



The European Organisation for Civil Aviation Equipment
L'Organisation Européenne pour l'Équipement de l'Aviation Civile

SAFETY AND PERFORMANCE REQUIREMENTS STANDARD FOR AIR TRAFFIC DATA LINK SERVICES IN CONTINENTAL AIRSPACE (CONTINENTAL SPR STANDARD)

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ED-120

May 2004

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CHAPTER 1

INTRODUCTION

This standard provides the operational, safety, and performance requirements (SPR) for the implementation of data link services that support air traffic services (ATS) in continental airspace. It is intended to support the implementation of communication, navigation, and surveillance / air traffic management (CNS/ATM) systems in worldwide application.

This document was developed in accordance with the criteria for SPR standards set forth in RTCA DO-264/EUROCAE ED-78A, "Guidelines for Approval of the Provision and Use of Air Traffic Services Supported by Data Communications." It provides the minimum operational, safety, and performance requirements and allocations based on the results of a coordinated requirements determination process, which includes an operational services and environment information capture, operational safety assessment (OSA), and an operational performance assessment (OPA). As part of the coordinated requirements determination process, these requirements were validated based on operational experience, simulations and analyses. A summary can be found in Appendix B. These requirements are necessary to provide adequate assurance that the elements of the CNS/ATM system, when operating together, will perform their intended function in an acceptably safe manner.

Figure 1-1 provides an overview of the CNS/ATM system and its elements. These elements comprise the aircraft system, the air traffic service provider (ATSP) provisions, and the operator's provisions to use the data link services. The ATSP and the operator's provisions may include third party or contracted communication services, but this standard does not provide any individual requirements for them; requirements may be derived from ATSP requirements.

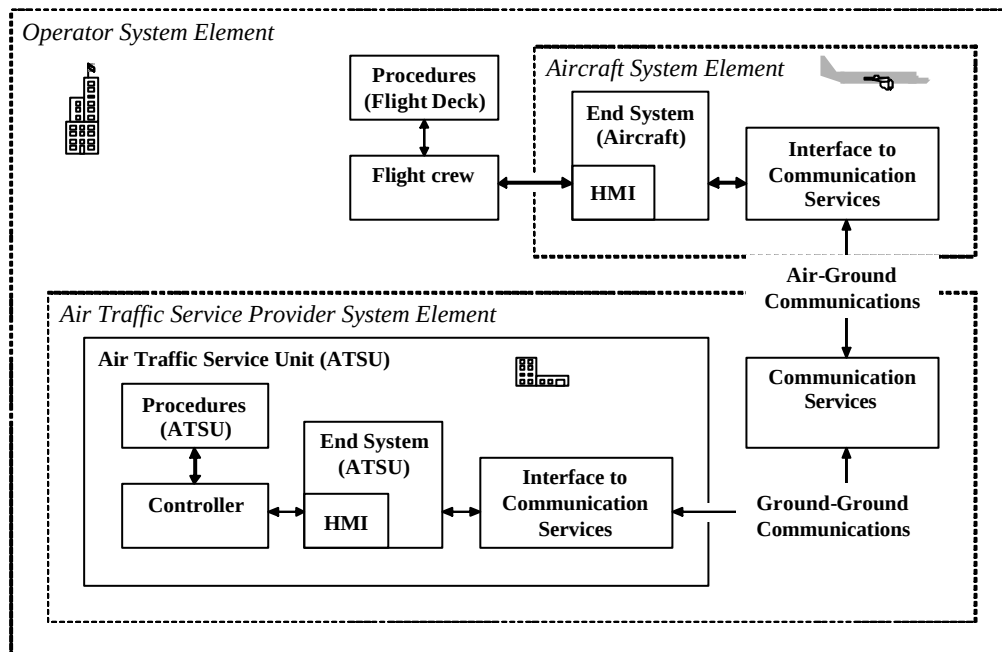


FIGURE 1-1 : OVERVIEW OF THE CNS/ATM SYSTEM

1.1 PURPOSE

This document defines and allocates the set of minimum requirements for the operational, safety, and performance aspects for implementations of data link services supporting ATS in continental airspace. Allocation is done by this SPR standard to the necessary elements of the CNS/ATM system. This SPR standard is intended for use with interoperability requirements (INTEROP) standards, and the guidelines described in RTCA DO-264/EUROCAE ED-78A.

NOTE: *Based on RTCA DO-264/EUROCAE ED-78A, INTEROP and SPR standards provide recommendations intended for government organizations, conference of governments, or agencies having statutory jurisdiction over the use and provision of data link services. These recommendations are for use by such government organizations to enunciate official policy related to such matters in aeronautical information publications (AIPs), notices to airmen (NOTAMS), airplane flight manuals (AFMs), and operator specifications.*

1.2 SCOPE

This document includes the definition of data link services, the environmental conditions relevant to the implementation of those data link services in continental airspace, and the operational, safety, and performance requirements for using the data link services. The data link services are:

- a) Data Link Initiation Capability (DLIC)
- b) Data link services for ATC communications:
 - ATC Communication Management (ACM)
 - ATC Clearance (ACL)
 - ATC Microphone Check (AMC)
 - Departure Clearance (DCL)
 - Downstream Clearance (DSC)
- c) Flight Information Service (FIS):
 - Data Link Automatic Terminal Information Service (D-ATIS)
- d) Data link services for surveillance
 - Flight Plan Consistency (FLIPCY)

NOTE 1: *The scope is limited to the requirements for operational data link services and related ATS functions when operations, safety, and performance are relevant to the air traffic services. Assumptions for the environment and other ATS functions may be stated when necessary to establish the operational, safety and performance requirements for the data link services that are within the scope of the document.*

NOTE 2: *This SPR standard is intended to provide the basis for demonstrating that an implemented system, considering its inherent design and technologies, can meet the relevant operational, safety, and performance requirements for the data link services described in this document. It is not intended to limit the use of an implementation only to the data link services and operational context defined herein. However, in cases where it is intended to support additional or define new data link services, the operational, safety and performance requirements for such operational contexts and/or new data link services will need to be established as a basis for approval qualification of the implemented systems.*

NOTE 3: *Requirements related to securing data link services that would provide for protection against malicious or intentional behavior causing harm are beyond the scope of this document.*

NOTE 4: *Requirements related to the recording of data communications for accident/incident investigation purposes are beyond the scope of this document.*

1.3 RELATIONSHIPS TO OTHER DOCUMENTS

1.3.1 ICAO material

This SPR standard considers International Civil Aviation Organization (ICAO) material. Terminology used in this standard is consistent with ICAO use.

This SPR standard provides the results of operational assessments on data link services that supplement the communication equipment required by ICAO Annex 6. These data link services support, in part, the provision and use of ATS governed by ICAO Annexes 2, 10 and 11. The extent to which these data link services can support ATS is described in [Section 2](#) of this document.

ICAO Annex 2, Rules of the Air, Annex 10, Aeronautical Telecommunications - Volume II (Communications Procedures including those with PANS status), and Annex 11, Air Traffic Services include Standards and Recommended Practices (SARPs) for the provision and use of ATS. Unless explicitly stated, this SPR standard assumes the provision and use of ATS are implemented in accordance with these SARPs.

ICAO Doc 4444, Procedures for Air Navigation Services - Air Traffic Management (PANS-ATM), and Doc 8400, ABC - ICAO Abbreviations and Codes, are complementary to the SARPs and include the ICAO procedures for the provision and use of ATS. This SPR standard uses these documents to align data link service descriptions with ICAO procedures for ATS communication.

ICAO Annex 15, Aeronautical Information Services provides SARPs relating to the publication in AIPs of lists of significant differences between local procedures and the related ICAO procedures. When local procedures are different from ICAO procedures, this SPR standard provides the means to assess the impact of those differences on the data link services and publish appropriate procedures and other relevant information in the AIP.

ICAO Annex 6, Operation of Aircraft, Part I - International Commercial Air Transport – Aeroplanes, includes SARPs for aircraft operations that are relevant to this SPR standard, including flight crew training and recording of data link communications. ICAO Doc. 8168, OPS - Aircraft Operations Volume I (Flight Procedures) include the flight procedures related to SARPs contained in Annex 6. Unless explicitly stated otherwise, this SPR standard assumes that the aircraft system relevant to the use of data link services is operated in accordance with these SARPs.

ICAO Doc. 9694, Manual of Air Traffic Services Data Link Applications and other documents listed in [paragraph 1.5](#) of this document provide guidance in applying data link applications to the provision and use of ATS. This SPR standard, in aligning its content with the ICAO Annexes and PANS-ATM, considers this guidance.

1.3.2 Approval material

This SPR standard is intended to support approval of a CNS/ATM system element. It is used with INTEROP standards and, when appropriate, other SPR standards, as evidence of a coordinated requirements determination process, which is defined in RTCA DO-264/ EUROCAE ED-78A. These standards provide the basis for qualifying the operational, safety, and performance aspects of an element of the CNS/ATM system. When qualifying, selected INTEROP standards have to be shown compatible with the SPR standards.

NOTE: *Recognition of SPR and INTEROP standards and any unique characteristics or adaptation affecting operations, safety, performance, and interoperability for a specific ATS provision, aircraft type design, or operator's operation can be found in the respective AIPs, NOTAMs, AFMs, and operator's specifications.*

Information on adapting an SPR standard to a specific implementation can be found in paragraph 1.3.3 of RTCA DO-264/EUROCAE ED-78A. Guidelines for qualifying a CNS/ATM system element to an SPR standard can be found in sections 5 and 6 of RTCA DO-264/EUROCAE ED-78A.

Table 1-1 provides additional guidance to RTCA DO-264/EUROCAE ED-78A, paragraphs 4.1.2.1.g) and 4.1.2.2.g). It includes definition of:

- a) Acceptable risk for Class 3 and Class 4 operational hazards. Quantitative values are provided to support quantitative analysis, when required for approval, and to facilitate operational and engineering judgment during qualitative analyses.
- b) Relationships of a software development assurance level to a safety objective. "Development assurance level" determines the level of rigor to be applied throughout system development and qualification. For "development assurance level" of software,
 - 1. Refer to DO-178B/ED-12B for "failure condition categorization" and its association with aircraft system "software level" and guidance for qualifying aircraft system software to a "software level."
 - 2. Refer to ED-109/DO-278 for ATSP "software assurance level" and its association with aircraft system "software level" and guidance for qualifying ATSP system software to a "software assurance level." DO-278/ED-109 is consistent with DO-178B/ED-12B.

NOTE 1: *Table 1-1 does not consider Class 1 and Class 2 operational hazards, which have not been identified for any of the data link services defined in this standard.*

NOTE 2: *If the conditions provided in Table 1-1 are not appropriate for the implementation (e.g., the ATSU only accumulates 4000 flight hours per year), then the associated acceptable risk values are not valid. States may need to adapt acceptable risk values to local conditions based on the acceptable risk value per flight hour provided in the table.*

TABLE 1-1 : ADDITIONAL GUIDANCE ON ACCEPTABLE RISK AND SOFTWARE CONSIDERATIONS

Hazard Class (See RTCA DO-264/EUROCAE ED-78A, paragraph 4.1.2.1)	3	4
Safety Objective (See RTCA DO-264/EUROCAE ED-78A, paragraph 4.1.2.1)	Remote	Probable
Acceptable Risk (average probability)	$<1 \times 10^{-5}$ per flight hour a. Given that an ATSU accumulates an average of 1×10^6 or more flight hours (includes flight hours only of aircraft that are filing to use the data link services) per year (8766 hours of continuous operation), this results in a relationship of 100 flight hours per ATSU hour. b. The identified hazard affects one aircraft at a time. Then the acceptable risk can be defined as: $<1 \times 10^{-3}$ per ATSU hour. Given that an average of 10 or less data link service transactions that can result in a level 3 hazard are processed per flight per ATSU, then the acceptable risk can be defined as: $<1 \times 10^{-6}$ per data link service transaction that can result in a class 3 hazard.	$<1 \times 10^{-3}$ per flight hour a. Given that an ATSU accumulates an average of 1×10^6 or more flight hours (includes flight hours only of aircraft that are filing to use the data link services) per year (8766 hours of continuous operation), this results in a relationship of 100 flight hours per ATSU hour; b. The identified hazard affects one aircraft at a time. Then the acceptable risk can be defined as: $<1 \times 10^{-1}$ per ATSU hour. Given that an average of 10 or less data link service transactions that can result in a level 4 hazard are processed per flight per ATSU, then the acceptable risk can be defined as: $<1 \times 10^{-4}$ per data link service transaction that can result in a class 4 hazard.
Relationship of a software development assurance level to a safety objective	A failure condition categorization of "major" for the aircraft system is associated with a safety objective of "Class 3" hazards occurring no more frequently than "remote." A failure condition categorization of "major" for the ATSU is associated with a safety objective of "Class 3" hazards occurring no more frequently than "remote."	A failure condition categorization of "minor" for the aircraft system is associated with a safety objective of "Class 4" hazards occurring no more frequently than "probable." A failure condition categorization of "minor" for the ATSU is associated with a safety objective of "Class 4" or hazards occurring no more frequently than "probable."

