



Annex “Specifications”

	Nordisk Sikkerhet AS
	Tender title: Supply of vehicle for radiation monitoring and post-detection activities
	Project title: “Post-detection equipment and training for Lisichansk unit of Luhansk border detachment, SBGS, Ukraine”

Specifications

Supply of vehicle for radiation monitoring
and post-detection activities
(mobile radiological complex)

Contracting Authority: Nordisk Sikkerhet AS

Recipient: Lisichansk unit of Luhansk border detachment of SBGS

Tenderer’s name: _____

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NOTE

The Tenderer shall fill in the Annex “Specifications” in the format given below. The Tenderer’s proposed supplies should be manufactured and certified in accordance with the technical regulations and standards of Ukraine and/or country of origin. 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. VEHICLE FOR RADIATION MONITORING AND POST-DETECTION ACTIVITIES (MOBILE RADIOLOGICAL COMPLEX)

	Contracting Authority’s Requirements	Tenderer’s Offer
Manufacturer	—	
Model	—	
Scope of supply	1 complex	
TECHNICAL SPECIFICATIONS		
Type	Mobile radiological complex based on a motor vehicle (motor vehicle is included in the scope of this contract)	
Functions	<p>The Mobile radiological complex shall be equipped with measuring instruments and tools needed for:</p> <ul style="list-style-type: none"> (a) Detection of RN materials, (b) Quick search, characterization and radionuclide analysis of the revealed RN material, (c) Radiological monitoring on broad territories, (d) Individual radiation dose monitoring for expert response team, (e) Post-detection activities such as: <ul style="list-style-type: none"> (i) Decontamination of equipment/vehicle (small areas), (ii) Decontamination of road surfaces and terrains (small areas), (iii) Personnel decontamination. 	

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Equipment	<p>The Mobile radiological complex shall be equipped with the following:</p> <ul style="list-style-type: none"> - Vehicle, - Automated workplaces for two operators (equipped with two tables, two seats, two PCs and multifunction printer), - Radiocommunication equipment (stationary radio station with five walkie-talkie sets with headphones), - Automated radiation monitoring system, portable measuring instruments and set for collecting samples, - Weather station, - Decontamination equipment and detergents for use against radioactive contamination (incl. two small portable decontamination systems for manual use and three handheld pressure sprinklers for detergents), - Personal protective equipment and personal decontamination kits. 	
Auxiliary equipment	<p>The Mobile radiological complex shall be equipped with the following:</p> <ul style="list-style-type: none"> - Set of lights (searchlight and a tower for it, hand lamp, emergency light, head light, etc.), - Warning signs and safety tapes to mark the boundaries (areas) of contamination with toxic and radioactive substances, - Portable device for placement of safety tapes and warning signs, - Photo/video cameras to ensure gathering of evidences and incident investigation. 	
Placement of equipment	<p>All the components should have a modular design and be firmly fixed inside the vehicle</p>	
Power supply	<p>From mains of AC current, 220 ±10% V, 50±5 Hz and from generator</p>	
Service life of vehicle, no less than	<p>10 years</p>	

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ENVIRONMENTAL REQUIREMENTS TO OPERATION AND STORAGE		
Ambient temperatures	From -30 to +45 °C	
Relative humidity	Up to 95% at ambient temperature of 35°C and lower, without condensation of moisture	
VEHICLE		
Type of vehicle	Van	
Class of vehicle	Class B	
Body type	Van	
Load carrying capacity	No less than 1200 ÷ 1500kg. Higher load carrying capacity is an advantage	
Colour	Dark green is recommended	
Drive gear	4-wheel drive	
Engine	<ul style="list-style-type: none"> - Turbocharged direct injection (TDI), - Power of 100 kW or greater, - Volume of 2000 cm³ or greater. 	
Type of gearbox	Mechanical, 6 gears or better	
Fuel type	Diesel	
Number of seats	First-row seats: 3 seats, including driver. Laboratory compartment: 2 seats, seats-transformers (360° turnover) are an advantage	
Sound, vibration and thermal insulation	Yes, both for the laboratory and rear compartments	
System assisting the cold-start of diesel engine	Yes, based on additional heater	
VEHICLE CONFIGURATION		
Parking radar	Yes, parking radar system with rear video camera	
GPS navigator	Yes	

