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**TECHNICAL SPECIFICATION AND REQUIREMENTS
for the DME Radio Navigation Equipment, No. 285-44**

Prepared by CNS/ATM Systems division

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1 Introduction

1.1 Purpose

Slovenia Control Ltd. (hereinafter also referred to as the Contracting Authority) plans to replace the existing DMEs at the following sites: Portorož Airport (VOR/**DME** PZ), Maribor Airport and Ilirska Bistrica (VOR/**DME** ILB). In addition, Slovenia Control Ltd. plans to install two new DMEs at new locations: Pasja Ravan and Krim.

Important notice:

The delivery, installation, and implementation of the DME equipment for the P. Ravan site shall be an option of the Contracting Authority. This means that the Contractor shall include it in its offer, the Contracting Authority shall take it into account in the evaluation of the offer, and it shall also be included in the contract; however, the selected Contractor shall deliver, install, and implement the equipment at this site only if it is additionally and expressly ordered by the Contracting Authority by means of a special written order. The Contracting Authority shall order the equipment under this option provided that all necessary permits for the installation of the equipment at the specified site are obtained. This option shall be a unilateral right of the Contracting Authority, to be exercised by written notice to the Contractor, and the Contractor shall be obliged to perform it under the same conditions as apply to the other equipment. The option shall remain valid for 12 months from the date of signature of the contract.

With installing new DMEs equipment Slovenia control intend to:

- To improve performance, safety, reliability – the existing equipment is at the end of the life cycle;
- Enable DME/DME capability.

Implementation day to deliver all systems (DME and RCMS) covered by the Contract is no later than 15th May 2027. The Contractor shall have completed all obligations as set out in the Technical Specification by that date, including the training of the users of the DME and RCMS.

1.2 Scope

This specification covers the requirements for a new DME systems.

1.3 General

| ID | Requirements | Compliance 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 table as set out below. | |
| GERQ0030 | Tenderers are encouraged to offer the existing baseline products that are compliant with or equivalent to all mandatory requirements. | |
| GERQ0040 | The offered system shall have at least the same or better technical characteristics as requested in this tender. | |

| | | |
|-----------------|---|--|
| GERQ0050 | <p>The Compliance table included in each chapter of this document provides an entry for each requirement.</p> <p>The Tenderer shall also provide additional remarks if they are considered helpful for assessing the response. Each remark shall be uniquely referred to corresponding document (Chapter, Paragraph).</p> | |
| GERQ0060 | The Tenderer compliance status shall be indicated against each paragraph of this specification in the 'Compliance' column with a Yes for Compliance or a No for Non-Compliance. | |
| GERQ0065 | No other response shall be recognised during the evaluation. | |
| GERQ0066 | Absence of Yes or No shall be counted as Not Compliant. | |
| GERQ0070 | The Tenderer shall provide the proof/explanation of every indicated Yes – Compliance in the 'Compliance' column. Additionally, where the answer can be found in the submitted documentation, | |
| GERQ0075 | The Tenderer shall provide the reference and point to the specific line/paragraph/chapter/document where the compliance status can be verified. | |
| GERQ0080 | <p>The technical capacity of the Tenderer shall be proved by submitting the following documents/information:</p> <p>The Tenderer/Supplier/Manufacturer shall present 5 references that the offered DME system has been installed and accepted (SAT signed) in at least five (5) reference projects in Eurocontrol area, demonstrating his experience in supplying DME and proprietary RCMS.</p> | |
| GERQ0082 | According to the requirement from GERQ0080 the references shall be for system or equipment, supplied to buyers in the Eurocontrol area. Such a reference can be issued by the system/equipment manufacturer, supplier or end-user of such system/equipment. In case equipment manufacturer or supplier references are presented, the buyer reserves the right to check the references at the final end-user of the system/equipment. | |
| GERQ0084 | Slovenia Control shall have the right to visit and assess the user experience for the references the Tenderer indicated. | |
| GERQ0090 | For all standards, certificates and regulations requested herein, the Contractor and all named subcontractors, or in case of a consortium all | |

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| | consortium members, shall comply with the respective requirement. | |
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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 | Requirements | Compliance YES/NO – references to evidence |
|-----------------|--|--|
| RDST0010 | The system design of the proposed DME system shall work completely in Compliance with the following documents: <ul style="list-style-type: none"> • ICAO standards / recommendations • ICAO Annex 10 (where applicable) • ICAO doc 8071 (where applicable) • EUROCAE MPS ED-57 – Minimum performance specification for distance measuring equipment (DME/N and DME/P) (ground equipment) • EEC Directives of CE Mark, RED (EMC, Safety and R&TTE) • EASA Detailed Specifications and Acceptable Means of Compliance & Guidance Material for certification or declaration of design compliance of ATM/ANS ground equipment (DS-GE.CER/DEC) | |
| RDST0012 | The equipment shall also meet the following standards for SW: <ul style="list-style-type: none"> • EUROCAE ED-153 or EUROCAE ED-109A (DS GE.GEN.003 Software, page 8) | |
| RDST0014 | The equipment shall also meet the following standards for environment: <ul style="list-style-type: none"> • ETSI EN 300 019-1-3 (V2.4.1) (DS GE.GEN.006, page 10) | |
| RDST0016 | The DME equipment shall have FMEA document as per: <ul style="list-style-type: none"> • EASA DS GE.GEN.007, page 10 – 14 | |
| RDST0018 | The all DME equipment delivered documentation shall meet: <ul style="list-style-type: none"> • EASA DS GE.GEN.007, page 14 | |
| RDST0020 | The equipment shall also meet the following standards for electrical safety: | |

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| | <ul style="list-style-type: none"> • IEC 60950 – International Safety Standard for Information Technology Equipment EN 60215. • EN 60215 - Safety of Radio Frequency Transmitters | |
| RDST0030 | The navigation equipment shall be newly-produced and shall meet the requirements for ground based aeronautical stations laid down in standard documents listed in RDST0010 and RDST0020 . | |
| RDST0035 | Navigation equipment shall meet the requirements to meet TCP/IP connectivity. | |
| RDST0040 | The Contractor shall comply with the EMC/EMI directives. | |
| RDST00540 | The Contractor to deliver DME shall comply to submit statemet that is (already) DPO by directive EU2023/1769 (Annex II page 14-20). Contractor shal also submit statemet that it is (if not already) in the process to become DPO by september 2028 and if needed it will support DME accreditation to CAA or EASA after September 2028with the EMC/EMI directives. | |

1.4.2 Regulatory Documents

| ID | Requirements | Compliance YES/NO – references to evidence |
|-----------------|---|---|
| RDRD0020 | The offered concept, design and equipment shall be fully compliant with Directive 2014/30/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to electromagnetic compatibility (recast) (OJ L OJ L 96, 29. 3. 2014, p. 79), as last amended by the Regulation (EU) 2018/1139 of the European Parliament and of the Council of 4 July 2018 on common rules in the field of civil aviation and establishing a European Union Aviation Safety Agency, and amending Regulations (EC) No 2111/2005, (EC) No 1008/2008, (EU) No 996/2010, (EU) No 376/2014 and Directives 2014/30/EU and 2014/53/EU of the European Parliament and of the Council, and repealing Regulations (EC) No 552/2004 and (EC) No 216/2008 of the European Parliament and of the Council and Council Regulation (EEC) No 3922/91(OJ L 212, 22. 8. 2018, p. 1). | |
| RDRD0040 | The offered training for the equipment shall be fully compliant with the ATSEP.OR.215 System and equipment rating training requirement of the Commission implementing regulation (EU) 2017/373 of 1 March 2017 laying down common requirements for providers of air traffic management/air navigation | |

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| | services and other air traffic management network functions and their oversight with all amendments. | |
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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, lamps, air filters, etc., that can be easily replaced by use of standard tools and procedures. |
| Civil Aviation Authority | Republic of Slovenia, Civil Aviation Agency |

Note: Terms “Tenderer”, “Contractor”, “Manufacturer” and “Supplier” are synonyms and shall mean entity, acting as bidder for public tender / entity, which implements public procurement.

1.6 Abbreviations

| Abbreviation | Meaning, description |
|--------------|---|
| ACC | Area Control Centre |
| AC | Alternating Current |
| ANSP | Air Navigation Service Provider |
| ATCC | Air Traffic Control Centre |
| ATCC | Air Traffic Control Centre |
| BITE | Built-in Test Equipment |
| ATM | Air Traffic Management |
| ATS | Air Traffic Service |
| ATSEP | Air Traffic Safety Electronics Personnel |
| COTS | Commercial-Of-The-Shelf |
| DBA | Dual Beam Antenna |
| DME | Distance Measuring Equipment |
| DT | Delivery Time. Defined as the time elapsed between the date of order of a part by the Contracting authority (in case of need of the order of additional spare parts) and the date of shipment of ordered part from the Contractor to the Contracting authority. |
| DC | Direct Current |
| EMP | Electromagnetic pulse |
| FAT | Factory Acceptance Test |
| FC | Flight Check |
| HMI | Human Machine Interface |
| HW | Hardware |

| | |
|----------|--|
| IP | Internet Protocol |
| IT | Information Technology |
| ILB | C VOR - ID for Ilirska Bistrica site |
| LAN | Local Area Network |
| LED | Light Emitting Diode |
| LRU | <p>Line Replaceable Unit that is repairable and that shall:</p> <ul style="list-style-type: none"> • in case of failure be identified by the Built-In-Test-Equipment (BITE) monitoring system, with the help of Technical Manual(s) and use of standard tool; • be easily accessible and replaceable (e.g., plug-in unit, screwed terminals or connectors); • have minimal adjustment requirements (e.g., voltage level setting, etc.) <p>be designed in such a way to ensure that the system returns to its full operational status within a meantime of 60 minutes (MTTR < 1 hour) when only one LRU has failed.</p> |
| 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. |
| NK | Not known (ID) |
| NTP | Network Time Protocol |
| PC | Personal Computer |
| POR | C VOR - ID for Portorož site |
| PMP | Project Management Plan |
| RCMS | Remote Control and Monitor System (including Status) |
| RCSE | Remote Control and Status System (Thales) |
| RF | Radio Frequency |
| RMM | Remote Maintenance and Monitoring system (Normac) |
| SAT | Site Acceptance Test |
| SAT | Site Acceptance Test |
| SIP | Session Initiation Protocol |
| SLA | Service Level Agreement |
| SNMP | Simple Network Management Protocol |
| SOC | Security Operations Centre |
| SRU | Swap Replaceable Unit, defined as a unit which is replaced within a LRU and is repairable. |
| SW | Software |
| TCP | Transmission Control Protocol |
| TMA | Terminal Area |
| TWR | Air traffic control tower |
| TWR LJLJ | Air traffic control tower - AD Ljubljana (Brnik) |
| TWR LJMB | Air traffic control tower - AD Maribor |
| TWR LJPZ | Air traffic control tower - AD Portorož |
| TRx | Transceiver |
| USB | Universal Serial Bus |

| | |
|------|---------------------------------|
| WAN | Wide Area Network |
| VOR | VHF Omnidirectional Radio Range |
| VSWR | Voltage standing wave ratio |

2 Functional and Technical Overview

2.1 General

This procurement specification defines the minimum desired features for the supply and installation of navigation equipment DME and its remote control to technical room. The scope of tender is:

- DME,
- Remote control to technical room at TWR LJMB, TWR LJLJ and ATCC Ljubljana.

Slovenia Control Ltd. intends to purchase and install new DME-s systems at the following five (5) locations:

- Airport Maribor DME (DME collocated to ILS),
- Airport Portorož DME (DME collocated to VOR POR),
- Iliska Bistrica DME (DME collocated to VOR ILB),
- Pasja Raven DME (standalone equipment),
- Krim (standalone equipment).

