

TECHNICAL SPECIFICATIONS AND REQUIREMENTS FOR THE SUPPLY OF DATA LINK SYSTEM

Prepared by CNS/ATM systems department

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1 Introduction

1.1 Purpose

Slovenia Control Ltd. (referred to as: the Contracting authority – or SCL) plans to implement Data link service as required in European Commission Regulation No 29/2009 and implementing regulation 2015/310.

According to ATM network structure and existing FDP system Slovenia Control - SCL wants to purchase reliable DL-FEP and ATN G/G router together (referred to as: Data Link system) to implement all required Data Link capabilities into the ATM structure.

1.2 Scope

Implementation process shall be divided in two phases.

The first phase shall include the following:

- Delivery of the system,
- Training,
- Instalation of DL-FEP servers,
- Instalation of ATN G/G router(s).

The second phase shall include the following:

- Connection Datalink system with FDPS and CSP's,
- Validation of the Datalik system,
- End – to – End Validation of the CPDLC service.

1.3 General

ID	Requirments	Conformity YES/NO – references to evidence
GERQ0010	The submitted tender documentation together with submitted technical documentation shall be neatly sorted in adequate sections and bound.	
GERQ0020	The response to the specification is required to be comprehensive with a completed Compliance Matrix as set out below.	
GERQ0030	The Suplier is expected to provide references, about at least two successfully completed Datalink projects (system installed) and integrated into ANSP's centres, which were certified to fully comply with EU legislation requirements regarding Datalink.	

GERQ0040	Suppliers are encouraged to offer the existing baseline products that are compliant with or equivalent to all mandatory requirements.	
GERQ0050	<p>The compliance matrix in an Appendix of this document provides an entry for each requirement. Each row of the table uniquely identifies each paragraph requiring response in this specification by Chapter, Paragraph (and sub paragraph).</p> <p>The Supplier shall also provide additional remarks if they are considered helpful for assessing the response (column Remarks in the compliance matrix). Each remark shall be uniquely referred to corresponding document (Chapter, Paragraph).</p>	
GERQ0060	The Supplier compliance status shall be indicated against each paragraph of this specification in the 'Compliance' column with a C for Compliance or an N for Non-Compliance. No other response shall be recognised during the evaluation and absence of C or N shall be counted as Not Compliant.	
GERQ0070	The Supplier shall provide the proof/explanation of every indicated C - Compliance in the 'Compliance' column. Additionally, where the answer can be found in the submitted documentation, the Supplier shall provide the reference and point to the specific line/paragraph/chapter/document where the compliance status can be verified.	

1.4 Reference Documents

Wherever reference is made in this technical specification to specific regulations, standards and codes, the provisions of the latest current edition or revision of the relevant regulations, standards or codes in effect shall apply unless otherwise expressly stated in the technical specifications. Where such standards and codes are national or related to a particular country or region, other authoritative standards that ensure substantial equivalence to the standards and codes specified will be acceptable.

1.4.1 Standards

ID	Requirments	Conformity YES/NO – references to evidence
RDST0010	<p>The whole supplied equipment shall work completely in conformity with the following documents:</p> <ul style="list-style-type: none"> ▪ ICAO Annex 10, Vol. II ▪ ICAO Annex 10, Vol. III ▪ ICAO Doc 4444 	

	<ul style="list-style-type: none"> ▪ ETSI EN 303 214 (latest official edition) Data link services (DLS) system; Community specification for application under the single European sky interoperability regulation EC 552/2004; Requirements for ground constituents and system testing. ▪ Interoperability Requirements Standard for Aeronautical Telecommunication Network Baseline 1 (ATN B1 Interop Standard) – EUROCAE ED-110B ▪ Safety and Performance Requirements Standard for Air Traffic Data Link Services in Continental Airspace – EUROCAE ED-120 	
RDST0020	<p>The equipment shall also meet the following standards for electrical safety:</p> <p>IEC 60950 - International Safety Standard for Information Technology Equipment</p>	
RDST0030	<p>The Data Link equipment shall be newly-produced and shall meet the requirements for Data link front end processor and ATN G/G router laid down in standard documents listed in RDST0010.</p>	

A TENDER FOR THE EQUIPMENT WHICH DOES NOT COMPLY WITH ALL ABOVE LISTED REQUIREMENTS SHALL BE AUTOMATICALLY REJECTED BY THE SCL.

1.4.2 Regulatory Documents

ID	Requirments	Conformity YES/NO – references to evidence
RDRD0010	The offered concept, design and equipment shall be fully compliant with EC Reg. No. 29/2009 laying down requirements on data link services for the single European sky (DLS) amended by Commission implementing Regulation (EU) 2015/310.	
RDRD0020	The offered concept, design and equipment shall be fully compliant with EC Reg. No. 1032/2006 laying down requirements for automatic systems for the exchange of flight data for the purpose of notification, coordination and transfer of flights between air traffic control units.	
RDRD0030	The offered concept, design and equipment shall be fully compliant with EC Reg. No. 30/2009 amending Regulation EC No. 1032/2006 as far as the requirements for automatic systems for the exchange of flight data supporting data link services are concerned.	

A TENDER FOR THE EQUIPMENT WHICH DOES NOT COMPLY WITH ALL ABOVE LISTED REQUIREMENTS SHALL BE AUTOMATICALLY REJECTED BY THE SCL.

1.5 Definitions

Term/Phrase	Definition
Availability	A measure of the degree to which an item is in an operable state at any time.
Reliability	The probability that an item will perform its intended function for a specified interval under stated conditions.
Maintainability	A measure of the ability of an item to be retained in, or restored to, a specified condition when maintenance is performed using prescribed procedures and technician skill levels.
Consumable spare	Expendable item, such as fuses, hard drives, air filters, etc., that can be easily replaced by use of standard tools and procedures.

1.6 Abbreviations

Abbreviation	Meaning, description
ACC	Area Control Centre
AC	Alternating Current
COTS	Commercial-Of-The-Shelf
DT	Delivery Time. Defined as the time elapsed between the date of order of a part by the SCL (in case of need of the order of additional spare parts) and the date of shipment of ordered part from the Supplier to the SCL.
FAT	Factory Acceptance Test
LAN	Local Area Network
MRT	Mean Response Time in hours (i.e. the average time from notification of failure for a technician to be ready to commence repair action).
MTBF	Mean Time Between Failures. A basic measure of reliability for repairable items. The average time during which all parts of the item perform within their specified limits, during a particular measurement period under stated conditions.
MTTR	Mean Time To Repair. A basic measure of maintainability. The sum of corrective maintenance times divided by the total number of failures within an item. The average time it takes to fully repair a failed system. Typically includes fault isolation, remove and replacement of failed item(s) and checkout. It excludes logistics downtime needed for spare part transport from stock to the installation site.
OAT	Operational Acceptance Test
MCS	Monitoring and Control System
SCL	Slovenia Control Ltd.
SRU	Shop Replaceable Unit, defined as a unit which is replaced within a LRU and is repairable.
TAT	Turn-Around-Time. The time elapsed between the date of arrival of the faulty item at repair workshop and the date of shipment of the repaired (or replaced) item from the repair workshop to the SCL.

2 Functional and Technical Requirements

2.1 General

ID	Requirments	Conformity YES/NO – references to evidence
FTGE0010	If any changes to the design (proposed by SCL) are necessary to meet the Specifications, the Supplier shall carry out such changes at no cost to the SCL.	
FTGE0020	The Supplier shall be responsible for the system engineering efforts associated with the design, production, installation, testing of the systems and equipment being provided.	
FTGE0030	The Supplier shall design a Data Link system according to the specified system described in this document and in its attachment diagrams.	
FTGE0040	The Supplier shall deliver detailed schematic diagrams for Data Link system layout interconnection from which a general and detailed design of the all Data Link system shall be clearly visible.	
FTGE0050	The Supplier shall deliver schematic diagrams how the system is connected to PENS, FDPS, Remote console, etc.	
FTGE0060	Provider shall offer a commercial-off-the-shelf (COTS) system with references of at least 2 installations in Eurocontrol member states.	

2.2 Functional

2.2.1 Position of Equipment

2.2.1.1 Positioning of Equipment

Operational:

ID	Requirments	Conformity YES/NO – references to evidence
POSE0010	Operational equipment (DL-FEP, ATN router) shall be installed in technical rooms (TEH1&TEH2) as hot/stby system configuration. For that purpose 19" racks will be prepared by SCL.	

Offline:

ID	Requirments	Conformity YES/NO – references to evidence
POSE0020	All equipment for test and validation purposes shall be placed in offline room. For that purpose 19” racks will be prepared by SCL.	

