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| **Nordisk Sikkerhet AS (NS)** |
| **Ref.: Avtale nr. 741, 07/07/2015** |
|  | **Project title: “Three fixed radiation portal monitors for FSUE “Atomflot”** |

**Specifications**

Turnkey supply of three fixed radiation portal monitors and training of the FSUE “Atomflot” personnel

**Contracting Authority:** Nordisk Sikkerhet AS

**Recipient:** FSUE “Atomflot”

**Tenderer’s name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

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BACKGROUND

The Tenderer shall fill in the Annex “Specifications” in the format given below. The Tenderer’s proposed supplies and services should be manufactured and certified in accordance with the technical regulations and standards of the Russian Federation given in Clauses 2.3, 4.3, and 6.4 of the document “Invitation to tender”. The complete table should be submitted to the Contracting Authority along with the required tender documents. On the front page of the Annex “Specifications”, the Tenderer shall indicate its name. After the completion of this document, it should be signed and dated by the Tenderer-authorized person.

1. **VEHICAL RADIATION PORTAL MONITOR**

|  | **The Contracting Authority’s Requirements** | **Tenderer’s Offer** |
| --- | --- | --- |
| Manufacturer | — |  |
| Model | — |  |
| **TECHNICAL SPECIFICATIONS** | | |
| **Vehicle RPM general specification** | | |
| Number of pillars | 2 |  |
| Dimensions of the pillar, no more than | 4200×900×400 mm |  |
| Detection channels | Gamma, neutron |  |
| Gamma channel | Organic plastic scintillator |  |
| Neutron channel | He-3 tubes |  |
| Detection zone no less than | Vertical: 3.0 m  Horizontal: 3.5 m |  |
| Occupancy sensors | Infra-red sensor or other type |  |
| Alarm indication | Audible and visual indication, both on the monitor pillar and at the operators workplace, different for neutron and gamma alarms |  |
| Tamper switch | Required |  |
| Remote audible and visual alarm unit | To be installed within ~200 meters away from RPM. |  |
| External connection to network | TCP/IP protocol. Ethernet type network is required |  |
| Requirements to cable lines | Cable must be laid outside in a corrugated metal pipe at an approximate distance to the operator's workplace of no more than 70 m |  |
| Image of alarm-causing objects  (video camera is to be included in the scope of this contract) | Associated IP-video camera based surveillance system with IR-illuminator |  |
| Power supply | 220 ±10% V / 50±5 Hz |  |
| Offline work in the event of power supply interruption, no less than | 6 hours for the whole system. |  |
| Power consumption | ≤ 50 W (≤ 1500 W with thermo regulation) |  |
| Regime of operation | 24 h of continuous operation |  |
| Service life, no less than | 10 years |  |
| Mean time between failures, no more than | 4000 hours |  |
| **Environmental requirements** | | |
| Ambient temperatures | From -50 to+50 0C |  |
| Relative humidity | Up to 95% at ambient temperature of 350C and lower, without condensation of moisture |  |
| Capability to operate in a maritime environment | Required |  |
| Protection degree, no less than | IP 54 as per GOST 14254-96 |  |
| **Electromagnetic compatibility** | | |
| Constant magnetic field | 400 A/m |  |
| Electrostatic discharges | 6 kV for contact  8 kV for air |  |
| Radio-frequency field | up to 10 V/m (20 - 1000 MHz) |  |
| **Mechanical resistance** | | |
| Vibration during transportation | acceleration of 2 g (frequency 10 - 33 Hz) |  |
| Vibration during operation | acceleration of 0.5 g (frequency 10 - 33 Hz) |  |
| **Performance** | | |
| False Alarm Rate | 1 per 10000 passages during 8 hours of operation, with confidence level of 95%. |  |
| *Minimal Identified Activity (for the speed of 2,2 ± 5% m/sec, background dose rate* ≤ *0.22 µSv/h, and the width of detection zone of 6.0 m)* | | |
| For Co-57, MBq | No more than 0.35 |  |
| For Cs-137, MBq | No more than 0.35 |  |
| *Identified Neutron Flux*  (*for the speed of 2,2 ± 5% m/sec, background dose rate* ≤ *0.22 µSv/h, and the width of detection zone of 6.0 m)* | | |
| For Cm-244 or Cf-252, neutr/s | No less than 2·104 |  |
| Natural gamma background suppression | Required |  |
| **CONSUMABLES AND SPARE PARTS** | | |
| Consumables and spare parts for three (3) years of normal usage | Yes |  |