Slovenia Control Ltd. intends to purchase and install remote control equipment to connect new DME-s systems in RCMS system to remotely access and control new DME equipment. RCMS system will connect DME systems with main RCMS installed at ATCC, TWR LJMB and TWR LJLJ.

| ID | Requirements | Compliance YES/NO – references to evidence |
|----------|---|--|
| FTGE0010 | The Tenderer is solely responsible for the System Design. If any changes to the design are necessary to meet the Specifications, the Contractor shall carry out such changes at no cost to the Contracting authority. | |
| FTGE0020 | The Tenderer shall be responsible for the system engineering efforts associated with the design, production, installation, testing and audit of the systems and equipment being provided. | |
| FTGE0030 | The Tenderer shall deliver a detailed rack layout and equipment placement scheme for every location, from which the placement of all equipment shall be clearly visible inside the object, with all installations, connections and cabling, to antenna or/and telecommunication equipment (if appropriate). | |
| FTGE0050 | The Tenderer shall deliver detailed schematic diagrams for RCMS layout interconnection from which a general and detailed design of the RCMS system shall be clearly visible (if appropriate). | |
| FTGE0060 | The Tenderer shall deliver detailed general schematic diagrams for locations/sites. | |

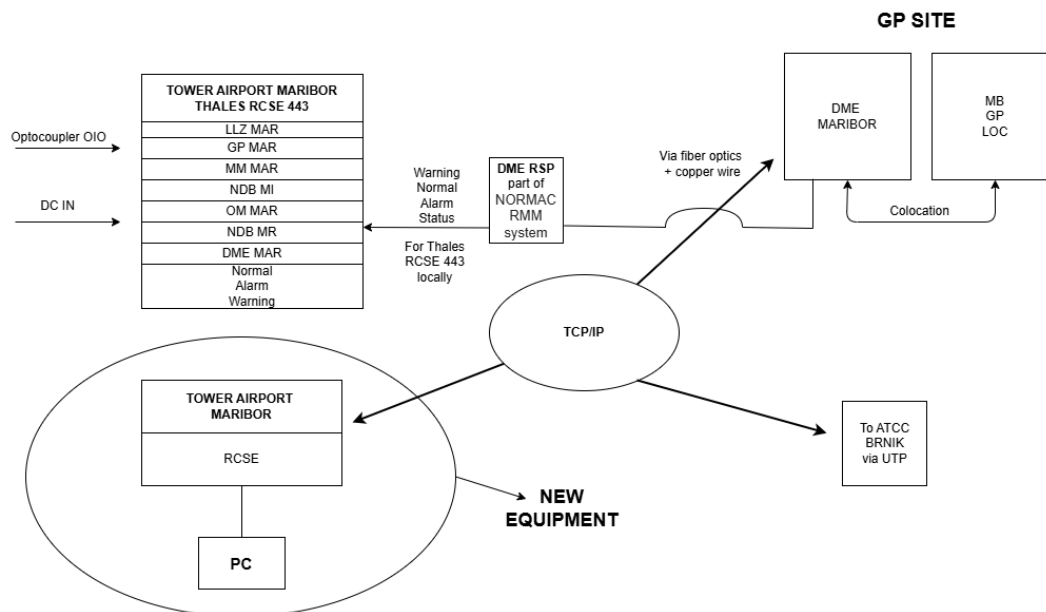


Figure 2: Overview of RMM and RCSE system at MB airport

2.2 Functional

2.2.1 Position and Replacement of Equipment

2.2.1.1 Positioning of Equipment

Airport Portorož:

| ID | Requirements | Compliance YES/NO – references to evidence |
|-----------------|---|--|
| POSE0010 | At Airport Portorož new DME, new antenna and new cabling should be installed in the existing VOR/DME POR container, replacing the old DME system. | |

Airport Maribor:

| ID | Requirements | Compliance YES/NO – references to evidence |
|-----------------|--|--|
| POSE0020 | At Airport Maribor new DME, new antenna and new cabling should be installed in the existing GP shelter (brick construction) of ILS MAR, replacing the old DME system. New antenna should be installed at the top of the existing GP mast (new antenna relocated in compare with existing antenna | |

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| | location). Special attention to distance cables length. Antenna cables length not exceeded 25m. | |
|--|---|--|

Ilirska Bistrica:

| | | Compliance YES/NO – references to evidence |
|-----------------|---|---|
| POSE0030 | At Ilirska Bistrica new DME, new antenna and new cabling should be installed in the existing VOR/DME ILB container, replacing the old DME system. | |

Site Pasja Ravan:

| ID | Requirements | Compliance YES/NO – references to evidence |
|-----------------|---|---|
| POSE0040 | At site Pasja Ravan new DME, new antenna and new cabling should be installed in the new shelter. Standard 20 feet ISO container, antenna mast 16m height will be provided by Contracting Authority. Special attention to distance cable length. Antenna cables length not exceeded 25m. | |
| POSE0050 | It is preferred that DBA antenna is delivered instead only DME antenna. DBA antenna consists of DME antenna (on top) and ADS-B antenna (at bottom) installed in one radom. | |
| | | |

Site Krim:

| ID | Requirements | Compliance YES/NO – references to evidence |
|-----------------|---|---|
| POSE0050 | At site Krim new DME, new antenna and new cabling should be installed in Slovenia Telecom telecommunication room. Special attention to distance cable length. Antenna cables length 50m long. | |

2.2.2 Quantity of DME Equipment

The Tenderer shall offer appropriate equipment and ensure its full functionality for the following sites.

| ID | Requirements | Compliance YES/NO – references to evidence |
|----------|--|---|
| | Airport Portorož: DME POR (one): | |
| QTYP0010 | 1000 W output pulse power | |
| QTYP0020 | Dual design equipment (Main/Stand By) | |
| QTYP0030 | Equipped with BITE | |
| QTYP0040 | Full control via local or remote PC possibility, | |
| QTYP0050 | Lead acid battery charging power supply, to charge batteries with the ability at least 15A charging current output. Battery capacity for work equipment equal to 24h. DC output 48V lead acid battery set. | |
| QTYP0060 | The largest floor plan of the equipment cabinet should not exceed standard 19" rack. Front and rear rack door equip with lock | |
| QTYP0070 | DME should be collocated with existing VOR POR. Type of VOR: SEL 4000. | |
| QTYP0080 | RF cable to replace RG 214 with equal or better specification (not exceed diameter 11 mm). | |
| remark | Available power supply: - AC line single phase 230V AC, 50Hz | |
| remark | Available power supply: - DC 48V lead acid battery's (to power existing VOR/DME equipment not to supply). | |
| remark | Available copper line and optic fiber to container | |

| ID | Requirements | Compliance YES/NO – references to evidence |
|----------|--|---|
| | Airport Maribor: DME LJMB (one) | |
| QTYM0010 | 1000 W output pulse power | |
| QTYM0020 | Dual design equipment (Main/Stand By) | |
| QTYM0030 | Equipped with BITE | |
| QTYM0040 | Full control via local or remote PC possibility | |
| QTYM0050 | Lead acid battery charging power supply, to charge batteries with the ability at least 15A charging current output. Battery capacity for work equipment equal to 24h. DC output 48V lead acid battery set. | |

| ID | Requirements | Compliance YES/NO – references to evidence |
|----------|--|---|
| QTYM0060 | The largest floor plan of the equipment cabinet should not exceed standard 19" rack. Front and rear rack door equip with lock | |
| QTYM0070 | Lead acid battery charging power supply, to charge batteries with the ability at least 15A charging current output. Battery capacity for work equipment equal to 24h. DC output 48V lead acid battery set. | |
| QTYM0080 | The largest floor plan of the equipment cabinet should not exceed standard 19" rack. Front and rear rack door equip with lock DME should be collocated with existing ILS. Type of ILS: NORMAC 7013 | |
| Remark | Available power supply: - AC line single phase 230V AC, 50Hz | |
| Remark | Available power supply: - DC 48V lead acid battery's (not to supply) to power DME. | |
| Remark | Available copper line and optic fiber to site | |

| ID | Requirements | Compliance YES/NO – references to evidence |
|----------|--|---|
| | Ilirska Bistrica VOR/DME: DME ILB (one) | |
| QTYI0010 | 1000 W output pulse power | |
| QTYI0020 | Dual design equipment (Main/Stand By) | |
| QTYI0030 | Equipped with BITE | |
| QTYI0040 | Full control via local or remote PC possibility | |
| QTYI0050 | Lead acid battery charging power supply, to charge batteries with the ability at least 15A charging current output. DME DC output must charge 49V lead acid battery set. | |
| QTYI0060 | The largest floor plan of the equipment cabinet should not exceed standard 19" rack. Front and rear rack door equip with lock | |
| QTYI0070 | DME should be collocated with existing VOR ILB. Type of VOR: THALES VOR 431 | |
| QTYI0080 | Equipment must work as standalone equipment if VOR not collocated. | |

| ID | Requirements | Compliance YES/NO – references to evidence |
|--------|--|---|
| Remark | Available power supply: - AC line single phase 230V AC, 50Hz | |
| Remark | Available power supply: - DC 48V lead acid battery's (not to supply) to power DME. | |
| Remark | Available dial up copper line | |

| ID | Requirements | Compliance YES/NO – references to evidence |
|----------|--|---|
| | Pasja Ravan DME (NK): DME xx (one) | |
| QTYR0010 | 1000 W output pulse power | |
| QTYR0020 | Dual design equipment (Main/Stand By) | |
| QTYR0030 | Equipped with BITE | |
| QTYR0040 | Full control via local or remote PC possibility | |
| QTYR0050 | Lead acid battery charging power supply with the ability at least 15A charging current output. DME DC output must charge 48V lead acid battery set | |
| QTYR0060 | The largest floor plan of the equipment cabinet should not exceed standard 19" rack. Front and rear rack door equip with lock | |
| QTYR0070 | Equipment must work as standalone equipment | |
| Remark | Available power supply: - AC line single phase 230V AC, 50Hz | |
| Remark | Available power supply: - DC 48V lead acid battery's (not to supply) to power DME. | |
| Remark | Available optic fiber | |

| ID | Requirements | Compliance YES/NO – references to evidence |
|----------|---------------------------------------|---|
| | Krim DME (NK): DME xx (one) | |
| QTYK0010 | 1000 W output pulse power | |

| ID | Requirements | Compliance YES/NO – references to evidence |
|----------|--|---|
| | | |
| QTYK0020 | Dual design equipment (Main/Stand By) | |
| QTYK0030 | Equipped with BITE | |
| QTYK0040 | Full control via local or remote PC possibility | |
| QTYK0050 | Lead acid battery charging power supply with the ability at least 15A charging current output. DME DC output must charge 48V lead acid battery set | |
| QTYK0060 | The largest floor plan of the equipment cabinet should not exceed standard 19" rack. Front and rear rack door equip with lock | |
| QTYK0070 | Equipment must work as standalone equipment | |
| Remark | Available power supply: - AC line single phase 230V AC, 50Hz | |
| Remark | Available power supply: - DC 48V lead acid battery's (not to supply) to power DME. | |
| Remark | Available optic fiber or link | |

2.2.3 Antenna System Requirements

| | | |
|----------|---|--|
| | Airport Portorož: DME antenna (one) with cables: | |
| QTYP0110 | Omnidirectional (KATHRAIN 715986) Vertical polarization Gain: ≥ 9 dB | |
| QTYP0112 | Coupling attenuation antenna to monitor probes: 21.5 +/- 3dB | |
| QTYP0114 | Maximum bearable wind speed: - 150 km/h with 2mm of ICE. | |
| QTYP0116 | Temperature range: -40 to +60°C | |
| QTYP0118 | All metal parts DC grounded | |
| QTYP0122 | All grounding parts corrosion proof | |

| | | |
|-----------------|---|--|
| QTYP0124 | All antenna cables should be surge/overvoltage protected with quarter wave shorting stub protectors as Huber and Suhner type 2400.17.0385 or better equivalent. | |
| QTYP0126 | Lightning and over voltage protection solution must be admitted to Contracting Authority, as a project, consist of technical drawing, etc | |
| QTYP0128 | Surge protective measures must be considered according to the standard IEC 62305. | |
| QTYP0130 | Mounting bracket/clamps compatible with existing VOR SEL 4000 antenna bracket. | |
| QTYP0132 | All antenna mounting bracket/clamps (adapters) must provide the supplier of DME | |
| QTYP0134 | Mounting/grounding accessory place meant with nut and bolt made of stainless stell. | |
| QTYP0136 | Double LED obstruction light at the top of DME antenna. Operation with 1 LED and activated failure detection. | |
| QTYP0138 | In case of malfunction of the main LED, the second led should be activated automatically. | |
| QTYP0142 | New DME antenna height must not exceed the height of the existing DME antenna, which is 3050 mm. | |
| QTYP0144 | Existing RF cable must be new, old to be replaced. | |
| QTYP0146 | RF cable to replace RG 214 with equal or better specification (not exceed jacket diameter approx. 11,0 mm). Flame retardant to IEC 60332-1 standard. | |
| QTYP0148 | Proper cable producer OEM hanger/clamps must be supplied to permanently fix supplied RF cables to antenna steel lattice tower. (Plastic/nylon cable ties/strips are not meant as main method to permanently fix a RF cable to a steel tower). | |
| QTYP0152 | All antenna parts must be weatherproof. | |

