European Union Aviation Safety Agency

Notice of Proposed Amendment 2023-07

in accordance with Article 6(1) of MB Decision 01-2022

Datalink services

RMT.0524 (SUBTASK 1)

EXECUTIVE SUMMARY

This Notice of Proposed Amendment (NPA) proposes changes to the Certification Specifications and Acceptable Means of Compliance for Airborne Communications, Navigations and Surveillance (CS-ACNS), to support the design and production organisations and in particular the aircraft operators required to provide ADS-C EPP (Automatic Dependent Surveillance - Contract Extended Project Profile) part of ATS-B2 (ATS baseline 2), in accordance with AF6 (ATM functionality 6 - initial trajectory information sharing) of Commission Regulation (EU) 2021/116 Common Project One (CP1).

As this proposal provides only the minimum changes required, it is expected that it will be followed by an additional regulatory effort to address the remaining and future data link connectivity challenges in line with the vision expressed in the 'Future Connectivity for Aviation – FCAV' white paper. The subsequent regulatory effort may be captured by various 'regular update' rulemaking tasks or by the RMT.0682 on 'Implementation of the regulatory needs in support of the SESAR deployment'

REGULATION(S) TO BE AMENDED/ISSUED	**ED DECISION(S) TO BE AMENDED/ISSUED**
None	ED Decision 2022/008/R — Certification Specifications and Acceptable Means of Compliance for Airborne Communications, Navigations and Surveillance (CS- ACNS)

AFFECTED STAKEHOLDERS

Design organisation approval (DOA) holders, production organisations, aircraft operators.

WORKING METHODS

Development	**Impact assessment(s)**	**Consultation**
By EASA with external support	Light	Public – NPA

RELATED DOCUMENTS / INFORMATION

ToR RMT.0524 Issue 1 issued on 29.01.2019

PLANNING MILESTONES: Refer to the latest edition of the EPAS Volume II.

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1. About this NPA

1.1. How this regulatory material was developed

The European Union Aviation Safety Agency (EASA) developed this Notice of Proposed Amendment (NPA) in line with Regulation (EU) 2018/1139[1] (the 'Basic Regulation') and the Rulemaking Procedure[2], in the context of Rulemaking Task (RMT).0524. This Task is included in Volume II of the European Plan for Aviation Safety (EPAS) for 2023-2025[3] and its scope and overall timescales are defined in the related Terms of Reference (ToR)[4].

This regulatory proposal was developed by EASA with the support of the RMG.0524.

1.2. How to comment on this NPA

The NPA is hereby submitted to all interested parties for consultation in accordance with Article 115 of the Basic Regulation, and Article 6(1) of the Rulemaking Procedure.

Please submit your comments using exclusively the dedicated **Comment-Response Tool (CRT)** available at **http://hub.easa.europa.eu/crt/**[5].

The deadline for the submission of comments is **8 September 2023**.

1.3. The next steps

Following the NPA public consultation, EASA will assess all the comments received and, if necessary, further review the subject regulatory proposal. Depending on the nature of the comments, a focused consultation event may be organised to clarify specific controversial aspects.

As a result of this process, EASA will issue a Decision to amend the 'Certification specifications and acceptable means of compliance for airborne communication, navigation and surveillance ('CS-ACNS').

When issuing the Decision, EASA will also provide feedback in relation to comments received via the NPA consultation, how such engagement and/or consultation was used in rulemaking, and how the comments were considered.

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1 Regulation (EU) 2018/1139 of the European Parliament and of the Council of 4 July 2018 on common rules in the field of civil aviation and establishing a European Union Aviation Safety Agency, and amending Regulations (EC) No 2111/2005, (EC) No 1008/2008, (EU) No 996/2010, (EU) No 376/2014 and Directives 2014/30/EU and 2014/53/EU of the European Parliament and of the Council, and repealing Regulations (EC) No 552/2004 and (EC) No 216/2008 of the European Parliament and of the Council and Council Regulation (EEC) No 3922/91 (OJ L 212, 22.8.2018, p. 1) (https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1535612134845&uri=CELEX:32018R1139).

2 EASA is bound to follow a structured rulemaking process as required by Article 115(1) of Regulation (EU) 2018/1139. Such a process has been adopted by the EASA Management Board (MB) and is referred to as the 'Rulemaking Procedure'. See MB Decision No 01-2022 of 2 May 2022 on the procedure to be applied by EASA for the issuing of opinions, certification specifications and other detailed specifications, acceptable means of compliance and guidance material ('Rulemaking Procedure'), and repealing Management Board Decision No 18-2015 (https://www.easa.europa.eu/the-agency/management-board/decisions/easa-mb-decision-01-2022-rulemaking-procedure-repealing-mb).

3 European Plan for Aviation Safety (EPAS) 2023-2025 | EASA (europa.eu)

4 https://www.easa.europa.eu/en/document-library/terms-of-reference-and-rulemaking-group-compositions/tor-rmt0524

5 In case of technical problems, please send an email with a short description at crt@easa.europa.eu.

Subsequent regulatory action may be needed to address the connectivity challenges in line with the common vision proposed by the white paper on the 'Future connectivity for aviation'[6].

[6] https://www.easa.europa.eu/en/document-library/general-publications/future-connectivity-aviation

2. In summary — why and what

2.1. Why we need to act — issue/rationale

This NPA addresses the need to timely support the initial trajectory information sharing (i4D) capability required of the operators for affected aircraft, in accordance with the provisions of Commission Regulation (EU) 2021/116[7].

2.2. Description of the issue

The airspace usage requirements relevant for data link systems equipage are provided in Commission Regulation (EC) No 29/2009[8] on data link services (the 'DLS IR'). It should be noted that Opinion No 01/2023[9] on conformity assessment of ATM/ANS systems and constituents, proposes to repeal the DLS IR and supersede it with provisions in the new regulation. Commission Regulation (EU) 2021/116, commonly known as 'the CP1 regulation', uses the DLS IR as a prerequisite and complements it with additional capability.

CP1 regulation requires the implementation of six ATM functionalities to achieve essential operational improvements. Such ATM functionalities (AF1 to AF6) are defined in Article 2 of the CP1 regulation and further detailed in its Annex. The functionality supported by this NPA is ATM functionality 6 or AF6 (i4D) which, when implemented, may result in fewer tactical air traffic control (ATC) interventions and improved de-conflicting situations.

AF6 of the CP1 regulation ('AF6 CP1') requires that aircraft operators ensure that aircraft certified on or after 31 December 2027 are equipped with ADS-C EPP (Automatic Dependent Surveillance - Contract Extended Project Profile) capability for affected flights. Aircraft operators would require design organisations approval (DOA) holders and production organisations to provide aircraft certified with ADS-C/EPP capability. While applicants may generally have the possibility to use other certification tools (e.g., special conditions) to document how they meet the requirements (ADS-C EPP capability), without the relevant certification specifications and acceptable means of compliance, DOA holders will face challenges to implement the required functionality in a timely and harmonised manner. The date established by CP1 leaves little time for DOA holders to change the equipment and aircraft design and incorporate the change in the production line.

Standards availability is an essential condition to achieve the level of maturity and harmonisation (i.e., industrialisation) needed for the AF6 implementation. Issue 4 of CS-ACNS (current issue) provides certification specifications supporting compliance with the DLS IR, which is a prerequisite for AF6 CP1, however does not provide certification specifications to support compliance with AF6 CP1. The target

[7] Commission Implementing Regulation (EU) 2021/116 of 1 February 2021 on the establishment of the Common Project One supporting the implementation of the European Air Traffic Management Master Plan provided for in Regulation (EC) No 550/2004 of the European Parliament and of the Council, amending Commission Implementing Regulation (EU) No 409/2013 and repealing Commission Implementing Regulation (EU) No 716/2014 (OJ L 36, 2.2.2021, p. 10–38) (https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32021R0116)

[8] Commission Regulation (EC) No 29/2009 laying down requirements on data link services for the single European sky (OJ L 13, 17.1.2009, p. 3)

[9] Regulatory framework on the conformity assessment of ATM/ANS systems and ATM/ANS constituents (ATM/ANS equipment) for the safe and seamless operation of the European ATM network (https://www.easa.europa.eu/en/document-library/opinions/opinion-no-012023)

date defined in the CP1 regulation for specification and standards availability supporting AF6 implementation is 31 December 2023, therefore an action is required before reaching this target date.

2.3. Assessment of the issue

Aircraft operators are affected by the AF6 CP1 requirements when performing general air traffic (GAT) flights in accordance with instrument flight rules (IFR) above FL 285 within the Single European Sky (SES). The AF6 CP1 applicability to flights above FL 285 is consistent with the similar provision of the DLS IR. It should be noted that aircraft currently certified are not intended to use the communication via DLS (Controller Pilot Data Link Communication - CPDLC) for non-routine, time critical situations, due to concerns related with the human machine interface and crew workload.

According to AF6 CP1, aircraft operators must ensure that aircraft operating flights with an individual certificate of airworthiness (CofA) first issued on or after 31 December 2027 are equipped with the capability to automatically downlink aircraft trajectory using ADS-C EPP as part of ATS B2 services. While the aircraft are not grounded if they do not have the required capability, they will not be able to access the airspace above FL 285. This restriction, therefore, effectively introduces limitations and penalties in terms of operations efficiency.

Considering the time needed by DOA holders, aircraft, and equipment manufacturers to modify the design and incorporate the changes into the production line to support the forward fit of ADS-C EPP capability, meeting the 31 December 2027 deadline may be challenging and would depend on the aircraft and avionics configurations and on the extent of the design changes needed.

Current CS-ACNS at Issue 4 would not be able to support aircraft operators acquiring aircraft in compliance with AF6 CP1 requirements. Even if another certification tool (e.g., special condition) would be used to document the additional design requirements, the level of maturity and harmonisation (i.e., industrialisation) would not be met and the certification process may be delayed. The options to support aircraft operators acquiring aircraft in compliance with AF6 CP1 are further defined in the light impact assessment in Appendix 1.

While the issue assessed is only the support to operators' need to comply with AF6 CP1 requirements, the remaining data link issues intended to be addressed by the RMT.0524 could be captured in various 'regular update' rulemaking tasks or by the RMT.0682 on 'Implementation of the regulatory needs in support of the SESAR deployment'. A future RMT.0682 subtask may consider addressing the current and future connectivity challenges, in alignment with the common vision proposed by the white paper on the 'Future connectivity for aviation'. The planning for this subtask should be established in a future EPAS revision synchronised with the ATM Master Plan[10].