1.4 DOCUMENT DESCRIPTION

1.4.1 Mandating and recommending phrases

When this document is recognized/endorsed by appropriate regulatory agencies, the words “shall” and “should” are interpreted as follows:

- “shall” indicates a mandated criterion; i.e., compliance is mandatory and no alternative may be applied;
- “should” indicates that although the criterion is regarded as the preferred option, alternative criteria may be applied. In such cases, alternatives should be identified in appropriate approval plans and agreement sought from the approval authority.

NOTE: *In a regulatory context, the “shalls” are considered a mandated criterion if the applicant includes the SPR standard in their approval plan and the approval authority accepted it as the basis for approval. “Shoulds” are typically used to describe guidelines for the processes used to produce elements of the system or for meeting the mandated criterion.*

1.4.2 Document organization

- [Section 1](#) provides an introduction to the SPR for continental airspace.
- [Section 2](#) provides a description of the operational objectives for the data link services in terms of the ATS objectives, as provided by ICAO Annex 11, and ATS functions related to implementing data link services.
- [Section 3](#) provides an overview of the environment and identifies conditions related to the provision and use of data link services.
- [Section 4](#) provides a description of the Data Link Initiation Capability (DLIC), operating methods, time sequence diagrams, DLIC messages, and the results of the OSA and OPA.
- [Section 5](#) provides a description of the data link services for ATC communications, operating methods, time sequence diagrams, ATC communications messages, and the results of the OSA and OPA.
- [Section 6](#) provides a description of the Flight Information Service (FIS), operating methods, time sequence diagrams, FIS messages, and the results of the OSA and OPA.
- [Section 7](#) provides a description of the data link services for surveillance, operating methods, time sequence diagrams, surveillance data link messages, and the results of the OSA and OPA.
- [Annex A](#) provides a summary of requirements for the data link services described in this document and indicates their applicability and allocation to each of the elements of the CNS/ATM system supporting the data link service.
- [Appendix A](#) provides a list of participants who contributed to the development of this SPR standard.
- [Appendix B](#) provides a history and how this document satisfies the terms of reference for SC-189/WG-53.
- [Appendix C](#) provides an improvement suggestion form.

1.4.3 Document traceability

Traceability is provided throughout the document to enable the user to adapt this standard to meet specific needs for any particular implementation. This traceability is provided through the use of tables and reference labels assigned to the different types of information provided in the tables. [Figure 1-2](#) provides an overview of the traceability provided across the tables.

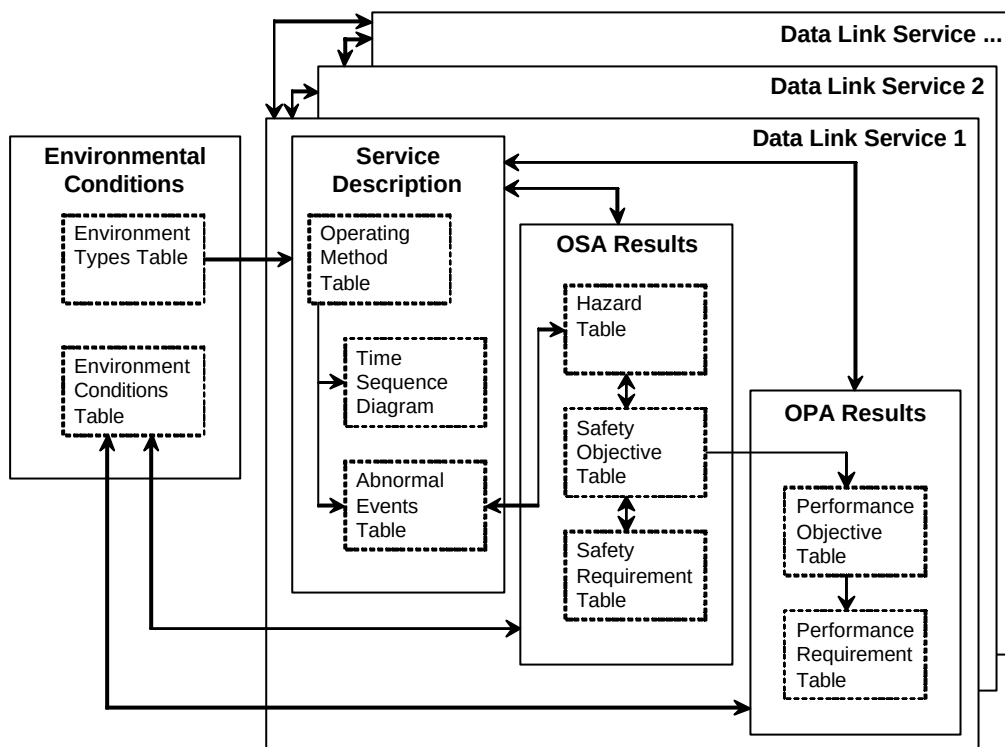


FIGURE 1-2 : DOCUMENT TRACEABILITY

1.4.3.1 Environmental description

1.4.3.1.1 Environmental types

Environmental types are described using a matrix of characteristics within continental airspace. Therefore, it does not provide a specific designator for each characteristic. However, a reference designator for each characteristic of the different environment types can be derived from the rows and columns in the tables using the following form:

ENV-[Type]-[Characteristic]

Where:

- ENV indicates that the reference pertains to the environment.
- [Type] is the type of environment (e.g., ER, TMA, APP/DEP, Aerodrome).
- [Characteristic] is a particular attribute for the environment type (i.e., airspace type; communication, navigation, and surveillance capability and performance, separation, sector density, and traffic complexity).

An example of an environmental characteristic is ENV-ER-Sector density.

NOTE: The form for the environmental types table is not presented in this section. See [section 3](#).

1.4.3.1.2 Environmental conditions

The environmental conditions that are relied upon to substantiate hazard classifications or performance requirements for any of the data link services described in this document are presented in an environmental condition table. If either the OSA or OPA results rely on an environmental condition, then that environmental condition applies to all environmental types in which a data link service is intended to be used. [Table 1-2](#) provides the format for the environmental conditions table.

TABLE 1-2 : DESCRIPTION OF ENVIRONMENTAL CONDITIONS TABLE

Reference	Environmental Condition
Reference takes the form: C-ENV-[#] Where: C = Condition ENV = Environment [#] is a unique integer assigned to each condition	Description of the environmental condition

1.4.3.2 Service descriptions

1.4.3.2.1 Operating method

This section provides a high level description of the purpose of the service, followed by a decomposition of the service into its principal functions. Operating methods tables, time sequence diagrams, and abnormal events are also provided for each service.

Table 1-3 provides a sample of the contents of operating method for each service. Each row in the table describes a step in the operation. A given step pertains to either the ATSP or the operator. When a step number is followed by a letter, "e.g., "S" for success or "F" for failure, this indicates that the step is conditional and all steps with the same letter occur when the condition is met.

TABLE 1-3 : DESCRIPTION OF OPERATING METHOD TABLE

Step	Operating Method
1	Action for initial step
2	Action for next step information required checking handling of information source and/or destination of information
3	Action for subsequent step
4S	Action for step when condition "S" as defined in table is met
5S	Results of the action in 4S . . .
4F	Action for step when condition "F" as defined in table is met
5F	Results of the action in 4F . . .
6	Final step

1.4.3.2.2 Time sequence diagram

For each of the data link services, time sequence diagrams (TSDs) for the operational communication transactions are used to:

- describe the operating method for the data link service;
- define starting and ending points of the allocations for the RCP parameters; and
- indicate the relationships among the allocations of RCP parameters.

Communication transactions that have multiple responses, i.e., the STANDBY, followed by the operational response, are treated as two transactions, both transactions start with the request and end upon receipt of each response. These scenarios are indicated on the TSDs and described in the operating method.

Figure 1-3 provides a typical TSD and indicates the conventions used. The acronyms and terms used in the figure are defined in paragraph 1.4.4.

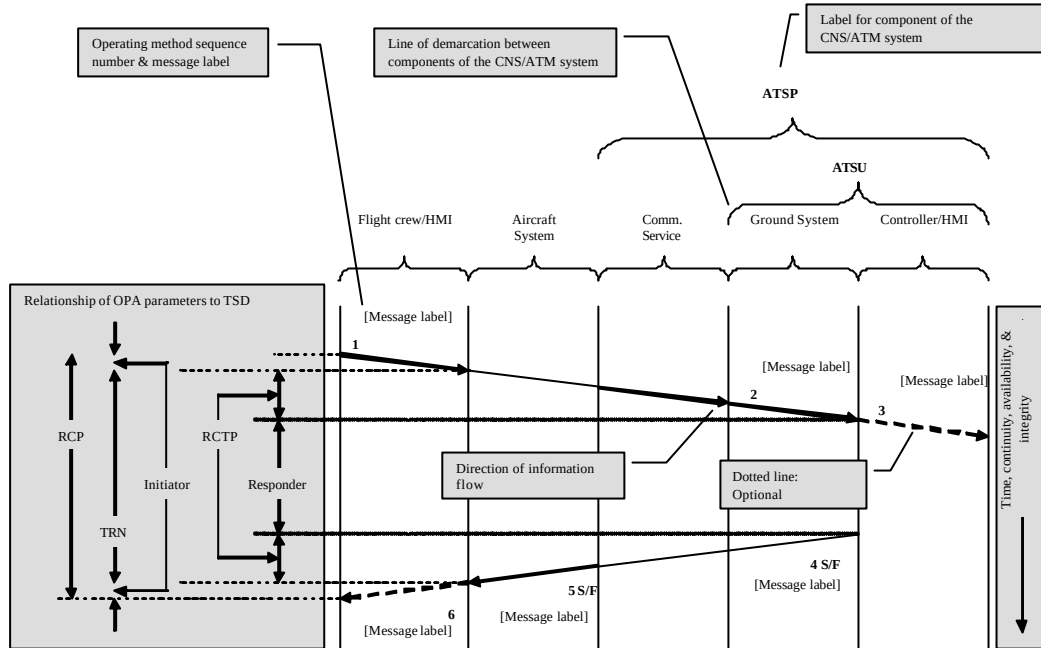


FIGURE 1-3 : DESCRIPTION OF TIME SEQUENCE DIAGRAM FOR AN OPERATIONAL COMMUNICATION TRANSACTION

1.4.3.2.3 Abnormal events

This section provides a table indicating abnormal events for each step in the operating method as applicable. Table 1-4 provides a description of the abnormal events table.

TABLE 1-4 : DESCRIPTION OF ABNORMAL EVENTS TABLE

Abnormal Event Reference #	Abnormal Event	Operational Result	Operating Reference	Method
Reference takes the form: AE-[Serv] -[#] Where: AE = abnormal event [Serv] specifies the applicable service name [#] is a unique integer assigned to each abnormal event.	Describes the abnormal event.	Describes the operational result of the abnormal event. <u>Note:</u> Some abnormal events have no operational results.	Indicates which table(s) and step(s) within the indicated table(s) where the abnormal event could occur.	

1.4.3.3 SA results

For each of the data link services, the OSA results are organized according to:

- a) operational hazards,
- b) safety objectives, and
- c) safety requirements.

The operational hazards associated with each data link service are presented in a hazard table providing hazards, indicating the applicable environmental conditions used to substantiate the hazard classification. This hazard classification remains valid only if these environmental conditions (e.g., C-ENV-X) are valid.

Safety Requirements (e.g., SR-XXX-YY) are shared risk mitigation strategies that aim at satisfying Safety Objectives and are applied to the data link services provision. These Safety Requirements are not used to reduce the hazard class severity at the service level.

