.

Affected SW Component	CR ID	CR Description	No Impact - Rationale
		greater than the system imposed limit of (ARG_MAX) bytes.	
libkernel.a	CR 1923	File descriptors may be incorrectly duplicated on fork() if process has discontiguous file descriptors and they are allocated in different indirect blocks	DLCA don't use the libkernel.a library.
libkernel.a	CR 4215	The exec() function kills the caller if the executable file is corrupted without any failure response to the calling routine.	DLCA don't use the libkernel.a library.
libkernel.a	CR 4337	Waitall exhibits incorrect behavior in VMs other than VM0 when no status return is required and the process id of a previously exit'ed process gets reused by the kernel.	DLCA don't use the libkernel.a library.
libc.a	CR 4525	pthread_join() does not release resources of the target thread	DLCA Application don't use the pthread_join() function.
libkernel.a	CR 4853	The read() and getdents() functions will return 0 (EOF) instead of -1 if an I/O error is encountered while reading the first requested block of a diskfile.	DLCA don't use the libkernel.a library.
libc.a	CR 5132	Buffered stream output on non-blocking devices may result in data loss.	DLCA don't have any impact, because this CR description [Section 12.3.1.2 of 815-0524-008 Rev-] states that: the only data loss is debug and fault logging information. This information is not useful in an aircraft environment because the RS232 is not connected.
libdrivers_rsc.a	CR 5430	Operations that open the ram disk driver without the O_SYNC or O_DSYNC flag may receive an incorrect return status	DLCA don't use the libdrivers_rsc.a library.

Affected SW Component	CR ID	CR Description	No Impact - Rationale
libkernel.a	CR 6453 CR 6523	The khm_post() race condition happens whenever two threads call khm_post at the same time. khm_post is responsible for queuing up a signal (such as SIGILL, SIGSEGV, SIGFPE) to health monitor's kernel thread so that it can be processed.	DLCA don't use the libkernel.a library.
Header files	CR 8115	The PTHREAD_MUTEX_INITIALIZER and PTHREAD_COND_INITIALIZER values used to initialize some pthread_mutex_t and pthread_cond_t structures are incorrectly defined and can cause compiler warning messages when including the ipc_1c.h (or pthread.h) header file.	DLCA don't include the ipc_1c.h and pthread.h header file.
libc.a	CR 8346	When accessing buffered streams opened using the fopen() family of routines, a forked child that causes the stream to be flushed (including by calling exit()) will cause the file position to be adjusted incorrectly, possibly causing it to become negative.	DLCA is not using Multithreading.
libc.a	CR 8348	Applications using message queues may core dump if bad addresses are passed to the POSIX message queue routines.	DLCA Application is not using any of the following Message queue functions: mq_close, mq_getattr, mq_setattr, mq_notify, mq_send, mq_receive.
Header files	CR 8478	The POSIX errno values EBADMSG and ENOTSUP are assigned the same value.	DLCA Application don't use the error codes of EBADMSG and ENOTSUP in its code.
libkernel.a	CR 8610	There is a race condition in the select_poll() kernel routine when select() is called on networking sockets. This may lead to networking threads blocking indefinitely.	DLCA don't use the libkernel.a library.

Affected SW Component	CR ID	CR Description	No Impact - Rationale
Header files	CR 8655	Some *_MIN and *_MAX values defined in stdint.h when __STDC_LIMIT_MACROS is defined, can cause the compiler to produce warning messages. In addition, the *_MIN values are defined using values that are off by 1.	DLCA Application redefines these values in the file hm_types.h. So no impact.