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GPS tracking system	<p>Yes, able to communicate the position data to the head of-fice of Luhansk border detachment.</p> <p>On the base of the GPS-tracking device having the following or better characteristics:</p> <ul style="list-style-type: none"> - support of GSM / GPRS / GNSS / BLUETOOTH technologies, - uncertainty of GPS coordinates up to 3 m or better, - built-in accelerometer, - inputs: 1 digital and 1 analog, - outputs: 1 digital, - memory: up to 128 MB, - registered at Ukrainian regulatory body for frequency supervision “Ukrchastotnadzor”. 	
Video surveillance system	Yes, 360° video surveillance system with video recorder	
Additional set of winter tires and car wheels	Yes	
Climate control system (or air conditioning)	Yes, both for driver’s cabinet and laboratory compartment	
Additional heater	Yes, feeding from the fuel tank of the vehicle	
Hydraulic jack	Yes, of 5 t	
Winch	<p>Yes, two winches:</p> <ul style="list-style-type: none"> - stationary one, on the front reinforced bumper, - portable one, located in the rear compartment. 	
Tow bar	Yes	
Car tool kit	Yes	
Entrenching tools	Yes, 1 set including the big shovel, small shovel, axe, saw, pail	
Tow rope of the appropriate tonnage	Yes	
Starting cables	Yes	
Anti-roll blocks	Yes, 2 sets (2 pcs. in one set).	

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Chains on wheels (for movement in deep snow)	Yes	
Car wheel anti-skid pads	Yes, 2 pcs	
First aid kit	Yes	
Reflective vests	Yes, 5 pcs.	
Fire extinguisher	Yes, 3 pcs of 5 kg (one per each compartment)	
Rooftop luggage rack	Yes, removable luggage rack, made of lightweight and corrosion-resistant material	
Road protection	Yes, armor protection plates for engine and chassis.	
Raised air intake system	Yes, adapted for overcoming water obstacles (i.e., raised air intake system/snorkel)	
Additional external lights	Yes, roof-mounted (rooftop rack -mounted) spot-lights to illuminate the area around the entire perimeter of the vehicle: on four sides and corners of vehicle	
Stationary ladder	Yes, stationary (non-detachable) ladder shall be mounted on the rear door to provide access to the rooftop luggage rack	
Invertor for the AC mains	Yes, converter 12V DC to 220V AC, active power of 2 kW or greater, able to operate in inverter/charger mode	
Generator	Yes, small diesel generator, AC current 220V, power of 2,5 kW or greater, feeding from the fuel tank of the vehicle	
Additional accumulator battery	Yes, of 12 V, 2 Gel batteries x 140 Ah	
RADIO STATION		
Scope of supply	<ul style="list-style-type: none"> - Stationary radio station – 1 set; - Portable radio stations (walkie-talkie) – 5 pcs.; - Active headphones with headset for communication inside the expert response group – 5 pcs.; - Portable antenna spike. 	

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Radio communication standard	DMR (Digital mobile radio)	
Frequency range	UHF (ultra high frequency) and VHF (very high frequency) range	
Radio station	<ul style="list-style-type: none"> - Radio station having the following or better characteristics: - 1000 channels, - IP 54 or better, - LCD display, - Support of operation with the repeater, - Frequency shift (kHz): 12.5 or 25, - Digital Vocoder: AMBE+2, - Protection of radio communication MIL-STD-810 C/D/E/F/G standards, - Authentication of users, - Registered at Ukrainian regulatory body for frequency supervision “Ukrchastotnadzor” . 	
AIR CLEANING SYSTEM		
Air cleaning system	Yes, air filtration system based on 1 µm filters against airborne radioactivity (radioactive aerosols)	
Air pressure	Positive air pressure in the driver’s cabinet and laboratory compartment	
Filters	Yes, 10 filter cartridges for radioactive aerosols from 1 µm	
OTHER REQUIREMENTS		
Resistance to decontaminating agents	Surfaces which may come into contact with radioactive materials shall be manufactured from corrosion-resistant materials or have a surface coating (paint) which is resistant to decontaminating products	
Certified for use	Yes, the equipment of the Mobile radiological complex shall be certified for use in Ukraine and/or in country of origin in accordance with the Ukrainian Legislation in force	