1.4.3.3.1 Operational hazards

The operational hazards associated with each data link service are presented in a hazard table providing hazards, indicating the applicable environmental conditions used. [Table 1-5](#) provides a description of the hazard table.

TABLE 1-5 : DESCRIPTION OF HAZARD TABLE

Hazard Reference #	Operational Hazard	Operational Effect	Environmental Conditions	Hazard Class	Abnormal Event Reference #
Reference takes the form: H-[Service]-[func]-[#], Where: H = hazard, [Service] specifies the applicable service name, [func], if applicable, is a letter designator signifying a function of the service, and [#] is a unique integer assigned to each hazard.	[Description], where the hazard is at the data link service level.	Describes effects on operations, occupants, flight crew, and air traffic services taking into account environmental conditions.	Includes list of reference designators for environmental conditions applicable to substantiate hazard classification See environmental condition Table 1-2 for correct form.	Hazards are classified as "1," "2," "3," "4," "5" per RTCA DO-264/ EUROCAE ED-78A.	Includes backward reference to the abnormal event associated with the hazard. See abnormal event Table 1-4 for correct form.

1.4.3.3.2 Safety objectives

The safety objectives provide the basis for determining the safety requirements that define risk mitigation strategy for the associated hazards. There is a one-to-one mapping between safety objectives and hazards associated with the data link service. The safety objective table provides the safety objectives associated with the functions of the data link service. For each safety objective, reference to the requirements for the shared risk mitigation strategy, if applicable, is indicated. [Table 1-6](#) provides a description of the safety objective table.

TABLE 1-6 : DESCRIPTION OF SAFETY OBJECTIVE TABLE

Safety Reference #	Objective	Safety Objective	Risk Mitigation Strategy	Hazard Reference #
Reference takes the form: SO-[Serv]-[func]-[#], Where SO = safety objective [Service] specifies the applicable service name, [func], if applicable, is a letter designator signifying a function of the service, and [#] is a unique integer assigned to each safety objective.	Establishes the required threshold of probability of occurrence of the associated hazard. Description takes the form: The likelihood of [H-[Service]-[func]-[#]] shall be no greater than [SO], Where [H-[Service]-[func]-[#]] is the hazard description and [SO] is "extremely improbable," "extremely remote," "remote," or "improbable," per RTCA DO-264/ EUROCAE ED-78A and <u>Table 1-1</u> of this document.	Provides forward reference to the safety requirements necessary for risk mitigation. If risk mitigation strategy is shared among elements of the CNS/ATM system, then includes list of reference designators for requirements that satisfy the risk mitigation strategy. If risk mitigation strategy is not shared, then indicates "not shared." <u>Note:</u> Requirements are determined by appropriate system element safety assessments based on the safety objective.	Provides backward trace to the hazard associated with the safety objective. See operational hazard <u>Table 1-5</u> for correct form.	

1.4.3.3.3 Safety requirements

The safety requirement table provides requirements that are derived from shared risk mitigation strategies that satisfy each of the safety objectives. Multiple safety requirements may be necessary to satisfy a given safety objective. Also, the same requirement may be used in shared risk mitigation strategies for more than one safety objective. The tables provide the forward and backward traceability to characterize the relationships between safety requirements and objectives.

NOTE 1: *In some cases, the safety requirement for one data link service, such as DLIC, may be the result of a risk mitigation strategy to satisfy a safety objective for a different service, such as ACL. The safety requirement table for one service will indicate safety objectives for another service, as applicable.*

NOTE 2: *The safety requirements resulting from the shared risk mitigation strategy are allocated to the aircraft, ATSP, and operator in Annex A.*

[Table 1-7](#) provides a description of the safety requirement table.

TABLE 1-7 : DESCRIPTION OF SAFETY REQUIREMENT TABLE

Safety Requirement Reference #	Safety Requirement	Safety Objective Reference #
Reference takes the form: SR-[SERV]-[func] -[#], Where SR = safety requirement, [Service] specifies the applicable service name, [func], if applicable, is a letter designator signifying a function of the service, and [#] is a unique integer assigned to each safety requirement.	Description takes the form: The [noun] shall [requirement], Where [noun] can be, for example, ATSU or aircraft system. Requirement always includes a "shall," however, its structure and form may vary to the extent necessary so that the requirement is clearly and concisely specified. Requirements are stated at the operational level and to the extent necessary to support validation, coordination, and allocation to an element of the CNS/ATM system to support approval.	Provides a back trace to applicable safety objective(s) for which the requirement contributes to the risk mitigation strategy for that safety objective. See safety objective Table 1-6 for correct form.

1.4.3.3.4 Cause and relationship diagrams

Cause and relationship diagrams are used to depict the risk mitigation strategy for safety objectives associated with Class 3 hazards. The risk mitigation strategy takes the form of safety requirements that are associated with the causes or contributors to the cause or the hazard. The diagrams use “OR” and “AND” gates to indicate how the requirement mitigates the cause or contributor of the hazard. A cause directly results in the occurrence of the hazard through “OR” gates, whereas a contributor to the cause or hazard is dependent on other conditions presented in the diagram using an “AND” gate. The safety objective indicates the level of confidence that must be attained for the overall risk mitigation strategy, taking into account the causes and contributors identified.

Cause and relationship diagrams are used as decision-making aid tool to specify qualitative safety requirements that are the minimum risk mitigation strategies. These diagrams do not intend to be used to allocate quantitative safety requirements by weighting how much each contributor is tolerated to occur due to its contribution to the hazard generation. They also do not go into common cause or independence of contributors or the architecture within an element of the CNS/ATM system (ATSP/operator).

Figure 1-4 provides an overview of the components of a cause and relationship diagram.

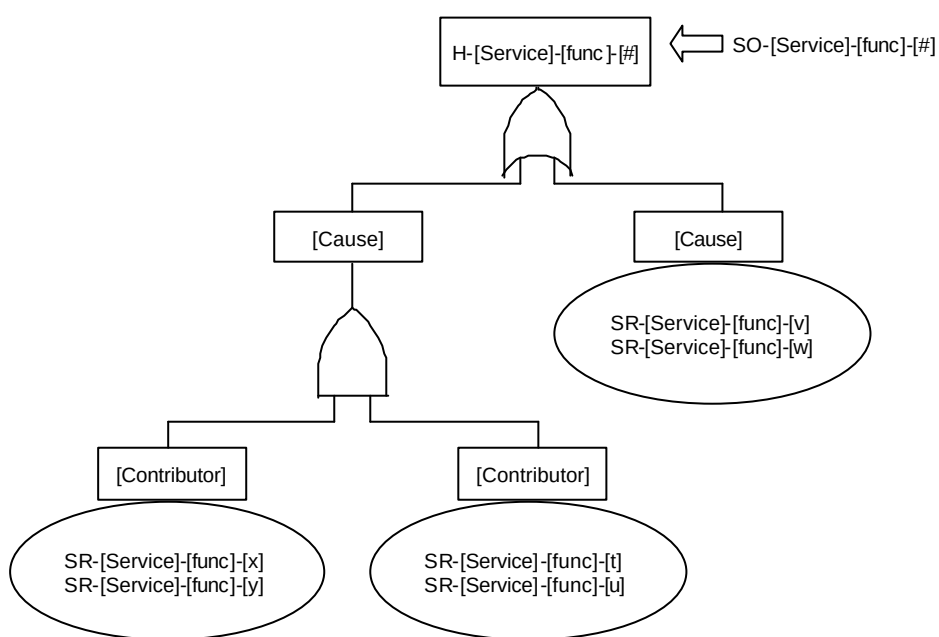


FIGURE 1-4 : COMPONENTS OF A CAUSE AND RELATIONSHIP DIAGRAM

1.4.3.4 OPA results

For each of the data link services, the OPA results are organized according to:

- performance objective table and
- performance requirement table.

The performance objectives and requirements may vary depending on environmental conditions and functions within the service. As a result, different values for the same performance parameter may appear in the table and the parameter is subscripted.

NOTE: Performance assessments are transaction based. Whenever a function or service (e.g., Update, AMC) is based only on a one-way transaction, no performance assessment was conducted. However, this does not imply that there are no associated performance characteristics.

1.4.3.4.1 Performance objectives

The performance objective table provides the performance objectives associated with the data link service. It provides the quantitative performance levels based on operational intent and safety assessments to establish minimum requirements for continuity, availability, and integrity. [Table 1-8](#) provides a description of the performance objective table.

TABLE 1-8 : DESCRIPTION OF PERFORMANCE OBJECTIVE TABLE

Performance Objective Reference	Environmental conditions	Performance Objective		Safety objective or operational expectation Reference (Source)
		Description of parameter	Value	
Reference takes the form: PO-[Serv]-[func]-[#], Where: PO = performance objective, [Service] specifies the applicable service name, [func], if applicable, is a letter designator signifying a function of the service, and [#] is a unique integer assigned to each performance objective.	(See Environmental Characteristic Table 1-2 for correct form) Includes list of reference designators for environmental conditions applicable to substantiate or constrain performance objective.	Description takes the form: Either: QSPL[subscript] - Quantitative safety performance level or QOPL[subscript] - Quantitative operational performance level - Where [subscript] is: UIT - Unexpected interruption of the transaction LOS - Loss of the service LOCP - Loss of the operational communication process UCT - Undetected corruption of the transaction	Value takes the form: [value], where [value] is a quantitative rate of acceptance for the performance objective parameter. See Table 1-1 .	(See safety objective Table 1-6 for correct form) Includes list of reference designators for safety objectives or reference to the operational description steps that are the source of the performance objective.

1.4.3.4.2 Performance requirements

The performance requirements for data link services may be different for different functions within the service or if the service is used in environments with different conditions. These differences, where applicable, are noted.

The performance requirements are stated in terms of RCP parameters, RCP allocations and TRN allocations. The RCP parameters, the RCP allocations and TRN allocations are delay values for expiration time (ET), transaction time for 95% of all transactions (TT(95)), continuity (C), availability of the service provision (A(PROVISION)), availability of use (A(USE)), and the integrity (I). The RCP parameter values for continuity, availability, and integrity are derived from the performance objectives. The RCP allocations are derived from the RCP parameter values. The TRN allocations are derived from the TRN parameter values. The relationship of RCP parameters and these allocations to the operational communication transaction is indicated in [Figure 1-3](#).

1.4.3.4.2.1 Performance requirement table

Table 1-9 provides a description of the performance requirement table. There are four main sections to the table:

- a) The first section provides the service label and, if applicable, the function, and any notes, such as environmental variations, that may apply to the table.
- b) The second section provides the values for the RCP parameters and, if applicable, the associated performance objective. For all RCP parameters, this section indicates whether the source is “Operational” or “Safety.”
- c) The third section provides the allocations of RCP to the Initiator and the TRN.
- d) The fourth section provides the allocations of TRN to the Responder and the RCTP.

NOTE 1: *TRN has been introduced in this standard to provide a starting and ending point for monitoring the actual performance of communication transactions. TRN excludes the human-machine interaction for message composition and recognition, whose performance is validated during initial qualification.*

NOTE 2: *The performance requirements resulting from the RCP assessment are allocated to the aircraft, ATSP, and operator, as appropriate, in Annex A.*

NOTE 3: *The acronyms used in this document are defined in [paragraph 1.4.4](#).*

1.4.3.4.2.2 Performance requirement references

The performance requirement table uses a matrix form to provide the performance requirements. Therefore, it does not provide a specific designator for each requirement. However, a performance requirement reference can be derived from the rows and columns in the tables using the following form:

PR-[Service]-[Function]-[Env]-[Parameter]_[Level/Portion]

Where:

- a) PR indicates a performance requirement
- b) [Service] is the service label (e.g., DLIC, ACM, ACL, DCL, DSC, AMC)
- c) [Function], if applicable, is a particular function of the service (e.g., flight crew initiated transaction (F), DLIC initiation, ACL advisory, ACL clearance, etc.)
- d) [Env], if relevant, indicates the environment in which the performance requirement applies to the service (e.g., ER, TMA, ARR/DEP, Aerodrome)
- e) [Parameter] is the performance parameter (e.g., ET, TT(95), C, A, I), and
- f) [Level/Portion] is the level in the allocation process and/or portion of the allocated value (e.g., RCP, Initiator, TRN, Responder, RCTP)

An example of a performance requirement reference is PR-ACL-F-ER-ETRCTP-AIRCRAFT.

