

APPROVED BY
Acting Administrator
S.E. "Chisinau International Airport"


Sergiu SPOIALĂ

TERMS OF REFERENCE No. 18/2024

ON THE IMPLEMENTATION OF CAT III VISUAL AIDS FOR AIR NAVIGATION (Airfield Ground Lighting) for Chisinau International Airport (LUKK) RWY 08

Beneficiary		
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No.	General Information	Main Information and Requirements
Part-I: WORK DESIGN		
1.	Name of the Works	Design and Cost Estimate Documentation Development Services on CAT III Visual Navigation Aids (airfield ground lighting) for Chisinau International Airport (LUKK) RWY 08
2.	Design Basis	Improve aviation safety and increase the access and reliability of air services at Chisinau International Airport (LUKK) in conditions of low visibility that frequently occur due to the geographical location and adverse weather conditions, which require the implementation of the Instrument Landing System (ILS) CAT III.
3.	Design Phase	<p>The Design and Cost Estimate Documentation will be developed in accordance with the legal norms and provisions of the Republic of Moldova, as well as national and international requirements in civil aviation.</p> <ul style="list-style-type: none">• Examine the implementation with the adjustment and integration of visual aids in the CAT III air navigation system on the existing runway 08/26 infrastructure and taxiways;• Decesive phases should be included and specified in detail in the design documentation;• The design documentation should be developed in phases to allow acceptance into operation of executed phases without any impediments, provided that the work will be conducted under continuous operational conditions of the facility:<ul style="list-style-type: none">➤ The phases will be outlined in a schematic format within the technical proposal.

		<ul style="list-style-type: none"> ➤ Phase I will consider the existing low-traffic infrastructure to meet the minimum flight safety requirements by implementing CAT III air navigation visual aids on the current runway 08/26 infrastructure. ➤ The other phases will be established by mutual agreement with the Beneficiary.
4.	Necessity to conduct Field Study and Research	<p>If applicable</p> <ul style="list-style-type: none"> • Topographical survey; • Geological prospecting; • Technical expertise of the facility.
5.	Basic Technical Parameters	<ul style="list-style-type: none"> • High voltage cable routes of the lights groups will be designed as safe as possible so that they are not destroyed during the reconstruction works of the runway 08/26. • Keep and intersect, where applicable, the high voltage cables for the existing lights groups of AGL. • New layout of existing lights, where applicable. • Layout of lights groups on the existing runway and taxiways. • New layout of the aerodrome signs. • RWY Holding position markings on taxiways A1, B, C1, taking in consideration RWY 26 –CAT I, RWY 08 – CAT III.
6.	Normative and Technical Documentation and Specific Basic Requirements	<p>Designed visual aids for air navigation shall be in accordance with the latest edition of the following documents:</p> <ul style="list-style-type: none"> • CS ADR DSN; • CT-AD Technical requirements on design and operation of aerodromes; • ICAO Doc. 9157 Part 4; • ICAO Doc. 9157 Part 5; • International Electrotechnical Commission IEC; • Electrical Installation Standards • Design documentation will be developed in two languages: Romanian and English;
7.	Initial Data for Design, Approvals, Agreements	<p>The Contractor will obtain in agreement with the Beneficiary the following:</p> <ul style="list-style-type: none"> • CAA authorisation • Verification opinions on a design and cost estimate documentation • Other permissive authorisations and required documents
8.	Content of the Project	<p>According to the norms and legal provisions in the field of civil aviation as well as NCM A. 07.02.2012/A1:2017;</p> <ul style="list-style-type: none"> • Development of a site design document for the Airfield Lighting Control and Monitoring Systems (ALCMS), which will include information about (the existing single-mode optical fiber): <ul style="list-style-type: none"> ➤ Computers, communication equipment, Human Machine Interface (HMI) devices, and other system components will be built using high-quality Commercial Off-The-Shelf (COTS) parts. This approach guarantees that the system will always utilize the most technologically advanced components within the system.