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| | Airport Maribor: DME antenna (one) with cables: | |
| QTYM0110 | Omnidirectional (KATHRAIN 715986) Vertical polarization Gain: ≥ 9 dB | |
| QTYM0112 | Coupling attenuation antenna to monitor probes: 21.5 +/- 3dB | |
| QTYM0114 | Maximum bearable wind speed: - 150 km/h with 2mm of ICE. | |
| QTYM0116 | Temperature range: -40 to +60°C | |
| QTYM0118 | All metal parts DC grounded | |
| QTYM0122 | All grounding parts corrosion proof | |
| QTYM0124 | All antenna cables should be surge/overvoltage protected with quarter wave shorting stub protectors as Huber and Suhner type 2400.17.0385 or better equivalent (provided by contractor). | |
| QTYM0126 | Lightning and over voltage protection solution must be admitted to Contracting Authority, as a project, consist of technical drawing, etc | |
| QTYM0128 | Surge protective measures must be considered according to the standard IEC 62305. | |
| QTYM0130 | DME antenna positioning at the top of the existing GP mast (old Thomson stell GP mast production year from around 1975 - 1980). | |
| QTYM0132 | All antenna mounting bracket/clamps (adapters) must provide the supplier of DME | |
| QTYM0134 | All antenna mounting bracket/clamps (adapters) is/are made from long-lasting noncorrosive material. | |
| QTYM0136 | Mounting/grounding accessorys, nuts and bolts, ..., made of stainless stell. | |
| QTYM0138 | Double LED obstruction light at the top of DME antenna. Operation with 1 LED and activated failure detection. | |
| QTYM0142 | In case of malfunction of the main LED, the second led should be activated automatically. | |
| QTYM0144 | Existing RF cable must be new, old to be replaced. | |

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| QTYM0146 | Special attention needs to be put on antenna coax cable – attenuations and delays. DME monitor and antenna cable antenna loss should not exceed power required power budget for 150 NM DME coverage. | |
| QTYM0148 | If applicable external type of cable = LCF ½” or better (RFS). | |
| QTYM0152 | Ecoflex 15 plus or better cables for internal (to cabinet) use | |
| QTYM0154 | Low loss antenna connectors must be used. (If applicable use OMIN FIT Premium E01 series connectors or better) | |
| QTYM0156 | Proper cable producer OEM hanger/clamps must be supplied to permanently fix supplied RF cables to antenna steel lattice tower. (Plastic/nylon cable ties/strips are not meant as main method to permanently fix a RF cable to a steel tower). | |
| QTYM0158 | All antenna parts must be weatherproof. | |

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| | <i>Ilirska Bistrica VOR/DME ILB:</i> DME antenna (one) with cables: | |
| QTYI0110 | Omnidirectional (KATHRAIN 715986) Vertical polarization Gain: ≥ 9 dB | |
| QTYI0112 | Coupling attenuation antenna to monitor probes: 21.5 +/- 3dB | |
| QTYI0114 | Maximum bearable wind speed: - 150 km/h with 2mm of ICE. | |
| QTYI0116 | Temperature range: -40 to +60°C | |
| QTYI0118 | All metal parts DC grounded | |
| QTYI0122 | All grounding parts corrosion proof | |
| QTYI0124 | All antenna cables should be surge/overvoltage protected with quarter wave shorting stub protectors as Huber and Suhner type 2400.17.0385 or better equivalent (provided by contractor). | |

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| QTYI0126 | Lightning and over voltage protection solution must be admitted to Contracting Authority, as a project, consist of technical drawing, etc | |
| QTYI0128 | Surge protective measures must be considered according to the standard IEC 62305. | |
| QTYI0130 | Mounting bracket/clamps compatible with existing THALES VOR 431 antenna bracket. | |
| QTYI0132 | All antenna mounting bracket/clamps (adapters) must provide the supplier of DME | |
| QTYI0134 | Mounting/grounding accessories, nuts and bolts, ..., made of stainless steel. | |
| QTYI0136 | Double LED obstruction light at the top of DME antenna. Operation with 1 LED and activated failure detection. | |
| QTYI0138 | In case of malfunction of the main LED, the second led should be activated automatically. | |
| QTYI0142 | DME antenna positioning at the top of the VOR antenna | |
| QTYI0144 | Existing RF cable must be new, old to be replaced. | |
| QTYI0146 | RF cable to replace RG 214 with equal or better specification (not exceed jacket diameter approx. 11,0 mm). Flame retardant to IEC 60332-1 standard. | |
| QTYI0148 | Low loss antenna connectors must be used. OMNI FIT Premium E01 series connectors. | |
| QTYI0152 | All antenna parts must be weatherproof. | |

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| | Pasja Ravan: DME antenna with cables: | |
| QTYR0110 | <p>DBA is dual beam antenna consist of two antennas DME and ADS-B enclosed in one weatherproof fiberglass radome. Two DBA antennas must be delivered.</p> <p>DME antenna array as top section (similar technical specification as dBs 5100A antenna): Omni directional Vertical polarization Gain main beam: ≥ 9 dB Circularity: ± 1 dB max on horizontal Frequency range: 962 to 1213 MHz Power handling: Up to at least 5KW peak RF power at 3%dc.</p> | |

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| | <p>Impedance: 50 OHM nominal Monitor probes: two couplong probes (level 25dB +/- 1dB, locate at the bottom of antenna base) Connector N female jack 3 each</p> <p>ADS-B antenna array as bottom section (similar technical specification as dBs 610 antenna): Omni directional Vertical polarization Gain maine beam: ≥ 6 dB Gaine horizont beam: ≥ 3 dB Maine beam elevation location: 10* nominal above horizon Slope (vicinity of horizon): 0.35 dB/* minimum Circularity: +/- 2 dB max on horizon Frequency range: 960 to 1215 MHz Power handling: Up to at least 5KW peak RF power at 3%dc. Impedance: 50 OHM nominal Connector N female jack</p> <p>Antenna isolation: ≥ 30 dBi</p> <p>DBA antenna with lightning assembly, red dual obstruction LED light, Base pipe adapter, N conectors at the bottom protected against weather influence,</p> | |
| QTYR0116 | Maximum bearable wind speed: - 150 km/h with 2mm of ICE. | |
| QTYR0118 | Temperature range: -40 to +60°C | |
| QTYR0120 | All metal parts DC grounded | |
| QTYR0122 | All grounding parts corrosion proof | |
| QTYR0124 | All antenna cables should be surge/overvoltage protected with quarter wave shorting stub protectors as Huber and Suhner type 2400.17.0385 or better equivalent (provided by contractor). | |
| QTYR0126 | Lightning and over voltage protection solution must be admitted to Contracting Authority, as a project, consist of technical drawing, etc | |
| QTYR0128 | Surge protective measures must be considered according to the standard IEC 62305. | |
| QTYR0130 | DME antenna positioning at the top of the new mast. DME antenna positioning at the cca. 17m mast provided by Contracting Authority. | |
| QTYR0132 | All antenna mounting bracket/clamps (adapters) must provide the supplier of DME | |

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| QTYR0132 | All antenna mounting bracket/clamps (adapters) is/are made from long-lasting noncorrosive material. | |
| QTYR0134 | Mounting/grounding accessorys, nuts and bolts, ..., made of stainless stell. | |
| QTYR0136 | Double LED obstruction light at the top of DME antenna. Operation with 1 LED and activated failure detection. | |
| QTYR0138 | In case of malfunction of the main LED, the second led should be activated automatically. | |
| QTYR0142 | Minimum antenna cable loss. Special attention needs to be put on antenna coax cable – attenuations and delays. DME monitor and antenna cable antenna loss shoud not exceed power required power budget for 150 NM DME coverage. If applicable external type of cable = LCF ½” or better | |
| QTYR0144 | Ecoflex 15 plus or better cables for internal (to cabinet) use. | |
| QTYR0146 | Low loss antenna connectors must be used. (If applicable use OMIN FIT Premium E01 series connectors or better) | |
| QTYR0148 | Proper cable producer OEM hanger/clamps must be supplied to permanently fix supplied RF cables to antenna mast (it is possible that clamp for messenger wire mounting must be used if antenna flanged pole is erected). Plastic/nylon cable ties/strips are not meant as main method to permanently fix a RF cable to a steel pilar. | |
| QTYR0152 | Ecoflex 15 plus or better cables for internal (to cabinet) use. | |
| QTYR0154 | All antenna parts must be weatherproof. | |

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| | KRIM: DME antenna (one) with cables: | |
| QTYK0110 | Omnidirectional (KATHRAIN 715986) Vertical polarization Gain: ≥ 9 dB | |
| QTYK0112 | Coupling attenuation antenna to monitor probes: 21.5 +/- 3dB | |

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|-----------------|---|--|
| QTYK0114 | Maximum bearable wind speed: - 150 km/h with 2mm of ICE. | |
| QTYK0116 | Temperature range: -40 to +60°C | |
| QTYK0118 | All metal parts DC grounded | |
| QTYK0122 | All grounding parts corrosion proof | |
| QTYK0124 | All antenna cables should be surge/overvoltage protected with quarter wave shorting stub protectors as Huber and Suhner type 2400.17.0385 or better equivalent (provided by contractor) | |
| QTYK0126 | Lightning and over voltage protection solution must be admitted to Contracting Authority, as a project, consist of technical drawing, etc | |
| QTYK0128 | Surge protective measures must be considered according to the standard IEC 62305. | |
| QTYK0130 | DME antenna positioning at the top of the existing TELECOM mast. | |
| QTYK0132 | All antenna mounting bracket/clamps (adapters) must provide the supplier of DME | |
| QTYK0134 | All antenna mounting bracket/clamps (adapters) is/are made from long-lasting noncorrosive material. | |
| QTYK0136 | Mounting/grounding accessory place meant with nut and bolt made of stainless steel. | |
| QTYK0138 | No obstruction lights. Top of antenna free of obstruction light. | |
| QTYK0144 | Existing RF cable must be new. | |
| QTYK0146 | Special attention needs to be put on antenna coax cable – attenuations and delays. DME monitor and antenna cable antenna loss should not exceed power required power budget for 150 NM DME coverage. Antenna cable is 50m long. | |
| QTYK0148 | If applicable external type of cable = LCF ½" or better (RFS). | |
| QTYK0152 | Ecoflex 15 plus or better cables for internal (to cabinet) use | |
| QTYK0154 | Low loss antenna connectors must be used. (If applicable use OMIN FIT Premium E01 series connectors or better) | |

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| QTYK0156 | Proper cable producer OEM hanger/clamps must be supplied to permanently fix supplied RF cables to antenna steel lattice tower. (Plastic/nylon cable ties/strips are not meant as main method to permanently fix a RF cable to a steel tower). | |
| QTYK0158 | All antenna parts must be weatherproof. | |
| remark | Deployment of all antenna cables and antenna at the top of telecom mast at KRIM is responsibility of contracting authority. | |

2.3 DME Technical Specifications

| | | |
|-----------------|---|--|
| | Technical Specifications | |
| DMET0010 | System configuration: dual 1kW full band | |
| DMET0020 | Transmitter: <ul style="list-style-type: none"> • Power output, • Frequency, • Frequency stability (+- xx%) • Channels • RF pulse spectrum • Spurious output and harmonics • Pulse rise and fall time (+- xx mms) • Pulse duration (+- xx mms) • Pulse pair spacing (+- xx mms) • Ident • Ident rate (pps) • Pulse repetition rate (pps) • System replay delay (+- xx mms) • Distance accuracy (+- m) • Replay delay time stability (+- xx mms) Remark: fill XX with DME data | |
| DMET0030 | Receiver: <ul style="list-style-type: none"> • Frequency, • Sensitivity • Adjacent channel and IF frequency rejection • Spurious rejection receiver decodes • N mode • Aircraft handling capacity | |
| DMET0040 | System remote control: <ul style="list-style-type: none"> • Local/remote • Interface PC and • by touch button (switch) interface • method | |
| DMET0050 | System monitoring (BITE): | |

| | | |
|-----------------|--|--|
| | <ul style="list-style-type: none"> • Number of BITE (please list all) • By system subunits (LRU please list all) • method | |
| DMET0060 | Monitor parameters: <ul style="list-style-type: none"> • primary (please list all) • secondary (please list all) • display by remote control local and remote (please list all) | |
| DMET0070 | Fanless equipment. | |
| DMET0080 | Hot swappable moduls. | |
| DMET0090 | Active standby monitoring. | |
| DMET0100 | Monitor self test | |

2.4 Remote Control and Monitoring System

Communication media:

| Site | Communication media |
|--|---|
| <i>Airport Portorož</i> VOR/DME POR: | Optic fibre and copper line available. LCU VOR SEL 4000 (THALES) at location. |
| <i>Airport Maribor</i> DME LJMB: | Optic fibre and copper line available. |
| <i>VOR/DME Ilirska Bistrica</i> DME ILB | One copper dial up line for VOR and DME (DME is connected via LCU THALES VOR 431 to send Alarm/Warning/Normal signalling. In case of double connecting needed alternative must be available (GSM modem!). |
| Site Pasja Ravan DME | Optical fibre or RF link/GSM modem. |
| Site Krim DME | Optical fibre or RF link |