NOTE: *States that specify operational performance requirements in AIPs, or other appropriate documents, should develop an RCP type, which is defined based on the RCP parameter values. The RCP allocations and TRN allocations may be adjusted through a coordinated requirements determination process in accordance with RTCA DO-264/ EUROCAE ED-78A.*

TABLE 1-9 : DESCRIPTION OF PERFORMANCE REQUIREMENT TABLE

Service	[Serv]-[function]					
Notes	<u>Note 1</u>: All values for ET and TT(95) are provided in seconds. All values for C, A(USE), and A(PROVISION) are provided as a probability on a per flight hour basis. All values for integrity are provided as a rate on a per flight hour basis. Values can be converted to a per ATSU hour or per transaction based on the criteria provided in <u>Table 1-1</u>. <u>Note 2</u>: A(PROVISION) is a requirement for the ATSP. Allocation is not necessary since the requirement is not shared. <u>Note 3</u>: Values for these parameters are to be specified by each state.					
Parameter	ET	TT(95)	C	A(USE)	A(PROV- ISION)	I
Source	O	O	QOPL _{UIT}	QOPL _{LOCP}	QOPL _{LOS}	QSPL _{UCT}
RCP	[Time in secs] See <u>Note 3</u>	[Time in secs] See <u>Note 3</u>	Probability (per flight hour) C _{RCP}	Probability (per flight hour) A(USE) _{RCP}	Probability (per flight hour) A(PROV- ISION) _{RCP}	Rate (per flight hour)
RCP Allocations						
Initiator	See <u>Note 3</u>	See <u>Note 3</u>	See <u>Note 3</u>	See <u>Note 1</u>	See <u>Note 1</u>	See <u>Note 1</u>
TRN	ET _{TRN}	TT(95) _{TRN}	C _{TRN}	A(USE) _{TRN}	See <u>Note 2</u>	I _{TRN}
TRN Allocations						
Responder	ET _{RESPONDER}	TT(95) _{RE- SPONDER}	C _{RESPONDER}	See <u>Note 1</u>	See <u>Note 2</u>	See <u>Note 1</u>
RCTP	ET _{RCTP}	TT(95) _{RCTP}	C _{RCTP}	A(USE) _{RCTP}	See <u>Note 2</u>	I _{RCTP}

1.4.4

Acronyms and glossary of terms

The terminology used in this document is consistent with the terminology of RTCA DO-264 / EUROCAE ED-78A. This document also contains additional terms. The following acronyms and terms are used in this document.

ACRONYMS

Acronym	Description
A	Availability
ACL	ATC Clearances Service
ACM	ATC Communications Management Service
AFM	Aircraft Flight Manual
AFTN	Aeronautical Fixed Telecommunications Network
AIP	Aeronautical Information Publication
AMC	ATC Microphone Check Service
AOC	Aeronautical Operational Control
APP/DEP	Approach / Departure
ATC	Air Traffic Control
ATIS	Automatic Terminal Information Service
ATM	Air Traffic Management
ATN	Aeronautical Telecommunication Network
ATS	Air Traffic Services
ATSP	Air Traffic Services Provider
ATSU	Air Traffic Services Unit
C	Continuity
C-ATSU	Current Air Traffic Services Unit
CDA	Current Data Authority

Acronym	Description
CNS/ATM	Communication, Navigation, and Surveillance/Air Traffic Management
CPDLC	Controller-Pilot Data Link Communications
CSP	Communication Service Provider
D-ATIS	Data Link ATIS
D-ATSU	Downstream Air Traffic Services Unit
DCL	Departure Clearance service
DLIC	Data Link Initiation Capability
DSC	Downstream Clearance service
ER	En Route
ET	Transaction Expiration Time
FIS	Flight Information Service.
FL	Flight Level
FLIPCY	Flight Plan Consistency
FMS	Flight Management System
HMI	Human Machine Interface
I	Integrity
IFR	Instrument Flight rules
ICAO	International Civil Aviation Organization
LOCP	Loss Of Communication Process
LOS	Loss Of Service
NOTAM	Notice to Airmen
OH	Operational Hazard
OHA	Operational Hazard Assessment
OPA	Operational Performance Assessment
OSA	Operational Safety Assessment
OSD	Operational Services and Environment Definition
PANS	Procedures for Air Navigation Services
PR	Performance Requirement
QOPL	Quantitative Operational Performance Level
QSPL	Quantitative Safety Performance Level
R-ATSU	Receiving Air Traffic Services Unit
RCP	Required Communication Performance
RNAV	Area Navigation
RNP	Required Navigation Performance
RCTP	Required Communications Technical Performance
R-sector	Receiving sector
RTCA	RTCA, Inc.
SPR	Safety and Performance Requirements
SSR	Secondary Surveillance Radar
T-ATSU	Transferring Air Traffic Services Unit
TMA	Terminal Control Area
TRN	Transaction
T-sector	Transferring sector
TT	Transaction Time
UCT	Undetected Corrupted Transaction
UIT	Unexpected Interrupted Transaction

GLOSSARY OF TERMS

Term	Definition
Acceptable risk	A quantitative value that represents the acceptable average probability threshold associated with a safety objective and provides the basis for quantitative analyses to determine that the safety objective is met.
Aerodrome	A defined area on land or water (including any buildings, installations and equipment) intended to be used either wholly or in part for the arrival, departure and surface movement of an aircraft. [ICAO]
Aircraft identification	A group of letters, figures or a combination thereof which is either identical to, or the coded equivalent of, the aircraft call sign to be used in air-ground communications, and which is used to identify the aircraft in ground-ground ATS communication. Per ICAO Doc 4444-RAC/501 Part 1
Aircraft system	The aircraft system as referred to in this document includes all sub-systems associated with data communications on an aircraft.
Air traffic advisory service	A service provided within advisory airspace to ensure separation, in so far as practical, between aircraft which are operating on IFR flight plans. [ICAO]
Air traffic control clearance	Authorization for an aircraft to proceed under conditions specified by an air traffic control unit. <u>Note 1</u> For convenience, the term "air traffic control clearance" is frequently abbreviated to "clearance." <u>Note 2</u> The abbreviated term "clearance" may be prefixed by the words "taxi", "take-off", "departure", "en-route", "approach" or "landing" to indicate the particular portion of flight to which the air traffic control clearance relates. [ICAO]
Air traffic control instruction	Directives issued by air traffic control for the purpose of requiring a pilot to take a specific action. [ICAO]
Air traffic control service	A service provided for the purpose of: preventing collisions: between aircraft, and on the maneuvering area between aircraft and obstructions; and expediting and maintaining an orderly flow of air traffic [ICAO]
Air traffic management	The aggregation of the airborne functions and ground-based functions (air traffic services, airspace management and air traffic flow management) required to ensure the safe and efficient movement of aircraft during all phases of operations.
Air traffic service	A generic term meaning variously, flight information service, alerting service, air traffic advisory service, air traffic control service (area control service, approach control service or aerodrome control service). [ICAO]
Air traffic services function	An application of air traffic services or portions thereof that satisfies an operational need.
Air traffic services unit	A generic term meaning variously, air traffic control unit, flight information centre or air traffic services reporting office. [ICAO]
Alerting service	A service provided to notify appropriate organizations regarding aircraft in need of search and rescue aid, and assist such organizations as required. [ICAO]
Approval	A document by which an authorized body, acting within a legislative framework, gives formal recognition that a product, process or service/operation conforms to applicable requirements.
Approval Process	A process by which an authorized body, acting within a legislative framework, gives formal recognition that a product, process or service/operation conforms to applicable regulatory requirements.

Term	Definition
Area Navigation (RNAV)	A method of navigation which permits aircraft operation on any desired flight path within the coverage of station-referenced navigation aids or within the limits of capability of self-contained aids, or a combination of these.
ATS provider	An appropriate ATS authority in a given airspace.
ATSP system	The total ATS provider system including the technical system and operational procedures.
Automatic terminal information service	The automatic provision of current, routine information to arriving and departing aircraft throughout 24 hours or a specified portion thereof: Data link-automatic terminal information service (D-ATIS). The provision of ATIS via data link. Voice-automatic terminal information service (Voice-ATIS). The provision of ATIS by means of continuous and repetitive voice broadcasts. [ICAO]
Availability	The probability that the communication system between the two parties is in service when it is needed
Clearance	See air traffic control clearance
Communication Services	The delivery of data messages and/or voice between end systems.
Continuity	The probability that the transaction will be completed before the transaction expiration time, assuming that the communication system is available when the transaction is initiated
CPDLC	A means of communication between controller and pilot, using data link for ATC communications.
Current-ATSU	In ACM context: The ATSU that can exchange ATC communications messages with an aircraft.
Development assurance	Planned and systematic actions performed to minimize generic errors during development and implementation, and provide confidence that the system is suitable for its intended use. [RTCA DO-264/ EUROCAE ED-78A]
Dialogue	A message exchange between the controller and the flight crew from sending message requiring a reply to the receipt of the operational reply. A dialogue remains open until receipt of an operational reply that closes the dialogue (STANDBY does not close a dialogue).
Downstream-ATSU	In the context of DSC, the downstream ATSU is expected to be responsible for control of the aircraft during later part of the flight.
Downstream clearance	A clearance issued by an ATC unit that is different from the controlling ATC unit.
End System	A system that contains the human-machine interface, application processing, and is distinct from system components interfacing the communication services. <u>Note:</u> This definition is modified from RTCA DO-264/EUROCAE ED-78A to remove technological dependencies.
Estimated off-block time (EOBT)	The estimated time at which the aircraft will commence movement associated with departure. [ICAO]
Flight information service	A service provided for the purpose of giving advice and information useful for the safe and efficient conduct of flights. [ICAO]

Term	Definition
Flight plan	Specified information provided to air traffic services units, relative to an intended flight or portion of a flight of an aircraft. [ICAO] A flight plan can take several forms, such as: Current flight plan (CPL). The flight plan, including changes, if any, brought about by subsequent clearances. <u>Note:</u> When the word “message” is used as a suffix to this term, it denotes the content and format of the current flight plan data sent from one unit to another. Filed flight plan (FPL). The flight plan as filed with an ATS unit by the pilot or a designated representative, without any subsequent changes. <u>Note:</u> When the word “message” is used as a suffix to this term, it denotes the content and format of the filed flight plan data as transmitted. Repetitive flight plan (RPL). A flight plan related to a series of frequently recurring, regularly operated individual flights with identical basic features, submitted by an operator for retention and repetitive use by ATS units. Aircraft flight plan. The flight plan used by the flight crew. The sequence of legs and associated constraints that define the expected 3D or 4D trajectory of the aircraft from takeoff to landing.
Initiator portion	The first part of the initiator portion starts when the initiator begins to compose a message and ends when the initiator releases the operational message (e.g., by pressing “ENTER”). The second part of the initiator portion starts when the initiator has got an indication of the operational reply and ends when the initiator has retrieved, read and understood the operational reply on the initiator’s HMI. <u>Note:</u> For operational messages generated by a system without human intervention, the initiator portion ends when the automation releases the operational message.
Integrity	An acceptable rate of transactions completed with undetected error.
Operator	A person, organization or enterprise engaged in or offering to engage in an aircraft operation.
Primary means of communication	Communication capability that is required for operational approval
Qualification	Process through which a State/approval authority/applicant ensures that a specific implementation satisfies applicable requirements with a level of confidence.
Quantitative Operational Performance Level (QOPL)	A quantitative value that characterizes the performance expectations from operators and ATS providers. QOPLs are used to establish values for the RCP parameters.
Quantitative safety performance level (QSPL)	A quantitative value based on the OSA results. QSPLs are used to establish values for the RCP parameters.
Radar services	Services that are provided by means of radar and are used in the provision of the air traffic control service, such as for providing navigation guidance, transferring control, separating aircraft, monitoring air traffic and resolving conflicts. These services enable surveillance capabilities and provide the controller with aircraft position information based on range, azimuth, and/or elevation. In addition to providing aircraft position information, radar services can include the display of safety-related alerts and warnings, such as conflict alert, minimum safe altitude warning, conflict prediction and unintentionally duplicated secondary surveillance radar (SSR) codes.
R-ATSU	In ACM context: The next ATSU that the aircraft will enter.