E.2 Core Platform Open Problem Reports that May Affect Applications

Affected Platform Software Component	CR ID	Title	No Impact - Rationale
VCT	FUSN00231460 (SCR 2963)	CINIT: stringdup return value not checked on malloc error	DLCA uses its own RC_String Library functions. It does not use the in_built functions. So no impact to DLCA.
Health Monitor	FUSN00231505 (PR 10463)	clock_settime only valid to 1/19/2038	There is no impact till 2038. After that the Health Monitor will not be able to set master time. A mandatory update will be required to address this issue prior to 2038.
LynxOS	FUSN00231717 (PR 11348)	Critical sections within the LynxOS code exceed the 40us maximum requirement	The Overhead because of this issue is 72Microseconds. Currently DLCA Worst case is 3322.8 microseconds. Adding the 72 will become 3394.8 micro seconds out of allocated 5 milli seconds. Which is 67.9% of the Allocated processor used and 6.79% of the total processor used. So there is no affect to DLCA.
Health Monitor	FUSN00231659	HM - Config reporting null terminates the HW part number and SW Part number when 24 characters long	This is not an Issue to DLCA as all the Part numbers are 13 characters including the null character.
CSP	FUSN00324308	CSP: Race condition in CSP clean_pagetable caused by a multiple process VM termination results in module reset	DLCA is a single threaded application. So race condition does not happen in DLCA.
IOC Device Driver	FUSN00406234	IOCDD - Partitioning Violation due to unprotected code in open entry point.	This issue cannot occur because the IOCA-6000 is the only application that uses the IOC device driver. So no impact to DLCA.
SNMP Library	FUSN00545088	SNMP parse_oid_name() may return incorrect OID or cause segmentation violation	The DLCA does not call the snmp_logical_to_oid() or parse_oid_name()

Affected Platform Software Component	CR ID	Title	No Impact - Rationale
			functions (the snmp_logical_to_oid() function calls the parse_oid_name() function). Do no impact to the DLCA.

E.3 AFDX-ASL Open problem reports that may affect applications.

Component	CR Number	Description	No Impact - Rationale
Winsock2 Library	CR FUSN00218952	AFDX-ASL - getsockname() returns incorrect address	The CoRE Platform Software 815-0524-008 Rev- Section 12.2.2 mentions “no effect on the software covered by this accomplishment summary”. So this WP has no impact to DLCA.
TFTP Library	CR FUSN00231633 (PR11286)	IPS ES SW: Migrate from - 100 TFTP library to -005 TFTP library	The CoRE Platform Software 815-0524-008 Rev- Section 12.2.2 mentions “no effect on the software covered by this accomplishment summary”. So this WP has no impact to DLCA.
TFTP Library	CR FUSN00231637 (SCR 3111)	TFTP RemoteHost error – won’t accept Hostname as a input	The CoRE Platform Software 815-0524-008 Rev- Section 12.2.2 mentions “no effect on the software covered by this accomplishment summary”. So this WP has no impact to DLCA.
AFDX-ASL Driver	CR FUSN00308555	AFDX-ASL - IVM transmit port status should always return 0 for queued messages.	The CoRE Platform Software 815-0524-008 Rev- Section 12.2.2 mentions “no effect on the software covered by this accomplishment summary”. So this WP has no impact to DLCA.
AFDX-ASL Driver	CR FUSN00309170	AFDX-ASL – RBP handler should not process failed connections	RBP connections are only used for the verification environment for testing the codec related functionality. It won’t affect the DLCA functionality.

Component	CR Number	Description	No Impact - Rationale
End System ASIC	CDN00009967	DCA flag bit may be captured incorrectly in 0 byte EDE messages	The CoRE Platform Software 815-0524-008 Rev- Section 12.2.2 mentions "no effect on the software covered by this accomplishment summary". So this WP has no impact to DLCA.
End System ASIC	CDN00016760	EDE Sequence Number Causes DCA (Dual-Channel Availability) Flag to Clear	The CoRE Platform Software 815-0524-008 Rev- Section 12.2.2 mentions "no effect on the software covered by this accomplishment summary". So this WP has no impact to DLCA.
End System ASIC	CDN00020217	Receive Buffer Availability (RBA) May Indicate "Message Available" Erroneously	The CoRE Platform Software 815-0524-008 Rev- Section 12.2.2 mentions "no effect on the software covered by this accomplishment summary". So this WP has no impact to DLCA.