2.4.1 DME to RCMS THALES RCME 443 Integration Requirements

| ID | Requirements | Compliance YES/NO – references to evidence |
|-----------------|---|---|
| RCMS0010 | The existing THALES RCMS (local) system shall be able to monitor and control new DME systems installed on site Airport Portorož Contractor may use all the parts of the existing RCMS system. | |

| ID | Requirements | Compliance YES/NO – references to evidence |
|----------|---|---|
| RCMS0012 | The existing THALES RCMS (local) system shall be able to monitor and control new DME systems installed on site Airport Maribor to send DME status. Contractor may use all the parts of the existing NORMAC RMM system (Remote Maintenance and Monitoring system NORMAC 7050). For controlling and indication DME can use in MB TWR MB installed DME REMOTE STATUS PANEL (lamp and switch indication control panel). This DME RSP can be use to export status to THALES RCMS. | |
| RCMS0014 | The existing THALES system shall be able to monitor and control new DME systems installed on site VOR/DME ILB Contractor may use all the parts of the existing THALES system. | |
| RCMS0016 | At Pasja Ravan and Krim there is not present THALES RCMS to control new DME. Contractor may use all the parts of the existing RCMS system in airport tower to connect to THALES RCMS. | |
| RCMS0020 | Statuses of the DME systems (ALARM, WARNING, NORMAL) of each site separately should be displayed at the existing THALES RCMS. | |
| RCMS0030 | Basic commands ON/OFF and CHANGEOVER of new DME systems must be enabled to be executed via pushbuttons. | |

2.4.2 RCMS data presentation

| ID | Requirements | Compliance YES/NO – references to evidence |
|----------|---|---|
| RCMS0220 | Critical operational alarms shall be presented on an RCMS alarm message window | |
| RCMS0230 | At the supervision room and local towers, the control and monitoring of remote operating equipment shall be indicated (visually and by audible alarms in critical cases). | |
| RCMS0260 | Reports shall cover the current and past statuses in several combined or divided forms: <ul style="list-style-type: none"> - Equipment status and alarms; - History events; - Equipment configuration (operational parameters and settings) for each unit and/or system. | |

| ID | Requirements | Compliance YES/NO – references to evidence |
|-----------------|---|---|
| | - | |
| RCMS0290 | All collected events and data shall be logged for a period of minimum 1 year. | |
| RCMS0310 | It shall be possible for the administrator to configure the access levels for each user separately for each DME site. Security/access levels: <ul style="list-style-type: none"> • standard access – except control functions, • control access – all control functions, • administrator access– system configuration possibilities. | |
| RCMS0340 | It shall be possible to configure a password for each individual user. | |
| RCMS0370 | The RCMS software application shall be configurable for Site-RCMS or Central-RCMS part. Overall status must be presented with connection control to individual sites on TWR locations ADMB, ADLJ and CTNC (ACC technical watch). | |
| RCMS0380 | The RCMS software application installed on the Central RCMS shall be able to monitor and/or control DME equipment at DME sites. | |
| RCMS0400 | Alarms and warnings shall be triggered based on the DME status, connection status and power supply status. Chang of status must be transferred frome local equipment to remote RCMS in real time. | |
| RCMS0402 | Presentation window for DME shall include tabs or sections or tickets: <ul style="list-style-type: none"> - Status, - Commands, - Measurement, - Maintenance, - Setting (of operational parameters), - Events (reading alarm, warning and info events) | |
| RCMS0404 | RCMS shall provide remote maintenance checks, access to set up all parameters of connected DME equipment, to handle storage and readout of measured monitored parameters and BIT values, measurements for maintenance and fault finding, and to control (ON/OFF/change over Tx1/Tx2) DME equipment. | |
| RCMS0140 | The RCMS software application installed on the Central RCMS shall be able to send all DME status to a third-party equipment via appropriate protocol e.g., RS-232, IP | |
| RCMS0142 | For the purpose of monitoring and control, the system shall provide an IP network-based protocol | |

| ID | Requirements | Compliance YES/NO – references to evidence |
|-----------------|---|---|
| | <p>that will allow queries or automatically send reports about statuses of navigation equipment.</p> <p>For instance: System shall support TCP connection where connecting clients can get information about statuses on request, or system shall send messages via UDP or TCP connection about statuses on regular basis (every 2 seconds).</p> | |
| RCMS0144 | <p>The delay for reporting a state shall be adjustable.</p> <p>UDP messages shall be sent at least every 5 seconds. Client shall be able to interrogate for status on a TCP connection in at least 5 second intervals.</p> | |
| RCMS0146 | <p>If only changes of states are reported, a heartbeat signal shall be provided to make sure the connection is still working (without changes of the equipment statuses).</p> | |
| RCMS0148 | <p>If only changes of states are reported, a full status report shall be possible for a newly connected client to get the whole status information.</p> | |
| RCMS0150 | <p>The Contractor shall deliver and install all necessary software supported with a valid software license for the entire life of the equipment including software upgrades and is not limited to number of users within Slovenia control.</p> | |
| RCMS0160 | <p>For all new installed DMEs supplier of the equipment must provide export of all equipment status (ALARM, WARNING, NORMAL) to the existing Thales RCMS. Type of connection can relay at least as INPUT/OUTPUT DC contact or higher type to existing RCMS. Transfer of the DME status to the existing Thales RCMS can be done locally at the DME site and/(or) ATCC LJ from the proprietor delivered DME RCMS.</p> | |

2.5 SNMP

| ID | Requirements | Compliance YES/NO – references to evidence |
|-----------|---|---|
| RESNM0010 | Recording servers shall allow integration in Slovenia Control's dedicated supervisory system. | |
| RESNM0020 | For this purpose, it shall provide a SNMP output interface using version v2c of SNMP protocol. All functions defined for this protocol version shall be available. | |
| RESNM0030 | System state information and its major components shall be delivered using a trapping mechanism (on occurrence of an event a trap is sent) and maintained through a polling mechanism (answering SNMP get requests). | |
| RESNM0040 | System information shall be hierarchal organized. | |
| RESNM0041 | System information shall be presented under a MIB (Management Information Base) form, | |
| RESNM0042 | System shall include the definition of all essential parameters of the system, as well as the definition for trap messages. | |
| RESNM0050 | Definition of the complete message structure shall be agreed at a later phase, through the establishment of an ICD. | |
| RESNM0060 | The configuration of SNMP manager, like the address and port number of trap destination shall be possible, and it shall also be possible to configure SNMP write and read communities. | |
| RESNM0062 | It shall also be possible to configure SNMP write and read communities. | |

2.6 Alarm functionality

| ID | Requirements | Compliance YES/NO – references to evidence |
|-----------|--|---|
| RECAL0010 | The correct functioning of the system shall be supervised from the Management PC. | |
| RECAL0015 | Active alarm presentation shall be designed in the way of a separate tab that will be presented 24/7 on the monitor of the Management and Replay PC. | |
| RECAL0020 | The system shall run continuous diagnostic checks, including periodical check procedures on units. | |
| RECAL0025 | The system shall be initiating visual alarms in the event of a failure. | |
| RECAL0030 | In case a failure is found, the system shall be able to provide detailed information about the failure in the form of visual alarm. | |
| RECAL0040 | The failure message shall contain at least: <ul style="list-style-type: none"> - Date and time of failure; - Severity level of failure; - Equipment involved in failure. - | |
| RECAL0050 | Alarm file(s) shall contain: <ul style="list-style-type: none"> - All resolved and still active error messages; - All error and warning messages; - Time of failure; - Type of failure; - Equipment involved in failure. | |
| RECAL0070 | For further analysis, it shall be possible to export data from alarm file or any filtered part of it to a standard industry format (e.g., xls, doc, pdf, txt, csv). | |
| RECAL0080 | Different alarms shall have different severity levels and should be configurable by the contracting authority. | |

2.7 System timing

| ID | Requirements | Compliance YES/NO – references to evidence |
|----------|--|---|
| RECT0010 | The system shall have an internal clock that shall be capable of being synchronized by an external source. | |
| RECT0030 | For the purpose of the logging all events and status of the DME, recording servers shall have the means to be synchronized by an external source – NTP server to be provided by Slovenia Control. | |

3 Training

Contracting authority covers travel and accommodation costs, incurred with attendance of Contracting authority's technical staff to training. All other costs, related to training, are included in contractual price. Contracting authority unilaterally designates trainees.

The Contractor shall monitor compliance of training to the requirements from TRNG0010 to TRNG0210.

The Contractor shall grant the Contracting authority access to the premises and applicable documentation for the purposes of TRNG requirements compliance monitoring by the Contracting authority, including access to the documentation of TRNG0220 compliance monitoring conducted by the Contractor itself.

| ID | Requirements | Compliance YES/NO – references to evidence |
|----------|---|---|
| TRNG0010 | The training for the equipment (DME and/or RCMS) shall be fully compliant with the ATSEP.OR.215 System and equipment rating training requirement of Commission Implementing Regulation (EU) 2017/373 of 1 March 2017 laying down common requirements for providers of air traffic management/air navigation services and other air traffic management network functions and their oversight with all amendments. | |
| TRNG0011 | The training shall include all needed to meet following requirements: a) The system and equipment rating training of ATSEPs shall be applicable to the duties to be performed and include the following: a. theoretical courses; b. practical courses; c. on-the-job training during system installation. | |

| ID | Requirements | Compliance YES/NO – references to evidence |
|----------|---|---|
| | <p>b) The system and equipment rating training shall ensure that candidate ATSEP acquire knowledge and skills pertaining to:</p> <ol style="list-style-type: none"> the functionality of the system and equipment; the actual and potential impact of ATSEP actions on the system and equipment; the impact of the system and equipment on the operational environment. performing repairs of the navigation system | |
| TRNG0012 | Training for the equipment (DME and/or RCMS) shall be performed on live working systems (by type equal equipment as it will be delivered to Contracting Authority). | |
| TRNG0014 | Training shall be performed at the factory premises of the producer of the systems by producer's instructor. | |
| TRNG0015 | The contractor shall deliver the statement prior the training, that the training will be performed in compliance with ATSEP.OR.215 System and equipment rating training requirement of Regulation EC 2017/373. | |
| TRNG0020 | <p>The following training of personnel is required:</p> <ul style="list-style-type: none"> System and equipment rating training of existing NAV qualified ATSEP up to 7 persons. | |
| TRNG0025 | The Tenderer shall define the course manager and compliance monitoring manager for the TRNG0020 training and their competencies after contract signature. | |
| TRNG0030 | The Tenderer shall submit in its offer an initial version of the Training Plan for each phase (theoretical, practical and on-the job training). The Training Plan shall be discussed in detail with the Contractor and approved by the Contracting authority in accordance with the agreed schedule. | |
| TRNG0040 | The number of trainees shall be defined by the contracting authority up to 7. | |
| TRNG0041 | <p>The training documentation shall include the following (for the all three phases of training – theoretical, practical and on-the job training:</p> <ol style="list-style-type: none"> Training programme/syllabuse (defining the subjects and topics), including the | |

| ID | Requirements | Compliance YES/NO – references to evidence |
|----|--|---|
| | <p>programme for all 3 phases (could be in one document for all 3 phases);</p> <p>b) Training agenda (defining timings) for each training (theoretical, practical and on-the job);</p> <p>c) a) and b) could be joined in one documents as a Training Plan;</p> <p>d) Training log book for all elements of training (for each phase), signed by the contractor's training manager and all competent trainer/trainers (including the signed list of participants (attendance list) from the contractor authority for each part of the training);</p> <p>e) Name of the course manager and course trainers/instructors (can be included in the training log book)</p> <p>f) A short report about course progress for each of ATSEPs regarding achieving goals of the course - each student's performance during each training element of this training;</p> <p>g) A summary report for practical assessment of each student;</p> <p>h) A copy of theoretical examination for each student;</p> <p>i) A certificate of competence for each person, for each training;</p> <p>A certificate shall be issued by Contractor. The certificate shall include the name and surname of participant, dates, when the training took place, date of the successfully competed course and the information, that the candidate passed the associated examination (if there will be an examination). For ATSEP personnel, the certificate shall include the statement, that the certificate is issued in compliance with the ATSEP.OR.215 System and equipment rating training requirement of Commission implementing regulation (EU) 2017/373. Each certificate should be signed either physically or digitally (only official digital signature is accepted), certificate of the contractor should be issued on the Contractor's letterhead).</p> | |