Term	Definition
Required communication performance (RCP)	A statement of the performance requirements for operational communication in support of specific ATS functions. (ICAO) RCP is a statement of the communication performance necessary for operation within a defined airspace. (DO-264)
Required communication technical performance (RCTP)	RCTP is determined for a specific RCP, where the human performance probabilities have been assessed in order to establish the RCTP, i.e., performance requirements bearing on the underlying infrastructure. (DO-264) RCTP is a statement of the performance requirements for operational communication limited to the technical communication portions of the communication process. (ICAO) RCTP=TRN-Responder RCTP is allocated to the aircraft system element, ATSP system element, and/or operator system element in accordance with locally coordinated agreements. The first portion of RCTP starts when the message is released by the controller, the flight crew, or by an automated system on behalf of the controller or flight crew, for onward transmission. It ends when the responder receives an indication of the message. The second portion of RCTP starts when the operational reply is released by the responder or by an automated system on behalf of the pilot or controller, for onward transmission. It ends when the initiator receives an indication of the operational response.
Responder portion	The responder portion starts when an indication of the receipt of a message is provided to the responder. The responder portion ends when the operational reply is released by the responder (e.g., by pressing "ENTER"). <u>Note:</u> For operational replies generated by a system without human intervention, the responder portion ends when the automation releases the operational reply.
R-sector	In ACM context: Within a given ATSU, the next sector that the aircraft will enter.
Supplemental means of communication	Communication capability that is not required for the intended operation, but if available can be used instead of the primary means in accordance with operational approval.
TRN	TRN starts when the initiator portion ends. TRN ends when the initiator receives an indication of the operational reply. TRN is not defined by RTCA DO-264/EUROCAE ED-78A and has been introduced in this standard to provide practical start and end points for operational monitoring
T-ATSU	In ACM context: The ATSU that the aircraft is about to leave.
T-sector	In ACM context: Within a given ATSU, the sector that the aircraft is about to leave.

1.5**REFERENCES**

The references cited in this document are listed below:

- a) RTCA DO-264/EUROCAE ED-78A, Guidelines for Approval of the Provision and Use of Air Traffic Services Supported by Data Communications.
- b) RTCA DO-278/EUROCAE ED-109, Guidelines for Communication, Navigation, Surveillance, and Air Traffic Management (CNS/ATM) Systems Software Integrity Assurance.
- c) RTCA DO-178B/EUROCAE ED-12B, Software Considerations for Airborne Systems and Equipment Certification.
- d) ICAO Annex 2 — Rules of the Air.
- e) ICAO Annex 6 — Operation of Aircraft, Part I - International Commercial Air Transport – Aeroplanes.
- f) ICAO Annex 10 — Aeronautical Telecommunications - Volume II (Communications Procedures including those with PANS status).
- g) ICAO Annex 11 — Air Traffic Services.
- h) ICAO Annex 15 — Aeronautical Information Services.
- i) ICAO Doc. 4444 — Procedures for Air Navigation Services - Air Traffic Management (PANS-ATM).
- j) ICAO Doc. 8168 — Procedures for Air Navigation Services — Aircraft Operations Volume I — Flight Procedures.
- k) ICAO Doc 8400 — ABC — ICAO Abbreviations and Codes.
- l) ICAO Doc. 9694 — Manual of Air Traffic Services Data Link Applications.

CHAPTER 2

ATS FUNCTIONS

Air traffic services (ATS) consist of the air traffic control (ATC) service, flight information service, air traffic advisory service, and alerting service. These services are provided by air traffic service units (ATSUs) performing specific ATS functions. Communications, navigation, and surveillance capabilities support these ATS functions. Data link services described in this document support the air traffic control service, flight information service, and flight operations related to these services through the communication and surveillance capabilities. Figure 2-1 illustrates the conceptual relationship between air traffic services, ATS functions, communications, navigation and surveillance capabilities, and the continental data link services.

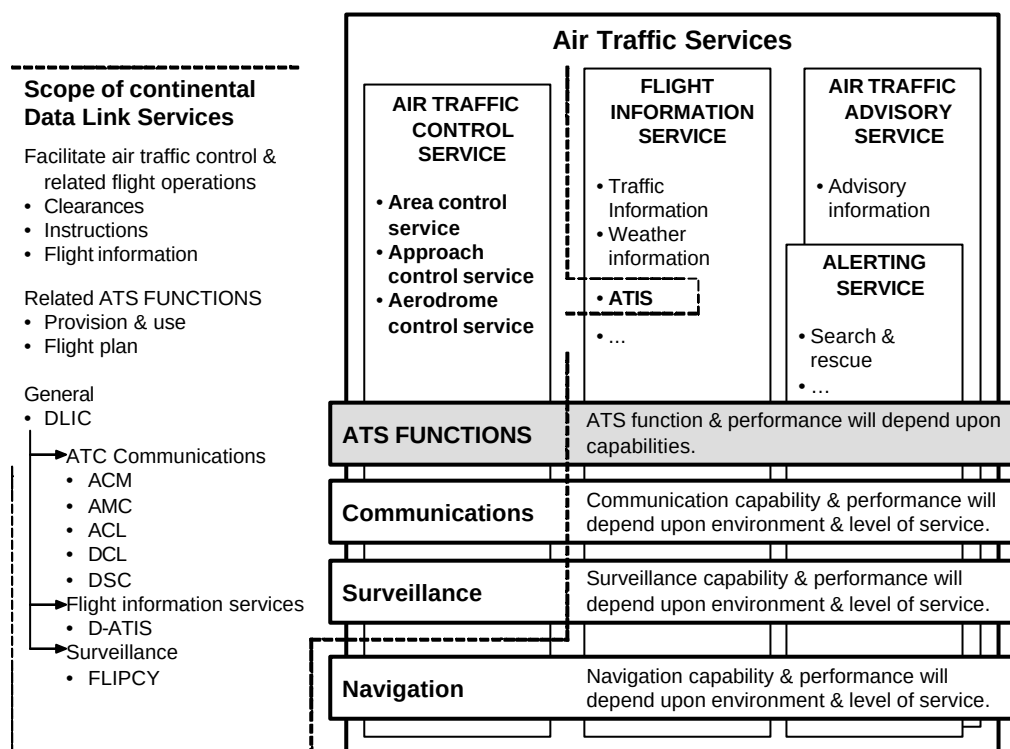


FIGURE 2-1 : CONCEPTUAL RELATIONSHIP OF ATS, ATS FUNCTIONS, COMMUNICATIONS, NAVIGATION AND SURVEILLANCE CAPABILITIES, AND DATA LINK SERVICES

2.1

ATS FUNCTIONS SUPPORTED BY DATA LINK SERVICES

This section provides a description of the ATS functions and communication and surveillance capabilities used in the data link services described in this document.

The data link services provide communication and surveillance capabilities for the ATSU to perform the following ATS functions:

- provide supplemental means to the controller to obtain information on the current position, actual progress, and intended movement of each aircraft for performing separation management;
- provide supplemental means to the controller to issue clearances and information for performing separation management;
- provide supplemental means to the flight crew to obtain clearances and instructions; and

- d) provide primary or supplemental means to the flight crew to obtain flight information.

NOTE 1: *These data link services provide communication and surveillance capabilities related to expediting and maintaining an orderly flow of air traffic; maintaining the separation standards; and handling limited non-routine situations. They are not intended to be used by the controller to intervene for preventing collisions or other ATS functions, such as for reducing separation standards or handling emergency or urgent, non-routine situations, that would require further operational safety and performance assessments than those performed for this document.*

NOTE 2: *The functional, safety and performance aspects of the data link services, by themselves, are not sufficient to meet or replace, in whole or part, the communication equipment requirements of ICAO Annex 6 or State regulatory requirements for operational communication and surveillance capabilities.*

NOTE 3: *With the exception of D-ATIS, these data link services are not intended to provide primary means of providing any of the ATS functions they support or relief from minimum equipment requirements for dispatching the aircraft for operation.*

Table 2-1 shows the relationship among data link services, air traffic services, and related international procedures as defined in ICAO PANS-ATM. The table signifies those international procedures for which the data link services described in this document were intended. States that adapt this standard to apply to international procedures not indicated in the table will need to assess the applicability of the data link services to those procedures.

Figure 2-2 shows the dependencies among the related ATS functions and data link services. Prior to operational use of data link services in a particular airspace:

- a) Operators, the State and its ATS provider establish the means to provide and use data link services per [paragraph 2.2](#);
- b) The data link capability is initiated per [section 4](#); and
- c) Controllers and flight crews take appropriate actions to provide and use:
 - ATC communications per [section 5](#)
 - flight information per [section 6](#), and/or
 - surveillance per [section 7](#).

TABLE 21 : RELATIONSHIP OF DATA LINK SERVICES TO ICAO MATERIAL

Data link service	Related Annex 11 air traffic services	Related PANS-ATM procedure
DLIC	General	4.15, Data link initiation procedures
ACM (CPDLC establishment and termination)	ATC service	4.15, Data link initiation [and termination] procedures
ACM (transfer of communication)	ATC service, area control service	8.7.5, 10.4.2.4, Transfer of communication
ACL	ATC service	4.5, Air traffic control clearances
ACL	ATC Service, area control service	4.6, Horizontal speed control instructions
ACL	ATC Service	4.7, Vertical speed control instructions
ACL	ATC Service	4.10, Altimeter setting procedures
ACL	ATC service	11.4.2, Movement and control messages
AMC	ATC Service	4.14, Failure and irregularity of communication systems
DCL	ATC service, aerodrome control service	6.3, Procedures for departing aircraft
DSC	ATC Service, area control service	4.6, Horizontal speed control instructions
D-ATIS	FIS	4.10, Altimeter setting procedures 9.1.3, Transmission of information
FLIPCY	ATC service	4.4.3, Acceptance of a flight plan

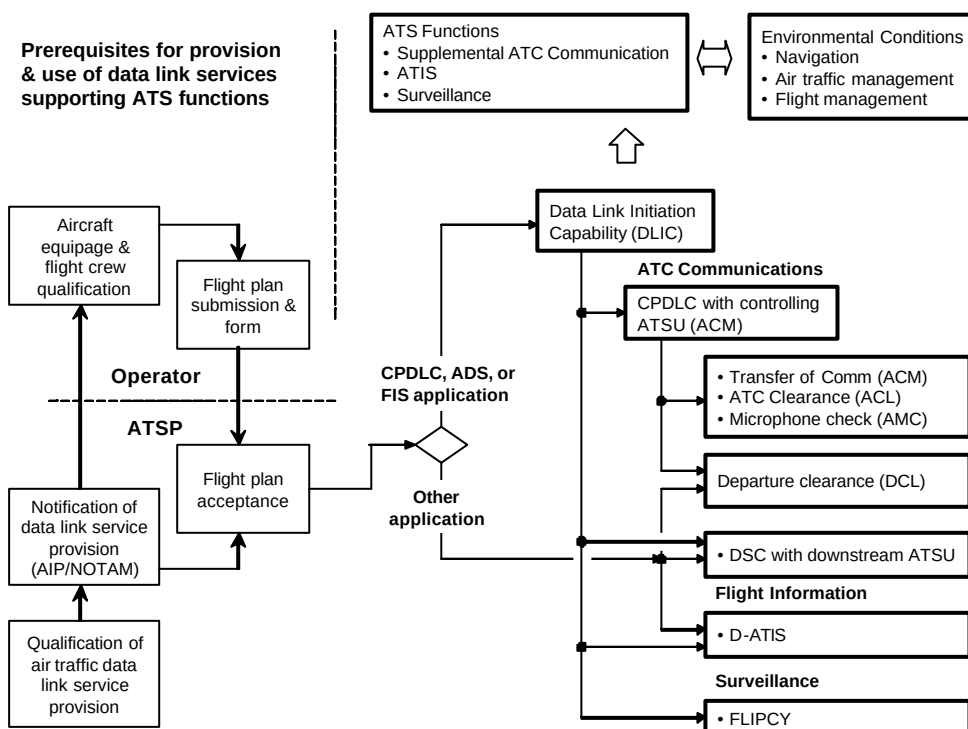


FIGURE 22 : DEPENDENCY DIAGRAM OF DATA LINK SERVICES

2.1.1 ATC communications

Data link services for ATC communications are intended to provide supplemental means to the ATC communications required by the operating rules, e.g., VHF voice communications, in continental airspace. Data link services are characterized as follows:

- a) used in situations where the delay or loss in operational data communications is not significant to the safety of operations. Delay or loss in operational data communications may be significant to operational usefulness of the system.
- b) procedures are established to revert to ATC voice communications, as required by operating rules, and within acceptable time limits when data link service can no longer be provided.
- c) required ATC communication, e.g., VHF voice, has the functionality and performance to satisfy the operational capability provided by the data link services in the event of loss of those data link services.
- d) provides sufficient integrity of operational communications to avoid the need for procedural mitigation of anomalous behavior of the system (e.g., voice read-back of the data message).