2.4. Who is affected by the issue

While the stakeholders impacted by the AF6 CP1 include ATS providers, NM, air traffic controllers (ATCO)s, the impact of this CS-ACNS amendment is limited to:

— DOA holders,

— Production organisations,

— Aircraft operators.

[10] https://www.atmmasterplan.eu/

2.5. How could the issue evolve

AF6 CP1 requires ADS-C EPP capability for the affected flights. To obtain such capability, aircraft operators will ask DOA holders, aircraft and equipment manufacturers for support. Applicants still have the possibility to use other certification tools (e.g., special conditions) to meet the intended design outcome (ADS-C EPP capability) to support AF6 CP1. However, in such case, the applicants are not aware beforehand of EASA's expectations by not having the corresponding regulatory material directly available. Not having the CS-ACNS developed, would introduce delays in the certification programmes.

If no detailed certification specifications are made available to support certification, it would also negatively impact the AF6 CP1 industrialisation readiness level.

In summary, a lack of regulatory action may result in:

— delays in the approval of design changes and installations, unharmonised implementation,

— missing the AF6 CP1 industrialisation target date, which may lead to the removal of AF6 from CP1.

2.6. What we want to achieve — objectives

The overall objectives of the EASA system are defined in Article 1 of the Basic Regulation. This NPA will contribute to achieving the overall objectives described in Section 2.1.

The specific objectives of this proposal are to:

— support aircraft operators to achieve ADS-C EPP capability for aircraft with a CofA issued on or after 31 December 2027, in accordance with CP1 requirements, and

— contribute to fulfilling the maturity level gate requirement by providing standards to support AF6 CP1 by the 31 December 2023.

2.7. How we want to achieve it — overview of the proposed amendments

The CP1 regulation requires the implementation of six ATM functionalities to contribute to essential operational improvements. The scope of this proposal is to support the implementation of AF6 which improves the use of target times and trajectory information, including where available the use of on-board 4D trajectory data by the ATC and Network Manager (NM) systems.

While more stakeholders are involved in enabling i4D, this proposal focuses on DOA holders and their needs.

To achieve the objectives set in paragraph 2.6 above, the following amendments to CS-ACNS Subpart B 'Communications', Section 2 'Data link services' are proposed:

— Modify the title of various paragraphs to remove the term 'B1', as the focus of the CS-ACNS should no longer be ATN B1 services and applications only.

— The CS ACNS.B.DLS.B1.001 on 'Applicability' is revised to include the ADS-C EPP in support of the CP1 as per of ATS B2. Guidance material has been further added to clarify the focus of the current amendment on accommodating the ADS-C EPP application only, as part of ATS B2.

— The CS ACNS.B.DLS.B1.015 on 'Flight deck interface' is updated to accommodate ADS-C EPP. Flight crew should be able to terminate ADS-C connections.

— The title of the CS ACNS.B.DLS.B1.020 'Data link Services' is changed to 'Data Link Capabilities', as the paragraph now includes the data link capabilities to downlink of the ADS-C EPP data. The related guidance material is updated to remove the link to the ETSI EN303214 document, as it should be superseded by the detailed ground specification.

— The AMC1 ACNS.B.DLS.B1.025 on 'Protection mechanism' is updated as the ICAO Doc 9705 has been superseded by ICAO Doc 9880. Some guidance material is removed as the references are either outdated, not needed, or not related to the protection mechanism topic.

Stakeholders are invited to comment if there is still a need to reflect in CS-ACNS the paragraphs related to the protection mechanism, or if these can be removed since the CPDLC Protected Mode (PM-CPDLC) has been baselined and is part of the basic design of data link system (the understanding of CPDLC today is PM-CPDLC).

— The CS ACNS.B.DLS.B1.040 on 'UTC requirement' is clearly stating the time accuracy, rather than relying on the reference the ICAO Annex II or EUROCAE standards.

— The AMC1 ACNS.B.DLS.B1.050 and AMC1 ACNS.B.DLS.B1.055 on 'DLIC service messages' are updated to include the possibility to refer to ED-229A.

— Various AMCs on 'CPDLC uplink and downlink messages' are updated to replace the references to ICAO Doc 9705 by the references to ICAO Doc 9880.

— A new paragraph CS ACNS.B.DLS.077 is added to support ADS-C EPP data link capability. An associated AMC1 CS ACNS.B.DLS.077 added.

Stakeholders are invited to comment if the means of compliance in AMC 1 ACNS.B.DLS.077 represents the minimum and sufficient means to demonstrate compliance with the ADS-C EPP message exchanges requirements in CS ACNS.B.DLS.077.

— A new paragraph CS ACNS.B.DLS.097 on 'ADS-C EPP safety and performance requirements' is added. Associated AMC1 CS ACNS.B.DLS.097 is added.

Stakeholders are invited to comment if the requirements proposed in CS ACNS.B.DLS.097 and associated AMC represent the minimum and sufficient safety and performance requirements and adequate means of compliance to support the intended operations.

— The AMCs to network, transport, session, presentation and application layers requirements references are updated, mostly as the ICAO Doc 9880 supersedes ICAO Doc 9705.

Stakeholders are invited to comment if there is still a need to maintain the paragraphs related to the various ATN layers (network, transport, session, presentation, application) in the CS-ACNS.

— The Appendix B 'Background information on data link systems' is removed.

In accordance with the EPAS 2023-2025, the decision to issue the proposed CS-ACNS amendment is planned for Q4 2023. The applicability of the decision should be shortly after it is issued.

2.8. What are the stakeholders' views

Prior to the public consultation of the enclosed proposal, the stakeholders' views were generally divided with regard to the extent of the certification specifications and design changes needed to support CP1 regulation.

Previous discussions held during the activity of the RMG.0524 on datalink services addressed the topic of the design requirements to support compliance with AF6 CP1 and partial ATS B2 capable installations (the ADS-C EPP proposal introduced in this proposal) in comparison with full ATS B2 capable installations. Some stakeholders argued that it would be beneficial on the long term to avoid

such partial installations and that is important to promote future datalink standardised development worldwide.

A specific work package (WP2 of RMT.0524) to amend the CS-ACNS was established. The result of this work package was a comprehensive revision of the CS-ACNS, where, depending on the operational needs, the applicants could choose the data link, network, and subnetwork. However, only the full ATS B2 capability was proposed as an option supporting AF6 CP1. This approach was rather similar to the approach adopted by the FAA for the AC 20-140C[11].

Nonetheless, other stakeholders argued that the only ATS B2 part required by the CP1 regulation is the EPP report and that the scope of work for EPP capability is considerably more limited than the complete ATS B2 capability.

Furthermore, the cost to develop, certify, and deploy such full ATS B2 capability is high while the use of such capability by the ANSPs may only gradually increase over time. While a full ATS B2 avionics suite will provide enhanced capabilities to execute various operational scenarios, only a limited part of such capabilities is in fact requested by AF6 CP1 and is planned to be used by the ground equipment, for the time being. Some stakeholders argued that the ground infrastructure needs to be already in place to support such airborne capability, and concerns were raised on the ground data link installations readiness level to properly use the information provided through ADS-C EPP.

Further concerns were raised on the adequacy and complexity of standards supporting the data link installations, prompting EASA to request standardisation bodies to consider a minimum operations performance standard for the Communication Management Unit (CMU).

2.9. Other relevant information

Together with other stakeholders and at EASA's initiative, a white paper on FCAV has been published. The vision and strategy outlined in this paper establishes timelines for data links supported by different technologies and protocols as aligned with the current AF6 CP1 mandates and foreseen targets for standards publications.
The time fence related with the ADS-C EPP in the FCAV paper is 31 December 2027 and is aligned with AF6 CP1 mandate. Furthermore, FCAV also provides 2032 as target date for full B2 capability supported by different technologies and protocols, in particular the Internet Protocol Suite (IPS).

[11] Guidelines for Design Approval of Aircraft Data Link Communication Systems Supporting Air Traffic Services (ATS) (AC 20-140C Guidelines for Design Approval of Aircraft Data Link Communication Systems (faa.gov)

3. What are the expected benefits and drawbacks of the regulatory material

While airborne certification of data link installations can be achieved, depending on the application, using, for example, special conditions, it is important to provide specifications and means of compliance to support compliance with AF6 CP1 regulation in a standardised and harmonised manner. If such certification specifications were not provided, the industrialisation target may not be met. Furthermore, applicants may not be able to support aircraft operators' compliance with AF6 CP1. As a consequence, these operators may not be able to use the airspace above FL 285 with their affected aircraft.

Considering the additional implementation cost of a full ATS B2 capability, complemented by a reduced readiness level to implement and use operationally a full ATS B2 capability by all stakeholders, a minimal change to the regulatory material to enable ADS-C EPP capability option is preferred. This change would ensure, at this time, the simplest, proportionate and least costly rulemaking intervention to support the objective of the AF6 CP1, as further detailed in Appendix 1 – impact assessment.

4. Proposed regulatory material

Proposed amendments and rationale

The amendment is arranged to show deleted, new or amended, and unchanged text as follows:

- deleted text is ~~struck through~~;
- new or amended text is highlighted in blue;
- an ellipsis '[…]' indicates that the rest of the text is unchanged.

Where necessary, the rationale is provided in *italics.*

SECTION 2 – DATA LINK SERVICES (DLS)

GENERAL

CS ACNS.B.DLS.~~B1.~~001 Applicability

(See GM1 ACNS.B.DLS.~~B1.~~001)

This section provides the airworthiness standards for ATN B1 and ATS B2 limited to the provision of ADS-C EPP ~~with VDL Mode 2 data link aircraft systems to be installed on aircraft intended to be used for CPDLC Communications~~.

Rationale

To introduce the ADS-C EPP part of ATS B2 capability, to support compliance with the provisions of the ATM functionality 6 (AF6) of the Common Project One (CP1) regulation (EU) 2021/116.

GM1 ACNS.B.DLS.~~B1~~001 Applicability

~~Controller–pilot communications through the data link are used worldwide. Different technologies may be used, and CS ACNS.B.DLS.B1.001 is intended to provide the airworthiness standard for such installations. Additionally, controller–pilot communications over the ATN B1 data link technology have been mandated in Europe through Regulation (EC) No 29/2009. Installations intended to operate within EU airspace, defined in the above-mentioned Regulation, should fully comply with all the requirements of the 'DATA LINK SERVICES' section.~~

~~Installations not intended to operate within EU airspace are not required to comply with the above-mentioned Regulation.~~

~~*Note 1: CS ACNS.B.DLS.B1.010 and CS ACNS.B.DLS.B1.015 are also applicable for CPDLC installations where, in addition to ATN B1 over VDL M2, other means of communication and other services are also provided.*~~

~~*Note 2: further background information on data link systems is provided in Appendix B – Background information on data link systems.*~~

ATN B1 data link installations referred to in this section (Section 2) support the data link services 'ATC Communications Management' (ACM), 'ATC Clearances' (ACL) and 'ATC Microphone Check' (AMC), through the CPDLC application.