1. **RAILROAD RADIATION PORTAL MONITOR**

|  | **The Contracting Authority’s Requirements** | **Tenderer’s Offer** |
| --- | --- | --- |
| Manufacturer | — |  |
| Model | — |  |
| **TECHNICAL SPECIFICATIONS** | | |
| **Railroad RPM general specification** | | |
| Number of pillars | 2 |  |
| Dimensions of the pillar, no more than | 4200×900×400 mm |  |
| Detection channels | Gamma, neutron |  |
| Gamma channel | Organic plastic scintillator |  |
| Neutron channel | He-3 tubes |  |
| Detection zone no less than | Vertical: 3.5 m  Horizontal: 6.2 m (in compliance with GOST R 51635-2000) |  |
| Occupancy sensors | Infra-red sensor or other type |  |
| Alarm indication | Audible and visual indication, both on the monitor pillar and at the operators workplace, different for neutron and gamma alarms |  |
| Tamper switch | Required |  |
| Remote audible and visual alarm unit | To be installed within ~200 meters away from RPM |  |
| External connection to network | TCP/IP protocol. Ethernet type network is required |  |
| Requirements to cable lines | The cable should be laid outside in a corrugated metal tube, the  approximate distance to the operator's workplace is no more than 70 m |  |
| Image of alarm-causing objects  (video camera is to be included in the scope of this contract) | Associated IP-video camera based surveillance system with IR-illuminator |  |
| Power supply | 220 ±10% V / 50±5 Hz |  |
| Off-line work in the event of power supply interruption, no less than | 6 hours for the whole system. |  |
| Power consumption | ≤ 50 W (≤ 1500 W with thermo regulation) |  |
| Regime of operation | 24 h of continuous operation |  |
| Service life, no less than | 10 years |  |
| Mean time between failures, no more than | 4000 hours |  |
| **Environmental requirements** | | |
| Ambient temperatures | From -50 to+50 0C |  |
| Relative humidity | Up to 95% at ambient temperature of 350C and lower, without condensation of moisture |  |
| Capability to operate in a maritime environment | Required |  |
| Protection degree, no less than | IP 54 as per GOST 14254-96 |  |
| **Electromagnetic compatibility** | | |
| Constant magnetic field | 400 A/m |  |
| Electrostatic discharges | 6 kV for contact  8 kV for air |  |
| Radio-frequency field | up to 10 V/m (20 - 1000 MHz) |  |
| **Mechanical resistance** | | |
| Vibration during transportation | Acceleration of 2 g (frequency 10 - 33 Hz) |  |
| Vibration during operation | Acceleration of 0.5 g (frequency 10 - 33 Hz) |  |
| **Performance** | | |
| False Alarm Rate | 1 per 10000 passages during 8 hours of operation, with confidence level of 95%. |  |
| *Minimal Identified Activity (for the speed of 2,2 ± 5% m/sec, background dose rate* ≤ *0.22 µSv/h and the width of detection zone of 6.0 m)* | | |
| For Co-57, MBq | No more than 0.35 |  |
| For Cs-137, MBq | No more than 0.35 |  |
| *Identified Neutron Flux*  (*for the speed of 2,2 ± 5% m/sec, background dose rate* ≤ *0.22 µSv/h and the width of detection zone of 6.0 m)* | | |
| For Cm-244 or Cf-252, neutr/s | No more than 2·104 |  |
| Natural gamma background suppression | Required |  |
| **CONSUMABLES AND SPARE PARTS** | | |
| Consumables and spare parts for three (3) years of normal usage | Yes |  |