2.1.2 Flight information

Data link services provide a means for automatic terminal information service.

NOTE: *There is no requirement for voice ATIS in addition to the D-ATIS.*

2.1.3 Surveillance

Data link services for surveillance will provide supplemental information for the controller to compare with the flight plan used by the ATSU and other information.

2.2 RELATED ATS FUNCTIONS SUPPORTING DATA LINK SERVICES

2.2.1 Provision and use

- a) The ATS provider notifies operators of data link provisions using the AIP or NOTAM. Notification indicates:
 - 1) ATS facility designation;
 - 2) DLIC address;
 - 3) Applications, including for each application: application name, version interoperability coverage, scheduled service, shutdowns, and information/alert bulletins;
 - 4) differences between national regulations and practices and related ICAO SARPs and procedures;
 - 5) requirements for use, including procedures for initiation and RCP type; and
 - 6) flight plan form and submission requirements.

NOTE: *Data link services are provided in an environment that is consistent with the standards set forth in ICAO material as described in [paragraph 1.3.1](#) of this document.*

- b) The operator's operational approval is based on information for use of data link provisions from AIPs/NOTAMs and flight manuals to formulate approved operating specifications. The operator determines:
 - 1) aircraft systems are properly equipped and approved for intended use of the data link services; and
 - 2) flight crews are qualified to use the data link services.

2.2.2

Flight plan

Prior to initiation of data link services, the flight plan is processed.

- a) Operator prepares and submits flight plan per ICAO format. The flight plan indicates:
 - 1) Aircraft identification, Field 7;
 - 2) Aircraft equipage, includes data link designation, subnetwork capability, and aircraft address, Field 10 & 18;
 - 3) Departure Aerodrome, Field 13;
 - 4) Estimated off-block time (EOBT), Field 13;
 - 5) Route, Field 15; and
 - 6) Destination Aerodrome, Field 16.
- b) ATSU is responsible for the origination of the flight and ATSUs along filed route receive, process, and accept the flight plan. ATSUs use information from the filed (accepted) flight plan to:
 - 1) associate flight data obtained from an aircraft with flight plan information;
 - 2) compare flight data with flight plan; and
 - 3) determine whether or not to offer a data link service based on the flight plan/flight data comparison.
- c) Operator executes the aircraft flight plan.

NOTE 1: *The aircraft flight plan data is different than the flight plan data accepted by the ATSU. As a result, while it is intended that the data be consistent, anomalies may occur which can result in inadvertent inconsistencies. The severity of the operational effect of the inconsistencies and appropriate mitigation is provided in the OSA results, as appropriate.*

NOTE 2: *ATSUs along the filed route receive the flight plan via ATS interfacility data communication or other means as established by States and regional agreements.*

CHAPTER 3

ENVIRONMENTAL CONDITIONS

This section defines the types and conditions of the environment, including related ATS functions, that are relevant to operational, safety, and performance requirements established for the data link services. The contents and level of detail are intended to capture the relevant information necessary to:

- establish operational requirements for the data link services;
- establish mitigation strategies and related requirements for hazards identified for the data link services; and
- establish performance requirements for the data link services.

An ATS function is dependent on the capabilities and performances of a complete CNS/ATM system. Also, the capabilities and performances of each of the components, communication, navigation, surveillance, and ATM of the CNS/ATM system are dependent on each other. For instance, the communication and surveillance capability and performance requirements for a given ATS function will depend on the navigation and air traffic management capability and performance requirements. In order to establish the capability and performance requirements for navigation and communication components, it will be necessary to consider the characteristics of relevant navigation, air and traffic management capabilities. Since the requirements for navigation and air traffic management capabilities are dictated by other standards, the characteristics are provided as environmental assumptions. These assumptions are based on a review of ICAO material referenced in [paragraph 1.3.1](#).

NOTE: *Environments that deviate from this ICAO material as described in [paragraph 1.3.1](#) will need to be assessed by the State against the criteria set forth in this standard to determine the suitability of the data link services in such environments*

If the characteristics of the types or conditions provided in this section are not appropriate for an implementation, States may need to assess the impact on the OSA and OPA results based on local conditions.

[Table 3-1](#) presents an overview of environmental types for continental airspace.

[Table 3-2](#) provides specific environmental conditions relevant to the operational safety assessment (OSA) and operational performance assessment (OPA) results.

TABLE 31 : ENVIRONMENTAL TYPES

	ER	TMA	ARR/DEP	Aerodrome
Airspace type	Continental Class A, B, C, D, and E	Continental Class A, B, C, D and E	Continental Class A, B, C, D, and E	Continental Major aerodromes
Communication capability and performance	Primary voice communication	Primary voice communication	Primary voice communication	Primary voice communication
Navigation capability and performance	RNAV/RNP 4 RVSM	RNAV/RNP 1	RNAV/RNP 1	Visual separation
Surveillance capability and performance	Radar service	Radar service	Radar service	Visual and communication
Separation (Horizontal)	5 NM	3-5 NM	3 NM 2.5 to 6 NM on final approach	Longitudinal 2 or 3 minutes or wake turbulence criteria, whichever is greater
Separation (Vertical)	1000 ft RVSM	1000 ft	1000 ft	N/A
Sector density	70 aircraft per hour Maximum of 20 aircraft at any given time	70 aircraft per hour Maximum of 20 aircraft at any given time	48 aircraft per hour Maximum of 15 aircraft at any given time	120 aircraft per hour Maximum of 30 aircraft at any given time
Traffic complexity	RNAV complex route structure	Complex route structure	Complex arrival and departure routes	Complex with visual guidance

TABLE 32 : ENVIRONMENTAL CONDITIONS RELEVANT TO THE OSA AND OPA RESULTS

Reference	Environmental Condition
C-ENV-1	In airspace where ATC data services are used, VHF and/or UHF voice services, as required by the operating rule, are available.
C-ENV-2	A controlled flight is under the control of only one controller at a time.
C-ENV-3	Surveillance enables the controller to detect incorrect aircraft movement.
C-ENV-4	Flight plan submission and processing, see paragraph 2.2.2 .
C-ENV-5	Provision and use of data link services, see paragraph 2.2.1 .
C-ENV-6	The airspace to which the clearance pertains is protected until the controller receives the response.
C-ENV-7	The users are properly trained to use data link.
C-ENV-8	Where a D-ATIS supplements the existing availability of Voice-ATIS, the information shall be identical in both content and format to the applicable Voice-ATIS broadcast.
C-ENV-9	The flight crew executes received instructions/clearances and updates onboard avionics in a timely manner.
C-ENV-10	An ATSU accumulates an average of 1×10^6 or more flight hours (includes flight hours only of aircraft that are filing to use the data link services) per year (8766 hours of continuous operation), this results in a relationship of 100 flight hours per ATSU hour.
C-ENV-11	An average of 10 or less data link service transactions that can result in a level 3 hazard are processed per flight hour. Note: This is the cumulative total across all data link services.

CHAPTER 4

DATA LINK INITIATION CAPABILITY (DLIC)

4.1

DLIC SERVICE DESCRIPTION

The DLIC service shall be provided and used in accordance with the service descriptions provided herein (SD-DLIC-1).

The DLIC service is executed prior to any other data link service. The service exchanges information between an aircraft and an ATSU to support other data link services. The DLIC service is used to uniquely identify an aircraft. The DLIC service provides version and address information for all data link services including itself.

The DLIC information must be available for each ATSU that will offer data link services. This can be accomplished by initiating the DLIC function between each ATSU and the aircraft. However, the DLIC initiation function only needs to be completed once for a given flight. In this case, the ATSU with which the initiation function was conducted either:

- provides all other required ATSU's information in the DLIC initiation response; or,
- allows other ATSUs to access the DLIC initiation information (e.g., DLIC server); or,
- provides aircraft DLIC initiation information to a subsequent ATSU, and each subsequent ATSU again passes the DLIC initiation information to its subsequent ATSU.

The DLIC service consists of the following functions:

- a) Initiation (I): The initial means to exchange application information between an aircraft and ATSU, and to provide flight data to an ATSU. This function is between a given aircraft-ATSU pair, but when available, information for other ATSUs may be exchanged (e.g., up to eight); and
- b) Contact (C): An ATSU provides the DLIC address of a specified ATSU to an aircraft and requests the initiation function be performed between the aircraft and the specified ATSU. The specified ATSU is different from the ATSU requesting the contact; and
- c) Update (U): An ATSU provides its updated initiation information to an aircraft. The ATSU may also update the information for other ATSUs when the ATSU has such initiation information. When an ATSU has received DLIC information from another ATSU, it may use the DLIC update function with an aircraft with which it has not executed the DLIC initiation function.

Figure 4-1 provides an overview of message exchanges between an aircraft and ATSUs for the DLIC initiation, contact, and update functions.

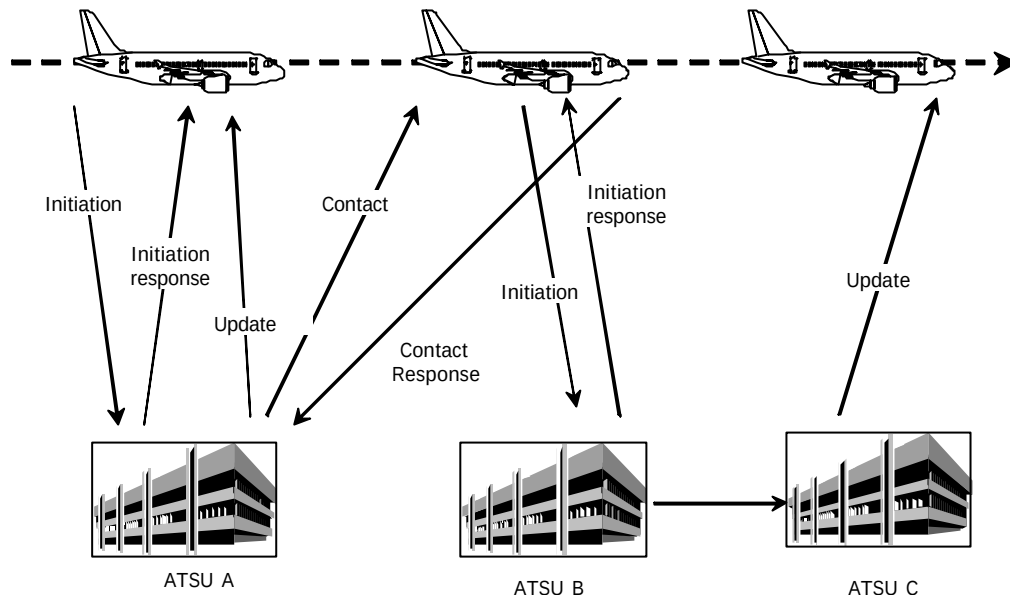


FIGURE 4-1 : OVERVIEW OF DLIC MESSAGE EXCHANGES

4.1.1 DLIC operating methods, time sequence diagrams, and messages

4.1.1.1 DLIC initiation function operating method

The DLIC initiation function operating method is shown in [Table 4-1](#).

4.1.1.2 DLIC initiation function time sequence diagram

[Figure 4-2](#) provides a time sequence diagram of the DLIC messages used by the DLIC initiation function. When air-ground messages are exchanged, numbers shown in the diagram map to steps in the DLIC initiation function operating method [Table 4-1](#).

4.1.1.3 DLIC contact function operating method

The DLIC contact function operating method is shown in [Table 4-2](#).

4.1.1.4 DLIC contact function time sequence diagram

[Figure 4-3](#) provides a time sequence diagram for the messages used by the DLIC contact function. When air-ground messages are exchanged, numbers shown in the diagram map to steps in the DLIC contact function operating method in [Table 4-2](#).