This section is also referring to the capability of the data link installations to downlink the extended projected profile (EPP) through the ADS-C application, as part of the ATS B2 data link.

The context management (CM) application and the DLIC service are pre-requisites for the initiation of CPDLC and ADS-C applications.

Rationale

To provide guidance in particular on the pre-requisites needed for the initiation of CPDLC and ADS-C applications.

CS ACNS.B.DLS.~~B1.~~005 Installation Requirements

(See AMC1 ACNS.B.DLS.~~B1.~~005)

The data link system includes a means to enable data communication and flight deck annunciations and controls.

GM1 ACNS.B.DLS.~~B1.~~005 Data Link System Installation

An example of installation may be a system comprising the following components or inputs:

— A VHF Data Radio (VDR) with Mode 2 capability and its associated antenna~~.~~;

— A Unit for Communication Management ~~with Mode 2 and ATN capabilities.~~;

— A ~~display unit with~~ means for crew to be notified of ATS Requests and Clearances, and issue downlink crew requests to controllers or responses to outstanding messages (from controllers)~~.~~;

— An adequate source for UTC time e.g. a Global Navigation Satellite System (GNSS)~~.~~;

— An adequate source for conducted flight plan information (Departure Airport, Destination Airport, Estimated Time of Arrival) e.g. Flight Management System (FMS);

— An adequate source of aeroplane position e.g. Flight Management System (FMS), or a Global Navigation Satellite System (GNSS) or both;

— An adequate source for Air/Ground Status information e.g. an interface with the landing gear or Flight Management System (FMS) or both;

— An adequate aural attention getter for announcements~~.~~;

— Adequate indication means of system and service availability~~.~~;

— Adequate control means for the crew.

Rationale

To introduce minor changes to make the guidance material less focused on ATN VDLM2 network/subnetwork.

FLIGHT DECK CONTROL AND INDICATION CAPABILITIES

CS ACNS.B.DLS.~~B1.~~010 Flight Deck Interface

(See AMC1 ACNS.B.DLS.~~B1.~~010)

(a) A means is provided:

(1) to inform clearly and unambiguously when uplinked messages are received;

(2) for the flight crew to initiate and to terminate the data link services and to terminate ADS-C connections;

(3) for the flight crew to know in real time the identifier of the ATS provider(s) and the established ADS contracts connecting with the aircraft;

(4) to display all messages, with minimal flight crew action, in a format that is easy to comprehend and distinguishable from each other;

(5) for the flight crew to respond to ATS messages;

(6) to inform the flight crew that pending or open messages are waiting for a response;

(7) for the flight crew to determine the status of the data link system;

(b) A means is provided to prohibit the deletion, confirmation, or clearance of a message until the entire message is displayed.

Rationale

To introduce flight deck interface specifications to support the ADS-C application.

AMC1 ACNS.B.DLS.~~B1.~~010 Flight deck interface

Flight crew control and display of data link related information (connectivity status, outstanding messages, etc.) should be consistent with the overall crew flight deck design philosophy.

Flight crew control and display of data link messages should satisfy integrity and interface design criteria appropriate for the intended purpose. Reference to the applicable CS xx.1309 requirements should be observed.

If a direct interface exists between the data link application and other on board systems, (e.g. flight planning and navigation), a means may be provided for the flight crew to initiate the use of the data contained in the message by the other on board system. The means provided should be separate from that used to respond to a message.

Flight deck annunciations should be compatible with the overall alerting scheme of the aircraft.

Audible and visual indications should be given by the data link system for each uplinked ATS message, including those messages not displayed immediately because of lack of crew response to an earlier ATS message. Visual alerts alone may be used for non-ATS messages.

Annunciation of the receipt of a message during critical flight phases should be inhibited until after the critical flight phase. The criteria that define critical flight phases should be consistent with the particular flight deck philosophy and the particular data link services supported.

Means should be provided for the flight crew to list, select, and retrieve the most recent ATS messages received and sent by the flight crew during the flight segment. The status of each message, the time it was received or sent, should be accessible.

When CPDLC messages are displayed:

(a) such location should be in the maximum field of view.

(b) messages should be provided in a dedicated display (or in a dedicated window of a display). Shared use of CPDLC and other applications in a common display (or in the same window of a display) should be avoided.

Note 1: (a) and (b) are intended for future extension of CPDLC use beyond en-route flight phase. Installations not in accordance with these recommendations are liable to be limited for CPDLC operations in the en-route or prior departure flight phase.

Note 2: Where data link messages are displayed on a shared display or on a shared display area, selection of another display format or function should not result in the loss of uplinked messages which are waiting for a response. In case the pilot is working on another task and a message is uplinked, the uplinked message should not interrupt the current work, nor result in the loss of any uplinked message and/or data entered while accomplishing the other task.

(c) messages from the ATS should remain displayed until responded, cleared or the flight crew selects another message.

(d) means should be provided for the flight crew to clear uplinked messages from the display. However, this capability should be protected against inadvertent deletion.

Means should be provided for the flight crew to create, store, retrieve, edit, delete, and send data link messages.

The data link system should indicate when message storage and/or printing is not available.

A flight deck printer could be used as a means of storing data communications messages received or sent during flight.

If a message intended for visual display is greater than the available display area and only part of the message is displayed, a visual indication shall be provided to the pilot to indicate the presence of remaining message.

Data link messages from the ATS should be displayed and remain displayed until responded, cleared or the flight crew selects another message.

The status of each message (i.e. source, time sent, open/closed) should be displayed together with the message.

CS ACNS.B.DLS.~~B1.~~015 Dual Data Link Capabilities (Dual stack)

(See AMC1 ACNS.B.DLS.~~B1.~~015)

For aircraft integrating both FANS 1/A and ATN B1 CPDLC applications:

(a) Control and display: Messages with the same intent that are transmitted or received through these technologies are displayed in the same way.

(b) Alerting: Where a common alerting is not demonstrable, a mean is provided to distinguish between the alerting scheme in a format that is easy to comprehend.

AMC1.ACNS.B.DLS.~~B1.~~015 Dual Data Link Capabilities (Dual stack)

Note: A Dual stack system is either a bilingual system capable of automatically selecting the data link network or a dual system that use manual selection with an interlock system.

The data link system should comply with ED-154A, interoperability requirements IR-207, IR-209, IR-210, IR-211, IR-212, IR-214, and IR-215 to ensure seamless transition between two adjacent ATSUs, one using FANS 1/A+ and the other using ATN B1.

The data link system should demonstrate common accessibility to the FANS 1/A and ATN B1 CPDLC applications. Accessibility demonstration should include common controls (i.e. line select keys) or, where different, the potential to introduce confusion or unacceptable flight crew workload should be evaluated.

The data link system should demonstrate common control and input procedures for retrieving and responding to FANS 1/A and ATN B1 uplink messages.

The data link system should demonstrate common control and input procedures for composing and sending FANS 1/A and ATN B1 downlink messages.

The data link system should demonstrate common flight deck indications for incoming FANS 1/A and ATN B1 messages. Where common alerting is not demonstrable, the alerting scheme evaluate to ensure that neither confusion nor unnecessary flight crew workload is introduced.

Annunciations and indications should be clear, unambiguous, timely, and consistent with the flight deck philosophy.

FANS 1/A differentiates messages alerting between normal and Urgent. Upon receipt of a high alert CPDLC message, the data link system should indicate it to the flight crew.

Note: FANS 1/A standard (ED-100A) identifies the term 'IMMEDIATELY', within the phraseology standardised for CPDLC communications. This term is to be understood within the required communications performance scope (RCP), which for oceanic and remote operations is either 240 seconds or 400 seconds. The use of these terms 'IMMEDIATELY' and 'EXPEDITE' are not to be confused with the terminology used in material related to CS 25.1322. However, annunciations and indications should allow flight crews to easily identify these messages (associated with Urgent and Distress urgency attribute) among the normal messages.

Flight Deck Display of Messages from either FANS 1/A or ATN B1 CPDLC Applications:

A common flight deck display should be capable of displaying messages with the same operational intent resulting from same message elements that may be implemented differently between FANS 1/A and ATN B1 CPDLC applications. The common format to display FANS 1/A messages may be in accordance with the preferred format denoted in Annex A of ED 122, which is consistent with Doc 4444, 15th Ed, and ATN B1 message formats.

Dual Stack ATS Data Link System Status Indication:

The system should provide the flight crew with a means to clearly identify the status of different modes of the data link system that affect significant operational capability. Examples of different modes of data link may include situations when downlink messages are available in one airspace, but not the other; or messages that may or may not be loadable depending on system status, i.e., ATN B1 or FANS 1/A.

ATSU Connections and Handoffs:

The system should be capable of the following functions:

(1) Proper connection and termination for FANS 1/A ATSU.

(2) Proper connection and termination for ATN B1 ATSU.

(3) Transfer to next data authority (e.g., FANS 1/A ATSU to ATN B1 ATSU), in both directions. This should include proper connection, maintenance of connection and connection termination protocol to ensure that aircraft does not hold two simultaneous active CPDLC connections.

(4) Ability for flight crew to manually terminate existing connection and establish new connection, initiate a DLIC 'logon' in both directions (i.e., FANS 1/A-to-ATN B1 and ATN B1-to-FANS 1/A).

(5) Ability for flight crew to verify current and next facility designation or name.

Note: FAA AC 20-140~~A~~C provides adequate guidance related to the application interoperability, sub-networks and performance designators. (refer to Tables 5.1 and 5.2).

Rationale

To change the title and a reference.

ATN B1 DATA LINK AND ADS-C EPP DOWNLINK CAPABILITY

CS ACNS.B.DLS.~~B1.~~020 Data Link ~~Services~~ Capabilities

(See AMC1 ACNS.B.DLS.~~B1.~~020 and GM1 ACNS.B.DLS.~~B1.~~020)

The data link system provides the following ~~services~~ capabilities:

(a) Data Link Initiation Capability (DLIC);

(b) ATC Communications Management (ACM);

(c) ATC Clearances and Information (ACL); and

(d) ATC Microphone Check (AMC);

(e) Downlink of ADS-C EPP.