1. **PEDESTRIAN RADIATION PORTAL MONITOR**

|  | **The Contracting Authority’s Requirements** | **Tenderer’s Offer** |
| --- | --- | --- |
| Manufacturer | — |  |
| Model | — |  |
| **TECHNICAL SPECIFICATIONS** | | |
| **Pedestrian RPM general specification** | | |
| Number of pillars | 2 |  |
| Dimensions of the pillar, no more than | 2200×630×200 mm |  |
| Detection channels | Gamma, neutron |  |
| Gamma channel | Organic plastic scintillator |  |
| Neutron channel | He-3 tubes |  |
| Detection zone, no less than | Vertical 0.8 m  Horizontal: 2 m |  |
| Occupancy sensors | Infra-red sensors or other type |  |
| Alarm indication | Audible and visual indication, both on the monitor pillar and at the operators workplace, different for neutron and gamma alarms |  |
| Tamper switch | Required |  |
| Remote audible and visual alarm unit | To be installed within ~200 meters away from RPM. |  |
| External connection to network | TCP/IP protocol. Ethernet type network is required |  |
| Requirements to cable lines | Cable line should be installed inside the building.  Approximate distance to the operator's workplace is no more than 40 m. |  |
| Image of alarm-causing objects  (video camera is to be included in the scope of this contract) | Associated IP-video camera based surveillance system with IR-illuminator |  |
| Power supply | 220 ±10% V / 50±5 Hz |  |
| Off-line work in the event of power supply interruption, no less than | 6 hours for the whole system. |  |
| Power consumption | ≤ 30 W |  |
| Regime of operation | 24 h of continuous operation |  |
| Service life, no less than | 10 years |  |
| Mean time between failures, no more than | 4000 hours |  |
| **Environmental requirements** | | |
| Ambient temperatures | From -5 to+40 0C  (K2 category in comply with GOST R 51635) |  |
| Relative humidity | Up to 75% at the ambient temperature of 30 oC and lower, without condensation of moisture (K2 category in comply with GOST R 51635) |  |
| Capability to operate in a maritime environment | Not required |  |
| Protection degree, no less than | IP 54 as per GOST 14254-96  (dust protection, solid bodies protection, antisplash) |  |
| **Electromagnetic compatibility** | | |
| Constant magnetic field | 400 A/m |  |
| Electrostatic discharges | 6 kV for contact  8 kV for air |  |
| Radio-frequency field | up to 10 V/m (20 – 1000 MHz) |  |
| **Mechanical resistance** | | |
| Vibration during transportation | Acceleration of 2 g (frequency 10 – 33 Hz) |  |
| Vibration during operation | Acceleration of 0.5 g (frequency 10 – 33 Hz) |  |

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| **Performance** | | |
| False Alarm Rate | 1 per 10000 passages during 8 hours of operation, with confidence level of 95%. |  |
| *Minimal Identified Activity (for the speed of 1,2 ± 5% m/sec, background dose rate* ≤ *0.22 µSv/h and the width of detection zone of 1.5 m)* | | |
| For Co-57, MBq | 0.25 |  |
| For Cs-137, MBq | 0.12 |  |
| *Identified Neutron Flux*  *(for the speed of 1,2 ± 5% m/sec, background dose rate* ≤ *0.22 µSv/h and the width of detection zone of 1.5 m)* | | |
| For Cm-244 or Cf-252, neutr/s | 1.2·104 |  |
| Natural gamma background suppression | Required |  |
| **CONSUMABLES AND SPARE PARTS** | | |
| Consumables and spare parts for three (3) years of normal usage | Yes |  |

1. **OPERATOR’S WORKPLACE EQUIPMENT AND SOFTWARE**

|  | **The Contracting Authority’s Requirements** | **Tenderer’s Offer** |
| --- | --- | --- |
| Manufacturer | — |  |
| Model | — |  |
| **TECHNICAL SPECIFICATIONS** | | |
| **PC general specification** | | |
| PC type | Industrial-grade |  |
| Processor frequency | ≥ 2GHz |  |
| RAM | ≥ 8GB |  |
| Hard disk volume | ≥ 1.0TB |  |
| Number of external connections: |  |  |
| Ethernet 100/1000 Mbit | ≥ 2 |  |
| USB 2.0 or higher | ≥ 2 |  |
| Display | LCD, preferred size of 24 - 28" |  |
| LCD brightness | ≥ 500 cd/m2 |  |
| Operating system | Windows 7 or higher |  |
| Functions | * Collection and visualization of information from the RPMs and camera * Registration of all detection events and a database of these events; * Detection protocol creation and periodic reports; * Issuance of control signals to the turnstile; * Communication with the inspection point security system over an Ethernet connection |  |
| **Software requirements** | | |
| The number of simultaneously connected RPMs | ≥ 10 |  |
| Multilevel access | At least 2 level access: operator and administrator |  |
| In normal (no alarm) state operator must be able to monitor: | - RPMs status;  - UPSs status (if there is no main power);  - Online video from associated camera/cameras. |  |
| Alarm window | - Displays count rate histogram of the alarm;  - Shows video fragment of the alarm causing object and allows to save best frame; |  |
| Database | Stores all collected data for at least 180 days, including video fragments of the alarms. |  |
| Power supply | 220 ±10% V / 50±5 Hz |  |
| Off-line work in the event of power supply interruption, no less than | 6 hours for the whole system |  |
| Power consumption | ≤ 300 W |  |
| Regime of operation | 24 h of continuous operation |  |
| Service life, no less than | 10 years |  |
| Mean time between failures, no more than | 4000 hours |  |
| **Associated network** | | |
| Network type | Wired network |  |
| Network equipment | No special requirements. Routers, switches and so on, if necessary. |  |
| Scope of supply | Network equipment,  Elements of structured cable system (cable communication lines, cable connectors, info-sockets and other components. |  |
| **Environmental requirements** | | |
| Ambient temperatures | From 0 to+40 0C |  |
| Relative humidity | Up to 75% at the ambient temperature of 30 oC and lower, without condensation of moisture |  |
| Capability to operate in a maritime environment | Not required |  |
| Protection degree, no less than | IP 54 as per GOST 14254-96 |  |