Appendix F FAA Order 8110.49A Matrix

Deviation from the PSAC: This section was not part of the PSAC [51].

FAA Order 8110.49A [60] has been changing to reduce the level of prescriptive guidance and therefore allow aircraft manufacturers more control over how regulatory concerns are addressed; often as FAA Issue Papers. However, the lack of information regarding FAA expectations creates an issue for product line avionics as all aircraft specific guidance may not be available during development. The product(s) addressed in this document are developed to the latest available FAA information to minimize issues when addressing individual aircraft Issue Papers, refer to the following table for applicable mapping.

Table 10 FAA Order 8110.49A Matrix

8110.49A Title/Topic	8110.49A Chapter	SAS Section
Introduction	1	N/A
Software Review Process - Certification Liaison	2.1	6.6
Software Review Process – Objectives of the Software Review Process	2.2	6.6
Reserved	3	N/A
Software Conformity Inspection - General	4.1	6.4
Software Conformity Inspection - Discussion	4.2	6.4
Software Conformity Inspection - Software Part Conformity Inspection	4.3	6.4
Software Conformity Inspection - Software Installation Conformity Inspection.	4.4	6.4
Software Conformity Inspection - Summary	4.5	6.4

Appendix G Software Configuration Index

The Software Configuration Index (SCI) for the Data Link Communications Application (DLCA-6500) [54] identifies the configuration of the DLCA 6500. As such, information relative to the environment (or SECI) to aid in the reproducing, re verification or modification of DLCA 6500 Computer Program Configuration Item (CPCI) is also included in section 10 Software Identification.

G.1 Software Life Cycle Environment Configuration Index (SECI)

The software life cycle configuration index identifies the configuration of the software life cycle environment of all the DLCA-6500 Computer Program Configuration Item (CPCI) section 10 Software Identification.

G.1.1 Development Hardware and Operating System

Refer to DLCA SVPR [28] for details regarding Hardware and Operating System used for DLCA-6500 development.

G.1.2 Software Life Cycle - Development Tools

G.1.2.1.1.1.1 Planning & Configuration Tools

Refer Software Configuration Index [54], sheet Tools, section Planning & Configuration Tools.

G.1.2.1.1.1.2 Editors

Refer Software Configuration Index [54], sheet Tools, section Editors.

G.1.2.1.1.1.3 Compilers

Refer Software Configuration Index [54], sheet Tools, section Compilers.

G.1.2.1.1.1.4 Other Tools

Refer Software Configuration Index [54], sheet Tools, section Other Tools.

G.1.2.1.1.1.5 Test Environment Tools

Refer Software Configuration Index [54], sheet Tools, section Test Environment Tools.

G.1.2.1.1.1.6 Qual Documents

Refer Software Configuration Index [54], sheet Tools, section Qual Documents.

Appendix H Outsourcing/Offshoring & Supplier Oversight

The DLCA-6500 team used Global Engineering Technology Center- India (GETC-I) as an offshore partner. Off-shore partners responsibilities included requirements definition, software development and verification.

The DLCA-6500 team also used onsite contractors from HCL Technologies, an Indian engineering firm. The onsite HCL contractors were utilized for development and verification. HCLT personnel were experienced DLCA engineers, and they have followed the DLCA SDP [7] the same as Rockwell Collins Cedar Rapids engineers.

The Rockwell Collins USA team was primarily responsible for meeting all the objectives of the software planning, requirements definition, software development, verification, and developmental configuration management processes.

H.1 Tasks and Responsibility

All systems engineering for DLCA-6500 were performed by system engineers located in the United States of America (USA).

Deviation from PSAC: PSAC [51] document, section 5.3.2 Tasks and Responsibilities, mentions Rockwell Collins India Design Center (RC IDC), which is renamed to Global Engineering Technology Center- India (GETC-I).