| ID | Requirements | Compliance YES/NO – references to evidence |
|----------|--|---|
| TRNG0050 | <p>In compliance to the ATSEP.OR.215 as per TRNG0010, the technical staff shall be trained by theoretical, practical and on-the-job training as well as to:</p> <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. | |
| TRNG0060 | <p>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.</p> | |
| TRNG0070 | <p>The training language shall be English. The Contractor shall provide necessary training on all products delivered within the project.</p> | |
| TRNG0080 | <p>Contractor shall ensure that personnel engaged in the theoretical, practical and on-the-job training of Contracting authority ATSEP are fluent in English and are suitably qualified to perform task of training instructor as well as competence assessor and experienced in the system domains ad per TRNG0050.</p> <p>Contractor shall submit documents proving that course staff is/are competent (like CV and/or number of trainings performed or any other proof, ex. statement of the contractor) of competency for each instructor.</p> | |
| TRNG0090 | <p>The content of the theoretical (theoretical training syllabus and theoretical training objectives) and practical (practical training syllabus, including practical exercises and the tools and instruments used for the practical hands-on training and practical training objectives) training courses, and practical on-the-job training during installation (on-the-job training objectives), shall be included in the Training Plan.</p> | |
| TRNG0092 | <p>Training plan shall be approved by the Contracting authority.</p> | |

| ID | Requirements | Compliance YES/NO – references to evidence |
|----------|---|---|
| TRNG0100 | The training material in electronic form (on USB stick) shall be made available for the trainees at least 1 week before the course begins. | |
| TRNG0101 | Paper (hard) copies of the training material shall be available for the trainees at the time the course begins. Equipment technical manual with circuit diagrams must be available also at the training course to all trainees. | |
| TRNG0110 | The Contracting authority shall have the right to use material provided for the training for further courses within its own organisation. | |
| TRNG0120 | The system and equipment rating training of ATSEPs shall be applicable to the duties to be performed and include the following: (1) theoretical courses; (2) practical courses; (3) on-the-job training during system installation. | |
| TRNG0130 | A detailed ATSEP training schedule for the training elements of TRNG0120 shall be defined after contract signature and approved by the Contracting authority. | |
| TRNG0145 | Contractor shall define the procedure in the event that an individual candidate fails to achieve the training objectives or fails to complete the training within the stipulated time of the training. | |
| | Contractor shall define and inform all candidates about the appeal procedure if an individual candidate wishes to appeal. | |
| TRNG0160 | The duration of the required ATSEP theoretical training course, practical training course and on-the-job shall last at least 10 working days with 60 training hours at least at the contractors premises. If 10 working days is not enough to performe adequat ATSEP training it is up to contractor to sugest proper training cours duration. | |
| TRNG0170 | Training for DME and RCME is held as separate couse. Contractor must define at least 5 working days for RCME trainig. If 5 working days is not enough it is up to contractor to sugest proper trainig cours duration. | |
| TRNG0180 | The theoretical DME and RCMS training course programme shall at least consist of: | |

| ID | Requirements | Compliance YES/NO – references to evidence |
|----------|--|---|
| | <ul style="list-style-type: none"> • Theory of operation, system architecture, block-schemes, HW modules; • Racks equipment, cabling installation, wiring and cabling, equipment fitting and connecting • System functions, SW, applications, menus, configuration, parameters; • Connections, integration, installation; • System maintenance, monitoring, site/equipment management, user/password management, troubleshooting. | |
| TRNG0190 | <p>The practical DME and RCMS training course programme shall at least consist of:</p> <ul style="list-style-type: none"> • The maintenance terminal, • Practical “hands-on” training is required, practical fault finding, practical tips etc., • Usage of tools. | |
| TRNG0191 | <p>If requested by Contracting Authority, the Contractor shall present all documentation related to setting processes and proving facts that the personnel engaged in the theoretical, practical and on-the-job training are competent to perform training as per ATCO.OR.215 is required. Contracting Authority have right to audit if and how these processes are in place and followed.</p> <p>Contractor shall agree to the following:</p> <ol style="list-style-type: none"> Contractor gives consensus that any training related documents required by Slovenian CAA will be provided and will grant an access for CAA if necessary; Contractor gives consensus that Slovenia Control Ltd staff responsible for compliance management have access to the course and relevant documentation during or after the course, if required. | |

4 Robustness and Behaviour

The system architecture shall be such that it fulfils all performance and operational requirements as well as the Availability, Reliability, Maintainability requirements as stated throughout this specification.

| ID | Requirements | Compliance YES/NO – references to evidence |
|----------|---|---|
| ROBE0010 | DME/RCMS operational hours – The DME/RCMS shall be designed for continuous operation 24/7 (24 hours a day, 365 days a year). | |
| ROBE0020 | Maximum resource usage – Resource usage, while working in “normal operation”, shall be less 70% of the total resources while operating at any load condition, including the maximum load scenario, and while operating in any configuration, including the maximum capacity configuration. | |

Note: Resources include CPU, disks, memory, disk storage, bandwidth, etc. The term ‘usage’ in this requirement is understood as the average of the instantaneous resource usage in a 5 s interval.

| ID | Requirements | Compliance YES/NO – references to evidence |
|----------|--|---|
| ROBE0030 | Independence of system components – Faulty behaviour of one system component shall operate in a way that there is no impact on the proper operation of another system component. Faulty behaviour of redundant system components is not propagated to internal or auxiliary components, affecting their proper operation. | |
| ROBE0040 | Autonomous operation of system components – Each individual system component shall act as an autonomous unit being equipped with its own processing capabilities to the maximum extent possible. | |

4.1 Alarm file

| ID | Requirements | Compliance YES/NO – references to evidence |
|----------|--|---|
| VCTM0010 | For the tracking of failures in the system a past alarm file(s) shall be delivered as part of the system. | |
| VCTM0020 | Alarm file(s) shall contain: <ul style="list-style-type: none"> - All resolved and still active error messages; - All error and warning messages; - Time of failure; | |

| ID | Requirements | Compliance YES/NO – references to evidence |
|-----------------|---|---|
| | <ul style="list-style-type: none"> - Type of failure; - Equipment involved in failure. | |
| VCTM0030 | Supplied system shall include a suitable unit for storage of at least 30 days of the alarm file. | |
| VCTM0040 | For further analysis it shall be possible to export data from alarm file or any filtered part of it to a standard industry format (e.g., xls, doc, pdf, txt, csv). | |

4.1.1 Statistics

| ID | Requirements | Compliance YES/NO – references to evidence |
|-----------------|---|---|
| VCTM0050 | The system shall be provided with a statistical information. | |
| VCTM0060 | <p>It shall be possible to collect the following information from the DME/RCME system:</p> <ul style="list-style-type: none"> - For individual system and RCMS - User identity login information; - Alarm/warring/normal information; - system activity statistic - parameter change - etc <p>The processed information shall:</p> <ul style="list-style-type: none"> - Be available for at least the last two-year days (on a daily/weekly basis); - Be exported the traffic analysis data into a standard format (e.g., xls, doc, pdf, txt, csv). | |

4.2 RAM (Reliability, Availability, Maintainability)

4.2.1 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 | Requirements | Compliance YES/NO – references to evidence |
|----------|--|---|
| VCRG0010 | The methodology, techniques, processes and tools the Tenderer intends to use to achieve the specified RAM objectives shall be described or referenced in specific plans addressing architecture, hardware and software aspects. | |
| VCRG0020 | Failures within the DME/RCMS shall automatically be detected and identified using online diagnostic software. | |

4.2.2 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 | Requirements | Compliance YES/NO – references to evidence |
|----------|--|---|
| VCRR0010 | The Tenderer shall provide in the tender documentation a reliability model consisting of reliability block diagrams covering all functions of the system. | |
| VCRR0020 | 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). | |
| VCRR0030 | The Tenderer should 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. Remark: In case other commonly used and accepted method is used, that needs to be clearly stated. | |

| | | |
|-----------------|--------------------------------------|--|
| VCRR0040 | MTBO for dual system (min. 45.000h). | |
|-----------------|--------------------------------------|--|

4.2.3 Maintainability

Maintainability is the measure of the ability of an item to be retained in or restored to a specified condition when maintenance is performed by personnel having specified skill levels, using prescribed procedures and resources, at each prescribed level of maintenance and repair. MTTR is the sum of corrective maintenance times at any specified level of repair, divided by the total number of failures within an item repaired at that level, during a particular interval under stated conditions.

| ID | Requirements | Compliance YES/NO – references to evidence |
|-----------------|--|--|
| VCRM0010 | The Tenderer shall provide in its response the MTTR estimates and prediction for each of the following: <ul style="list-style-type: none"> • Line Replaceable Unit (LRU); • Each major equipment; | |
| VCRM0020 | The Tenderer shall state in its response the average turn-around time (TAT) for a Line Replaceable Unit (LRU). | |
| VCRM0030 | Malfunctions shall be indicated visually at the Technical Monitoring and Control System. | |
| VCRM0040 | Automatic fault monitoring of all power supplies, and optional external alarms shall be provided. | |
| VCRM0060 | An error log file shall be available for a continuous error report. | |

4.2.4 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.

The figures for Availability quoted in this Specification are for Operational Availability (Ao) and **shall** be calculated using the following equation:

$$Ao = \frac{MTBF}{MTBF + MTTR + MRT}$$

MTBF = Mean Time Between Failures in hours.

MTTR = Mean Time to Repair in hours.

MRT = Mean Response Time in hours (i.e., the average time from a notification of failure for a technician to be ready to commence a repair action).

| ID | Requirements | Compliance YES/NO – references to evidence |
|----------|---|---|
| VCRA0010 | The DME / RCMS shall provide an inherent availability of at least five 9's (>99.999%). | |

Note: Inherent Availability is defined as the probability that a system or equipment, when used under specified conditions, not considering delays due to the support environment (i.e., readily available tools, spares, maintenance personnel, etc.), will operate satisfactorily at any point in time, as required.

| ID | Requirements | Compliance YES/NO – references to evidence |
|----------|--|---|
| VCRA0020 | The lifetime of the DME/RCMS shall be not less than 15 years or 130.000 hours operation. | |
| VCRA0030 | All calculation shall be provided to indicate the system ability to meet the requirements with full explanation of all assumptions. | |

4.3 Interoperability

The role of the Tenderer, is to ensure and declare compliance of its EATMN constituent with the EASA Detailed Specifications and Acceptable Means of Compliance & Guidance Material for certification or declaration of design compliance of ATM/ANS ground equipment (DS-GE.CER/DEC).

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 REGULATION (EC) No 2023/1768.

Instruction to tenderers:

Tenderer shall assure compliance with the regulatory requirements, directives and applicable standards.

| ID | Requirements | Compliance YES/NO – references to evidence |
|----------|--|---|
| FTIO0010 | The Tenderer shall provide during the project (equipment / system delivery) at the minimum: <ul style="list-style-type: none"> - Design / Technical documentation, - Technical / Admin / User Manuals, | |

| ID | Requirements | Compliance YES/NO – references to evidence |
|----------|---|---|
| | <ul style="list-style-type: none"> - Tenderer Safety documentation, - FMEA document (or one with equivalent content), - Training documentation, - Test documentation (FAT / SAT Test Protocol with tests) <p>for the equipment / system (the Constituents) that is part of the offer and future delivery.</p> | |
| FTIO0020 | The Tenderer shall provide during the project (equipment / system delivery) all compliance matrixes for showing compliance with standards as defined in DS-GE.CER/DEC (at the minimum as defined in requirement RDST0012 and RDST0014) for the equipment / system (the Constituents) that is part of the offer and future delivery. | |

5 DME/RCMS – System Integration Platform

5.1 Monitoring

| ID | Requirements | Compliance YES/NO – references to evidence |
|----------|--|---|
| SIMO0010 | The integration platform's overall monitoring system shall monitor the status of the DME and RCMS system elements that are installed. | |
| SIMO0020 | The monitoring DME and RCMS system shall display the health state of all components (e.g.: ALARM/ WARNING/ NORMAL or problem). | |
| SIMO0030 | The monitoring system shall monitor system as required by ICAO documentation. | |
| SIMO0040 | An upward SNMP based interface to an umbrella management system shall be provided to obtain the overall system status. | |
| SIMO0050 | The Monitoring tool of the Management and PC shall perform: | |

| ID | Requirements | Compliance YES/NO – references to evidence |
|----|--|---|
| | <ul style="list-style-type: none"> - Reporting of system events (e.g., change of system status, occurrence of failures); - Fault diagnosis; <p>Statistics about system elements' availability shall be produced.</p> | |

5.2 Security & Safety

| ID | Requirements | Compliance YES/NO – references to evidence |
|-----------------|--|---|
| SISS0010 | The Tenderer/Contractor shall provide the operational security guidelines that are applicable for his products. | |
| SISS0020 | To minimize the network attack surface, all network reachable services shall deploy a “deny all” rule by default. Only ports which are explicitly documented and defined in the service descriptor configuration are allowed. The service descriptor configuration is only accessible by a privileged account holder. | |