TABLE 41 : DLIC INITIATION FUNCTION OPERATING METHOD

Step	Operating Method
1	Aircraft sends initiation message to ATSU including: • information on each requested application for data link service, • flight plan information to allow unambiguous association of the aircraft with the flight plan information used by an ATSU, and • optionally request for information for up to eight other ATSUs.
2	ATSU receives DLIC initiation message.
3	ATSU may correlate its flight plan information with the flight plan information received from the aircraft.
4S	ATSU sends initiation response to aircraft indicating success including: • information on each supported application that was requested, • when requested and available, information for other ATSUs.
5	When successful, the ATSU: • either retains initiation information, when no such information was previously received for the aircraft, or replaces initiation information when such information was previously received for the aircraft, • makes initiation information available to other applications, and • may provide indication to controller.
4F	ATSU sends initiation response to aircraft indicating failure • explicit failure indication, or • response containing no information (blank).
6	Upon receipt of initiation response, the aircraft : • retains initiation information when provided in the initiation response; • may indicate such to the flight crew.

TABLE 42 : DLIC CONTACT FUNCTION OPERATING METHOD

Step	Operating Method
1	The requesting ATSU sends a contact message to the aircraft instructing the aircraft to perform the DLIC initiation function with the specified ATSU. The contact instruction indicates the ATS facility designation of the ATSU with which the aircraft is to perform the initiation function.
2	The aircraft sends a DLIC initiation message to the specified ATSU including: • information on each requested application for data link service, • flight information to allow unambiguous association of the aircraft with the ATSU's flight plan information.
3	Specified ATSU receives DLIC initiation message
4	Specified ATSU may correlate aircraft flight plan information with ATSU flight plan information.
5S	Specified ATSU sends initiation response to aircraft indicating success including information on each supported application that was requested.
6S	When successful the specified ATSU: • retains initiation information, when no such information was previously received for the aircraft, or • replaces the information when such information was previously received for the aircraft, • makes initiation information available to other applications, and • may provide indication to controller.
5F	Specified ATSU sends initiation response to aircraft indicating failure • explicit failure indication, or • response containing no information (blank).
7	Upon receipt of initiation response, the aircraft system: • retains initiation information when provided in the initiation response; may indicate such to the flight crew.
8	The aircraft sends a message to the requesting ATSU indicating whether the requested contact succeeded or failed. <u>Note:</u> Success indicates that the initiation function was completed with the specified ATSU whether or not the initiation response was successful. Failure indicates that the aircraft was unable to complete (or start) initiation function with the specified ATSU.

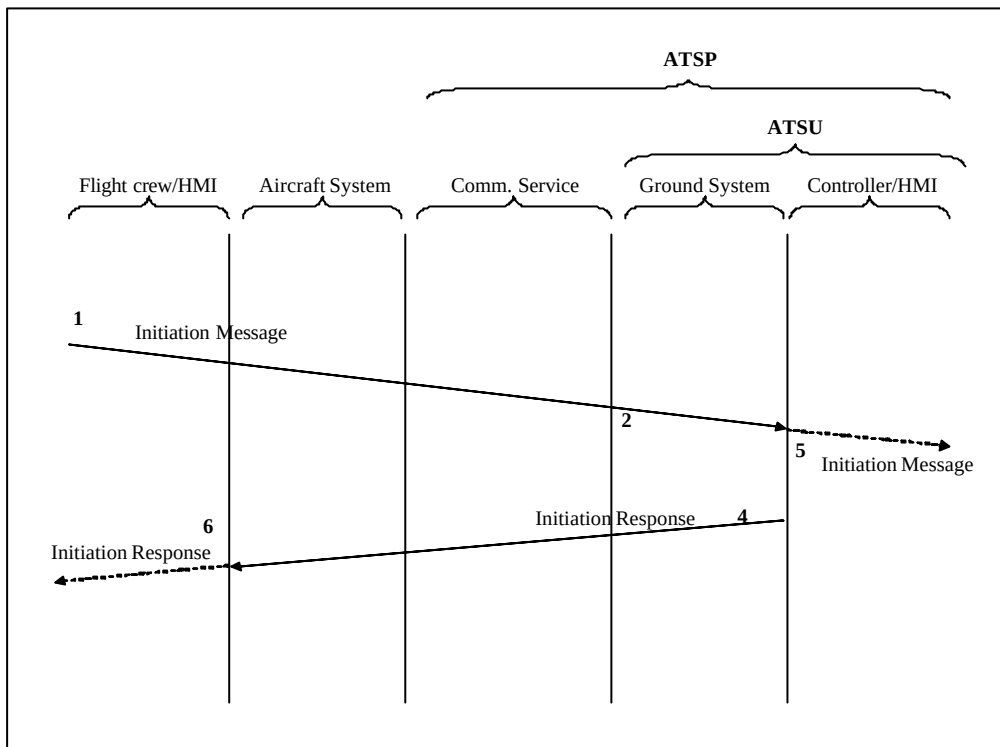


FIGURE 42 : DLIC INITIATION FUNCTION TIME SEQUENCE DIAGRAM

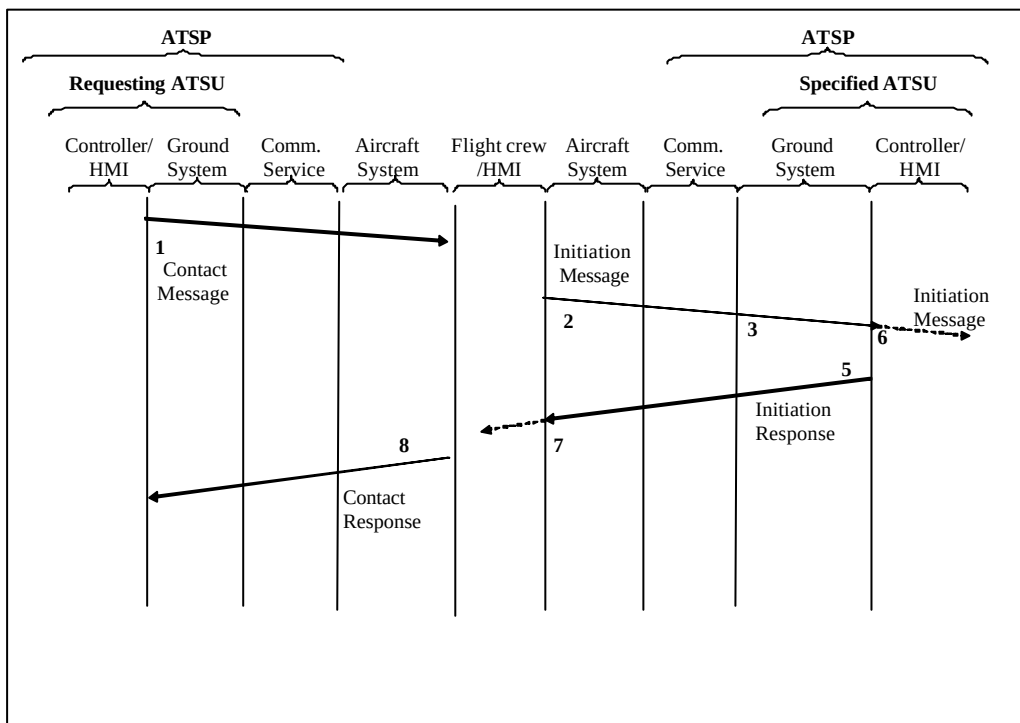


FIGURE 43 : DLIC CONTACT FUNCTION TIME SEQUENCE DIAGRAM

4.1.1.5 DLIC update function operating method

The DLIC update function operating method is as shown in [Table 4-3](#).

TABLE 43 : DLIC UPDATE FUNCTION OPERATING METHOD

Step	Operating Method
1	The ATSU sends a update message to the aircraft containing DLIC information that has changed since the completion of the DLIC initiation function with the aircraft
2	Upon receipt of the update message the aircraft system: • replaces the changed DLIC information, and • may indicate receipt to the flight crew. <u>Note:</u> All unchanged DLIC information remains as is.

4.1.1.6 DLIC update function time sequence diagram

[Figure 4-4](#) provides a time sequence diagram for the DLIC messages used by the DLIC update function. When air-ground messages are exchanged, numbers shown in the diagram map to steps in the DLIC update function operating method [Table 4-3](#).

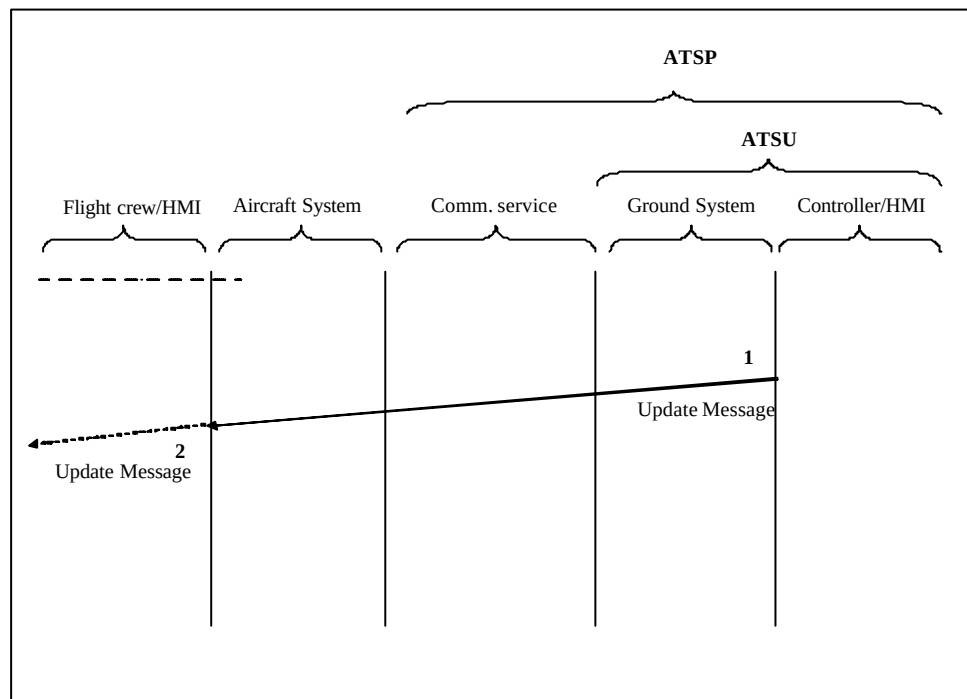


FIGURE 44 : DLIC UPDATE FUNCTION TIME SEQUENCE DIAGRAM

4.1.1.7 DLIC messages

Table 4-4 provides the DLIC messages exchanges between an aircraft and an ATSU, the message contents, and the applicable DLIC function.

TABLE 44 : DLIC MESSAGES

Message	Message contents	Applicable Function
Initiation message	- DLIC address, - aircraft address, - for each requested application that can only be initiated by the air:, - name - version - for each requested application and that can be initiated by the ATSU, - name - version - address - aircraft identification (as required), - facility designation for which information is desired if different than addressed ATSU - flight information: - departure airport, - destination airport, and - estimated off-block time (EOBT) (when available). - or - position and - time at position - up to eight other ATSUs for which the application information is requested (optional)	Initiation Contact

TABLE 4-4 : DLIC MESSAGES (CONTINUED)

Message	Message contents	Applicable Function
Initiation response	- for each supported application that can be initiated by the air - name, - version, and - address, and - for each supported application that is only permitted to be ATSU initiated - name and - version - when supported, information for up to eight other ATSU's for which the application information was requested - or - failure indication - or - no information (blank response indicating failure)	Initiation Contact
Contact message	- specified facility designation, and - DLIC address for specified facility.	Contact
Contact response	indication of success or failure of requested contact	Contact
Update message	- updated aircraft initiated applications (optional), and - updated ATSU initiated applications (optional).	Update

4.1.2 DLIC abnormal events

Table 4-5 presents abnormal events (when applicable) for each of the steps in the operating method for the DLIC initiation (Table 4-1), DLIC contact (Table 4-2) and DLIC update (Table 4-3) function operating methods.