Rationale

To add the capability of the data link system to downlink the ADS-C EPP. 'Capability' wording is intended to describe the overall design needs, which include both DLS services listed from (a) to (d) required by the DLS IR, and ADS-C EPP downlink capability required by AF6 CP1.

AMC1 ACNS.B.DLS.~~B1.~~020 Data Link ~~Services~~ Capabilities

When the aircraft has no CPDLC Current Data Authority, the data link aircraft equipment should provide crew members entering an airspace of a data link equipped ATS unit with the capability to initiate a DLIC 'Logon' function (e.g. send a CMLogonRequest message) with the applicable ATS unit, in order to identify the aircraft and initiate the use of data link services.

GM1 ACNS.B.DLS.~~B1.~~020 Data link ~~Services~~ Capabilities

~~Community Specification EN 303 214 'Data Link Services (DLS) System' provides a set of test scenarios to~~Data link capabilities should be demonstrated using a ~~verified~~representative ground data link system or a ground data link system simulator.

(a) **Data link initiation capability (DLIC) service**

The DLIC service enables the exchange of information between aircraft and ground data link equipment, necessary for the establishment of data link communications. It ensures:

(1) the unambiguous association of flight data from the aircraft with flight plan data used by an ATS unit,

(2) the exchange of the supported air–ground application type and version information,

(3) the delivery of the addressing information of the entity hosting the application.

(b) **ATC Communications Management (ACM) Service**

The ACM service provides automated assistance to flight crews for conducting the transfer of ATC communications (voice and data). It includes:

(1) the initial establishment of CPDLC with an ATS unit;

(2) the CPDLC ATC transfer instruction from one ATS unit to the next ATS unit;

(3) the CPDLC ATC instructions for a change in voice channel;

(4) the normal termination of CPDLC with an ATS unit.

(c) **ATC Clearances and Information (ACL) Service**

The ACL service provides flight crews with the ability to:

(1) send requests and reports to air traffic controllers;

(2) receive clearances, instructions and notifications issued by air traffic controllers to flight crews.

(d) **ATC Microphone Check (AMC) Service**

The AMC service provides CPDLC ATC instructions to flight crew(s) requesting him/them to verify the status of his/their voice communication equipment

Rationale

To remove the reference to the Community Specification EN 303214, as the ground detailed specifications should be addressed by RMT.0161 on conformity assessment.

CS ACNS.B.DLS.~~B1.~~025 Protection mechanism

(See AMC1 ACNS.B.DLS.~~B1.~~025 and AMC2 ACNS.B.DLS.~~B1.~~025 ~~AMC3 ACNS.B.DLS.B1.025, GM1 ACNS.B.DLS.B1.025, GM2 ACNS.B.DLS.B1.025 and GM3 ACNS.B.DLS.B1.025~~)

A means is provided to protect the integrity of the message.

AMC1 ACNS.B.DLS.~~B1.~~025 Protection mechanism

The data link system should comply with the following ~~ATN Baseline 1~~ applicable standards:

— ICAO Document ~~9705~~ 9880 (Edition 2) Part I 'Air-Ground Applications', Part III 'Upper Layer Communications Service (ULCS) and Internet Communications Service (ICS)' ~~for ICS (Sub-Volume V), ULCS (Sub-Volume IV), CM CPDLC (Sub-Volume II) ASE requirements~~;

— EUROCAE Document ED-110B (references to ICAO Doc 9705 to be replaced by the equivalent ones in the ICAO Doc 9880, where applicable for the protection mechanism);

— EUROCAE Document ED-229A;

— ICAO Document 9776 and ARINC 631-6 for VDL Mode 2 multi-frequency operations.

The data link aircraft equipment should provide support for the CPDLC and ADS-C applications message integrity check mechanism, with support for 'default checksum algorithm' only.

Rationale

To update the applicable standards and replace the reference to the obsolete ICAO Doc 9705 by the reference to ICAO Doc 9880. The AMC has been updated to add ADS-C application.

AMC2 ACNS.B.DLS.~~B1.~~025 Protection mechanism

Testing demonstrations could be based in two main steps:

— Equipment testing (done by equipment manufacturer) using adequate simulation testing tools.

— System testing, at system test bench and/or at aircraft test level (either on ground or in flight).

Equipment qualification testing data may be reused from the avionics manufacturer, provided that full and unrestricted access to the compliance data is established and maintained. However, the applicant remains responsible for all test data used in the course of compliance demonstration.

AMC3 ACNS.B.DLS.~~B1.~~025 Protection mechanism

Where ARINC 631-6 identifies a specific deviation from ICAO Doc 9776 (Manual on VDL Mode 2), the provisions of the former should take precedence.

ARINC 631-6 also references ARINC 750 for definition of Signal Quality Parameter (SQP) levels. Measurements of SQP levels may be passed over the air-ground link as parameters in the XID exchanges.

~~GM1 ACNS.B.DLS.B1.025 Protection mechanism~~

~~EUROCAE Document ED-110B sections 3.3.5.1 and 3.3.6 mentions an 'ATN Message Checksum Algorithm' (or 'Application Message Integrity Check (AMIC)') that does not exist in ICAO Document 9705 Edition 2. These terms are correctly referenced in ICAO Doc 9705 PDR M60050001.~~

Rationale

To remove the guidance material, as the ICAO DOC 9705 is obsolete and no longer referenced in the AMC1 ACNS.B.DLS.025.

~~GM2 ACNS.B.DLS.B1.025 Protection mechanism~~

~~Both ICAO Document 9705 and EUROCAE Document ED-110B include requirements for the support of FIS and ADS-C applications. These two applications are not mandated for operations in European airspace. Data link aircraft implementations are free to support these applications and should notify their application availability in the DLIC logon function.~~

Rationale

To remove the guidance material, as it does not refer to the protection mechanism.

~~GM3 ACNS.B.DLS.B1.025 Protection mechanism~~

~~Further guidance material from EUROCONTROL is available on EUROCONTROL website (www.eurocontrol.int):~~

- ~~LINK2000+/ATC DATA LINK OPERATIONAL GUIDANCE, Version 6.0, Date: 17 December 2012.~~
- ~~LINK 2000+ Guidance to Airborne Implementers, Version 1.1, Date: 09 December 2009.~~
- ~~LINK2000+/FLIGHT CREW DATA LINK OPERATIONAL GUIDANCE Version 5.0, Date: 17 December 2012.~~
- ~~LINK2000+ Programme, Generic Interop Test Plan for Avionics - Part 1, Upper Layers and CM/CPDLC applications, Version 2.3, Date: 15th June 2010.~~

Rationale

To remove the guidance material, as documents listed in it are outdated.

SYSTEM PERFORMANCE REQUIREMENTS

CS ACNS.B.DLS.~~B1.~~030 Integrity

The data link system integrity is designed commensurate with a 'major' failure condition.

CS ACNS.B.DLS.~~B1.~~035 DLS system continuity

(See AMC1 ACNS.B.DLS.~~B1.~~035 and GM1 ACNS.B.DLS.~~B1.~~035)

The data link system is designed to provide a level of continuity that supports the intended operation.

AMC1 ACNS.DLS.~~B1.~~035 DLS system continuity

The loss of the data link system function is considered to be a minor failure condition.

GM1 ACNS.DLS.~~B1.~~035 DLS system continuity

The definition of continuity in CS-ACNS is different from the definition of continuity in EUROCAE Documents ED-120 and ED-228A. Throughout CS-ACNS, continuity (system continuity) refers to 'the probability that a system will perform its required function without unscheduled interruption'.

In the context of ED-120~~,this would be commensurate with the term 'availability'.~~and ED-228A, 'continuity' refers to the probability that the transaction is completed before the transaction expiration time, assuming that the communication system is available when the transaction is initiated.

Rationale

To clarify the meaning of 'continuity' in the context of CS-ACNS.

TIME

CS ACNS.B.DLS.~~B1.~~040 Universal Time Coordinated (UTC)

(See AMC1 ACNS.B.DLS.~~B1.~~040)

For time synchronisation a valid UTC time source is used.

Wherever time is utilized in the application of data link communications, it is accurate to within 1 second of UTC.

Rationale

To detail the time accuracy specification.

AMC1 ACNS.B.DLS.~~B1.~~040 Universal Time Coordinated (UTC)

A Global Navigation Satellite System (GNSS) sensor provides an acceptable source of synchronised UTC time.

~~Time synchronisation is required by ICAO Annex II, chapter 3, section 3.5 as referred by EUROCAE Document ED-110B, section 3.3.2. It is also identified as a safety requirement in EUROCAE Document ED-120 (e.g. SR-ACL-15).~~

Rationale

To remove the reference to ED-110B and ED-120, as the time synchronization specification was provided in the CS ACNS.B.DLS.040.

DATA LINK INITIATION CAPABILITY (DLIC) SERVICE MESSAGES

CS ACNS.B.DLS.~~B1.~~050 DLIC Uplink Messages

(see AMC1 ACNS.B.DLS.~~B1.~~050)

The data link system is capable of receiving and processing the following messages for the DLIC logon and contact functions:

Function	Message
Logon	CMLogonResponse
Contact	CMContactRequest

AMC1 ACNS.B.DLS.~~B1.~~050 DLIC Uplink Messages

Data link aircraft equipment should comply with ~~ICAO Doc 9705 (Edition 2), section 2.1.4 and~~ EUROCAE Documents ED-110B, section 2.2.1 or ED-229A, section 2.4.1.

Rationale

To update the applicable standards and remove the reference to the obsolete ICAO Doc 9705.

CS ACNS.B.DLS.~~B1.~~055 DLIC Downlink Messages

(see AMC1 ACNS.B.DLS.~~B1.~~055)

The data link system is capable of sending the following messages for the DLIC logon and contact functions:

Function	Message
Logon	CMLogonRequest
Contact	CMContactResponse

AMC1 ACNS.B.DLS.~~B1.~~055 DLIC Downlink Messages

Data link aircraft equipment should comply with ~~ICAO Doc 9705 (Edition 2), section 2.1.4 and~~ EUROCAE Document ED-110B, section 2.2.1 or ED-229A, section 2.4.1.

Rationale

To update the applicable standards and remove the reference to the obsolete ICAO Doc 9705.

CS ACNS.B.DLS.~~B1.~~060 DLIC initiation when in 'CPDLC inhibited' state (uplink)

When the data link system is in the 'CPDLC inhibited' state, a DLIC Contact Request is processed but the system remains in the 'CPDLC inhibited' state.