2.2.2 Quantity of DL-FEP

The Supplier shall offer appropriate equipment HW and SW to ensure its full functionality for the following purpose:

ID	Requirments	Conformity YES/NO – references to evidence
QTYE0010	The DL-FEP in operational environment shall run on two (2) servers with full functionalities.	
QTYE0020	The DL-FEP in test & validation environment shall run on two (2) servers with full functionalities.	

2.2.3 Quantity of ATN G/G Router

ID	Requirments	Conformity YES/NO – references to evidence
QTYE0030	At least 2 (two) pcs. of ATN routers are needed for operational use.	
QTYE0040	At least 1 (one) ATN router is needed for test & validation use.	

2.2.4 Quantity of other Test equipment

ID	Requirments	Conformity YES/NO – references to evidence
QYTE0050	For test & validation environment one piece of a test tool – test equipment shall be provided.	

2.2.5 Quantity of other equipment

ID	Requirments	Conformity YES/NO – references to evidence
QTYE0060	The Supplier shall offer other equipment if it is needed to complete the Datalink System as requested by SCL.	

2.2.6 Delivery

SCL development team set out delivery time for specific item as follow, but Supplyer is encourage to deliver equipment as soon as possible.

ID	Requirments	Conformity YES/NO – references to evidence
DLIV0010	The Supplier shall deliver: <ul style="list-style-type: none">- 2 pcs of DL-FEP and 1 pcs test equipment not later then 1.9.2017	
DLIV0020	All other equipment shall be delivered not latere then 1.11.2017.	
DLIV0030	Operational acceptance test shall be done not later then 15.12.2017	

2.3 System

2.3.1 DL-FEP specifications

ID	Requirments	Conformity YES/NO – references to evidence
DLFE0010	Provider shall offer a linux based product.	
DLFE0020	DL-FEP shall allow customizations of interfaces to fit into SCL internal network and communication infrastructure.	
DLFE0030	DL-FEP shall be connected into internal networks with IPv4 addressing. Note: Detailed information about SCL internal network and communication infrastructure essential for successful integration is described in other requirements.	

DLFE0040	DL-FEP shall provide following data link services: <ul style="list-style-type: none"> • Data Link Initiation Capability (DLIC); • ATC communication management service (ACM); • ATC clearance and information service (ACL); • Microphone check service (AMC); 	
DLFE0050	DL-FEP shall support at least: <ul style="list-style-type: none"> • 100 CPDLC active connections • A peak throughput of 200 messages per minute on all interfaces • up to 500 logged in aircraft 	
DLFE0060	DL-FEP shall include interface for connection with FDP.	
DLFE0070	DL-FEP shall support FMTP connection for messages exchange with FDP.	
DLFE0080	DL-FEP shall support TCP/IP connection for exchange of messages with FDPS in ASN.1 format.	
DLFE0090	Messages between DL-FEP and FDPS shall be exchanged in ASN.1 BER format.	
DLFE0100	DL-FEP shall support connection to a minimum of two CSP's ATN networks.	
DLFE0110	Local legal recording functionality shall be supported. Note: The system shall record locally all the messages received and sent. The system shall keep the messages for at least 92 days.	
DLFE0120	DL-FEP shall support connection for external legal recording. Note: The external recording system shall receive the messages via UDP or TCP/IP protocol.	
DLFE0130	Recording shall save at least the following information: <ul style="list-style-type: none"> • timestamp in text format, • type of message in text format, • message content in text format, • sender information in text format, • receiver information in text format, • optionally, the whole packet content in binary format. 	
DLFE0140	If recorded information is not stored in text format, tools shall be provided to view, search and analyze the data.	
DLFE0150	The Datalink FEP shall synchronise its system time via NTP.	
DLFE0160	DL-FEP shall provide redundant network connections to high availability FDPS cluster.	
DLFE0170	DF-FEP shall connect to active server of FDPS cluster, which owns the cluster IP address.	

	Note: If active/standby roles are changed in the FDPS cluster, the cluster address is moved to new active server and DL-FEP shall connect to the same IP address, which has moved to another server.	
DLFE0180	DL-FEP shall provide redundant network connections to ATN routers.	
DLFE0190	All other network connections on DL-FEP shall be redundant.	
DLFE0200	All network connections on DL-FEP shall be Lan Ethernet (RJ45 connectors).	
DLFE0210	DL-FEP shall be provided in high availability HW configuration for operational and test environment.	
DLFE0220	HW equipment shall be COTS and rack-mountable for standard 19" racks.	
DLFE0230	DL-FEP software shall provide high availability solution with Active/Hot standby configuration.	
DLFE0240	Any SW licences required for DL-FEP shall be described in detail and their fees specified in the total price.	

2.3.1.1 Data Link Initiation Capability (DLIC)

ID	Requirements	Conformity YES/NO – references to evidence
DLFE0300	DL-FEP implementations of the DLIC service shall comply with the interoperability requirements specified in ED-110B	
DLFE0310	DLIC implementations shall satisfy the performance requirements specified in ED-120.	
DLFE0320	DLIC implementations shall satisfy the safety requirements specified in ED-120.	
DLFE0330	DL_FEP shall support white and black list management.	
DLFE0340	The DLIC flight plan correlation shall be carried out by the ANSP's FDP system, not the DL-FEP.	
DLFE0350	The DL_FEP shall present an interface to the ANSP's systems that allows those systems to forward such ATN login data to the FEP as is required for aircraft to successfully login via CM, where that information has been forwarded to ANSP systems via ground-ground forwarding.	
DLFE0360	DL_FEP shall support white and black list management. Capacity of the lists shall be at least 1000.	

2.3.1.2 ACM

ID	Requirments	Conformity YES/NO – references to evidence
DLFE0400	Implementations of the ACM service shall comply with the air-ground interoperability requirements specified in ED-110B.	
DLFE0410	ACM implementationsshall satisfy the requirements specified in ED-120.	
DLFE0420	DL-FEP shall allow offline configuration of supported ACM messages.	
DLFE0430	Unsupported ACM messages shall be automatically refused.	

2.3.1.3 ACL

ID	Requirments	Conformity YES/NO – references to evidence
DLFE0500	Implementations of the ACL service shall comply with the air-ground interoperability requirements specified in ED-110B.	
DLFE0510	ACL implementationsshall satisfy the requirements specified in ED-120	

2.3.1.1 AMC

ID	Requirments	Conformity YES/NO – references to evidence
DLFE0600	Implementations of the AMC service shall comply with the air-ground interoperability requirements specified in ED-110B.	
DLFE0610	AMC implementationsshall satisfy the requirements specified in ED-120	

2.3.2 ATN G/G ROUTER specifications

2.3.2.1 General requirement

ID	Requirments	Conformity YES/NO – references to evidence
ATNR0010	Suppliers shall deliver ATN G/G Router in redundant configuration	
ATNR0020	Suppliers shall in its initial offer detail all redundancy mechanisms (hardware and software) implemented in order to ensure high availability rate of the ATN Router service.	
ATNR0030	The services implemented in the ATN router shall be compliant with all the requirements applicable to the ATN Ground/Ground routing function (clas 4 router) presented in the Eurocontor Specification on Data Link Services and in the ICAO Documents 9896 and 9880.	
ATNR0040	The ISO/IEC 9542 (ES/IS) shall be implemented as defined in the ICAO Document 9880 and in the Eurocontrol Specification.	
ATNR0050	The ISO/IEC 10589 (IS/IS) should be implemented as defined in the ICAO Document 9880 and in the Eurocontrol Specification.	
ATNR0060	For the interface with the ATN End-Systems it shall also be compliant with: <ul style="list-style-type: none">▪ the 8802-2 SND CF shall be implemented in compliance with the ICAO Documents 9896 and 9880,▪ the IP SND CF shall be implemented in compliance with the ICAO document [SND CF-IP].	
ATNR0070	Suppliers shall provide the completed Protocol Implementation Conformance Statement (PICS) for its implementation of the Class 4 router as defined in this Technical Specification (including the IP SND CF).	
ATNR0080	Suppliers shall detail all the protocols/services supported by its implementation(s) of the ATN ICS standard	
ATNR0090	Suppliers shall specify the minimum requirements (e.g. hardware, Operating System...) to operate the software of the ATN routers.	
ATNR0100	All offered hardware shall be COTS hardware using industry standard components. Suppliers shall provide in its proposal details of the ATN Router Hardware.	

2.3.2.2 Capacity & ATN Router Processing performance

ID	Requirments	Conformity YES/NO – references to evidence
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ATNR0200	The capacity of the ATN router in terms of simultaneous connections shall be sufficient to prevent denial of service in the airspace.	
ATNR0210	The ATN router should support (work properly) at least 6 adjacent IDRP ground neighbours at the same time.	
ATNR0220	The ATN router should support (work properly) at least 6 adjacent network systems (End-system) at the same time.	
ATNR0230	The ATN router should support (work properly) at least 500 routes learned from IDRP at the same time; this includes routes from aircrafts and routes from other service providers (ANSP, ACSP).	
ATNR0240	Any processing performed by the ATN router including the interface to the IP and ATN networks shall not affect the payload of the exchanged packets.	
ATNR0250	Whatever the number of connections currently supported, any processing performed by the ATN router including the interface to the IP network should not delay an exchanged packet for more than 50 milliseconds.	
ATNR0260	The provided ATN router should support a message rate uplink/downlink of 5000 messages per minute with maximum transit delay of 50 milliseconds.	
ATNR0270	In line with the requirements above, Suppliers shall detail in the tender the limitations in terms of capacity of the proposed ATN routers.	