TABLE 45 : DLIC ABNORMAL EVENTS

Abnormal Event Reference #	Abnormal Event	Operational Result	Operating Method Reference
AE-DLIC-1	Aircraft cannot send initiation request	No data link for affected aircraft	Table 4-1 step 1 Table 4-2 step 2
AE-DLIC-2	Initiation request is received by unintended ATSU	Possible unintended ATSU initiates data link with aircraft	Table 4-1 step 2 Table 4-2 step 3

TABLE 4-5 : DLIC ABNORMAL EVENTS (CONTINUED)

Abnormal Event Reference #	Abnormal Event	Operational Result	Operating Method Reference
AE-DLIC-3	No response received within acceptable time to a DLIC initiation request.	Initiation request can be sent again Unless and until a response is received, no air-initiated data link services can occur (e.g., D-ATIS). Unless and until a response is received, the status of ATSU-initiated data link services is unknown for the aircraft: when ATSU did not receive initiation information; no data link services, or when ATSU did receive initiation information then for each ATSU initiated application for which initiation was successful, ATSU may initiate data link.	Table 4-1 step 4 Table 4-2 step 5
AE-DLIC-4	Application data, version, name, or address data not included or corrupted (detected and not usable) for a given or all applications in either initiation request or response.	For each application that the data is not included/corrupted in the initiation request, that application information will not be included in the response, and subsequently not available. For each application that the data is not included/corrupted in the initiation response: For air initiated applications, the application will not be available for aircraft initiation, For ATSU initiated applications the situation is ambiguous, the ATSU may or may not initiate the application.	Table 4-1 step 1/4 Table 4-2 step 2/5

Abnormal Event Reference #	Abnormal Event	Operational Result	Operating Method Reference
AE-DLIC-6	Flight plan information not received in DLIC initiation request, or flight plan information received but aircraft flight plan information fails to correlate with ATSU flight plan information.	For ATSUs performing flight plan correlation prior to sending a DLIC initiation response, initiation will fail (blank response). For ATSUs performing flight plan correlation after sending a DLIC initiation response, the DLIC response may indicate success, but ATC services requiring successful flight plan correlation, will not be offered.	Table 4-1 step 3 Table 4-2 step 4

TABLE 4-5 : DLIC ABNORMAL EVENTS (CONTINUED)

Abnormal Event Reference #	Abnormal Event	Operational Result	Operating Method Reference
AE-DLIC-7	Flight plan information received in DLIC initiation request falsely correlates with ATSU flight plan information e.g., data corrupted, but correlates, data correlates, but not correct aircraft data (e.g., hull swap) flight plan correlation function fails and false match results	No error will be apparent and data link services may be initiated with unintended aircraft.	Table 4-1 step 3 Table 4-2 step 4
AE-DLIC-8	No response received, or no response received within acceptable time to a DLIC contact request.	Contact request can be sent again. When the requesting ATSU does not receive a contact response, the ATSU cannot determine whether or not the requested initiation function occurred. However, this does not affect whether or not data link services will result with the specified ATSU.	Table 4-2 step 8

4.2 DLIC OSA RESULTS

This section provides the OSA results based on the service description provided in [paragraph 4.1](#).

4.2.1 DLIC hazards and safety objectives

Since DLIC is a prerequisite to all other data link services, there are no hazards or safety objectives associated with the DLIC service. The DLIC functionality is assessed in the context of the other services. The resulting safety requirements are based on the safety objectives for the other services.

4.2.2 DLIC safety requirements

Table 4-6 presents the DLIC safety requirements resulting from the hazard assessment.

TABLE 46 : DLIC SAFETY REQUIREMENTS

Safety Requirement Reference #	Safety Requirement	Safety Objective Reference #
SR-DLIC-1	When flight plan correlation is performed as part of DLIC, an ATSU shall reject the initiation request if the flight identifier, departure or arrival aerodrome contained in the DLIC message does not match the ATSU's corresponding flight plan information.	SO-ACM-5 SO-ACM-7 SO-ACL-9 SO-ACL-10 SO-AMC-3 SO-DCL-9 SO-DCL-10 SO-DSC-9 SO-DSC-10 SO-DATIS-5 SO-FLIPCY-6
SR-DLIC-2	ATSUs and aircraft shall not permit data link services when there are non compatible version numbers	SO-ACM-9 SO-ACM-11 SO-ACL-12 SO-ACL-13 SO-DCL-12 SO-DCL-13 SO-DSC-12 SO-DSC-13 SO-DATIS-3 SO-FLIPCY-4
SR-DLIC-3	The aircraft shall perform the initiation function again with applicable ATSUs when any of the application or flight information changes.	SO-ACM-5 SO-ACM-7 SO-ACL-9 SO-ACL-10 SO-AMC-3 SO-DCL-9 SO-DCL-10 SO-DSC-9 SO-DSC-10 SO-DATIS-5 SO-FLIPCY-6

TABLE 4-6 : DLIC SAFETY REQUIREMENTS (CONTINUED)

Safety Requirement Reference #	Safety Requirement	Safety Objective Reference #
SR-DLIC-4	The ATSU shall perform the correlation function again when the flight plan information used for correlation changes after correlation has been completed, but prior to initiating an application requiring such correlation (e.g., CPDLC).	SO-ACM-5 SO-ACM-7 SO-ACL-9 SO-ACL-10 SO-AMC-3 SO-DCL-9 SO-DCL-10 SO-DSC-9 SO-DSC-10 SO-DATIS-5 SO-FLIPCY-6

Safety Requirement Reference #	Safety Requirement	Safety Objective Reference #
SR-DLIC-5	The ATSU shall delete and replace all previously held application data relating to an aircraft after a successful DLIC initiation function	SO-ACM-5 SO-ACM-7 SO-AMC-3 SO-DATIS-5
SR-DLIC-6	ATSUs shall not permit data link services when the aircraft flight plan information fails to correlate with the ATSU's corresponding flight plan information.	SO-ACM-5 SO-ACM-7 SO-ACL-9 SO-ACL-10 SO-AMC-3 SO-DCL-9 SO-DCL-10 SO-DSC-9 SO-DSC-10 SO-DATIS-5 SO-FLIPCY-6

TABLE 4-6 : DLIC SAFETY REQUIREMENTS (CONTINUED)

Safety Requirement Reference #	Safety Requirement	Safety Objective Reference #
SR-DLIC-7	Any processing (data entry/encoding/ transmitting/decoding/ displaying) shall not affect the intent of the DLIC message.	SO-ACM-9 SO-ACM-11 SO-ACL-9 SO-ACL-10 SO-ACL-12 SO-ACL-13 SO-DCL-9 SO-DCL-10 SO-DCL-12 SO-DCL-13 SO-DSC-9 SO-DSC-10 SO-DSC-12 SO-DSC-13 SO-DATIS-3 SO-FLIPCY-4 SO-FLIPCY-6
SR-DLIC-8	The aircraft system shall insert the relevant initiation data in initiation message.	SO-ACL-9 SO-ACL-10 SO-ACL-12 SO-ACL-13 SO-DCL-9 SO-DCL-10 SO-DCL-12 SO-DCL-13 SO-DSC-9 SO-DSC-10 SO-DSC-12 SO-DSC-13 SO-FLIPCY-4 SO-FLIPCY-6

4.3 DLIC OPA RESULTS

This section provides the OPA results based on the service description provided in paragraph 4.1.

NOTE: The Update function does not require an operational response. Therefore, there are no performance objectives or requirements for this function.

4.3.1 DLIC performance objectives

The DLIC performance objectives are shown in Table 4-7. Since there are no safety objectives defined for DLIC, the performance objectives quantified for QSPL are derived based on the most stringent safety objectives for the data link services DLIC supports and the resulting safety requirements applied to the DLIC service.

- Initiation function is designated "I"
- Contact function is designated "C"

4.3.2 DLIC performance requirements

The DLIC service shall meet the performance requirements presented in Table 48 and Table 4-9 as applicable.

TABLE 47 : DLIC PERFORMANCE OBJECTIVES

Performance Objective Reference	Environmental conditions	Performance Objective		Safety objective or operational expectation Reference (Source)
		Description of parameter	Value	
PO-DLIC-I-1 PO-DLIC-C-1	C-ENV-1	QSPL _{UIT}	No requirement	None
PO-DLIC-I-2 PO-DLIC-C-2	C-ENV-5	QOPL _{UIT}	10^{-2}	Table 4-1 step 1 Table 4-2 step 1
PO-DLIC-I-3 PO-DLIC-C-3	C-ENV-1	QSPL _{LOCP}	No requirement	None
PO-DLIC-I-4 PO-DLIC-C-4	C-ENV-5	QOPL _{LOCP}	$7 \cdot 10^{-3}$	Table 4-2 step 4 Table 4-2 step 5
PO-DLIC-I-5 PO-DLIC-C-5	C-ENV-1	QSPL _{LOS}	No requirement	None
PO-DLIC-I-6 PO-DLIC-C-6	C-ENV-5	QOPL _{LOS}	10^{-3}	Table 4-1 step 1 Table 4-2 step 1
PO-DLIC-I-7 PO-DLIC-C-7	C-ENV-11	QSPL _{UCT}	10^{-5}	SO-ACM-5 SO-ACM-7 SO-ACL-9 SO-ACL-10 SO-AMC-3 SO-DCL-9 SO-DCL-10 SO-DSC-9 SO-DSC-10 SO-DATIS-5 SO-FLIPCY-6 SO-FLIPCY-7
PO-DLIC-I-8 PO-DLIC-C-8	C-ENV-10	QOPL _{UCT}	10^{-5}	Table 4-1 all Table 4-2 all

TABLE 48 : DLIC INITIATION PERFORMANCE REQUIREMENTS

Service	DLIC initiation					
Notes	<u>Note 1</u>: The performance requirements are applicable to all defined environments. <u>Note 2</u>: The operational response is generated by the system and therefore, the controller will not be notified upon expiry of ETRESPONDER. <u>Note 3</u>: Values for these parameters are to be specified by each state. <u>Note 4</u>: The allocations for C, A(USE), A(Provision), and I, may need to be adjusted as further validation is necessary. <u>Note 5</u>: A(PROVISION) is a requirement for the ATSP. Allocation is not necessary since the requirement is not shared.					
Parameter	ET	TT(95)	C	A(USE)	A(PROV- ISION)	I
Source	O	O	QOPL _{UIT}	QOPL _{LOCP}	QOPL _{LOS}	QSPL _{UCT}
RCP	See <u>Note 3</u>	See <u>Note 3</u>	0.99	0.993	0.999	10 ⁻⁵
RCP Allocations						
Initiator	See <u>Note 3</u>	See <u>Note 3</u>	See <u>Note 3</u>	See <u>Note 4</u>	See <u>Note 4</u>	See <u>Note 4</u>
TRN	60	30	0.99	0.993	See <u>Note 5</u>	10 ⁻⁵
TRN Allocations						
Responder	20	6	0.995	See <u>Note 4</u>	See <u>Note 4</u>	See <u>Note 4</u>
RCTP	40	24	0.995	0.993	See <u>Note 5</u>	10 ⁻⁵

TABLE 49 : DLIC CONTACT PERFORMANCE REQUIREMENTS

Service	DLIC contact					
Notes	<u>Note 1</u>: The performance requirements are applicable to all defined environments. <u>Note 2</u>: Responder and RCTP times are double the DLIC initiation values due to the involvement of two ATSUs to complete the transaction. <u>Note 3</u>: The operational response is generated by the system and therefore, the controller will not be notified upon expiry of ET_{RESPONDER}. <u>Note 4</u>: Values for these parameters are to be specified by each state. <u>Note 5</u>: The allocations for C, A(USE), A(Provision), and I, may need to be adjusted as further validation is necessary. <u>Note 6</u>: A(PROVISION) is a requirement for the ATSP. Allocation is not necessary since the requirement is not shared.					
Parameter	ET	TT(95)	C	A(USE)	A(PROV- ISION)	I
Source	O	O	QOPL _{UIT}	QOPL _{LOCP}	QOPL _{LOS}	QSPL _{UCT}
RCP	See <u>Note 4</u>	See <u>Note 4</u>	0.99	0.993	0.999	10 ⁻⁵
RCP Allocations						
Initiator	See <u>Note 4</u>	See <u>Note 4</u>	See <u>Note 4</u>	See <u>Note 5</u>	See <u>Note 5</u>	See <u>Note 5</u>
TRN	120	60	0.99	0.993	See <u>Note 6</u>	10 ⁻⁵
TRN Allocations						
Responder	40	12	0.995	See <u>Note 5</u>	See <u>Note 5</u>	See <u>Note 5</u>
RCTP	80	48	0.995	0.993	See <u>Note 6</u>	10 ⁻⁵