		<ul style="list-style-type: none"> ➤ The ALCMS core platform will contain at least the following subsystems: <ul style="list-style-type: none"> - HMI for users. - Redundant server computers providing redundant centralized processing and data storage. - I/O servers to interface with external equipment. - Ethernet network to interconnect system components. - COTS platform client/server architecture - ASMGCS system integration. ➤ The air traffic controller's workstation must include at least the following functions: <ul style="list-style-type: none"> - HMI for airfield ground lighting control in approach, runway, taxiway areas. - Workstation configuration according to user profile, area of responsibility, etc. - Control commands for all lighting elements. - Control of runway lights including status display - Taxiway lights control including status display - Stop bar control including status display. - RVR monitoring - AWOS/Meteo status display - Area of responsibility - Maintenance approval - Runway occupancy alert. - Runway incursion alert/STB - CAT control keys and status display - Provides alerts/alarms. - Zoom-In/Out, zoom windows, "Snapshot" image alignment, distance measurement, etc. - Audible alarm setup and support. - UTC date and time and local time. ➤ The workstation for technical service personnel must include at least the following functions: <ul style="list-style-type: none"> - Platform for all maintenance instruments with an aerodrome chart. - Airfield Navigator - Tree view displaying substation equipment, controllers, circuits, and lights. - Equipment views - controllers, computers, network etc. - A detailed information window that provides status updates on equipment parameters for all lighting and ancillary components. - Easy to use navigation from equipment visualization to graphics and vice versa. - Comprehensive catalog of alerts and alarms, acknowledgement, etc. - Audible alarms. - Reporting tool. - User management. - Bright AGL view, zoom in/zoom out. - Interface status monitoring. - Auxiliary system monitoring. - Screenshot (printable).
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- Event database.
- Alarm report.
- Tower command report.
- Event report.
- Configuration report.
- Current alarms report.
- Alarm archive min. 180 days.

- The ALCMS will integrate the existing equipment for runways 09-27 and 08-26 into a single system, with the capability to expand the equipment in the future.
- The ALCMS will be designed to allow for the future connection of light groups that are planned but not implemented in the first phase, without requiring software modifications or upgrades. For example, functions for light groups such as RTP 08, TCL TWY B, and LEAD ON/OFF TWY B will be included in the software but remain inactive during phase 1. Technical service staff with MAINT Supervisor level access will be able to activate these functions as needed.
- Server modules to be designed redundant.
- Presentation of fiber optic loop status and optical switch status.
- The system will have the capability to switch the current regulators to an "Out of Service" mode, making them invisible to the software. In this mode, all messages and alarms from the regulators will not be recorded in the event log.
- Integration of ancillary equipment (wind indicator, generators, AAR 0.4 kV circuit breaker status, UPS status) via DI/DO or Ethernet.
- Transformer substations PT2, PT22, and PT23 will be equipped with two redundant Station Management Computers. 22" LCD monitors.
- The control tower will be equipped with two 24-inch LCD touch screen monitors, connected to two workstations for Air Traffic Controllers/Central Management Computers.
- The PD-44 technical staff room will be equipped with a computer for creating and storing the event database, along with a 22-inch LCD monitor.
- The system must be equipped with a color printer.
- Possibility to select and print selected event log.

- Detailed technical design AGL
- Detailed Design Project, coordinated with the Beneficiary
- Detailed explanatory (technical) report;
- Pre-measurements – AGL;
- Pre-measurements – electrical connection
- Electrical installation time tracking program
- Quality control program of works
- Tracking program of execution in determined phases
- General plan (layout plan, situation plan);
- Detailed technical drawings by parts;