2.3.2.3 Recording and Statistic requirements

ID	Requirments	Conformity YES/NO – references to evidence
ATNR0300	The ATN Router shall record all messages in the format in which they are communicated to the CSPs, and to the ATM system.	
ATNR0310	Suppliers shall detail all statistics the Router can provide.	
ATNR0320	The system shall keep internal log files for the purposes of investigations.	
ATNR0330	The ATN Router shall timestamp these messages with UTC at the recording interface. It shall be able to synchronise to at least three (3) NTP time sources.	
ATNR0340	Log files and recorded data shall be backed up locally to ensure a single disk failure shall not lose data.	

ATNR0350	The length of time data is stored shall be configurable. At least 60 days recording space shall be available.	
ATNR0360	The Router hardware shall have a USB interface so as files may be copied on USB stick.	

2.3.2.4 Integration in the IP and ATN Networks

ID	Requirments	Conformity YES/NO – references to evidence
ATNR0400	Each ATN Router shall provide redundant physical and logical interfaces to each Network.	
ATNR0410	The ATN Routers shall be redundant, shall not contain a single point of failure which can impact the services supported by the equipment (all the connections supported at IDRP or TP4 levels shall be maintained).	
ATNR0420	Suppliers shall detail the proposed technical solution and, if any, the functions which shall be supported by the WAN IP to handle such redundancy mechanism.	
ATNR0430	Physical dedicated link between ATN Router physical components used for data synchronization shall be redundant	
ATNR0440	The ATN routers shall provide the following standard interfaces to connect them to the ANSP network: <ul style="list-style-type: none"> ▪ At least 100 Base-T Ethernet Interface, ▪ Internet Protocol version 4 and 6 	
ATNR0450	All addressing shall be done in accordance with SCL addressing scheme.	
ATNR0460	ATN Router Interface Control document defining all specifications and requirements for interfaces between ATN Routers and SCL's ATM system shall be mutually agreed during system design phase between Supplier and SCL.	

2.3.3 TEST SYSTEM specifications

ID	Requirments	Conformity YES/NO – references to evidence

TEST0010	A test support system shall be provided to support the testing, validation and verification of SCL Datalink system.	
TEST0020	Test support system shall support both GUI-based and script-based tools that allow the full testing of the ATN server by emulation of interfacing ground systems, ATN airborne systems.	
TEST0030	For test & validation environment a test tool shall be provided to emulate ATN equipped aircraft.	
TEST0040	Test tool for aircraft emulation shall enable automatic or manual responses.	
TEST0050	The test support system shall be capable of emulating the interfaces on which the CM and CPDLC applications are presented to the DL-FEP.	
TEST0060	The test support system shall be capable of running in a Graphical User Interface (GUI) mode.	
TEST0070	The test support system shall be capable of injecting data via scenario scripts	
TEST0080	The scenario scripted mode of the test support system shall be designed to support stress testing- This shall include support for multiple logged-in aircraft.	
TEST0090	The test support system shall support the testing of error conditions by allowing the injection of errors and out-of-sequence messages.	
TEST0100	The stress testing support capability in the test support system shall be able to stress the DL-FEP capacity and performance requirements.	

2.3.4 Technical supervision and system control

SCL wants to use two different systems for monitoring and controlling of the system:

- Monitoring through SMC – central monitoring system of SCL,
- Dedicated TMCS station

2.3.4.1 Integration into existing SMC system

Basic conditions are following:

ID	Requirments	Conformity YES/NO – references to evidence

TSMC0010	Monitoring and Control of the system shall be possible via SNMP Mib over IP protocol without influence on its performance.	
TSMC0020	SNMP MIB files for monitoring hardware and software of the system shall be provided by the Supplier.	
TSMC0030	SNMP MIB files should be documented allowing easy integration into SCL`s existing SMC – system monitoring and control.	
TSMC0040	The ATN Router and DL-FEP shall be able to interface to at least two SNMP managers.	
TSMC0050	SNMP MIB shall enable SCL`s SNMP Manager to: <ul style="list-style-type: none"> ▪ Monitor the health and status of all hardware and software components ▪ Application healt status ▪ Diagnose hardware and application faults and problems ▪ Monitor the status of connections 	
TSMC0060	Standard MIBs provided by HW of operating system shall be used for: <ul style="list-style-type: none"> - HW status (disks, power supply, etc.) - Operating system (free disk space, memory, etc.) 	
TSMC0070	The Supplier should during system design phase propose the list of critical SNMP variables which status change may indicate loss of operational service or redundancy loss. For these SNMP variables the Supplier should also specify recommended threshold values (normal, warning, critical thresholds)	
TSMC0080	It shall be possible to locally manage the ATN Router and DL-FEP via Command Line Interface. Command Line Interface shall also be accessible from the remote station via SSH secure connection	
TSMC0090	Monitoring of server infrastructure: HW, OS, OS resources (CPU, MEM, DU, system processes).	
TSMC0100	Monitoring of services (applications, databases)	
TSMC0110	The solution shall provide the following types/protocols: <ul style="list-style-type: none"> • SNMP v1, v2 and v3 on standard (UDP 161, 162) ports • TCP ports (80, 443...) 	
TSMC0120	The solution shall provide real time reports via SNMP traps and/or syslog for all nonstandard events (alarms, failures, disconnections...) and for all system elements	
TSMC0130	The solution shall provide a detailed description of all monitored elements (mib variables, trap definitions).	
TSMC0140	The solution shall provide a categorization of critical state of individual events (severity of alarms)	

TSMC0150	The solution shall provide the possibility to setup the sending of alarms according to the critical state of events.	
TSMC0160	Options: possibility to monitor security events (failed authentication...)	

In case of special conditions for monitoring and control these must be defined in public tender and must comply with above requirements.

2.3.4.2 TMCS station

ID	Requirements	Conformity YES/NO – references to evidence
TMCS0010	The TMCS shall be based on HW (PC or server) provided by supplier.	
TMCS0020	TMCS should support graphical interface (DVI output) supported by 1900x1200 dpi resolution. Monitor and KVM extender for TMCS will be provided by SCL	
TMCS0030	Critical operational alarms shall be presented on an MCS alarm message window. The alarm data shall contain all alarm details, e.g. date, time, alarm description, equipment location, etc.	
TMCS0040	The user shall be allowed to change and organize content of the screen in data and graphical form, e.g. positions, equipment, etc.	
TMCS0050	At the supervision room, the control and monitoring of remote operating equipment shall be indicated (visually alarms in critical cases).	
TMCS0060	The TMCS SW application shall facilitate the generation of various reports according to the user selection (visible on the screen)	
TMCS0070	All reports and configurations shall be made possible to archive and recall in the TMCS application with a version date/number.	
TMCS0080	It should also be possible to locally manage the ATN Router and DL-FEP using GUI interface.	

2.3.5 Hardware general requirements

For installation of HW the Supplier has already available racks:

- All 19" telecommunication cabinets are prepared for housing DL-FEP and ATN G/G equipment with maximum 43U high.
- All telecommunication cabinets are prepared for connecting all equipment to the AC dual line (A&B) supply.
- All telecommunication cabinets are designed for housing the 19" equipment.

ID	Requirments	Conformity YES/NO – references to evidence
HWRQ0010	The hardware shall use RAID disks so as a single hard disk failure shall not fail the ATN Router and DL-FEP.	
HWRQ0020	The hardware shall have two power supplies so as two power sources can be used for resilience.	

2.3.5.1 Power Supply

ID	Requirments	Conformity YES/NO – references to evidence
RPSR0010	For AC supply the equipment shall be designed for a 230 V AC single phase.	
RPSR0020	The frequency 50 Hz \pm 2 % shall be met.	
RPSR0030	The AC Supply Voltage Variation tolerance + 10/-15 % shall be met.	

2.4 Software

ID	Requirments	Conformity YES/NO – references to evidence
FTSW0010	The provided system shall be based on Linux operating system.	
FTSW0020	Provided software licences shall not have time limited validity.	
FTSW0030	The complete software shall be available on installation media.	

FTSW0040	The software, i.e. a software installation media, shall enable the installation on a standard server with specified minimum requirements.	
FTSW0050	A Specific Document (e.g. a version description document or equivalent) shall be issued for each software release or upgrade.	