2. LABORATORY COMPARTMENT

	Contracting Authority's Requirements	Tenderer's Offer
LABORATORY COMPARTMENT		
Manufacturer	—	
Model	—	
Scope of supply	1. Operator's desks – 2 pcs, 2. Operator's seats – 2 pcs, 3. PCs – 2 pcs, 4. Multifunction printer – 1 pc, 5. Cupboard and rack with shelves – 1 set.	
TECHNICAL SPECIFICATIONS		
Wall between the driver's cabinet and the laboratory compartment	No	
Wall between the laboratory and the rear compartment	Yes	
Number of automated operator's workplaces	2	
Operator's desk	Yes, for 2 operators minimum	
Operator's seat	Yes, for 2 operators minimum. Seats-transformers (360° turnover) are an advantage.	
Safety belts at operator's workplace	2 minimum. All the seats shall be secured with seat-belts, so that it is possible to occupy them by operators while vehicle is in motion.	
Cupboard and rack with shelves	Yes, cupboard and rack with shelves to store and charge equipment and accessories, including fasteners to fix the instruments on the shelves and shock protection of the equipment. Cupboard and rack should contain the identification labels for equipment and accessories.	
Operation from external power supply	AC current, 220 ±10% V, 50±5 Hz	
Multifunction printer	Yes, multifunction device for printing, scanning, copying documents (MFD), having the following or better characteristics: - Laser black-and-white printing, - Paper size of A5 to A4.	

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	Contracting Authority's Requirements	Tenderer's Offer
LABORATORY COMPARTMENT		
Manufacturer	—	
Model	—	
Scope of supply	1. Operator's desks – 2 pcs, 2. Operator's seats – 2 pcs, 3. PCs – 2 pcs, 4. Multifunction printer – 1 pc, 5. Cupboard and rack with shelves – 1 set.	
TECHNICAL SPECIFICATIONS		
Wall between the driver's cabinet and the laboratory compartment	No	
Wall between the laboratory and the rear compartment	Yes	
Automated operator workplace	On the base of the PC having the following or better characteristics: - Shockproof system unit (or laptop), - Quadra-core CPU 2.5 GHz Core i5 or greater; - RAM 16 GB; - HDD/SSD 256 GB; - External connections: USB 3.0 or higher ≥ 3; - Monitor of 15.6" or larger; - Wireless keyboards; - Wireless mouse.	
Shockproof	Yes, except for multifunction printer	
Waterproof	Yes, IP54 or better, except for multifunction printer	
System and application software for automated operator workplace	Yes, including Win 10 Pro (licensed CD-ROM shall be included in the scope of supply)	
Software licenses	Yes, for 5 years of operation	

3. DECONTAMINATION EQUIPMENT AND DETERGENTS

	Contracting Authority's Requirements	Tenderer's Offer
DECONTAMINATION EQUIPMENT		
Manufacturer	—	
Model	—	
Scope of supply	1. Small portable decontamination system for manual use – 2 pcs, 2. Handheld pressure sprinkler for detergents – 3 pcs., 3. Detergents – 90 kg, 4. Personal decontamination kits – 30 pcs.	
Purpose	Decontamination against radioactive substances: (i) Manual decontamination of people (skin), (ii) Manual decontamination of equipment/vehicles (small areas), (iii) Manual decontamination of road surfaces and terrains (small areas)	
Canister capacity, no less than	<ul style="list-style-type: none"> - 10 liters for small portable decontamination system, - 1 liters for handheld pressure sprinkler for detergents. 	
Accessories	<ul style="list-style-type: none"> - Set of brushes, - Gun for detergents, - Telescopic pole (of 1 m long or more) 	
DETERGENTS		
Applied detergents (to be included in the scope of supply)	Mobile radiological complex shall allow the use of the following solution: <ul style="list-style-type: none"> - 25 % sulphanole, - 50% three polyphosphate, - 18% sodium sulfate or equivalent decontaminants for equipment and people. 	
Quantity of detergents (to be included in the scope of supply)	90 kg of detergent	