		<ul style="list-style-type: none"> • Lists of quantities by type of work: installation works, materials, equipment, mechanisms/technological equipment, software and other by parts; • Bill of quantities, according to CP L.01.01-2012/A1:2017, on preparation of estimates for construction and installation works by resource method (including forms 1, 3, 5, 7); • Specifications for the execution of the works; • Development of “Organization of the construction site including the schedule for the execution of works in installments”; • Technical calculation for RWY Holding position on taxiways A1, B, C1, taking in consideration RWY 26 –CAT I, RWY 08 – CAT III. • Markings design for runway 08/26 and taxiways TWY A1, B, C1. • Runway turn pad lights 08; • Taxiway center line lights (TCL, LEAD ON/OFF) on TWY B and TWY C1; • Taxiway center line lights on TWY E, TWY D, TWY C2., • STOP BAR lights on TWYs A1, B, C1; • Flashing lights RWY 08, • RWY guard lights on TWY A1, B, C1; • Intermediate holding position lights; • Signs required for CAT III; • ALCMS system (airfield lighting control and monitoring systems) – schematic diagram; • General power supply diagram (existing and new); • Detailed diagram of the routes with manholes; • Detailed technical execution drawings for general construction-installation works; • List of general construction and installation workload; • General technical drawing with the position of all the lights and their serial number; • Technical drawing of lights installation; • Technical drawing of cable routes; • Cable circuits, group of lights; • Calculation of electric circuit power; • CCR calculation; • Single-wire electrical connection diagram for CCR - 0.4 kV installation. • Ground outlet design and light grounding details. • Online modular UPS design (Uninterruptible Power Supply) for 15 min Backup at PT 2, PT 22, PT 23 that meet the following conditions: <ul style="list-style-type: none"> ➤ ONLINE topology with double conversion. ➤ runtime - 15 min. ➤ pure sine wave output. ➤ automatic voltage regulation (AVR). ➤ multifunction LCD readout. ➤ hot swappable batteries, modular. ➤ extended battery module (EBM). ➤ external battery cabinet.
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9.	Number of Copies of the Project Documentation	<ul style="list-style-type: none"> • At least 4 original copies (properly verified and approved) + electronic format PDF, DWG (ACAD).
10.	Qualification Requirements	<ul style="list-style-type: none"> • Individuals or legal entities with wide experience in the field who hold a license and are certified in accordance with the legal provisions of the Republic of Moldova regarding the design activities as well as execution of works; • Design experience - minimum 7 years (i.e. experience in airport infrastructure design, this criterion will apply to the bidder and his subcontractors); • The Contractor should have experience in developing AGL systems, ALCMS (Airfield Lighting Control and Monitoring); • At least 3 developed projects of similar proportions, nature, and complexity to that of the proposed project, during the last 5 years; • Ensure author's supervision during the execution of the works with appropriate recordings in the Technical Booklet and minutes.
11.	Acceptance of Design Documentation and Cost Estimate	<ul style="list-style-type: none"> • The Contractor will summon the Beneficiary by written notification to submit the design documentation and cost estimate for examination and verification. • The design and cost estimate documentation will be accepted only after all permissive authorisations certifying its conformity with the norms and requirements of the Beneficiary and legal provisions in the field are received.
Part-II: CONSTRUCTION WORKS, ELECTRICAL INSTALLATION AND COMMISSIONING		
12.	Name of the Works	General construction works, electrical installation, commissioning, automation of visual aids system (AGL) of CAT III air navigation for Chisinau International Airport (LUKK) RWY 08 .
13.	Specific Basic Requirements for the Contractor	<ul style="list-style-type: none"> • Legal entities with wide experience in the field who hold a license to execute this type of work according to the legal provisions of the Republic of Moldova regarding the activities of executing special works; • Involvement in legal processes, litigation history. • Experience in similar works - minimum 5 years (i.e. experience in airport infrastructure works, this criterion will apply to the bidder and his subcontractors); • The Contractor should have experience in works such as AGL systems, ALMS (Airfield Lighting Control and Monitoring). • At least 3 projects of a similar proportions, nature and complexity to that of the proposed project, during the last 5 years.