2.5 Interoperability

The role of the Supplier, or its authorised representative established in the Community (in this case: the Supplier), is to ensure and declare compliance of its EATMN constituent with the essential requirements, specific requirements contained within the relevant implementing rules for interoperability and other relevant technical specifications (e.g. Community specifications, standards).

The purpose of the following requirements is to ensure that the procured and implemented system is compliant by all means with the requirements laid down in The Interoperability Regulation: REGULATION (EC) No 552/2004 on the interoperability of the European Air Traffic Management network as amended by REGULATION (EC) No 1070/2009 of the European Parliament and of the Council of 21 October 2009. The system shall be compliant also with COMMISSION REGULATION (EC) No 29/2009 of 16 January 2009 laying down requirements on data link services for the single European sky as amended by COMMISSION IMPLEMENTING REGULATION (EU) No 2015/310 of 26 February 2015.

Essential requirements defined in Interoperability Requirements Standard for Aeronautical Telecommunication Network Baseline 1 (Interop ATN B1) – EUROCAE ED-110B shall be applicable by the system also.

Instruction to suppliers:

The Supplier's disability to comply with the regulatory requirements, directives and applicable standards shall lead to the immediate rejection of the offer.

ID	Requirements	Conformity YES/NO – references to evidence
FTIO0010	The Supplier shall attach with the tender documentation the EC Declaration of Conformity for all parts of the equipment/system (the Constituents) that is part of the offer and future delivery.	
FTIO0020	The Supplier shall prepare and attach with the system documentation the EC Declaration of Suitability for use for the delivered datalink system.	

2.6 RAM (Reliability, Availability, Maintainability)

2.6.1 General

Reliability, Maintainability and Availability are characteristics of the overall system which shall be specified, designed, implemented, tested, validated and documented.

The quality of equipment can be considered as its ability to satisfy the user needs for the specified period of time and can be expressed with its operational availability. Two major contributors to the quality are:

- a) Reliability, and
- b) Maintainability

ID	Requirments	Conformity YES/NO – references to evidence
FTRG0010	The methodology, techniques, processes and tools the Supplier intends to use to achieve the specified RAM objectives shall be described or referenced in specific plans addressing architecture, hardware and software aspects.	

2.6.2 Reliability

Reliability is defined as a probability that equipment will perform its intended function without error, under stated conditions, for a specified period of time.

ID	Requirments	Conformity YES/NO – references to evidence
FTRR0010	The Supplier shall provide in the tender documentation a reliability model consisting of reliability block diagrams covering all functions of the system.	
FTRR0020	The MTBF and MTTR in hours and the availability shall be clearly shown in either a block diagram or a list showing the equipment breakdown to the functional unit level, with the identification of a specific common failure mode (e.g. switch over equipment).	
FTRR0030	The Supplier shall provide in the tender documentation reliability predictions and analysis as per standard MIL-HDBK-217 or other commonly used and accepted method which shall be clearly stated.	
FTRR0040	The reliability shall be the highest possible, warranting at least a 15.000 hours mean time between failures (MTBF) with normal periodic maintenance.	

2.6.3 Availability

For the purpose of this specification, Availability is defined as a ratio of the total time the system is capable of performing its mission, against the time for which it is required to perform that mission, expressed as a percentage. The availability calculation excludes all planned downtimes.

ID	Requirments	Conformity YES/NO – references to evidence
FTRA0010	The proposed Datalink system shall be considered as failed when one of the DL-FEP server or one of the ATN Router is not available.	

3 Logistic Support

3.1 Maintenance Concept

Maintenance of this system and associated environmental features will be efficient and responsive to operational needs and the requirements of aviation safety.

ID	Requirments	Conformity YES/NO – references to evidence
LSMC0010	The Supplier shall propose his own vision and concept of the most appropriate and the most efficient maintenance approach (especially corrective maintenance), during warranty period and also after.	
LSMC0020	The Supplier shall support the establishment of a support and, if necessary, service agreement with local companies covering the repair/replacement of COTS items by the original suppliers.	

3.2 Spares and Support

3.2.1 General

SCL will provide remote access to all system components on demand for support and maintenance purposes.

ID	Requirments	Conformity YES/NO – references to evidence

LSSU0010	The offered initial set of spare parts shall be specified in a tender documentation, in a form of the Mandatory Spare Parts List, which shall contain all spare parts with the price for each individual item.	
LSSU0020	<p>A Spare Parts List shall, for each spare part, include:</p> <ul style="list-style-type: none"> • Spare Part Description, • Recommended Quantity of Spare Parts to be delivered, • Warranty period (only in case of specifically defined warranty period for certain parts). 	
LSSU0040	The Supplier shall deliver all spare parts to the SCL, in the quantity and quality which is in accordance with the Contract requirements, at the latest 7 calendar days before the start of commissioning. These spare parts shall be inspected and tested (except consumables) during the Operational Acceptance Test (Guarantee Test).	
LSSU0050	The Supplier shall notify the SCL if the delivery of a particular type of spares is becoming difficult or if the manufacturing of that part has stopped. Such notification accompanied by a spare parts replacement proposal shall be given at least 6 months in advance.	
LSSU0060	The above stated requirement (LSSU 0070) shall be valid for parts procured from the Supplier or any of the suppliers involved in the procurement of spare parts for this system.	
LSSU0070	The Supplier shall include technical SCL support maintenance by a professional/specialist ATC engineer, based in the Supplier's premises. Upon contract signature, the Supplier shall provide the contact details (Name/Surname, Title, Position/Department, Telephone, Fax, E-mail address, Office Working time) for the entitled professional mentioned above.	
LSSU0080	Upon contract signature, the Supplier shall, provide the contact details for a substitute of the entitled professional mentioned above in case of his/her absence (or a Help Desk).	
LSSU0090	In case of blocking error or system failure (SW bug, etc.) the supplier shall start to solve the problem immediately when the problem is reported.	

3.2.2 Mandatory Spare Parts List

ID	Requirments	Conformity YES/NO – references to evidence
LSSL0010	The Supplier shall include in its offer a mandatory set of spare parts to enable the efficient ten (10) years' maintenance of all parts of the system. The SCL reserves the right to procure an additional set of spares.	
LSSL0020	The offered initial set of mandatory spare parts shall be based on the RAM calculation, but not less than: <ul style="list-style-type: none">• HW for one (1) ATN router server• HW for one (1) DL-FEP server	
LSSL0030	The offered mandatory set of spares shall be of the same type/model/version as the equipment installed.	

3.2.3 Recommended spare parts

ID	Requirments	Conformity YES/NO – references to evidence
LSSL0040	The Supplier is encouraged to propose an additional set of spare parts according to its own experience and maintenance concept, which should be useful. This list should be clearly divided from a Mandatory Spares Part list from 3.2.2.	

3.3 Warranty

3.3.1 General

Warranty is the firm and written obligation of the Supplier to fix, at its costs and over an agreed period, the defects and deficiencies occurring on the accepted deliverables (hardware, software, documentation, etc.).

This obligation does not apply when the Supplier can prove that such defect or deficiencies fall outside the warranty coverage.

ID	Requirments	Conformity YES/NO – references to evidence

LSWG0010	The entire costs, including the costs for analysis of the reported problems, for possible shipment of the defective goods back to Factory and for the correction of deficiencies falling under warranty shall be borne by the Supplier.	
LSWG0020	The warranty shall be applicable to all the System and ancillary deliverables developed and/or delivered by the Supplier (hardware, software, documents).	
LSWG0030	The warranty shall not extend to any damage arising in consequence of proven negligence or improper manipulation/repair of the equipment by SCL or by a third party, nor to consumable parts of the product.	
LSWG0040	Services such as installation, setting-up and tuning shall be covered by warranty while the others (training, support) are not covered by any warranty clause.	
LSWG0050	The Supplier shall warrant the COTS HW as well as special developments which might be required.	
LSWG0060	The Supplier shall interface with the COTS HW and FW vendors for solving any problems occurring during the warranty period.	
LSWG0070	The Supplier shall warrant the delivery of SW developed by itself or by its Sub-Suppliers.	
LSWG0080	The Supplier shall defend the SCL interests in face of COTS SW vendors for solving any problems occurring during the warranty period.	
LSWG0090	The contents, presentation, accuracy, correctness and completeness of all documentation provided to satisfy the contract requirements shall be covered by the warranty (whether or not originating directly from the Supplier).	
LSWG0100	The Supplier shall specify a detailed scope of warranty, considering SCL's requirements of this chapter.	
LSWG0110	<p>The Supplier shall include in the tender documentation a description of warranty repair eligibility conditions, i.e.:</p> <ul style="list-style-type: none"> • Fault reporting procedures ; • Procedures for sending hardware for repairs; • Software repairing/upgrading procedures ; • The Help-Desk (On call expert technical assistance) service scope and conditions. 	
LSWG0120	<p>The Supplier shall specify defect elimination times:</p> <ul style="list-style-type: none"> • Interventions on the SW instalation; • Phone, fax, e-mail assistance; 	

	<ul style="list-style-type: none"> Other options, if any. 	
LSWG0130	The Supplier shall include in the response a description of the method of providing post-warranty maintenance services.	
LSWG0140	The Supplier shall include in the response a declaration of availability of spare parts for at least 10 years from the date of Operational Acceptance.	
LSWG0150	The Supplier shall include in the response a declaration of availability of higher software versions that can be used to upgrade the system functionality.	