CPDLC MESSAGES

CS ACNS.B.DLS.~~B1.~~070 CPDLC uplink messages

(See AMC1 ACNS.B.DLS.~~B1.~~070, GM1 ACNS.B.DLS.~~B1.~~070 and GM2 ACNS.B.DLS.~~B1.~~070)

The data link system is capable of receiving, processing and displaying the following message elements:

ID	Message
UM0	UNABLE
UM1	STANDBY
UM3	ROGER
UM4	AFFIRM
UM5	NEGATIVE
UM19	MAINTAIN [level]
UM20	CLIMB TO [level]
UM23	DESCEND TO [level]
UM26	CLIMB TO REACH [level] BY [time]
UM27	CLIMB TO REACH [level] BY [position]
UM28	DESCEND TO REACH [level] BY [time]
UM29	DESCEND TO REACH [level] BY [position]
UM46	CROSS [position] AT [level]
UM47	CROSS [position] AT OR ABOVE [level]
UM48	CROSS [position] AT OR BELOW [level]
UM51	CROSS [position] AT [time]
UM52	CROSS [position] AT OR BEFORE [time]
UM53	CROSS [position] AT OR AFTER [time]
UM54	CROSS [position] BETWEEN [time] AND [time]
UM55	CROSS [position] AT [speed]
UM61	CROSS [position] AT AND MAINTAIN
UM64	OFFSET [specifiedDistance] [direction] OF ROUTE
UM72	RESUME OWN NAVIGATION
UM74	PROCEED DIRECT TO [position]
UM79	CLEARED TO [position] VIA [routeClearance]
UM80	CLEARED [routeClearance]
UM82	CLEARED TO DEVIATE UP TO [specifiedDistance] [direction] OF ROUTE
UM92	HOLD AT [position] AS PUBLISHED MAINTAIN [level]
UM94	TURN [direction] HEADING [degrees]
UM96	CONTINUE PRESENT HEADING
UM106	MAINTAIN [speed]
UM107	MAINTAIN PRESENT SPEED

UM108	MAINTAIN [speed] OR GREATER
UM109	MAINTAIN [speed] OR LESS
UM116	RESUME NORMAL SPEED
UM117	CONTACT [unitname] [frequency]
UM120	MONITOR [unitname] [frequency]
UM123	SQUAWK [code]
UM133	REPORT PRESENT LEVEL
UM148	WHEN CAN YOU ACCEPT [level]
UM157	CHECK STUCK MICROPHONE [frequency]
UM159	ERROR [errorInformation]
UM162	SERVICE UNAVAILABLE
UM165	THEN
UM171	CLIMB AT [verticalRate] MINIMUM
UM172	CLIMB AT [verticalRate] MAXIMUM
UM173	DESCEND AT [verticalRate] MINIMUM
UM174	DESCEND AT [verticalRate] MAXIMUM
UM179	SQUAWK IDENT
UM183	[freetext]
UM190	FLY HEADING [degrees]
UM196	[freetext]
UM203	[freetext]
UM205	[freetext]
UM211	REQUEST FORWARDED
UM213	[facilitydesignation] ALTIMETER [altimeter]
UM215	TURN [direction] [degrees]
UM222	NO SPEED RESTRICTION
UM231	STATE PREFERRED LEVEL
UM232	STATE TOP OF DESCENT
UM237	REQUEST AGAIN WITH NEXT UNIT

The data link system is capable of receiving and processing the following message elements:

UM160	NEXT DATA AUTHORITY [facility]
UM227	LOGICAL ACKNOWLEDGEMENT

AMC1 ACNS.B.DLS.~~B1~~.070 CPDLC uplink messages

The data link system should comply with EUROCAE Document ED-110B, Section 2.2.3, and with the CPDLC message syntax in ICAO Doc ~~9705~~ 9880 (Edition 2), Part I, Section ~~2.1.4~~3.4.

The data link system should prepare the appropriate response downlink message to a received uplink message in compliance with EUROCAE Document ED-110B, Section 2.2.3.3, Table 2-4. Received uplink messages with the response type 'A/N' indicated in the 'Response' column should be responded to with either DM2 (STANDBY), DM4 (AFFIRM) or DM5 (NEGATIVE). Received uplink messages with the response type 'R' indicated in the 'Response' column should be responded to with either DM2 (STANDBY), DM3 (ROGER) or DM1 (UNABLE).

The aircraft data link system should also handle unsupported messages (i.e. uplink messages not referenced in CS ACNS.B.DLS.~~B1.~~050) as specified in EUROCAE Document ED-110B, Section 3.3.7.6.

Rationale

To update the applicable standards and remove the reference to the obsolete ICAO Doc 9705.

GM1 ACNS.B.DLS.~~B1.~~070 Uplink Messages

The following table associates uplink CPDLC messages to the data link services.

ID	Message	ACM	ACL	AMC
UM0	UNABLE		x	
UM1	STANDBY		x	
UM3	ROGER		x	
UM4	AFFIRM		x	
UM5	NEGATIVE		x	
UM19	MAINTAIN [level]		x	
UM20	CLIMB TO [level]		x	
UM23	DESCEND TO [level]		x	
UM26	CLIMB TO REACH [level] BY [time]		x	
UM27	CLIMB TO REACH [level] BY [position]		x	
UM28	DESCEND TO REACH [level] BY [time]		x	
UM29	DESCEND TO REACH [level] BY [position]		x	
UM46	CROSS [position] AT [level]		x	
UM47	CROSS [position] AT OR ABOVE [level]		x	
UM48	CROSS [position] AT OR BELOW [level]		x	
UM51	CROSS [position] AT [time]		x	
UM52	CROSS [position] AT OR BEFORE [time]		x	
UM53	CROSS [position] AT OR AFTER [time]		x	
UM54	CROSS [position] BETWEEN [time] AND [time]		x	
UM55	CROSS [position] AT [speed]		x	
UM61	CROSS [position] AT AND MAINTAIN		x	
UM64	OFFSET [specifiedDistance] [direction] OF ROUTE		x	
UM72	RESUME OWN NAVIGATION		x	
UM74	PROCEED DIRECT TO [position]		x	
UM79	CLEARED TO [position] VIA [routeClearance]		x	
UM80	CLEARED [routeClearance]		x	
UM82	CLEARED TO DEVIATE UP TO [specifiedDistance] [direction] OF ROUTE		x	
UM92	HOLD AT [position] AS PUBLISHED MAINTAIN [level]		x	
UM94	TURN [direction] HEADING [degrees]		x	
UM96	CONTINUE PRESENT HEADING		x	
UM106	MAINTAIN [speed]		x	
UM107	MAINTAIN PRESENT SPEED		x	
UM108	MAINTAIN [speed] OR GREATER		x	
UM109	MAINTAIN [speed] OR LESS		x	
UM116	RESUME NORMAL SPEED		x	
UM117	CONTACT [unitname] [frequency]	x		
UM120	MONITOR [unitname] [frequency]	x		
UM123	SQUAWK [code]		x	
UM133	REPORT PRESENT LEVEL		x	
UM148	WHEN CAN YOU ACCEPT [level]		x	
UM157	CHECK STUCK MICROPHONE [frequency]			x

UM159	ERROR [errorInformation]	x	x	
UM160	NEXT DATA AUTHORITY [facility]	x		
UM162	SERVICE UNAVAILABLE		x	
UM165	THEN		x	
UM171	CLIMB AT [verticalRate] MINIMUM		x	
UM172	CLIMB AT [verticalRate] MAXIMUM		x	
UM173	DESCEND AT [verticalRate] MINIMUM		x	
UM174	DESCEND AT [verticalRate] MAXIMUM		x	
UM179	SQUAWK IDENT		x	
UM183	[freetext]	x	x	x
UM190	FLY HEADING [degrees]		x	
UM196	[freetext]		x	
UM203	[freetext]		x	
UM205	[freetext]		x	
UM211	REQUEST FORWARDED		x	
UM213	[facilitydesignation] ALTIMETER [altimeter]		x	
UM215	TURN [direction] [degrees]		x	
UM222	NO SPEED RESTRICTION		x	
UM227	LOGICAL ACKNOWLEDGEMENT	x	x	
UM231	STATE PREFERRED LEVEL		x	
UM232	STATE TOP OF DESCENT		x	
UM237	REQUEST AGAIN WITH NEXT UNIT	x	x	

GM2 ACNS.B.DLS.~~B1.~~070 Uplink Messages

The above ACL messages correspond to the common subset of ACL messages defined in EUROCAE Document ED-120 section 5.2.1.1.5 ~~as required by Regulation (EC) No 29/2009~~.

Rationale

To change the title and suppress the reference to Regulation (EC) 29/2009.

CS ACNS.B.DLS.~~B1.~~075 CPDLC downlink messages

(See AMC1 ACNS.B.DLS.~~B1.~~075, GM1 ACNS.B.DLS.~~B1.~~075, GM2 ACNS.B.DLS.~~B1.~~075 and GM3 ACNS.B.DLS.~~B1.~~075)

The data link system is capable of preparing and sending the following downlink message elements:

ID	Message
DM0	WILCO
DM1	UNABLE
DM2	STANDBY
DM3	ROGER
DM4	AFFIRM
DM5	NEGATIVE
DM6	REQUEST [level]
DM18	REQUEST [speed]
DM22	REQUEST DIRECT TO [position]
DM32	PRESENT LEVEL [level]

DM62	ERROR [errorInformation]
DM63	NOT CURRENT DATA AUTHORITY
DM65	DUE TO WEATHER
DM66	DUE TO AIRCRAFT PERFORMANCE
DM81	WE CAN ACCEPT [level] AT [time]
DM82	WE CANNOT ACCEPT [level]
DM98	[freetext]
DM99	CURRENT DATA AUTHORITY
DM100	LOGICAL ACKNOWLEDGEMENT
DM106	PREFERRED LEVEL [level]
DM107	NOT AUTHORIZED NEXT DATA AUTHORITY
DM109	TOP OF DESCENT [time]

AMC1 ACNS.B.DLS.~~B1.~~075 Downlink messages

The data link system should comply with EUROCAE Document ED-110B, Section 2.2.3, and with the CPDLC message syntax in ICAO Doc ~~9705~~ 9880 (Edition 2) Part I, Section ~~2.1.4~~ 3.4.

The data link aircraft equipment should prepare the appropriate response downlink message to a received uplink message in compliance with EUROCAE Document ED-110B, Section 2.2.3.3, Table 2-4.

Rationale

To update the applicable standards and remove the reference to the obsolete ICAO Doc 9705 and replace it with a reference to ICAO Doc 9880.

GM1 ACNS.B.DLS.~~B1.~~075 Downlink messages

The following table associates downlink messages with data link services.