6 Logistic Support

6.1 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 | Requirements | Compliance YES/NO – |
|----|--------------|------------------------|
|----|--------------|------------------------|

| | | references to evidence |
|-----------------|--|------------------------|
| LSMC0010 | The Contractor shall support the establishment of a support and, if necessary, service agreement covering the repair/replacement of COTS items by the original suppliers. | |
| LSMC0020 | The Contractor shall guarantee support and repair/replacement of all hardware, software and documentation (including COTS products as well), including the supply of spare parts for a period corresponding to the expected life of the system, but not less than 15 years. | |

6.2 Spares and Support

6.2.1 General

| ID | Requirements | Compliance 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 recommended Spare Parts List, which shall contain all spare parts (LRUs, SRUs, consumables), with the price for each individual item. As spare part proper extension boards must be provided. | |
| LSSU0020 | Recommended Spare Parts List defined by contractor must show (numeric number) percentage of equipment it covers (requested min 50 %)! DME | |
| LSSU0022 | List of parts representing single point of failure: DME | |
| LSSU0026 | Recommended Spare Parts List defined by contractor must show (numeric number) percentage of equipment it covers (requested min 50 %)! RCMS | |
| LSSU0028 | List of parts representing single point of failure: RCMS | |
| LSSU0030 | A Spare Parts List shall , for each spare part, include: <ul style="list-style-type: none"> Contractor/Manufacturer Name, Part Number (P/N), Spare Part Description, | |

| ID | Requirements | Compliance YES/NO – references to evidence |
|-----------------|---|---|
| | <ul style="list-style-type: none"> Recommended Quantity of Spare Parts to be delivered, Quantity of parts to be installed in the system, <p>Warranty period (only in case of specifically defined warranty period for certain parts).</p> | |
| LSSU0040 | If at the end of the warranty period it is proven that the measured spares consumption and/or MTBF is not within the limits as defined in the Contract, the Contractor shall review its spares calculations, as well as upgrade and supply the spares package at its own cost. | |
| LSSU0050 | The Contractor shall guarantee the shortest possible TAT (turn-around time) for parts sent to the Repair Workshop for repair or exchange, which shall be less than 30 calendar days. | |
| LSSU0060 | The Contractor shall guarantee the shortest possible DT (delivery time) for parts that will be additionally ordered by the Contracting authority, which shall be less than 60 calendar days. | |
| LSSU0065 | The Contractor shall deliver all spare parts to the Contracting authority, in the quantity and quality which is in accordance with the Contract requirements, at the latest 7 calendar days before the start of commissioning. | |
| LSSU0070 | Delivered spare parts shall be inspected and tested (except consumables) during the Site Acceptance Test (Guarantee Test). | |
| LSSU0075 | The Contractor shall notify the Contracting authority if the delivery of a particular type of spares is becoming difficult or if the manufacturing of that part has stopped. | |
| LSSU0080 | Notification from requirement LSSU0070 accompanied by a spare parts replacement proposal shall be given at least 6 months in advance. | |
| LSSU0090 | The above stated requirement (LSSU 0070) shall be valid for parts procured from the Contractor or any of | |

| ID | Requirements | Compliance YES/NO – references to evidence |
|----|---|---|
| | the suppliers involved in the procurement of spare parts for this system. | |

6.2.2 Mandatory Spare Parts List

| ID | Requirements | Compliance YES/NO – references to evidence |
|-----------------|--|---|
| LSSL0010 | The Tenderer shall include in its offer a recommended set of spare parts to enable the efficient seven (7) years maintenance of all parts of the system. The Contracting authority reserves the right to procure an additional set of spares. | |
| LSSL0020 | The offered initial set of recommended spare parts shall be based on the RAM calculation, but not less than: define by Tenderer | |
| LSSL0030 | The offered recommended set of spares shall be of the same type/model/version as the equipment installed. | |

6.3 Warranty

6.3.1 General

Warranty is the firm and written obligation of the Contractor 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 Contractor can prove that such defect or deficiencies fall outside the warranty coverage.

6.3.2 Warranty Period

| ID | Requirements | Compliance YES/NO – references to evidence |
|-----------------|--|---|
| LSWP0010 | The warranty period for all HW and SW mentioned above shall be at least 60 months from the date the Site Acceptance is approved for each location separately. | |
| LSWP0020 | The Contractor's obligation to correct defects and deficiencies shall apply until all the reported and pending defects and deficiencies from the Site | |

| ID | Requirements | Compliance YES/NO – references to evidence |
|-----------------|--|---|
| | 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 DME and RCMS (no matter of which faulty equipment is down) is not operationally available (DOWN TIME). | |
| LSWP0040 | After the warranty reporting period, any newly detected deficiencies shall not fall under the warranty any longer. | |

6.3.3 Obligations of the Contractor

| ID | Requirements | Compliance YES/NO – references to evidence |
|-----------------|---|---|
| LSWO0010 | If defects and deficiencies affecting the contractually agreed supplies and services arise during the appropriate warranty period, the Contractor 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 Contractor receiving a notification in the time from Monday to Friday, 8:00 to 16:00 hours, rectification of the defects shall begin within 5 working days after the receipt of the Contractor's notification. | |

| ID | Requirements | Compliance YES/NO – references to evidence |
|----|--------------|---|
|----|--------------|---|

| | | |
|-----------------|--|--|
| LSWO0030 | In this respect the Contractor 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 Slovenia Control's personnel who have given the notification of the fault. | |
| LSWO0040 | Where complex system faults are identified, the project managers shall reach an agreement regarding the suitable location for troubleshooting and regarding deadlines. | |
| LSWO0050 | Upon expiry of the above deadlines Slovenia Control may rectify the fault by itself, or have it rectified at the Contractor's expense. The Contractor's warranty obligation shall thereby remain unaffected if the work has been performed properly and Slovenia Control has informed the Contractor thereof without delay. | |
| LSWO0060 | The rectification of faults and any other work performed on accepted or operational systems shall be carried out in compliance with the Slovenia Control's internal work instructions; where applicable, special arrangements will be made in individual cases. | |
| LSWO0080 | 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 Contractor and submitted to Slovenia Control with the correction. | |
| LSWO0090 | Replacement parts already delivered to Slovenia Control may be used by the Contractor during the warranty period. | |
| LSWO0100 | The Contractor shall provide replacements, at no expense to Slovenia Control, for defective parts during the warranty period. | |
| LSWO0110 | The Contractor shall correct, at no expense to Slovenia Control, 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. | |

| ID | Requirements | Compliance YES/NO – references to evidence |
|-----------------|---|---|
| LSWO0130 | The documentation shall be updated as required to reflect the HW/SW deficiencies corrected under the warranty. | |
| LSWO0140 | During the warranty period, the Contractor shall provide support to Slovenia Control in solving any problem arising from the license arrangements that the Contractor has negotiated with the vendors in place and name of Slovenia Control. | |

7 Technical System Documentation

| ID | Requirements | Compliance YES/NO – references to evidence |
|-----------------|---|---|
| TSDO0010 | The documentation shall be compliant by all means with the requirements laid down in the Regulation (EC) No 1070/2009. | |
| TSDO0020 | The documentation shall be provided in English. | |
| TSDO0022 | The information contained shall be complete, accurate, and as simple and brief as possible. | |
| TSDO0024 | Consistent terms shall be used throughout the documentation sets. | |
| TSDO0030 | Each manual shall be uniquely identified. It shall additionally contain documentation version, change history, publishing date, product version (if applicable) and issuing organisation. | |
| TSDO0035 | Each manual shall additionally contain documentation version, change history, publishing date, product version (if applicable) and issuing organisation. | |
| TSDO0050 | For navigation purposes, each manual shall at least contain a table of contents, and an index (if applicable). Additional navigation elements are recommended. | |
| TSDO0052 | Electronic media shall equally provide navigation support to allow fast access to information. | |

| ID | Requirements | Compliance YES/NO – references to evidence |
|-----------------|--|---|
| TSDO0054 | Users shall always be able to determine their location within the electronic document, and all locations to which they can move from their current location. | |
| TSDO0060 | Instructional parts of the documentation shall provide procedural information according to the user's tasks. | |
| TSDO0062 | Reference documentation shall allow random access to individual units of information. | |
| TSDO0070 | The system documentation for each site shall consist of: <ul style="list-style-type: none"> • Hardware documentation, • Software documentation, • Operational user manual, • Training documentation, • Site installation documentation. | |
| TSDO0080 | The final versions of the system documentation shall consist of 1 hard copy per site and 1 copy on USB stick. | |
| TSDO0090 | The system documentation shall be written and printed in accordance with either ISO A4 or ISO A3 format standards. | |
| TSDO0095 | All drawings shall be documented in a commonly available CAD/MSVisio utility. | |
| TSDO0100 | The Tenderer 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, SAT, etc.) | |
| TSDO0110 | The Tenderer shall also supply for each site the COTS documentation i.e., a set of technical documents of the system hardware and software units, provided by the manufacturer of COTS products (such as PCs, clients, modems, network equipment), including: <ul style="list-style-type: none"> a) Tehnical Manual of the system in place, b) Operation procedures, (can be part of the manual) c) Troubleshooting procedures (can be part of the manual) d) Local diagrams of interconnection systems | |
| TSDO0115 | Documents from requirement TDS0110 shall be delivered in the same quantity as the system documentation. | |

| ID | Requirements | Compliance YES/NO – references to evidence |
|----------|--|---|
| TSDO0120 | 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 Contracting authority. | |
| TSDO0130 | All documentation to be delivered shall be issued in a final version and provided to the Contracting authority, prior to the Site Acceptance. | |
| TSDO0140 | <p>The tech documentation shall include the following:</p> <ul style="list-style-type: none"> • Equipment description; • Equipment block diagram; • Unit layout in racks and rack wiring; • Detailed description and purpose of each unit; • Part list, Schematic diagrams, layout drawings for PCB-s, • Interconnections within units; • Setting-up and operating procedures; • Preventive maintenance and its procedures; • Corrective maintenance and its procedures; • Specification of all equipment units with part number, serial number and manufacturer; • Other information necessary to perform regular and preventive maintenance. | |
| TSDO0150 | 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 comprise sufficient details to permit full understanding and maintenance of the system. | |
| TSDO0160 | <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 down to the LRU/SRU level; • Install and configure any LRU/SRU in case of complete equipment failure or malfunction of that LRU/SRU; • Perform all necessary measurements and adjustments. | |

8 Safety, Quality and Security Assurance

8.1 Safety

8.1.1 Safety Audit

| ID | Requirements | Compliance YES/NO – references to evidence |
|----------|--|---|
| SASA0010 | The safety audit shall be conducted by the Contracting authority in duration of approximately one working day according to the Contracting authority's safety audit plan previously delivered, subject to mutual agreement. | |
| SASA0020 | The safety assurance process shall be audited and the Contractor shall provide full support to the Contracting authority's safety audit team including access to evidence and arguments. | |

8.1.2 Safety Plan

| ID | Requirements | Compliance YES/NO – references to evidence |
|----------|---|---|
| SASP0010 | The Contractor shall provide a Safety Plan which shall include all activities to be performed by the Contractor 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 90 days after contract signature, and shall be reviewed and approved by the Contracting authority. | |

| ID | Requirements | Compliance YES/NO – references to evidence |
|-----------------|---|---|
| SASP0030 | <p>Safety activities to be specified in the Safety Plan shall be carried out to cover:</p> <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 Slovenia Control's staff (training consists of 3 parts – theoretical, practical (in the phase of FAT) and on-the job training (in the phase of SAT), • 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 Contractor shall produce updates of the Safety Plan, if necessary. | |

8.1.3 Safety Reports

| ID | Requirements | Compliance YES/NO – references to evidence |
|-----------------|--|---|
| SASR0010 | <p>Safety reports cover the Safety Assessment process, containing as a minimum, the following:</p> <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 shall be produced in accordance with the Safety Plan. | |
| SASR0030 | <p>Safety Reports shall include, as a minimum, the following set of documents and due dates:</p> <ul style="list-style-type: none"> • Functional Hazard Assessment Report (FHAR), due date: 90 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; | |

| ID | Requirements | Compliance YES/NO – references to evidence |
|----|---|---|
| | <ul style="list-style-type: none"> Safety Issue Log (SIL). The document shall contain all safety critical issues which shall be mitigated in a procedural or human related matter. Due date: Start of the equipment installation; Software Safety Folder. The Contractor shall use the Guidelines for ANS Software Safety Assurance, EUROCAE document ED-153. | |