3.3.2 Warranty Period

ID	Requirments	Conformity YES/NO – references to evidence
LSWP0010	The warranty periods for all HW and SW mentioned above shall be at least 24 months from the date the Operational Acceptance is approved (signing the Operational Acceptance Certificate).	
LSWP0020	The Supplier's obligation to correct defects and deficiencies shall apply until all the reported and pending defects and deficiencies from the Operational Acceptance, as well as from the warranty reporting period, have been corrected in a satisfactory way.	
LSWP0030	The warranty reporting period for the HW/SW items and documentation shall automatically be extended by the period during which the DL-FEP or ATN router (per piece) is not operationally available (DOWN TIME).	
LSWP0040	After the warranty reporting period, any newly detected deficiencies shall not fall under the warranty any longer.	

3.3.3 Obligations of the Supplier

ID	Requirments	Conformity YES/NO – references to evidence
LSWO0010	If defects and deficiencies affecting the contractually agreed supplies and services arise during the appropriate warranty period, the	

	Supplier shall begin to rectify such defects in compliance with the provisions listed hereinafter:	
LSWO0020	Where the warranty period is concerned, it is generally agreed that, in case of the Supplier receiving a notification in the time of office working hours, rectification of the defects shall begin within 5 working days after the receipt of the Supplier's notification.	
LSWO0030	In this respect the Supplier shall guarantee a support service for the above mentioned periods. Based on a detailed description of the fault, an appropriate system specialist shall, without delay, contact by telephone the SCL personnel who have given the notification of the fault.	
LSWO0050	Where complex system faults are identified, the project managers shall reach an agreement regarding the suitable location for troubleshooting and regarding deadlines.	
LSWO0060	Upon expiry of the above deadlines SCL may rectify the fault by itself, or have it rectified at the Supplier's expense. The Supplier's warranty obligation shall thereby remain unaffected if the work has been performed properly and SCL has informed the Supplier thereof without delay.	
LSWO0070	The rectification of faults and any other work performed on accepted or operational systems shall be carried out in compliance with the SCL's internal work instructions; where applicable, special arrangements will be made in individual cases.	
LSWO0080	After completion of the repair or modification the Supplier shall demonstrate the compliance with the specification of the HW/SW and Documentation.	
LSWO0090	A report (including a Version Description Document for SW items) describing the nature of the deficiency/defect, the cause and the corrective measures taken, shall be prepared by the Supplier and submitted to SCL with the correction.	
LSWO0100	Replacement parts already delivered to SCL may be used by the Supplier during the warranty period.	
LSWO0110	The Supplier shall provide replacements, at no expense to SCL, for defective parts during the warranty period.	
LSWO0120	The Supplier shall correct, at no expense to SCL, all defects in the design of hardware or software during the warranty period, where these defects cause the system not to meet specified performance requirements.	
LSWO0130	Fixes to the software shall undergo regression testing.	
LSWO0140	The documentation shall be updated as required to reflect the HW/SW deficiencies corrected under the warranty.	

LSWO0150	During the warranty period, the Supplier shall provide support to SCL in solving any problem arising from the license arrangements that the Supplier has negotiated with the vendors in place and name of SCL.	
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4 Technical System Documentation

ID	Requirments	Conformity YES/NO – references to evidence
TSDO0010	The documentation shall be in English.	
TSDO0020	The system documentation for each system shall consist of: <ul style="list-style-type: none"> • Hardware documentation, • Software documentation, • Operational user manual, • Training documentation, • Interoperability documentation. 	
TSDO0030	The final versions of the system documentation shall consist of 3 hard copies and 1 copy on USB stick. Documents shall be signed and dated or there shall be additional document written, which defines the applicability date of the documentation.	
TSDO0040	The system documentation shall be written and printed in accordance with either ISO A4 or ISO A3 format standards. All drawings shall be documented in a commonly available CAD utility.	
TSDO0050	The Supplier shall specify a list of all system documentation specifying reference numbers (if applicable at the time of tender procurement), description of documentation, delivery milestones in relation to project milestones (Contract Signature, FAT, OAT, etc.)	
TSDO0060	Defects, misunderstandings, inadequate or incomplete descriptions and other findings in the documentation, which compromise the quality of the documentation and/or influence the usability of the documentation for the planned purposes, shall be corrected without any extra costs to the SCL.	
TSDO0070	All documentation to be delivered shall be issued in a final version and provided to the SCL, prior to the Operational Acceptance.	
TSDO0080	The documentation shall include the following: <ul style="list-style-type: none"> • Equipment description; • Equipment block diagram; • Detailed description and purpose of each unit; • Interconnections within units; • Setting-up and operating procedures; • Preventive maintenance and its procedures; • Corrective maintenance and its procedures; 	

	<ul style="list-style-type: none"> • Specification of all equipment units with part number, serial number and manufacturer; • Other information necessary to perform regular and preventive maintenance. 	
TSDO0090	The software documentation (e.g. the Software User Manual or equivalent and the Version Description Document or equivalent) shall contain a description of the system software and shall comprise sufficient details to permit full understanding and maintenance of the system.	
TSDO0100	<p>The documentation shall provide guidelines for the technical staff to:</p> <ul style="list-style-type: none"> • Understand the equipment function in detail; • Perform preventive and corrective maintenance of the equipment; • Troubleshoot the system • Install and configure of the system components; • Basic test and validation procedures 	
TSDO0110	The successful Supplier shall provide an EC declaration of conformance for use and/or EC Declaration of Suitability for Use of an EATMN Constituent. EC Regulation No 552/2004, the interoperability Regulation, Article 5 and Annex III (3) as amended by EC Regulation No 1070/2009	
TSDO0120	The successful Supplier shall provide a TECHNICAL FILE for EC declaration of conformance for use and/or EC Declaration of Suitability for Use of the EATMN constituent.	

5 Training

ID	Requirments	Conformity YES/NO – references to evidence
TRNG0010	The following personnel training is required: <ul style="list-style-type: none"> • System hardware and software training of technical staff 	
TRNG0020	The Supplier shall submit in its offer an initial version of the Training Plan. The Training Plan shall be discussed in detail with the Supplier and approved by the SCL in accordance with the agreed schedule.	
TRNG0030	Supplier shall provide a training for one group of max. six trainees.	
TRNG0040	The technical staff shall be trained to: <ul style="list-style-type: none"> • Understand equipment architecture and configuration, • Understand operational functions and features of all equipment units, • Understand and use system software application(s) which are part of delivered equipment, • Perform preventive maintenance of the equipment, • Perform corrective maintenance, i.e. troubleshoot the system, • Perform system test procedures, • Understand the diagnostic and test utilities and procedures. 	
TRNG0050	The Training shall address all of the hardware and software delivered in the scope of the Contract, which means that the training for installation, maintenance and operation of COTS products shall be included in the Tender Documentation and in the Training Plan, as well.	
TRNG0060	The training language shall be English or Slovene. The Supplier shall provide necessary training on all products delivered within the project.	
TRNG0070	All instructors engaged in the training shall be fluent in English, qualified, skilled, shall have excellent knowledge of the system and shall be experienced trainers.	
TRNG0080	The content of the training course(s) shall be included in the Training Plan and shall be approved by the SCL.	
TRNG0090	The training material in electronic form (on USB stick) shall be made available for the trainees at least 1 week before the course begins. Paper copies of the training material shall be available for the trainees at the time the course begins.	