ID	Message	ACM	ACL	AMC
DM0	WILCO	x	x	
DM1	UNABLE	x	x	
DM2	STANDBY	x	x	
DM3	ROGER		x	
DM4	AFFIRM		x	
DM5	NEGATIVE		x	
DM6	REQUEST [level]		x	
DM18	REQUEST [speed]		x	
DM22	REQUEST DIRECT TO [position]		x	
DM32	PRESENT LEVEL [level]		x	
DM62	ERROR [errorInformation]	x	x	
DM63	NOT CURRENT DATA AUTHORITY	x		
DM65	DUE TO WEATHER		x	
DM66	DUE TO AIRCRAFT PERFORMANCE		x	
DM81	WE CAN ACCEPT [level] AT [time]		x	
DM82	WE CANNOT ACCEPT [level]		x	
DM98	[freetext]	x	x	
DM99	CURRENT DATA AUTHORITY	x		
DM100	LOGICAL ACKNOWLEDGEMENT	x	x	

DM106	PREFERRED LEVEL [level]		x	
DM107	NOT AUTHORIZED NEXT DATA AUTHORITY	x	x	
DM109	TOP OF DESCENT [time]		x	

GM2 ACNS.B.DLS.~~B1.~~075 Downlink Messages

The above ACL messages correspond to the common subset of ACL messages defined in EUROCAE Document ED-120 section 5.2.1.1.5 ~~as required by Regulation (EC) No 29/2009~~.

Rationale

To update the title and suppress the reference to Regulation (EC) 29/2009.

GM3 ACNS.B.DLS.~~B1.~~075 Optional ACL Downlink Messages

The data link system may also allow the sending the following ACL messages defined in EUROCAE Document ED-120 section 5.2.1.1.5. The message syntax should also comply with ICAO Doc ~~9705~~ 9880 (Edition 2), section ~~2.3.4~~ 3.4.

ID	Message
DM9	REQUEST CLIMB TO [level]
DM10	REQUEST DESCENT TO [level]
DM27	REQUEST WEATHER DEVIATION UP TO [specifiedDistance] [direction] OF ROUTE

Note: To prevent costly retrofitting, implementation of the above optional messages is highly recommended.

Rationale

To update the title, applicable standards, and remove the link to the obsolete ICAO Doc 9705.

ADS-C EPP MESSAGES

CS ACNS.B.DLS.077 ADS-C EPP Messages

The data link system is capable of:

- receiving and processing ADS-C EPP requests; and
- preparing and sending ADS-C EPP reports according to the ADS-C requests.

Rationale

To introduce data link system specifications to allow for the exchange of ADS-C EPP messages.

AMC1 ACNS.B.DLS.077 ADS-C EPP messages

The data link system should comply with EUROCAE Document ED-228A, Sections 6.1 and 6.2 and EUROCAE ED-229A, Sections 3.2 and 5.3 to support the exchange of EPP.

Rationale

To provide means of compliance to support the exchange of ADS-C EPP messages.

DATA LINK SERVICES AND ADS-C EPP DOWNLINK REQUIREMENTS

CS ACNS.B.DLS.~~B1.~~080 Data link initiation capability (DLIC) service

(See AMC1 ACNS.B.DLS.~~B1.~~080 and GM1 ACNS.B.DLS.~~B1.~~080)

The data link system for DLIC conforms with Sections 4.1, 4.2.2 and 4.3.2 of EUROCAE Document ED-120 'Safety and Performance Requirements Standard For Initial Air Traffic Data Link Services In Continental Airspace', ~~and~~ Sections 2.2.1 and 4.1 of EUROCAE Document ED-110B 'Interoperability Requirements Standard for Aeronautical Telecommunication Network Baseline 1'

Rationale

To change the title and introduce some clerical changes.

AMC1 ACNS.B.DLS.~~B1.~~080 Data Link Initiation Capability (DLIC) Service

(a) The data link aircraft equipment DLIC logon function should comply with the aircraft system PR-DLIC-Init-ET_{RCTP} and PR-DLIC-Init-TT performance values, respectively 6 seconds and 4 seconds, as specified in EUROCAE Document ED-120 Table A-3.

(b) The data link aircraft equipment DLIC contact function should comply with the aircraft system PR-DLIC-Cont-ET_{RCTP} and PR-DLIC-Cont-TT performance values, respectively 12 seconds and 8 seconds, as specified in EUROCAE Document ED-120 Table A-3.

(c) The data link system should:

(1) not permit data link services when there are incompatible DLIC version numbers;

(2) reinitiate the service with the applicable ATSUs when any of the application or flight information changes;

(3) insert the relevant initiation data in the initiation messages;

(4) not affect the intent of the DLIC message during processing (data entry/encoding/ transmitting/decoding/displaying).

GM1 ACNS.B.DLS.~~B1.~~080 Data Link Initiation Capability (DLIC) Service

The Performance Tables in the main body of EUROCAE Document ED-120 for DLIC (Table 4-8 and Table 4-9), ACM (Table 5-21) and ACL (Table 5-31 and Table 5-32) provide the allocated values for the required transaction performance.

A detailed allocation for Aircraft delays is provided in EUROCAE Document ED-120 Annex A Table A-3.

CS ACNS.B.DLS.~~B1.~~085 ATC communications management (ACM) service(See AMC1 ACNS.B.DLS.~~B1.~~085 and GM1 ACNS.B.DLS.~~B1.~~085)

The data link system for ACM conforms with Section 5.1.1, 5.1.2.3 (excluding requirements relating to downstream clearance) and 5.1.3.2 of EUROCAE Document ED-120 'Safety and Performance Requirements Standard For Initial Air Traffic Data Link Services In Continental Airspace'.

AMC1 ACNS.B.DLS.~~B1.~~085 ATC Communications Management (ACM) Service

The data link system for ACM service should comply with the aircraft system PR-ACM-ET_{RCTP} and PR-ACM-TT performance values, respectively 6 seconds and 4 seconds, as specified in EUROCAE Document ED-120 Annex A Table A-3.

GM1 ACNS.B.DLS.~~B1.~~085 ATC Communications Management (ACM) Service

The Performance Tables in the main body of EUROCAE Document ED-120 for DLIC (Table 4-8 and Table 4-9), ACM (Table 5-21) and ACL (Table 5-31 and Table 5-32) provide the allocated values for the required transaction performance.

A detailed allocation for Aircraft delays is provided in EUROCAE Document ED-120 Annex A/Table A-3.

CS ACNS.B.DLS.~~B1.~~090 ACL service safety requirements

(See AMC1 ACNS.B.DLS.~~B1.~~090 and GM1 ACNS.B.DLS.~~B1.~~090)

The data link system for ACL conforms with Section 5.2.1, 5.2.2.3 and 5.2.3.2 of EUROCAE Document ED-120 'Safety and Performance Requirements Standard For Initial Air Traffic Data Link Services In Continental Airspace'.

AMC1 ACNS.B.DLS.~~B1.~~090 ATC Clearances and Information (ACL) Service

The data link system for ACL service should comply with the aircraft system PR-ACL-ET_{RCTP} and PR-ACL-TT performance values, respectively 6 seconds and 4 seconds, as specified in EUROCAE Document ED-120 Annex A Table A-3.

GM1 ACNS.B.DLS.~~B1.~~090 ATC Clearances and Information (ACL) Service

The Performance Tables in the main body of EUROCAE Document ED-120 for DLIC (Table 4-8 and Table 4-9), ACM (Table 5-21) and ACL (Table 5-31 and Table 5-32) provide the allocated values for the required transaction performance.

A detailed allocation for Aircraft delays is provided in EUROCAE Document ED-120 Annex A Table A-3.

CS ACNS.B.DLS.~~B1.~~095 ATC microphone check (AMC) service

The data link system for AMC conforms with Section 5.3.1, 5.3.2.3 and 5.3.3.2 of EUROCAE Document 'ED-120 Safety and Performance Requirements Standard For Initial Air Traffic Data Link Services In Continental Airspace'.

CS ACNS.B.DLS.097 ADS-C EPP safety and performance requirements

The data link system for ADS-C EPP conforms with Sections 6.3.1 and 6.3.2 of EUROCAE Document 'ED-228A Safety and Performance Requirements Standard for Baseline 2 ATS Data Communications'.

Rationale

To introduce specifications for safety and performance to support ADS-C EPP.

AMC1 ACNS.B.DLS.097 ADS-C EPP safety and performance requirements

The required surveillance performance (RSP) 160 should apply, in accordance with the intended use of ADS-C EPP within the SES.

Rationale

To provide means of compliance to support compliance with the ADS-C EPP safety and performance specifications.

CS ACNS.B.DLS.~~B1.~~100 Network Layer Requirements

(See AMC1 ACNS.B.DLS.~~B1.~~100 and GM1 ACNS.B.DLS.~~B1.~~100)

The ATN Router conforms to Class 6 with the capability to support Inter-domain routing protocol (IDRP).

AMC1 ACNS.B.DLS.~~B1.~~100 Network Layer Requirements

The ATN Router should comply with ICAO Document ~~9705~~ 9880 (Edition 2) Part III, sections 3.2.4.1, ~~5.2.4.1,~~ 3.2.4.3~~, 5.2.4.3~~ with an IDRP Hold Time value of 900 seconds.

Rationale

To change the title and replace the reference to the obsolete ICAO Doc 9705 with a reference to ICAO Doc 9880.

GM1 ACNS.B.DLS.~~B1.~~100 Network Layer Requirements

Compression Schemes

Airborne ATN Router may implement several distinct, yet complementary, compression schemes.

Airborne ATN Routers should support the CLNP Header Compression (also known as 'LREF Compression'). Other compression schemes in ICS are optional.

In addition to the CLNP Header Compression, data link ATN Routers that claims support for optional DEFLATE compression should also support ICAO PDU M0070002 ('Interoperability impact when deflate compression is used. Non-compliance with Zlib').

CS ACNS.B.DLS.~~B1.~~105 Transport Layer Protocol Requirements

(See AMC1 ACNS.B.DLS.~~B1.~~105 and GM1 ACNS.B.DLS.~~B1.~~105)

The ATN Connection Oriented Transport Protocol (COTP), conforms to Transport Protocol Class 4.

Rationale

To change the title and references.

AMC1 ACNS.B.DLS.~~B1.~~105 Transport Layer Requirements

The ATN End System of the data link aircraft equipment should comply with the Transport Protocol Class 4 specified in ICAO Document ~~9705~~ 9880 (Edition 2), Part III ~~Sub volume V~~, section 3.5.2 ~~5.5.2~~.