8.1.4 Software Safety Requirements

| ID | Requirements | Compliance YES/NO – references to evidence |
|-----------------|---|---|
| SASS0010 | <p>These ATM and programme related applicable standards/regulations/directives (and any amendments of documents released before the establishment of the contractual relationship in which this document is referenced) are applicable for software safety assurance:</p> <ul style="list-style-type: none"> Annex IV to ED Decision 201/022/R of 30 Oct 2019 establishing a software safety assurance system to be implemented by air navigation service providers; As a means of compliance with Annex IV to ED Decision 201/022/R ED-153/EUROCAE GUIDELINES FOR ANS SOFTWARE SAFETY ASSURANCE. <p>The Contractor shall produce evidence and arguments demonstrating that:</p> <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 requirements, as identified by the risk assessment and mitigation process; 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: | h |

| ID | Requirements | Compliance YES/NO – references to evidence |
|-----------------|---|---|
| | <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 Contractor 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 of the Contracting authority 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. 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 Contractor shall describe the functional behaviour of software in nominal and 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.</p> | |
| SASS0040 | <p>To assure the software safety requirements verification, the Contractor 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. | |

| ID | Requirements | Compliance YES/NO – references to evidence |
|-----------------|--|---|
| | <ul style="list-style-type: none"> The software verification shall be correct, complete and documented. | |
| SASS0050 | <p>To assure the software configuration management, the Contractor 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 Contractor 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; the assurances corresponding to each software assurance level must give sufficient confidence that the software can be operated tolerably safely. | |
| SASS0080 | <p>For any software (such as COTS, non-developmental software or previously used software, etc.), for which some of the requirements cannot be applied, the Contractor 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.</p> | |

| ID | Requirements | Compliance YES/NO – references to evidence |
|----|--------------|---|
| | | |

8.2 Quality

8.2.1 General

| ID | Requirements | Compliance YES/NO – references to evidence |
|-----------------|---|---|
| QGEN0010 | The Tenderer/Supplier/Manufacturer shall be certificated, holding a valid ISO 9001:2015 and ISO 14001 or equivalent Quality Management System Certificate. | |
| QGEN0020 | The Tenderer shall submit documentary evidence in the Tender establishing to the Contracting authority satisfaction that the Tenderer has a valid Quality Management System certificate. | |

8.2.2 Quality Assurance Plan

| ID | Requirements | Compliance YES/NO – references to evidence |
|-----------------|--|---|
| QAAP0010 | The Contractor shall develop a Quality Assurance Plan, subject to the approval by the Contracting authority. | |
| 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. | |

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|-----------------|---|--|
| QAAP0060 | The Preliminary Quality Assurance Plan shall be provided by the Contractor to the Contracting Authority within 10 working days from the day of the signature of the contract on. | |
| QAAP0070 | The final version of the Quality Assurance Plan shall be available within 60 days from contract signature. | |

8.2.3 Quality Audit

| ID | Requirements | Compliance 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. | |
| ID | Requirements | Compliance YES/NO – references to evidence |
| QAQA0030 | The Contractor shall provide full support to the Contracting authority's quality audit team including access to evidence and arguments. | |

8.3 Security

8.3.1 General

| ID | Requirements | Compliance YES/NO – references to evidence |
|-----------------|---|---|
| SECG0010 | During the execution of the contract, the Contractor shall be able to provide evidence that a required security by design framework that includes documented secure software development, quality management system and ISMS has been adopted. | |
| SECG0020 | The Contractor agrees with the performance of penetration tests as mentioned below and performed in accordance with the penetration testing best practices and / or standards by the Contracting Authority. | |

| ID | Requirements | Compliance YES/NO – references to evidence |
|----------|---|---|
| SECG0030 | The Contractor shall provide competent interlocutors and / or engineers for performing penetration testing as well as person (contact information; name; rank, email, phone) responsible for maintaining security of the system. | |
| SECG0040 | The Contractor shall include the penetration testing into project management timeline / deployment of the system as prearranged / agreed with the Contracting Authority. The scope of penetration test will be agreed in advance between Contractor and Contracting Authority. | |
| SECG0050 | The Contracting Authority is planning on performing following penetration test; aproduction penetration testing – after successful installation on Contracting Authority environment | |
| SECG0060 | In addition, external security audits can be performed during the execution of the contract: by the Contracting Authority on the Contractor, or a 3rd party auditing party (Contracting Authority may outsources the auditing of the Contractor to a competent auditor). | |
| SECG0070 | The Contractor shall inform the Contracting Authority of any change that may materially impact the security of system (vulnerabilities, data leakage) within a period no longer than 48 hours. The Contractor will demonstrate to the Contracting Authority that they have a process in place to enable this. | |
| SECG0080 | The Contractor shall track, document and report to the Contracting Authority as soon as possible, but no later than 48 hours from the security Incident being detected and propose remediation plan - solution no later than 72 hours and be able to implement the solution immediately after the conformation from the Contracting Authority. | |
| SECG0081 | The Contractor shall ensure that the system is designed with appropriate resilience to meet the agreed SLA. | |
| SECG0090 | The Contractor must ensure that a capability is in place to log and monitor actions and events, and to | |

| ID | Requirements | Compliance YES/NO – references to evidence |
|-----------------|--|---|
| | detect unauthorised access and misuse of the system. | |
| SECG0100 | The system shall log events, be capable of exporting logs in a secure manner to an external system and have audit functionalities to guarantee complete user and service processing accountability. | |
| SECG0110 | The Contractor shall maintain and, if requested to do so by the Contracting Authority, provide a list of staff (including subcontracted personnel) working on the system. | |
| SECG0120 | Where appropriate, the Contractor's staff (including any subcontracted personnel) shall be capable of obtaining/holding security clearances relevant to the areas they are required to access, as defined by the Contracting Authority. | |
| SECG0130 | The Contractor shall provide competent interlocutors and engineers for performing cyber security risk assessment of the contracting authority system. The duration / presence of competent Contractor's personnel shall last at least 2 working days. | |
| SECG0140 | The Contractor shall provide initial Cyber Security Risk Assessment for the system, according to either ISO 27000, NIST or ISACA / COBIT methodology. | |

8.3.2 System Hardening (w.r.t. cyber security)

| ID | Requirements | Compliance YES/NO – references to evidence |
|-----------------|--|---|
| SECH0010 | The system shall have adequate levels of protection against intrusion in order to, as far as is reasonably practicable, avoid unauthorised access, modification, or erasure of data by a third party. | |
| SECH0020 | The system shall implement appropriate authentication mechanisms to validate the respective user credentials prior to providing access | |

| ID | Requirements | Compliance YES/NO – references to evidence |
|-----------------|--|---|
| | to the service (e.g., multifactor authentication) where appropriate. | |
| SECH0030 | The system shall enforce the "Least Privilege Principle". | |
| SECH0040 | The system shall enforce the "Separation of Privilege Principle"; Privileged User actions must be performed from dedicated Privileged User Accounts segregated from standard user accounts. | |
| SECH0050 | The system shall have the capabilities to detect security incidents. | |

8.3.3 Security Training

| ID | Requirements | Compliance YES/NO – references to evidence |
|-----------------|---|---|
| SECT0010 | The Contractor shall ensure that all Contractor's personnel with access to the system or contracting authority data, receive information security training appropriate to their role, and responsibilities, including being made aware of relevant cyber security risks, according to EC Regulation 2015/1998 and its amendment Commission Implementing Regulation (EU) 2019/1583 of 25 September 2019. | |
| SECT0020 | The Contractor shall provide thorough system information to internal Security Operations Centre (SOC), and perform training and familiarisation (relevant architecture disclosure, relevant network and dataflows disclosure, integration specifics were external, specific protocol definitions) for Slovenia Control SOC Personnel. The process shall last no longer than 2 days at the Contractor's premises. | |

9 Project Management

9.1 General

| ID | Requirements | Compliance YES/NO – references to evidence |
|----------|--|---|
| PMGE0010 | The Contractor 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. | |
| PMGE0015 | The Contractor shall plan its activities according to the project implementation deadline, which is 15 th of May 2027. | |
| PMGE0020 | The Contractor shall establish a project organization in accordance with the requirements included herein, having necessary resources, qualification and experience to fulfil all of its obligations. | |
| PMGE0030 | The Tenderer shall define and describe the part of its organization which will manage or be involved in the project. | |
| PMGE0040 | The Contractor shall appoint the Contractor's Representative, who will be an interface to the Contracting authority's Project Manager, and be at the Contracting authority's disposal for all matters relating to contract execution. | |
| PMGE0050 | In case another person will act as his substitute, the Contracting authority shall be notified at least 2 weeks in advance of the other person proposed to substitute him. | |
| PMGE0060 | The Contractor's Representative (or his substitute) shall be present at all meetings during the contract execution. | |
| PMGE0070 | The Contractor'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 Contractor and the Contracting authority shall be in accordance with the Contracting authority's practice. Details of a Communication Procedure between the Contractor and the Contracting authority shall be defined by the Contracting authority. Concluded contract defines contact persons. | |
| PMGE0090 | If deemed necessary during contract execution, the Contracting authority or the Contractor may propose progress meetings. | |

| ID | Requirements | Compliance YES/NO – references to evidence |
|----------|---|---|
| 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 Contractor's Representative, • The Contracting authority's Project Manager, • Any other persons who the above representatives consider important to be present. | |
| PMGE0120 | The venue of meetings shall be premises of Contracting authority. Contractor covers all costs, related to attendance to the meeting (travel costs etc.). Meeting can be held on alternative location, if so, agreed in writing by Contracting authority or via MS Teams or video conference. | |
| PMGE0130 | The Contractor shall prepare minutes of the meetings and submit them for approval to the Contracting authority not later than 3 working days after the meeting finishes. | |
| PMGE0140 | The Contractor shall issue and manage a Progress Chart (Master Time Schedule). The starting date is to be the date of entering the contract into force. | |
| PMGE0150 | The Progress Chart shall specify dates of all major actions and decisions to be taken by both the Contracting authority and the Contractor. Any alterations to this chart will be mutually agreed. | |
| PMGE0160 | The initial progress chart shall be included in the tender documentation. | |
| PMGE0170 | The progress chart shall be agreed between the Contractor and the Contracting authority and be kept updated during contract execution. | |
| PMGE0175 | The version control of an electronic file of the Progress Chart shall be established. | |
| PMGE0180 | The Contractor shall establish close coordination with the Contracting authority 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 | The Contractor shall prepare at least the following Project Plans at the appropriate stage in the project for review and approval by the Contracting authority: <ul style="list-style-type: none"> • Project Management Plan (PMP), • Logistic Support Plan (LSP), • Documentation Plan (DP), | |

| ID | Requirements | Compliance YES/NO – references to evidence |
|----|--|---|
| | <ul style="list-style-type: none"> • Safety Assurance Plan (SAP), • Quality Assurance Plan (QAP), • Training Plan (TP) - (for all three phases – theoretical, practical and on-the job), • Installation and Commissioning Plan (IP), • FAT Plan and Procedures, • SAT Plan and Procedures. | |

9.2 Project Management Plan

| ID | Requirements | Compliance YES/NO – references to evidence |
|-----------------|--|---|
| PMPM0010 | The Contractor shall prepare a Project Management Plan (PMP) in accordance with the requirements included in the present chapter. | |
| PMPM0020 | A draft version of the PMP shall be provided as part of the tender documentation. | |
| PMPM0025 | An initial official version of the PMP shall be provided by Contractor within 10 working days from the signature of the contract on. | |
| 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 Contracting authority, 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 Contractor, • 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 Contracting authority's approval. The PMP shall be kept up-to-date. | |
| PMPM0050 | The PMP shall normally include at least the following aspects: | |

| ID | Requirements | Compliance YES/NO – references to evidence |
|----|---|---|
| | <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. | |

9.3 Documentation Plan

| ID | Requirements | Compliance YES/NO – references to evidence |
|-----------------|---|---|
| PMDP0010 | A Documentation Plan shall specify the list of all documents to be delivered to the Contracting authority during contract execution. | |

| ID | Requirements | Compliance YES/NO – references to evidence |
|-----------------|---|---|
| PMDP0020 | A draft version of the Documentation Plan shall be provided by the Tenderer in the tender documentation. | |
| PMDP0025 | An initial official version of the Documentation Plan shall be provided by the Contractor within 10 working days from the day of the signature of the contract on. | |
| PMDP0030 | <p>The Documentation Plan shall include at least the following:</p> <ul style="list-style-type: none"> • Title of document, • The Contractor, • 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. | |

9.4 Logistic Support Plan

| ID | Requirements | Compliance YES/NO – references to evidence |
|-----------------|---|---|
| PMLS0010 | <p>The Contractor 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, for theoretical, practical and on-job 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, • 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 provided by the Contractor within 30 working days from the day of the signature of the contract on. | |