TRNG0100	The SCL shall have the right to use such material for further courses within its own organisation.	
TRNG0110	The Training shall include theoretical education together with the elements of practical training.	
TRNG0120	A schedule for the training course(s) shall be defined after contract signature.	
TRNG0130	The Supplier shall conduct a final written and practical exam for each trainee (student) at the end of the training. A Trainee shall be considered as competent ("A trainee successfully completed the course.") for system maintenance and operation if he passes a practical exam with a score of at least 70% and a theoretical (written) exam of at least 70%.	
TRNG0140	<p>After the completion of each course, the following reports shall be provided to the SCL:</p> <ul style="list-style-type: none"> • Each student's performance; • A summary report for each examination; • An attendance report; • Certificate of competence for each student who successfully completed a course with a score of at least 70% for each exam. 	
TRNG0150	<p>The technical staff shall be trained:</p> <ul style="list-style-type: none"> • During the system installation, which will be considered as an on-the-job-training, as it is intended that trainees participate in installation activities as much as possible, while the Supplier will make the supervision and have the responsibility of correct system installation. The Supplier is encouraged to perform a day or two of pre-installation training in order that the SCL's technical staff will be able to actively participate in the system installation. 	
TRNG0160	The technical staff training should last 5 working days at least.	
TRNG0170	<p>A Factory training programme shall at least consist of:</p> <ul style="list-style-type: none"> • DL-FEP training: theory of operation, functions, menus, trouble shooting, adjustments, connections/integration/installation, practical tips etc. • ATN G/G router: theory of operation, functions, menus, trouble shooting, adjustments, connections/integration/installation • TMCS sub-system training: troubleshooting, functions, menus, trouble shooting, applications, installation, user/password management etc. • Test tool training: using of test tool, validation procedures, trouble shooting. 	

TRNG0180	Additionally, the Supplier may offer additional topics that are relevant for handling the system.	
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6 Safety and Quality Assurance

6.1 Safety

6.1.1 General

ID	Requirments	Conformity YES/NO – references to evidence
SARQ0010	<p>When creating the safety documentation, including a safety plan and safety reports, the Supplier shall take into account:</p> <ul style="list-style-type: none">• Requirements from EC regulations EC 552/2004, EC 1070/2009, with related Implementing Rules (IR) and Community Specifications (CS),• Requirements from EC regulation EC 482/2008,• The Supplier shall follow Eurocontrol's Safety Assessment Methodology as much as practicable,• All comments provided by SCL (when updating this documentation),• Safety reports shall include the safety recommendations to SCL, as a possible means for risk mitigation. This shall include procedural and human mitigations, e.g. training, shift management, maintenance procedures, operational procedures etc.	
SARQ0020	<p>The safety documentation shall be provided to the SCL for review and approval in accordance with the milestones specified in the Documentation Plan.</p>	

6.1.2 Safety Audit

ID	Requirments	Conformity YES/NO – references to evidence

SASA0010	The safety audit shall be conducted by The SCL in duration of approximately one working day according to the SCL's safety audit plan previously delivered, subject to mutual agreement.	
SASA0020	The safety assurance process shall be audited and the Supplier shall provide full support to the SCL's safety audit team including access to evidence and arguments.	

6.1.3 Safety Plan

ID	Requirments	Conformity YES/NO – references to evidence
SASP0010	The Supplier shall providea Safety Plan which shall include all activities to be performed by the Supplier to meet the requirements related to safety, in such a way that the delivered technical system is safe for operation and minimises the risks which may contribute to aircraft accidents as far as reasonably practicable.	
SASP0020	A preliminary version of the Safety Plan shall be delivered at the latest 30 days after contract signature, and shall be reviewed and approved by the SCL.	
SASP0030	Safety activities to be specified in the Safety Plan shall be carried out to cover: <ul style="list-style-type: none"> • All hardware and software to be delivered (components to be developed, procured, modified, or re-used), up to external interfaces of the system, • Safety related procedures and training of the SCL staff, • The whole time span of the Project and all activities with safety significance, i.e. the system specification, design, development, integration, installation, acceptance, commissioning, transition to operation and maintenance of the system. 	
SASP0040	The Supplier will produce updates of the Safety Plan, if necessary.	

6.1.4 Safety Reports

ID	Requirments	Conformity YES/NO – references to evidence
SASR0010	Safety reports will cover the Safety Assessment process, containing as a minimum, the following: <ul style="list-style-type: none">• Hazards identification and analysis for each system function, including the determination of hazard likelihood and severity, and possible effect on operation,• Identification of possible effect on operation for each hazard,• Identification of risk mitigation measures for each hazard.	
SASR0020	Safety Reports will be produced in accordance with the Safety Plan.	
SASR0030	Safety Reports shall include, as a minimum, the following set of documents and due dates: <ul style="list-style-type: none">• Functional Hazard Assessment Report (FHAR), due date: 30 days after contract signature;• Preliminary System Safety Assessment Report (PSSAR), due date: 2 calendar weeks before the FAT starting date;• System Safety Assessment Report (SSAR), due date: 1 calendar week before installation of the target system;• Safety Issue Log (SIL). The document shall contain all safety critical issues which should be mitigated in a procedural or human related matter. Due date: Start of the equipment installation;• Software Safety Folder. The Supplier shall use the Guidelines for ANS Software Safety Assurance, EUROCAE document ED-153.	

6.1.5 Software Safety Requirements

ID	Requirments	Conformity YES/NO – references to evidence
SASS0010	The Supplier shall produce evidence and arguments demonstrating that: <ul style="list-style-type: none">• the software safety requirements correctly state what is required by the software, in order to meet safety objectives and	

	<p>requirements, as identified by the risk assessment and mitigation process;</p> <ul style="list-style-type: none"> • traceability is addressed in respect of all software safety requirements; • the software implementation contains no functions which adversely affect safety, particularly there must not be the CSCI whose single failure would induce the effect with severity class 1 as per ESARR 4; • the software satisfies its requirements with a level of confidence which is consistent with the software criticality ; • assurances are provided confirming that the general safety requirements set out in the previous points are satisfied, and the arguments that demonstrate the required assurances are at all times derived from: <ul style="list-style-type: none"> (i) a known executable version of the software; (ii) a known range of configuration data; (iii) a known set of software products and descriptions, including specifications that have been used in the production of that version. 	
SASS0020	<p>The Supplier shall allocate software assurance levels (SWAL) to all operational software, in compliance with the following:</p> <ul style="list-style-type: none"> • The software assurance level shall relate the rigour of the software assurances to the software criticality by using the severity classification scheme set out in Section 3.2.4 of Annex II to Regulation (EC) No 2096/2005, combined with the likelihood of occurrence of a certain adverse effect. A minimum of four software assurance levels shall be identified, with software assurance level 1 indicating the most critical level (if such software exists); • An allocated software assurance level shall be commensurate with the most severe effect that software malfunctions or failures may cause, as referred to in Section 3.2.4 of Annex II to Regulation (EC) No 2096/2005. This shall, in particular, take into account the risks associated with software malfunctions or failures and the architectural and/or procedural defences identified. • Software components that cannot be shown to be independent of one another shall be allocated the software assurance level of the most critical of the dependent components. 	
SASS0030	<p>To assure software safety requirements validity, the Supplier shall describe the functional behaviour of software in nominal and</p>	

	downgraded modes, timing performances, capacity, accuracy, software resource usage on the target hardware, robustness to abnormal operating conditions and overload tolerance, as appropriate. Software safety requirements shall be complete and correct, and compliant with the system safety requirements.	
SASS0040	<p>To assure the software safety requirements verification, the Supplier shall ensure that:</p> <ul style="list-style-type: none"> • The software functional behaviour, timing performances, capacity, accuracy, software resource usage on the target hardware, robustness to abnormal operating conditions and overload tolerance, shall comply with the software requirements. • The software shall be adequately verified by analysis and/or testing and/or equivalent means. • The software verification shall be correct, complete and documented. 	
SASS0050	<p>To assure the software configuration management, the Supplier shall ensure that:</p> <ul style="list-style-type: none"> • Configuration identification, traceability and status accounting facilitate that the software life cycle data is shown to be under configuration control throughout the software life cycle. • Problem reporting, tracking and corrective actions facilitate that safety related problems associated with the software are shown to have been mitigated. • Retrieval and release procedures facilitate that the software life cycle data is regenerated and delivered throughout the software life cycle. 	
SASS0060	<p>To assure the software safety requirements traceability, the Supplier shall ensure that:</p> <ul style="list-style-type: none"> • Each software safety requirement is traced to the same level of design at which its satisfaction is demonstrated. • Each software safety requirement, at each level in the design at which its satisfaction is demonstrated, is traced to a system safety requirement. 	
SASS0070	<p>The assurances from SASS0030 to SASS0060 shall include the rigour for each software assurance level which shall increase as the software increases in criticality. For that purpose:</p> <ul style="list-style-type: none"> • the variation in rigour of the assurances per software assurance level must include the following criteria: 	

	<ul style="list-style-type: none"> ▪ required to be achieved with independence; ▪ required to be achieved; ▪ not required; <ul style="list-style-type: none"> • the assurances corresponding to each software assurance level must give sufficient confidence that the software can be operated tolerably safely; 	
SASS0080	For any software (such as COTS, non-developmental software or previously used software, etc.), for which some of the requirements cannot be applied, the Supplier shall provide, through other means, the same level of confidence as the relevant software assurance level whenever defined. Those means must give sufficient confidence that the software meets the safety objectives and requirements, as identified by the safety risk assessment and mitigation process.	
SASS0090	The ATN router and DL-FEP including the interface to the IP network shall be compliant with the Assurance Level 4 or higher as defined in the EUROCAE Document ED-109. Suppliers shall state the SWAL level the router complies with.	