1. **EQUIPMENT DOCUMENTATION**

|  |  |  |
| --- | --- | --- |
| **DOCUMENTATION** | | |
| Specifications as per GOST 2.114-95 (“Tehnicheskie Usloviia”) | In Russian |  |
| Programme and procedure of factory tests | In Russian |  |
| Design documentation for cable lines installation, including the following documents:  -Chart of external points connection  -Cable log  -Mounting drawings  -Power supply drawings | In Russian |  |
| Operator’s manual including procedure for calibration and periodical verification | In Russian |  |
| Programme and procedure of site acceptance tests | In Russian |  |
| Transportation documentation | In Russian |  |
| Certified for use in Russia | Yes |  |

1. **EQUIPMENT DELIVERY TERMS AND CONDITIONS**

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| **DELIVERY TERMS AND CONDITIONS** | | |
| Terms of delivery | DDP, Incoterms 2010 |  |
| Place of Delivery | FSUE Atomflot’s warehouse, 183017, Murmansk-17, Russia |  |
| Unloading at the place of delivery | Provided by Contractor, free of charge |  |
| Delivery Time | ≤ 90 calendar days after the date of contract signature |  |
| Warranty Period | ≥ 24 months after signature of the Certificate of Acceptance |  |

1. **TRAINING COURSE: OPERATION, MAINTENANCE AND REPAIR**

|  | **The Contracting Authority’s Requirements** | **Tenderer’s Offer** |
| --- | --- | --- |
| **GENERAL TERMS** | | |
| Training should be held in | Russian language |  |
| Number of trainees per course, up to | 15 |  |
| Duration, hours | 32 |  |
| Themes to be covered | - The nature of gamma and neutron radiation  - Radioactive sources and nuclear materials  - The interaction of radiation with matter  - Gamma / neutron detectors  - Operationing principles of radiation portal monitors  - Detailed analysis of all units of the supplied equipment  - Operation  - Detailed analysis of algorithms and features of operation  - Maintenance  - Minor repairs  - Specialized software: installation and operation. |  |
| Theoretical part duration, hours | ≥ 10 |  |
| Practical part duration, hours | ≥ 20 |  |
| Instructional video | As an advantage |  |
| **ACKNOWLEDGMENT OF COMPLETION OF THE COURSE** | | |
| Verification | Test, written form. |  |
| Number of questions | ≥ 20 |  |
| Possible answers per question | ≥ 4 |  |
| Percentage of right answers to pass | ≥ 80 |  |

1. **TRAINING COURSE DOCUMENTATION**

|  |  |  |
| --- | --- | --- |
| **DOCUMENTATION** | | |
| One certificate per trainee | In Russian |  |
| List of materials to provide on one CD/DVD per trainee | - Set of training materials;  - User documentation for the installed equipment. |  |
| Training materials language | In Russian |  |
| Results of test should be delivered to the Contracting Authority and Recipient | Yes |  |

1. **TRAINING COURSE DELIVERY TERMS AND CONDITIONS**

|  |  |  |
| --- | --- | --- |
| **DELIVERY TERMS AND CONDITIONS** | | |
| Number of courses | 1 |  |
| Should take place in | Russia, Murmansk-17, at the FSUE “Atomflot” site |  |
| Delivery Time | Within 14 calendar days after the date of installation and commissioning of the RPMs. |  |

1. **TIME SCHEDULE**

The full cycle for implementation of all operations under this tender should not exceed one hundred and twenty-one (120) calendar days.

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|  | **Action** | **Period of completion** | **Tenderer’s Offer** | **Note** |
| 1 | Submission of documents:   * Equipment specifications (“Tehnicheskie usloviia”) * Programme and procedures of factory acceptance test * Design documentation for cables installation * Programme and procedures of on-site acceptance tests at the FSUE Atomflot | Within 45 calendar days after the signing of Contract |  |  |
| 2 | Equipment manufacturing and factory acceptance testing | Within 60 calendar days after the signing of Contract |  |  |
| 3 | Equipment delivery | Within 30 calendar days after the factory acceptance test |  |  |
| 4 | On-site commissioning and training of the FSUE “Atomflot” personnel | Within 30 calendar days after equipment delivery |  |  |
| 5 | Contract Completion (signed Certificate of acceptance by the Contracting Authority, the Contractor, and the Recipient) | Within 14 calendar days after the commissioning of equipment |  |  |

**Authorized person on behalf of the Tenderer:**

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Title: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_