9.5 Installation and Commissioning Plan

| ID | Requirements | Compliance YES/NO – references to evidence |
|-----------------|--|---|
| PMIM0010 | <p>On each site where installation is going to take place, the Contractor shall prepare an Installation and Commissioning Plan comprising:</p> <ul style="list-style-type: none"> • The Contractor's scope of work, • Sub-contractors involved and their scope of work (if applicable), • The Contracting authority's scope of work, • Tasks to be performed and the person(s) responsible for each task, • Timing of the tasks, | |

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|-----------------|--|--|
| | <ul style="list-style-type: none"> 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 shall be submitted at least 4 weeks and approved by the Contracting authority at least 3 weeks before the start of installation activities. | |

9.6 Acceptance Test Plans and Procedures

| ID | Requirements | Compliance YES/NO – references to evidence |
|-----------------|--|--|
| PMAP0010 | The Contractor shall provide acceptance test plans and procedures (test specifications) for Factory Acceptance Test and Site Acceptance Test, including a detailed description of the proposed test techniques and procedures to verify all equipment parameters, together with a schedule for such tests. | |
| PMAP0015 | The following documents shall be provided: <ul style="list-style-type: none"> Factory Acceptance Test Plan and Procedures, Site Acceptance Test Plan and Procedures. Flight check | |
| PMAP0020 | These acceptance test plans and procedures (test specifications) shall at least contain the following: <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 are conducted and approved, A detailed description of the tests to be performed. Flight check protocol | |

| ID | Requirements | Compliance YES/NO – references to evidence |
|-----------------|--|--|
| PMAP0030 | The FAT Plan and Procedures shall be submitted to the Contracting authority 4 weeks before the FAT at the latest. The document shall be reviewed by Contracting authority and shall be amended or | |

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| | changed if necessary, and approved by both parties 2 weeks before the FAT at the latest. | |
| PMAP0035 | The document shall be reviewed by Contracting authority or changed if necessary, and approved by both parties 2 weeks before the FAT at the latest. | |
| PMAP0040 | The Site Acceptance Test Plan and Procedures shall be submitted to the Contracting authority 4 weeks before the SAT at the latest. | |
| PMAP0045 | The document shall be reviewed by Contracting authority or changed if necessary, and approved by both parties 2 weeks before the SAT at the latest. | |

10 Installation and Commissioning/Transition

10.1 Installation

| ID | Requirements | Compliance YES/NO – references to evidence |
|-----------------|--|---|
| INST0010 | The planning of the system installation and setting up shall be developed in close cooperation with the Contracting authority. | |
| INST0020 | The Installation and Commissioning Plan, specifying all installation and transition activities, shall be approved by the Contracting authority prior to the installation. | |
| INST0030 | The Contractor may perform a site survey before the installation takes place in order to identify necessary works to be performed, if deemed necessary. | |
| INST0040 | The Contracting authority shall perform, prior to the installation, a complete physical check of the goods received (equipment, accessories, spare parts, documentation, etc. – all according to the Contract specification), and will notify the Contractor if the delivery does not fulfil the requirements listed in the Contract Specification. | |
| INST0050 | The Contractor shall have full responsibility for the system installation and setting up. | |
| INST0060 | The Contractor shall produce, procure and supply all necessary equipment, tools, etc., consumable as well as non-consumable, needed for the installation and setting-up. | |
| INST0070 | Installation on the site shall be conducted by Contractor's skilled staff with support of the Contracting authority's technical staff under close Contractor's supervision. | |

| ID | Requirements | Compliance YES/NO – references to evidence |
|-----------------|---|---|
| | | |
| INST0075 | Activities from requirement INST0070 shall form On-the-Job Training for Contracting authority's staff that will be carried out during the installation in accordance with the agreed conditions given in the Training Plan. | |
| INST0080 | The installation shall take into consideration all applicable local legislation rules and procedures. | |
| INST0090 | The Contractor shall prepare a list of staff (for non-Slovenian residents) to conduct the installation activities, as well as all necessary documents early enough. | |
| INST0100 | The Contractor shall state in the Installation and Commissioning Plan the aspects of the installation to be included in the documentation concerning: <ul style="list-style-type: none"> • Co-location aspects (where applicable); • Cabling arrangements, routing, identification; • EMC compatibility; • Earthing arrangements; • Equipment mounting, cooling, etc. | |
| INST0110 | The Contractor shall specify all the facilities and procedures the Contracting authority has to provide for test purposes. | |

10.1.1 Power supply

| ID | Requirements | Compliance YES/NO – references to evidence |
|-----------------|---|---|
| INST0190 | The DME and RCMS shall normally be fed from main 230 V / 50 Hz AC by Slovenia Control. Slovenia Control will provide power distribution units (PDU) with 16 A outlets and a proper earth connection. | |
| INST0200 | DME shall normally charge and be fed from local DC battery 48V supply. | |
| INST0210 | The system shall operate without any degradation in the range 230 VAC +/-10%, 50 Hz +/-10%. | |
| INST0220 | All performance requirements shall be achieved without readjustment when voltage vary between these specified limits. | |

| ID | Requirements | Compliance YES/NO – references to evidence |
|----------|---|---|
| INST0240 | The failure of one power supply shall not be the cause for any system degradation. | |
| INST0250 | In the case of single power supply failure, the redundant power supply in operation shall have enough capacity to maintain operation. | |
| INST0260 | Switching from one power supply to the other shall not cause any interruption of the service. | |
| INST0270 | The offer shall include values for heat dissipation, power consumption and physical dimensions of all equipment that have to be delivered. | |
| INST0280 | Power consumption | |

10.2 Pre-Commissioning and Completion

| ID | Requirements | Compliance YES/NO – references to evidence |
|----------|--|---|
| RROM0010 | The Contractor shall issue a written notice to the Contracting authority when the installation within the site is finished and commissioning may commence. | |
| RROM0020 | The Contracting authority shall conduct an inspection of the site and the installation itself. | |
| RROM0030 | If some defects or deficiencies are found during the site inspection, the Contracting authority's Project Manager shall notify the Contractor's representative and list all of them in a Completion Report. | |
| RROM0035 | In the case of defects or deficiencies from requirement RROM0030 the Contractor shall take necessary remedial actions at its own expense, and the procedure shall be repeated. | |

11 Verification Requirements

Note: This section describes the plan for the testing of the DME / RCMS. The overall objective of the testing process is to verify that the delivered system meets the Contracting authority's requirements, as defined in this specification.

11.1 Test documentation

| ID | Requirements | Compliance YES/NO – references to evidence |
|----------|--|---|
| RRTD0010 | The testing process shall be controlled and its progress monitored through the test documentation. | |
| RRTD0020 | In the Test Procedure Book the conducted test cases shall be documented. | |
| RRTD0030 | Test procedures and test reports shall be prepared for all the testing phases described below. | |
| RRTD0040 | The test procedures shall be prepared not only to show conformance, but also to expose non-conformance with the requirements. | |
| RRTD0050 | Deficiency reports shall be prepared whenever deficiencies are discovered. | |

11.2 System Test

| ID | Requirements | Compliance YES/NO – references to evidence |
|----------|---|---|
| RRST0010 | The fully equipped system in the deliverable configuration shall be tested so as to verify that the equipment meets all specified requirements and is free from production errors prior to shipment. | |

11.3 Factory Acceptance Test

| ID | Requirements | Compliance YES/NO – references to evidence |
|----------|---|---|
| RRFA0010 | Factory acceptance Test shall be performed with the fully equipped system in its deliverable configuration in order to verify that the equipment fully complies with the specification requirements. | |
| RRFA0015 | Non-complying equipment found pre or during FAT shall be rejected. | |
| RRFA0020 | Factory acceptance shall be witnessed by the Contracting authority's representative(s), if participating at FAT is decided by contracting authority. | |
| RRFA0030 | All factory acceptance tests shall be normally carried out before the system installation and on the basis of a test specification submitted to Contracting authority by the Contractor at least 4 weeks before the FAT. | |
| RRFA0040 | The Contractor 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 will be conducted and approved, the forms of documenting test results, together with a schedule for such tests. | |

| ID | Requirements | Compliance YES/NO – references to evidence |
|----------|--|---|
| RRFA0050 | 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 Contracting authority. | |
| RRFA0060 | All FAT procedures shall comply with and be performed according to the applicable standard documents, recommended practices or procedures. | |
| RRFA0070 | The Contracting authority reserves the right to request some further tests (free testing) to be performed (which are not listed in the FAT specification) if deemed necessary. These tests, if performed, shall be also noted in the FAT report. | |

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| RRFA0080 | If a failure occurs during acceptance testing, the Contractor shall take necessary remedial actions at its own expense, and all relevant tests shall be repeated unless the Contracting authority decides otherwise. | |
| RRFA0090 | After successful completion or unsuccessful attempt of the FAT, the FAT Report shall be immediately prepared, issued and signed by the Contractor. | |
| RRFA0095 | The FAT report shall be signed by both the Contractor's and Contracting authority's FAT representatives. | |
| RRFA0100 | After successful completion of the FAT, the FAT Certificate shall be issued and signed by the Contractor. | |
| RRFA0105 | The FAT Certificate shall be signed by Slovenia Control's Project Manager not later than 7 days after FAT completion and sent to the Contractor's Representative according to the official communication procedure. | |

11.4 Site Acceptance Test

The purpose of a Site Acceptance Test (Guarantee Test) is to demonstrate Compliance of the delivered equipment and proper functioning of the system after commissioning, specified in the Contract.

| ID | Requirements | Compliance YES/NO – references to evidence |
|-----------------|---|---|
| RRSA0010 | The fully equipped DME and RCMS system shall undergo site acceptance testing to ensure that the DME and RCMS system will operate in accordance with the specifications outlined in this document when used in its operational environment. | |
| RRSA0020 | The SAT shall be carried out after the system installation at all sites are completed on the basis of a test specification (SAT Plan and Procedures). | |
| RRSA0030 | The Contracting authority reserves the right to request some further tests (site specific free testing) to be performed (which are not listed in the SAT specification) if deemed necessary. These tests, if performed, shall be also noted in the Site Acceptance Report. | |
| RRSA0040 | The Site Acceptance testing (Guarantee Test) shall be performed by the Contractor's and Contracting authority's representatives. | |
| RRSA0050 | If a failure occurs during acceptance testing, the Contractor shall take necessary remedial actions at | |

| ID | Requirements | Compliance YES/NO – references to evidence |
|----------|--|---|
| | its own expense, and all relevant tests will be repeated unless the Contracting authority decides otherwise. | |
| RRSA0060 | The Contractor shall be responsible for providing all test equipment (hardware and/or software) necessary for the tests. The test facilities provided by the Contractor are not part of the delivery. | |
| RRSA0070 | After successful completion or unsuccessful attempt of each Site Acceptance, a Site Acceptance Report shall be prepared and issued by the Contractor as soon as possible, but no longer than 7 days. | |
| RRSA0072 | Part of the Site Acceptance Report shall be successful performed Flight Check. FC must be performed for each station as commissioning typ for en route DME equipment. Max coverage for DME is part of FC test. FC is integral part of certification and obligatory of the contractor. | |
| RRSA0074 | The Site Acceptance Report shall be signed both by the Contractor's and Contracting authority's Site Acceptance representatives and approved by the Contracting authority's Site Acceptance representative appointed. | |
| RRSA0080 | Following satisfactory completion of Site Acceptance Test (Guarantee Test) the Contractor shall offer the System for formal acceptance by the Contracting authority. | |
| RRSA0090 | Authorized Slovenia Control representatives shall grant the Site Acceptance if the following conditions are satisfied: | |

| ID | Requirements | Compliance YES/NO – references to evidence |
|----------|---|---|
| | <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 fulfils the requirements listed in the Contract Specification; • The system has been installed correctly; • FC commissioning test with proper FC protocols for each station will be delivered (ON ROUTE, coverage) • The documentation has been supplied and is in Compliance with the Contract Specification; • Training of the Slovenia Control's staff has been carried out in accordance with the agreed conditions, with all the necessary documentation delivered to the Contractor Authority; • Spare parts have been delivered according to the Contract Specification and have been tested in real operation; • Site Acceptance tests have successfully been completed; • Signed and approved Site Acceptance Report has been issued. | |
| RRSA0100 | All Site Acceptance Report problems and observations shall be closed or a relevant action assigned and agreed. | |
| RRSA0110 | The Contractor for all deliverable items (including software) shall provide all Certificates of Conformance and Suitability for use. | |
| RRSA0120 | The Site Acceptance shall be granted by issuing a Site Acceptance Certificate by the Contractor. | |
| RRSA0125 | The Site Acceptance Certificate shall be signed Slovenia Control's Project Manager not later than 7 days after completion of Site Acceptance and sent to the Contractor's Representative according to the official communication procedure. | |
| RRSA0130 | If any kind of certificate regarding the equipment will be requested by Civil Aviation Authority such document shall be provided by Contractor at no cost for Contracting Authority. | |

..... *end of document*