Software requirements, design, and development was done in the USA by RC personnel located within the USA, onsite HCL Technology (HCLT) contractors, and the Global Engineering Technology Center- India (GETC-I). GETC-I is a Rockwell Collins subsidiary based in India with locations in Hyderabad and Bangalore. All work done was performed per the SDP [7] and was reviewed per the Peer Review process [10] using the Data Link Products Peer Review Checklists [9].

DLCA-6500 utilized Global Engineering Technology Center- India (GETC-I) and onsite HCLT contractors, to perform all verification activities. GETC-I and onsite HCLT personnel were used to develop requirements-based test procedures, verified those RBT's (Requirement Based Test) provided full coverage of the DLCA-6500 software requirements, ran requirements-based test procedures to produce the data used for structural coverage analysis, ran test procedures for a "dry-run-for-score", and participated in a formal "run-for-score" at Rockwell Collins facilities.

The processes utilized by DLCA in previous verification efforts with off-shore verification were repeated for this project. A verification lead was assigned that is located in the USA. This person were responsible for coordination with our off-shore partners. A verification lead at each of our off-shore partners were also assigned to this project which coordinated activities at the off-shore facilities and ensure enforcement of the DLCA processes.

All formal Run For Score (RFS) testing on the target system was performed in the USA at Rockwell Collins facilities by GETC-I. The target solution only existed at Rockwell Collins facilities in the USA. Requirements-based test procedures were executed at GETC-I off-shore facilities using the DLCA-6500 host environment for Structural Coverage purposes. Structural Coverage Analysis (SCA) was performed at both the GETC-I off-shore and USA Rockwell Collins facilities. GETC-I and USA Rockwell Collins both had identical host solutions at their facilities.

All safety activities were done by personnel located in the USA.

H.2 Technical Oversight

Cedar Rapids Engineering Leads provided oversight to ensure offsite development and verification engineers complied with Data Link's processes currently in place.

All activities performed; regardless of what partner was conducting them; were performed using the same tools, plans and processes used by the Rockwell Collins USA team.

Over 50% of the artifacts modified or generated by our offshore partners were reviewed by an experienced member of the development team and 5% by the Rockwell Collins USA DAC for Quality. The tools and access to version control repositories that were necessary to accomplish these tasks were available to our off-shore partners and domestic partners. Some restrictions on network usage for the off-shore partners were enforced by Rockwell Collins USA team to fully comply with export control regulations.

To maintain synchronization, weekly and monthly status reports and teleconferences were scheduled between the Rockwell Collins USA and off-shore partners team members.

H.3 Visibility of Regulations, Plans, and Standards

Deviation from the PSAC: This section was not part of the PSAC [51].

All activities, regardless of which partner is conducting them, were performed using the same tools, plans and processes used by the Rockwell Collins USA team. All offshore/outsource partners have access to the applicable project plans and standards, either through direct access to the project repositories located in Cedar Rapids, Iowa, or through an agreed upon method of delivery.

The tools and access to version control repositories that are necessary to accomplish these tasks were made available to both our offshore partners and domestic partners. Some restrictions on network usage for the offshore partners are enforced by the Rockwell Collins USA team to fully comply with export control regulations.

H.4 Integration Management

Deviation from the PSAC: This section was not part of the PSAC [51].

All life cycle artifacts generated by offshore/outsource partners, either in whole or part, are maintained in Rockwell Collins repositories, databases, and network drives located in Cedar Rapids, Iowa. The development, management, and validation of such artifacts were completed in accordance with the defined processes in the SDP [7].

The target solution only existed at Rockwell Collins facilities in the USA. Requirements-based test procedures were executed at GETC-I off-shore facilities using the DLCA-6500 host environment for Structural Coverage purposes. Structural Coverage Analysis (SCA) was performed at both the GETC-I off-shore and USA Rockwell Collins facilities. GETC-I and USA Rockwell Collins both had identical host solutions at their facilities.