The data link aircraft equipment should implement Transport Protocol Class 4 parameter settings in accordance with the following table:

Scope	Parameter	Definition	Value
Inactivity	Inactivity time (I)	A bound for the time after which a transport entity will, if it does not receive a Transport Protocol Data Unit (TPDU), initiate the release procedure to terminate the transport connection.	360 sec
Re-transmission	Retransmission time (T1)	A bound for the maximum time the transport entity will wait for acknowledgement before re-transmitting a TPDU. The retransmission time is adaptive.	Initial value 30 sec
	Maximum Retransmission (N)	Maximum number of TPDU retransmissions.	7
Window	Window time (W)	A bound for the maximum time a transport entity will wait before retransmitting up-to-date window information.	120 sec
Flow Control	Local Acknowledgement delay (AI)	A bound for the maximum time which can elapse between the receipt of a TPDU by the local transport entity from the network layer and the transmission of the corresponding acknowledgement.	1 sec

Rationale

To change the title, and to replace the reference to the obsolete ICAO Doc 9705 with a reference to ICAO Doc 9880.

GM1 ACNS.B.DLS.~~B1.~~105 Transport Layer Requirements

Transport Protocol Classes

ICAO Doc ~~9705~~ 9880 (Edition 2), ~~Sub volume V~~ Part III, section ~~5.5~~ 3.5 identifies both Connection Oriented and Connection-Less Transport Protocols (as specified in, respectively, ISO/IEC 8073 for COTP and ISO/IEC 8602 for CLTP). The only mandated support is for COTP (i.e. CLTP support is not required).

In addition, ISO/IEC 8073 identifies 5 distinct possible implementations for COTP support, ranging from Class 0 (the less constraining to implement, but also the less reliable) to Class 4 (most reliable). The fifth Class, i.e. COTP Class 4 (also known as 'TP4'), is the only mandated implementation (all other implementations classes are useless for the ATN COTP support).

Transport Protocol Classes

In ~~the ATN Baseline 1 SARPS (i.e.~~ ICAO Doc ~~9705~~ 9880, Edition 2, Part III~~)~~, the Transport Class 4 - as known as TP4 - is as specified in ISO 8073, that mandates support for a 16-bits checksum. Such checksum is considered to be insufficient to detect, and thus compensate, all potential miss deliveries of CLNP Packets by the underlying network routers. The analysis that concluded of TP4 inability to detect and compensate all CLNP miss deliveries is available in ICAO PDR M00040002. The use of a 32-bits long checksum is identified as a solution to address this potential issue.

Rationale

To change the title and to replace the references to the obsolete ICAO Doc 9705 with references to ICAO Doc 9880.

CS ACNS.B.DLS.~~B1.~~110 Session Layer (See AMC1 ACNS.B.DLS.~~B1.~~110)

ATN Session protocol is capable of supporting the following session protocol data units (SPDUs):

Abbreviation	Full SPDU Name
SCN	Short Connect
DRPSAC	Short Accept
SACC	Short Accept Continue
SRF	Short Refuse
SRFC	Short Refuse Continue

AMC1 ACNS.B.DLS.~~B1.~~110 Session Layer Requirement

(a) The ATN End System of the data link aircraft equipment should support a Session Protocol as specified in ICAO Doc ~~9705~~ 9880 (Edition 2), ~~Sub volume IV~~ Part III, section ~~4.4~~ 2.4 including the ISO/IEC 8327 Technical Corrigendum 1 (2002), listed in the following table.

Value (Hex)	Abbreviation	Full SPDU Name
E8	SCN	Short Connect
F0	SAC	Short Accept
D8	SACC	Short Accept Continue
E0-E3	SRF	Short Refuse E0: TC retained, transient refusal E1: TC retained, persistent refusal E2: TC released, transient refusal E3: TC released, persistent refusal
A0	SRFC	Short Refuse Continue

(b) The ATN End System Session Protocol of the data link system should make use of the value 'E3' to encode the Short Refuse (SRF) SPDU.

Rationale

To change the title and replace the reference to the obsolete ICAO Doc 9705 with a reference to ICAO Doc 9880.

CS ACNS.B.DLS.~~B1.~~115 Presentation layer requirements

(See AMC1 ACNS.B.DLS.~~B1.~~115)

The ATN Presentation protocol is capable of supporting the presentation protocol data units (PPDUs) listed in the following table:

Abbreviation	Full PPDU Name
SHORT-CP	Short Presentation Connect, unaligned PER
SHORT-CPA	Short Presentation Connect Accept, unaligned PER
SHORT-CPR	Short Presentation Connect Reject

AMC1 ACNS.B.DLS.~~B1.~~115 Presentation Layer Requirement

(a) The ATN End System of the data link aircraft equipment should support a Presentation Protocol as specified in ICAO Doc ~~9705~~ 9880 (Edition 2), ~~Sub Volume IV~~ Part III, section ~~4.5~~ 2.5, and listed in the following table:

Value (Hex)	Abbreviation	Full PPDU Name
02	SHORT-CP	Short Presentation Connect, unaligned PER
02	SHORT-CPA	Short Presentation Connect Accept, unaligned PER
x2	SHORT-CPR	Short Presentation Connect Reject Where x = reason code: 02: presentation-user 12: reason not specified (transient) 22: temporary congestion (transient) 32: local limit exceeded (transient) 42: called presentation address unknown (permanent) 52: protocol version not supported (permanent) 62: default context not supported (permanent) 72: user data not readable (permanent)

(b) The ATN End System Presentation Protocol of the data link aircraft equipment should make use of the value '02' to encode the SHORT-CPR PPDU.

Rationale

To change the title and replace the reference to the obsolete ICAO Doc 9705 with a reference to ICAO Doc 9880.

CS ACNS.B.DLS.~~B1.~~120 Application Layer Requirements

(See AMC1 ACNS.B.DLS.~~B1.~~120 and GM1 ACNS.B.DLS.~~B1.~~120)

The Application Layer is application-independent (also known as 'Layer 7a'), and composed of a Convergence Function supporting operations of an Application Control Service Element (ACSE).

Rationale

To change the title and references.

AMC1 ACNS.B.DLS.~~B1.~~120 Application Layer Requirements

(a) The ATN End System of the data link system should support an ATN Convergence Function compliant with ICAO Doc ~~9705~~ 9880 (Edition 2), ~~Sub Volume IV~~ Part III, section ~~4.3~~ 2.3.

(b) The ATN End System of the data link system should support an ATN Association Control Service Element (ACSE) compliant with ICAO Doc ~~9705~~ 9880 (Edition 2), ~~Sub Volume IV~~ Part III, section ~~4.6~~ 2.6.

Rationale

To change the title and replace the references to the obsolete ICAO Doc 9705 with references to ICAO Doc 9880.

GM1 ACNS.B.DLS.~~B1.~~120 Application Layer Requirements

From an OSI perspective, the ATN Application layer is composed of three distinct parts:

— Layer 7a, that includes all application-independent services (Convergence Function + ACSE).

— Layer 7b, that includes all application-dependent service elements (such as the CPDLC-ASE).

— Layer 7c, that includes applications (such as the CPDLC application, that uses CPDLC-ASE for its communications with ground-based systems).

CS ACNS.B.DLS.~~B1.~~125 Database

The Network Service Access Point (NSAP) address database is capable of being updated.

APPENDICES

Appendix A – Background information on voice communication systems

[…]

~~Appendix B – Background information on data link systems~~

~~(iv) General~~

~~This appendix provides additional references, background information, and guidance for maintenance testing, as appropriate to Data Link System installations.~~

~~(b) Related references~~

~~(1) ICAO~~

~~i. ICAO Doc 4444 Air Traffic Management 15th Ed 2007~~

~~ii. ICAO Doc 9705 MANUAL OF TECHNICAL PROVISIONS FOR THE AERONAUTICAL TELECOMMUNICATION NETWORK (ATN) 2nd Ed 1999~~

iii. ICAO Doc 9776 Manual on VHF Digital Link (VDL) Mode 2 1st Ed 2001.

(2) ARINC

Specification 631-6 Guidelines for Design Approval of Aircraft Data Link Communication Systems Supporting Air Traffic Services (ATS) dated 11/2010

(3) FAA

AC 20-140B Guidelines for Design Approval of Aircraft Data Link Communication Systems Supporting Air Traffic Services (ATS) dated 27/09/2012

(4) EUROCONTROL

i. LINK2000+/ATC DATA LINK OPERATIONAL GUIDANCE, Version 6.0, Date: 17 December 2012.

ii. LINK 2000+ Guidance to Airborne Implementers, Version 1.1, Date: 09 December 2009.

iii. LINK2000+/FLIGHT CREW DATA LINK OPERATIONAL GUIDANCE Version 5.0, Date: 17 December 2012.

iv. LINK2000+ Programme, Generic Interop Test Plan for Avionics – Part 1, Upper Layers and CM/CPDLC applications, Version 2.3, Date: 15th June 2010.

(5) ISO/IEC

i. Document 8073 Information technology – Open Systems Interconnection – Protocol for providing the connection-mode transport service Edition 4,0 including amendment 1 dated 09/1998

ii. Document 8602 Information technology – Protocol for providing the OSI connectionless-mode transport service Edition 2,0 including amendment 1 dated 12/1996

iii. ISO/IEC 8327-1:1996 Information technology — Open Systems Interconnection — Connection-oriented Session protocol: Protocol specification TECHNICAL CORRIGENDUM 1 Published 15/05/2002

(6) EUROCAE

i. ED-110B, December 2007, 'Interoperability Requirements Standard for Aeronautical Telecommunication Network Baseline 1' (Interop ATN B1),

ii. ED-120, May 2004, 'Safety and Performance Requirements Standard For Initial Air Traffic Data Link Services In Continental Airspace (SPR IC)'. Including change 1, change 2, and change 3.

iii. ED-122 February 2011 Safety and Performance Standard for Air Traffic Data Link Services in Oceanic and Remote Airspace (Oceanic SPR Standard)

iv. ED-154A March 2012 Future Air Navigation System 1/A (FANS 1/A) – Aeronautical Telecommunications Network (ATN) Interoperability Standard

Rationale

To suppress the Appendix due to the removal of the guidance material reference from GM1 ACNS.B.DLS.B.001 Applicability.

5. Monitoring and evaluation

EASA intends to monitor whether the objectives described in section 2.6. have been achieved through the implementation of the minimal changes to support AF6 CP1 in accordance with the proposed regulatory text, or through voluntary full ATS B2 capability implementation.