<p>14.</p>	<p>Works Phase I according to the project</p>	<p style="text-align: center;">TWY A1 TCL A1 (LEAD ON/OFF)</p> <ul style="list-style-type: none"> • Installation of secondary cable in existing ducts and transformers within existing manholes, for 36 lights (using existing cables). • Installation of 36 lights with 2 connectors (Lights and transformers, connectors are to be tendered, their technical characteristics as per project). <p style="text-align: center;">TWY B SIGNS</p> <ul style="list-style-type: none"> • Installation of LED Retro Fit Kits for existing signs (LED kits must be provided according to the specified technical requirements). <p style="text-align: center;">IHP Lights</p> <ul style="list-style-type: none"> • Installation of intermediate holding position lights <ul style="list-style-type: none"> ➢ TWY D intersection with TWY L1 ➢ TWY D intersection with TWY L3 ➢ TWY B intersection with TWY D (lights, bases, transformers are to be tendered according to designed technical specifications). <p style="text-align: center;">TWY C1 + Signs</p> <ul style="list-style-type: none"> • Installation of LED Retro Fit Kits for existing signs (LED kits are to be tendered according to the technical specifications designed). <p style="text-align: center;">TWY D + Signs</p> <ul style="list-style-type: none"> • Installation of LED Retro Fit Kits for existing signs (LED kits are to be tendered according to the technical specifications designed). • Installation of additional lights according to the project (lights, bases, transformers are to be tendered according to the designed technical specifications). <p style="text-align: center;">SFLS 08 Approach Flashing Systems</p> <ul style="list-style-type: none"> • New system and equipment are to be tendered and installed according to designed technical specifications. <p style="text-align: center;">Current regulators CCR 961 HELLA</p> <ul style="list-style-type: none"> • Installation and commissioning of 10 existing modular current regulators CCR 961 HELLA. <p style="text-align: center;">UPS at PT2, PT22, PT23</p> <ul style="list-style-type: none"> • Equipment tendered and installed according to the designed technical specifications. <p style="text-align: center;">ALCMS system</p> <ul style="list-style-type: none"> • Installation, adjustment, and commissioning of the ALCMS system in accordance with the approved Site Design Document.
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		<ul style="list-style-type: none"> • SAT (Site Acceptance Test) signing. • All work will be tendered and executed according to the coordinated, approved and verified project.
15.	Acceptance of Works	<ul style="list-style-type: none"> • Complete the Technical Booklet chapters B and C in accordance with the norms and legal provisions in force • Designer's opinion upon the acceptance of the works in operation • Solve all objections issued by the Beneficiary, where applicable • Receive all necessary opinions regarding the acceptance of the facility in operation upon completion of the works • Sign individual and overall test minutes • Sign commissioning and adjustment report • Sign acceptance act upon completion of the works • Sign acceptance act of executed works • Train Beneficiary's personnel regarding operation and technical servicing • Train the personnel of MoldATSA on implementation of operational applications • Draw up instructions on technical maintenance, operation of installed systems and equipments • Mobile technical means for diagnosing, setting and monitoring of the equipment (Portable computer with software) • Warranty for Soft and ALCMS machinery and equipment min. 2 years; • Letters of guarantee, passports, guarantee vouchers, list of service and spare parts companies, access to backup equipment and software • The costs incurred by additional works due to design errors will be borne by the winning tenderer as designer (as part of the actual execution of the works).
Part-III: OBLIGATIONS		
16.	Mandatory Requirements for the Contractor	<p>The Contractor should have mandatorily personnel certified in accordance with the legal provisions such as Law No.721 of 02.02.1996 on Construction Quality and Government Decision No. 361 of 25.06.1996 on construction quality assurance in the following areas:</p> <ul style="list-style-type: none"> • Site manager certified for general construction works according to Government Decision No. 329 of 23.04.2009 on approval of Regulation on technical and professional certification of specialists with activities in construction: domains – 1, a; 2, f. • Site manager certified for specialized electrical installation works according to Government Decision No. 329 of 23.04.2009 on approval of Regulation on technical and professional certification of specialists with activities in construction: domains – 4.
17.	Works execution period	<ul style="list-style-type: none"> • The period for execution of the works stipulated in Part I and Part II of these specifications is 120 days.

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