H.5 Problem Reporting and Resolution

Problem Reporting and Resolution includes a series of steps during the design and developmental process. A build was created per the schedule and the state of the development. The build underwent subsystem testing to ensure that the delivered Work Package (WP) were implemented correctly and function properly on the system rig. A Work Package was Generated using *JIRA* for any issues found in any DLCA-6500 artifact (i.e. documents, code, etc.). This Work Package (WP) went through the Change Control Board (CCB), and the necessary actions were taken.

When a build was delivered to the Verification Team, a similar process was followed. Upon any bug or deviation from the requirement, a Work Package was generated. The WP(s) goes through CCB to determine the actions to be taken on the Work Package.

H.6 Integration Verification Activity

Deviation from the PSAC: This section was not part of the PSAC [51].

Rockwell Collins USA personnel, onsite HCL Technology (HCLT) contractors, and the Global Engineering Technology Center- India (GETC-I) will have responsibility for all integration verification activities in accordance with the SDP [7].

A verification lead was assigned that is located in the USA. This person were responsible for coordination with off-shore partners. A verification lead at each of off-shore partners were also assigned to this project which coordinated activities at the off-shore facilities and ensure enforcement of the DLCA processes.

H.7 Configuration Management

This section is covered in detail in section 6.3 Software Configuration Management.

H.8 Assurance Oversight

This section is covered in detail in section 6.4 Software Quality Assurance.

H.9 Compliance Substantiation and Data Retention

Deviation from the PSAC: This section was not part of the PSAC [51].

All artifacts pertaining to compliance substantiation and data retention were kept in project repositories and archived databases located in Cedar Rapids, Iowa. Peer Review records are maintained in the project's PREP tool databases. Change Request records are archived in the change tracking tool database (JIRA). DAC Quality Assurance records are archived in an audit tool database.

H.10 Certification Oversight

Deviation from the PSAC: This section was not part of the PSAC [51].

All TCR activities will be done by personnel located in the USA. This effort will not be done through offshoring. GETC-I will also have DAC Representative on site that will assure that the team performs to Rockwell Collins USA processes and standards outlined in Software Development Plan [7].

Appendix I Process Deviations/Additions

This appendix documents the known deviations and additions to the Software Development [7] and related process documents.

I.1 Combine Design and Code artifacts in a single review.

Section 7.4.3.1.2 and 7.4.3.2.2 in the *Software Development* [7] describes the entry conditions for performing a peer review of the software source code whereby the relevant software architecture, detailed design, and low-level requirements have been reviewed and approved.

While the relevant software architecture and low-level requirements are still required to be reviewed and approved as an entry condition, this deviation allows the detailed design artifact(s) to be reviewed along with the software source code in a combined peer review.

I.2 Peer Review method

Peer review method [10]. This document is called out in the SDP [7].

Section 4.1.5.2 Reviewer Checklist states The Reviewer Checklist shall be completed by the Main Reviewer only after all required participants (and any optional participants who wish to participate) have completed their review, documented any and all findings, and those findings have been Assigned or Closed/Cancelled (i.e. moved out of Draft).

The deviation is that the above was not met on all peer reviews for DLCA-6500, due to once all required participants have completed their review and all findings assigned it was found that sometimes findings need to be added based on the implementation of assigned findings.

Note: Although these are deviations to the process document, they do not violate the spirit and intent of the Findings activity.

I.3 Verification Credit from System Testing

Appendix A.1 in Software Verification Procedures and Results (SVPR)[28], mentions note "Target Log status for below mentioned Scripts are marked as *PASS as the Corresponding System tests are passed" with Table containing List of Test Procedures, and their Corresponding System tests. Deviation is taken for the above-mentioned List of Test Procedures in SVPR[28] to take verification credit from Corresponding System Testing, due to Filter Driver issue in IPS target-based test environment. Refer SVPR [28], section 4.1.1, Verification of DLCA-6500 application, sub section IPS RIG Based Testing, for reference details regarding hardware part number and software part number of system rig.