6. Proposed actions to support implementation

EASA intends to provide a focused communications for Advisory Bodies (AB) meetings (Technical Bodies (TeBs) and Technical Committees (TECs)), after the amending decision is published.

7. References

— ED-110B, December 2007, 'Interoperability Requirements Standard for Aeronautical Telecommunication Network Baseline 1' (Interop ATN B1)

— ED-120, May 2004, 'Safety and Performance Requirements Standard for Initial Air Traffic Data Link Services in Continental Airspace (SPR IC)', including Change 1, Change 2, and Change 3

— ED-122, February 2011, Safety and Performance Standard for Air Traffic Data Link Services in Oceanic and Remote Airspace (Oceanic SPR Standard)

— ED-154A, March 2012, Future Air Navigation System 1/A (FANS 1/A) – Aeronautical Telecommunications Network (ATN) Interoperability Standard

— ED-228A, March 2016, Safety and Performance Requirements Standard for Baseline 2 ATS Data Communications (Baseline 2 SPR Standard)

— ED-229A, March 2016, Interoperability Requirements Standard for Baseline 2 ATS Data Communications (Baseline 2 Interop Standard)

— AC 20-140C, Sep 2016, Guidelines for Design Approval of Aircraft Data Link Communication Systems Supporting Air Traffic Services (ATS)

— ICAO Doc 9776, 1st Edition 2001, Manual on VHF Digital Link (VDL) Mode 2

— ICAO Doc 9880 second Edition – 2016, Manual on Detailed Technical Specifications for the Aeronautical Telecommunication Network (ATN) using ISO/OSI Standards and Protocols

— ARINC 631-6, January 2011, VHF Digital Link (VDL) Mode 2 Implementation Provisions

Appendix 1 — Impact assessment(s)

1. Introduction

This impact assessment refers to the approaches proposed in Section 2.3.

2. What are the possible options

Among the three options assessed, 2 options are identified as relevant for the achievement of the objective.

Option 0 is the baseline scenario. It is the 'do nothing' option which implies no change to the regulatory framework.

Option 1 foresees a minimum change to the regulatory framework (CS-ACNS) to enable the ADS-C EPP (as part of the minimum ATS B2) capability.

Option 2 foresees a comprehensive change to the regulatory framework (CS-ACNS) to enable full ATS B2 capability. Option 1 and 2 support operators' compliance with the AF6 CP1.

Table 1: Selected policy options

Option No	*Short title*	*Description*
0	No change	No policy change (rules remain unchanged and risks as outlined in Section 2.5 above, under the Issue analysis).
1	Minimum change	Minimum changes to CS-ACNS to enable the ADS-C EPP (part of minimum ATS B2) capability.
2	Comprehensive ATS B2 change	Comprehensive change of the CS-ACNS to enable full ATS B2 capability.

3. Methodology and data

a. Methodology applied

The impact of various options is difficult to be quantified due to the wide range of aircraft installations and avionics configurations with DLS capability.

Furthermore, some DOA holders and production organisations may be waiting for a decision on passing the AF6 CP1 maturity level gate, before proceeding and subsequently consider the extent of the change as a decision factor.

Considering the above, the assessment is performed using a qualitative approach.

b. Data collection

Stakeholders are invited to provide any other quantitative information they deem useful to bring to the attention of EASA, to support and improve the analysis and the choice between option 1 and option 2. As a result, the relevant parts of the impact assessment may be adjusted on a case-by-case basis.

4. What are the impacts

The scope of the change proposed by this regulatory intervention is an amendment to CS-ACNS, and it would impact primarily the airborne stakeholders.

CP1 regulation requires ADS-C EPP capability for aircraft with a CofA issued on or after 31 December 2027. Furthermore, AF6 CP1 maturity (industrialisation) level gate is targeted for the end of 2023. Passing such gate depends on the availability of standards (i.e., detailed specifications) including but not only limited to the CS-ACNS.

a. Safety impact

With Option 0, the safety risks would remain unchanged.

The implementation of either Option 1 or Option 2 is expected to have a safety benefit at the airspace level. Nonetheless, such benefit will incrementally grow as the fleet is getting renewed, for aircraft with a CofA issued on or after 31 December 2027. The safety benefit at the airspace level may result of the reduced number of ATC tactical interventions as well as the improved the de-conflicting situations, as envisaged by the CP1. If only the ADS-C EPP downlink capability would be used, both options proposed would result in similar benefits.

b. Environmental impact

With Option 0, detailed specifications for airspace users will not be made available, which will negatively impact the AF6 CP1 maturity level gate. If the AF6 CP1 functionality would be removed from CP1, the aircraft may not be able to benefit from a more efficient trajectory which may translate into an additional environmental impact.

This could be avoided with any of the other options (option 1 or option 2). Both options 1 and 2 would result into airborne configurations which are expected to have an equal positive environmental impact, based on the expected use of the airborne capability. Once the maturity level gate is passed, it is expected that the aircraft with a CofA issued on or after 31 December 2027 will be ADS-C EPP capable. However, in the absence of the required capability, the aircraft will be required to use the airspace below FL 285, which would have a negative environmental impact.

c. Social impact

No social impact is envisaged.

d. Economic impact

The economic impact of the proposed options is as follows:

For Option 0, the economic impact could be the following:

— The detailed specifications for airborne to support operators' compliance with AF6 CP1 will not be provided on time to support the industrialization target date of 31 December 2023.

  If the maturity level gate for AF6 CP1 is not passed, the AF6 may be removed from CP1. As such there would be a lost opportunity to operate the aircraft on less than optimum trajectories, with increase in fuel cost and potential delays due to less efficient air traffic management.

  Even if the maturity level gate would be passed, in the absence of a dedicated detailed specification for airspace users, there would be additional costs if a certification review item (CRI) or special condition (SC) were used. CRIs need to be avoided to save time and resources

for both the applicants and EASA. The provision of certification specifications would facilitate the certification process and the applicants would benefit from the relevant material being made available to everyone. With Option 0, EASA does not fulfil its obligations to ensure that its regulatory material, including the Acceptable Means of Compliance, reflects the state of the art and the best practices in the fields concerned.

— Option 0 would not support operators of affected aircraft to obtain the ADS-C EPP capability in compliance with 31 December 2027 deadline set by CP1.

— Option 0 would result in a misalignment with the vision in the FCAV paper.

For Option 1, there will be a 'compliance cost' associated with designing, installing, and implementing the changes for operators of aircraft with a CofA issued on or after 31 December 2027. As the design change is limited to ADS-C EPP capability, by implementing this option, the cost may also be limited for several avionics configurations and aircraft implementations.

For Option 2, there will be a 'compliance cost' associated with designing, installing, and implementing the changes for operators of aircraft with a CofA issued on or after 31 December 2027. Compared with Option 1, this option adds more capability than required by AF6 CP1. The additional capability (full ATS B2) may increase the compliance cost as more avionics units would need to be upgraded. Such additional capability is however not required by AF6 CP1, therefore the cost incurred would be disproportionate compared with the requirements of AF6 CP1.

Stakeholders are invited to provide elements to quantify the economic impact of the options 1 or 2, or alternatively, propose other options.

e. General Aviation (GA) and proportionality issues

As most of GA aircraft are flying below FL 285, neither the DLS IR nor the AF6 CP1 requirements would be applicable. Nonetheless, some aircraft considered GA, operated as GAT in accordance with IFR within the airspace above FL 285, are affected by this proposal. For those aeroplanes the assessment is as follows:

Option 0 will bring no change to the current conditions.

Option 1 is expected to support GA operators' compliance with the AF6 CP1 in an efficient way by requiring the minimum changes needed to support compliance.

Option 2 is expected to support GA operators' compliance with AF6 CP1, however, the economic impact to upgrade to a full ATS B2 capability is expected to be considerably more than if Option 1 is pursued. A full ATS B2 capability requires more complex and expensive changes and implementation effort, as more avionics units may require upgrades to support the additional capability.

5. Conclusion

a. Comparison of the options

Option 0 will be no change to the current situation; however, it will not support the AF6 CP1 objectives. It will not contribute to the deployment of ATM tools to equip airspace users and ATC to conduct future trajectory-based operations, thus preventing or delaying improvements in the environmental sustainability and ATM efficiency of the Single European Sky.

Option 1 ensures that the objective of AF6 CP1 is met. It should be noted that applicants may still proceed voluntarily with full ATS B2 capability. Option 1 is also aligned with the proposals of the FCAV document.

Option 2 ensures that the objectives of AF6 CP1 are met. The additional capability provided by having full ATS B2 is however not required by AF6 CP1, making the additional cost incurred disproportionate with the intended AF6 CP1 operation.
In conclusion, Option 1 is proposed as a way forward since it would achieve more efficiently the objectives of AF6 CP1.

Stakeholders are invited to provide their feedback on the proposed option.

Appendix 2 — Quality of the NPA

To continuously improve the quality of its documents, EASA welcomes your feedback on the quality of this document regarding the following aspects:

Please provide your feedback on the quality of this document as part of the other comments you have on this NPA. We invite you to also provide a brief justification, especially when you disagree or strongly disagree, so that we consider this for improvement. Your comments will be considered for internal quality assurance and management purposes only and will not be published, (e.g., as part of the CRD).

1. The regulatory proposal is of technically good/high quality

Please choose one of the options
Fully agree / Agree / Neutral / Disagree / Strongly disagree

2. The text is clear, readable, and understandable

Please choose one of the options
Fully agree / Agree / Neutral / Disagree / Strongly disagree

3. The regulatory proposal is well substantiated

Please choose one of the options
Fully agree / Agree / Neutral / Disagree / Strongly disagree

4. The regulatory proposal is fit for purpose (achieving the objectives set)

Please choose one of the options
Fully agree / Agree / Neutral / Disagree / Strongly disagree

5. The regulatory proposal is proportionate to the size of the issue

Please choose one of the options
Fully agree / Agree / Neutral / Disagree / Strongly disagree

6. The regulatory proposal applies the 'better regulation' principles[1]

Please choose one of the options
Fully agree / Agree / Neutral / Disagree / Strongly disagree

7. Any other comments on the quality of this document (please specify)

[1] For information and guidance, see:
- https://ec.europa.eu/info/law/law-making-process/planning-and-proposing-law/better-regulation-why-and-how_en
- https://ec.europa.eu/info/law/law-making-process/planning-and-proposing-law/better-regulation-why-and-how/better-regulation-guidelines-and-toolbox_en
- https://ec.europa.eu/info/law/law-making-process/planning-and-proposing-law/better-regulation-why-and-how/better-regulation-guidelines-and-toolbox/better-regulation-toolbox_en