6.2 Quality

6.2.1 General

ID	Requirments	Conformity YES/NO – references to evidence
QGEN0010	The Supplier shall be certificated, holding a valid ISO 9001:2016 or equivalent Quality Management System Certificate.	
QGEN0020	The Supplier shall submit documentary evidence in the Tender establishing to the SCL satisfaction that the Supplier has a valid Quality Management System certificate.	

6.2.2 Quality Assurance Plan

ID	Requirments	Conformity YES/NO – references to evidence
QAAP0010	The Supplier shall develop a Quality Assurance Plan, subject to the approval by the SCL.	
QAAP0020	The Quality Assurance Plan shall describe the organisation, processes, tasks and responsibilities with respect to quality assurance.	
QAAP0030	The Quality Assurance Plan shall identify the documents to be produced in appropriate phases of the lifecycle (see also the Project Management Plan), and shall state how these documents are checked for adequacy.	
QAAP0040	The Quality Assurance Plan shall identify the standards, practices, conventions, and metrics to be applied and shall state how compliance with these items is to be monitored and assured.	
QAAP0050	The project applicable and referenced documents and standards shall be listed in the Quality Assurance Plan, with their title and version number.	
QAAP0060	The Preliminary Quality Assurance Plan shall be available at contract signature.	
QAAP0070	The final version of the Quality Assurance Plan shall be available within 60 days from contract signature.	

6.2.3 Quality Audit

ID	Requirments	Conformity YES/NO – references to evidence
QAQA0010	The Quality Assurance processes, technical documentation and products produced shall be subject to quality audit. The date, schedule and scope shall be mutually agreed.	
QAQA0020	The duration of quality audit shall be approximately one working day.	
QAQA0030	The Supplier shall provide full support to the SCL's quality audit team including access to evidence and arguments.	

7 Project Management

7.1 General

ID	Requirments	Conformity YES/NO – references to evidence
PMGE0010	The Supplier shall be responsible for the management, performance, monitoring and coordination of the whole project from the project kick-off until the completion of the contract.	
PMGE0020	The Supplier shall establish a project organization in accordance with the requirements included herein, having necessary resources, qualification and experience to fulfill all of its obligations.	
PMGE0030	The Supplier shall define and describe the part of its organization which will manage or be involved in the project.	
PMGE0040	The Supplier shall appoint the Supplier's Representative, who will be an interface to the SCL's Project Manager, and be at the SCL's disposal for all matters relating to contract execution.	
PMGE0050	In case another person will act as his substitute, the SCL shall be notified at least 2 weeks in advance of the other person proposed to substitute him.	
PMGE0060	The Supplier's Representative (or his substitute) shall be present at all meetings during the contract execution.	
PMGE0070	The Supplier's Representative shall be responsible for project co-ordination and will take all necessary actions to ensure the project progress according to the agreed schedule.	
PMGE0080	Communication between the Supplier and the SCL shall be in accordance with the SCL's practice. Details of a Communication Procedure between the Supplier and the SCL will be proposed by the SCL and mutually agreed after contract signature.	
PMGE0090	If deemed necessary during contract execution, the SCL or the Supplier can propose progress meetings.	
PMGE0100	The agenda for this meeting(s) shall be mutually agreed and prepared at least 3 working days prior the date of a meeting.	
PMGE0110	The following persons shall be present at progress meetings: <ul style="list-style-type: none"> • The Supplier's Representative, • The SCL's Project Manager , 	

	<ul style="list-style-type: none"> Any other persons who the above representatives consider important to be present. 	
PMGE0120	The venue of meetings will be mutually agreed.	
PMGE0130	The Supplier shall prepare minutes of the meetings and submit them for approval to the SCL not later than 3 working days after the meeting finishes.	
PMGE0140	The Supplier shall issue and manage a Progress Chart (Master Time Schedule). The contract shall be executed in accordance with the progress chart. This chart will be set out in the form of a linear timetable (preferably using the MS Project). The starting date is to be the date of entering the contract into force.	
PMGE0150	The Progress Chart will specify dates of all major actions and decisions to be taken by both the SCL and the Supplier. Any alterations to this chart need to be examined and mutually agreed.	
PMGE0160	The initial progress chart shall be included in the tender documentation.	
PMGE0170	The progress chart shall be agreed between the Supplier and the SCL and shall be kept updated during ontract execution. The version control of an electronic file of the Progress Chart shall be established.	
PMGE0180	The Supplier shall establish close coordination with the SCL for the development of all planning activities related to the project, forwarding relevant plans, procedures, etc. for review and approval, prior to putting them into force.	
PMGE0190	<p>The Supplier shall prepare at least the following Project Plans at the appropriate stage in the project for review and approval by the SCL:</p> <ul style="list-style-type: none"> Project Management Plan (PMP), Logistic Support Plan (LSP), Documentation Plan (DP), Safety Assurance Plan (SAP), Quality Assurance Plan (QAP), Training Plan (TP), Installation and Commissioning Plan (IP), FAT Plan and Procedures, Operational Acceptance Plan and Procedures. 	

7.2 Project Management Plan

ID	Requirments	Conformity YES/NO – references to evidence
PMPM0010	The Supplier shall prepare a Project Management Plan (PMP) in accordance with the requirements included in this document and contract.	
PMPM0020	A draft version of the PMP shall be provided as part of the tender documentation. An initial official version of the PMP shall be issued on the date of contract signature at the latest.	
PMPM0030	<p>The Project Management Plan shall include at least the following:</p> <ul style="list-style-type: none"> • Project scope and overview, • Project deliverables (shall also include a Documentation List), • Work Breakdown Structure (Shall define the scope of work and resources necessary to meet the Contract requirements. The work breakdown shall also include the work to be performed by the SCL, e.g. participation in reviews and tests, preparation of data.), • Project organisation and responsibilities, • Master Time Schedule (Progress Chart), • Quality assurance activities to be performed in the project by the Supplier, • Configuration management activities (regarding hardware, software and documentation version changes). 	
PMPM0040	Any change to the PMP or to the processes outlined in it will be subject to the formal SCL's approval. The PMP shall be kept up-to-date.	
PMPM0050	<p>The PMP shall normally include at least the following aspects:</p> <ul style="list-style-type: none"> • Management procedures and practices; • Work breakdown structure (WBS); • Master time schedule, showing dates and deliverables; • Master resource plan, showing roles and responsibilities; • Key risks that might jeopardize the project. 	

7.3 Documentation Plan

ID	Requirments	Conformity YES/NO – references to evidence
PMDP0010	A Documentation Plan shall specify the list of all documents to be delivered to the SCL during contract execution.	
PMDP0020	A draft version of the Documentation Plan shall be provided by the Supplier in the tender documentation. An initial official version of the Documentation Plan shall be issued on the date of contract signature at the latest.	
PMDP0030	<p>The Documentation Plan shall include at least the following:</p> <ul style="list-style-type: none"> • Title of document, • The Supplier, • Applicability of the document (e.g. entire system, a certain subsystem or a particular COTS product, hardware documentation, software documentation, etc.), • Reference and version number of the document, • Dates of each document delivery. 	

7.4 Logistic Support Plan

ID	Requirments	Conformity YES/NO – references to evidence
PMLS0010	<p>The Supplier shall prepare a Logistic Support Plan (or equivalent) which shall specify in more detail logistic aspects of the Contract. The Logistic Support Plan shall include:</p> <ul style="list-style-type: none"> • Maintenance concept of the system, • Maintenance activities, levels and responsibilities (maintenance flows overview), • Overview of the technical documentation to be provided, especially stating the manuals with maintenance procedures, • Spare Parts List which shall meet the requirements of this Technical Specification, • Relation of maintenance activities with the skills obtained at technical training, • Tools and test equipment list to be provided and/or required, • All aspects of warranty support including a detailed description of the scope of warranty support, 	

	<ul style="list-style-type: none"> • Possible post-warranty support arrangements regarding the system maintenance , • Overview of recommended preventive maintenance actions. 	
PMLS0020	A draft version of the Logistic Support Plan shall be issued on the date of contract signature at the latest.	

7.5 Installation and Commissioning Plan

ID	Requirments	Conformity YES/NO – references to evidence
PMIM0010	<p>The Supplier shall prepare an Installation and Commissioning Plan comprising:</p> <ul style="list-style-type: none"> • The Supplier's scope of work, • Sub-suppliers involved and their scope of work (if applicable), • The SCL's scope of work, • Tasks to be performed and the person(s) responsible for each task, • Timing of the tasks, • Documentation (e.g. instructions, specifications, drawings, interconnection diagrams and other relevant information for installation), • Other information important for the final installation. 	
PMIM0020	An initial (draft) version of the Installation and Commissioning Plan shall be provided in the tender documentation.	
PMIM0030	The final Installation and Commissioning Plan plan shall be submitted at least 4 weeks and approved by the SCL at least 3 weeks before the start of installation activities.	

7.6 Acceptance Test Plans and Procedures

ID	Requirments	Conformity YES/NO –
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		references to evidence
PMAP0010	<p>The Supplier shall provide acceptance test plans and procedures (test specifications) for Factory Acceptance and Operational Acceptance, including a detailed description of the proposed test techniques and procedures to verify all equipment parameters, together with a schedule for such tests. The following documents shall be provided:</p> <ul style="list-style-type: none"> • Factory Acceptance Test Plan and Procedures, • Operational Acceptance Test Plan and Procedures. 	
PMAP0020	<p>These acceptance test plans and procedures (test specifications) shall at least contain the following:</p> <ul style="list-style-type: none"> • A schedule of the actions to be taken in the testing of various parts of the equipment, • The forms of documentation of test results, • The condition under which the tests shall be conducted and approved, • A detailed description of the tests to be performed. 	
PMAP0030	<p>The FAT Plan and Procedures shall be submitted to the SCL at latest 2 weeks before the FAT. The document shall be reviewed by SCL and shall be amended or changed if necessary, and approved by both parties 1 week before the FAT at the latest.</p>	
PMAP0040	<p>The Operational Acceptance Test Plan and Procedures shall be submitted to the SCL at latest 4 weeks before the OAT. The document shall be reviewed by SCL and shall be amended or changed if necessary, and approved by both parties 2 weeks before the OAT at the latest.</p>	

8 Installation and Commissioning

8.1 Installation

ID	Requirments	Conformity YES/NO – references to evidence

INST0010	The planning of the system installation and setting up shall be developed in close cooperation with the SCL.	
INST0020	The Installation and Commissioning Plan, specifying all installation activities, shall be approved by the SCL prior to the installation.	
INST0030	The Supplier can perform a site survey before the installation takes place in order to identify necessary works to be performed, if deemed necessary.	
INST0040	The SCL will perform, prior to the installation, a complete physical check of the goods received (equipment, spare parts, documentation, etc. – all according to the Contract specification), and will notify the Supplier if the delivery does not fulfill the requirements listed in the Contract Specification.	
INST0050	The Supplier shall have full responsibility for the system installation and setting up.	
INST0060	Installation shall be conducted by Supplier's skilled staff with support of the SCL's technical staff under close Supplier's supervision. These activities shall form On-the-Job Training of the SCL's staff that shall be carried out during the installation in accordance with the agreed conditions given in the Training Plan.	
INST0070	The Supplier shall prepare a list of staff to conduct the installation activities.	
INST0080	The Supplier shall specify all the facilities and procedures the SCL has to provide for test purposes.	

8.2 Pre-Commissioning and Completion

ID	Requirments	Conformity YES/NO – references to evidence
TCOM0010	The Supplier shall issue a written notice to the SCL when the installation is finished and commissioning may commence.	

TCOM0020	The SCL shall conduct an inspection of the installation itself.	
TCOM0030	After successful completion of the site inspection, the SCL shall issue a Completion Certificate and grant the commissioning within fourteen (14) days from receipt of the Supplier's completion notice.	
TCOM0040	If some defects or deficiencies are found during the site inspection, the SCL's Project Manager shall notify the Supplier's representative and list all of them in a Completion Report. The Supplier shall take necessary remedial actions at its own expense, and the procedure shall be repeated.	

9 Testing and Acceptance

9.1 Factory Acceptance

ID	Requirments	Conformity YES/NO – references to evidence
TFAT0010	Factory acceptance shall be performed to verify that the equipment fully complies with the specification requirements. Non-complying equipment will be rejected.	
TFAT0020	Factory acceptance shall be normally witnessed by the SCL's representative(s), if not decided otherwise.	
TFAT0030	If the SCL's representative(s) does/do not witness the Factory acceptance testing, the Supplier shall perform Factory Acceptance Tests without the presence of the SCL's technical staff, issue a FAT Report (results and protocols) and send it to the SCL via official communication procedure.	
TFAT0040	All factory acceptance tests shall be normally carried out before the system installation and on the basis of a test specification submitted to SCL by the Supplier at least 4 weeks before the FAT.	
TFAT0050	The Supplier shall provide a test specification (FAT Plan and Procedures) including a detailed description of the proposed test techniques and procedures to verify all equipment parameters, conditions under which the tests shall be conducted and approved, the forms of documenting test results, together with a schedule for such tests.	
TFAT0060	All equipment and sub-units shall be fully interconnected and built up into a complete system configuration. Specific tests considered as	

	impracticable within the given system configuration will be performed using simulated inputs/outputs or a test bench when specifically approved by the SCL.	
TFAT0070	All FAT procedures shall comply with and be performed according to the applicable standard documents, recommended practices or procedures (ICAO, ETSI, ITU, EUROCAE, CEI...).	
TFAT0080	The SCL reserves the right to request some further tests to be performed (which are not listed in the FAT specification) if deemed necessary. These tests shall be also noted in the FAT report.	
TFAT0090	If a failure occurs during acceptance testing, the Supplier shall take necessary remedial actions at its own expense, and all relevant tests shall be repeated unless the SCL decides otherwise.	
TFAT0100	After successful completion or unsuccessful attempt of the FAT, the FAT Report shall be immediately prepared and issued by the Supplier. The FAT report shall be signed by both the Supplier's and SCL's FAT representatives.	
TFAT0110	After successful completion of the FAT, the FAT Certificate shall be issued by SCL. The FAT Certificate shall be prepared and signed by SCL's Project Manager not later than 10 days after FAT completion and sent to the Supplier's Representative according to the official communication procedure.	

9.2 Operational Acceptance

ID	Requirments	Conformity YES/NO – references to evidence
TOAT0010	The purpose of an Operational Acceptance Test (Guarantee Test) is to demonstrate conformity of the delivered equipment and proper functioning of the system after commissioning, specified in the Contract.	
TOAT0020	The OAT shall be carried out after the system installation, followed by issuing a Completion Certificate and on the basis of a test specification (OAT Plan and Procedures).	

TOAT0030	Supplier shall support the interoperability testing with Bretigny by being present for two days upon SCL's demand.	
TOAT0040	The SCL reserves the right to request some further tests to be performed (which are not listed in the OAT specification) if deemed necessary. These tests shall be also noted in the Operational Acceptance Report.	
TOAT0050	The Operational Acceptance testing (Guarantee Test) shall be witnessed by the SCL's representative(s).	
TOAT0060	If a failure occurs during acceptance testing, the Supplier shall take necessary remedial actions at its own expense, and all relevant tests will be repeated unless the SCL decides otherwise.	
TOAT0070	The Supplier is responsible for providing all test equipment (hardware and/or software) necessary for the tests. The test facilities provided by the Supplier are not part of the delivery. SCL test tool delivered by the Supplier shall also be used for all necessary tests.	
TOAT0080	All delivered spare parts shall be tested in real operation during the Operational Acceptance Test.	
TOAT0090	After successful completion or unsuccessful attempt of each Operational Acceptance, an Operational Acceptance Report shall be prepared and issued by the Supplier as soon as possible, but no longer than 7 days. The Operational Acceptance Report shall be signed both by the Supplier's and SCL's Operational Acceptance representatives and approved by the SCL's Operational Acceptance representative appointed.	
TOAT0100	Following satisfactory completion of all Operational Acceptance Tests (Guarantee Test) the Supplier shall offer the System for formal acceptance by the SCL.	
TOAT0110	<p>Authorized SCL representatives shall grant the Operational Acceptance if the following conditions are satisfied:</p> <ul style="list-style-type: none"> • The inventory and a complete physical check of the goods received have shown that the delivery in all aspects fulfills the requirements listed in the Contract Specification; • The system has been installed correctly; • The documentation has been supplied and is in conformity with the Contract Specification; • Training of the SCL staff has been carried out in accordance with the agreed conditions; • Spare parts have been delivered according to the Contract Specification and have been tested in real operation; • Operational acceptance tests have successfully been completed; • Signed and approved Operational Acceptance Report has been issued. 	

TOAT0120	All Operational Acceptance Report problems and observations shall be closed or a relevant action assigned and agreed.	
TOAT0130	All Certificates of Conformance and Suitability for use shall be provided by the Supplier for all deliverable items (including software).	
TOAT0140	The Operational Acceptance shall be granted by issuing an Operational Acceptance Certificate by the SCL. The Operational Acceptance Certificate shall be prepared and signed by SCL's Project Manager not later than 7 days after completion of Operational Acceptance and sent to the Supplier's Representative according to the official communication procedure.	

10 Drawings

10.1 Principal Positioning

10.1.1 The architecture of SCL datalink connections