4. PERSONAL PROTECTIVE EQUIPMENT

	Contracting Authority's Requirements	Tenderer's Offer
Manufacturer	—	
Model	—	
Scope of supply	1. Protective suits - 10 pcs, 2. Protective gasmasks - 10 pcs, 3. Filtering and absorbing elements – 20 pcs.	
PROTECTIVE SUITS		
Radiation protection	Protection against surface radiation contamination (radioactive particles)	
Category	Category III as per EU standard. Chemical protection clothing	
Components	- Overall (10 pcs), - Protective gloves (10 pairs), - Protective boots (10 pairs), - Protective overboots (100 pairs), - Carrying bag (10 pcs).	
Material	TYCHEM 6000F or equivalent	
Material of boots/high boots	Butyl rubber	
Material of gloves	Butyl rubber	
Protection against radioactive particles	EN 1073-2:2002(1)	
Protection against liquids under pressure of 3 Bar	Type 3B - EN 14605:2005 (DSTU EN 14605:2007)	
Protection against liquid aerosols	Type 4 - EN 14605:2005 (DSTU EN 14605:2007)	
Protection against airborne solid particles	Type 5 - EN ISO 13982-1:2004 (DSTU EN ISO 13982-1:2009)	
Protection against liquid chemicals	Type 6 - EN 13034:2005 (DSTU EN 13034:2007)	
Biological barrier	EN 14126:2003 (DSTU EN 14126:2008)	
Period of validity, no less than	4 years	
PROTECTIVE GAS MASKS		
Radiation protection	Protection against airborne radioactivity	
Protection grade	2-3 Class as per standard DSTU EN 136:2003 (ДСТУ EN 136:2003 in Cyrillic)	

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Material of gas mask	Halobutyl, bromobutyl rubber or EPDM (ethylene propylene diene monomer)	
Filter	Threaded joint diameter of 40 mm.	
Type of protection	Chemical, radioactive and biological agents	
Components	<ul style="list-style-type: none"> - Gas mask, - Filtering and absorbing element. 	
Front	<ul style="list-style-type: none"> - Protection against chemical, radioactive and biological agents for 24 hours or greater, - Resistance to respiration of no more than 250 Pa, - Legibility of speech of 95% or greater 	
Weight, no more than	0.6 kg	
Period of validity, no less than	10 years	
OTHER REQUIREMENTS		
Certified for use	Certification of equipment in Ukraine and/or in country of origin in accordance with the Ukrainian Legislation in force	

5. SYSTEM FOR AUTOMATED RADATION MONITORING OF THE ENVIRONMENT (INCLUDING GROUND GAMMA SURVEY)

	Contracting Authority's Requirements	Tenderer's Offer
Manufacturer	—	
Model	—	
Scope of supply	1 set	
TECHNICAL SPECIFICATIONS		
Purpose	Radiological monitoring on broad territories: (a) Automated radiation monitoring of the environment (gamma radiation background), (b) Automated radiation monitoring of the radioactive contamination of soil (ground gamma survey), (c) Marking the map with gamma dose rate measurements.	
Type	Measuring system mounted in/on the vehicle	
Functions	<ul style="list-style-type: none"> - Measurement of gamma radiation dose rate in two positions: <ul style="list-style-type: none"> (i) measurement of ambient dose equivalent rate $H^*(10)$ (alternatively, personal dose equivalent rate $H_p(10)$), (ii) measurement of the ground contamination, - Marking the map with measurements; - Indication of measured values and radiological maps at the operator's workplace (on one of the PCs); - Visual and audible alarm at the operator's workplace when thresholds of radiation level are exceeded; - Recording the measurements in the application software; - Self-diagnosis of the detection units. 	
Operation mode	Up to 24 h of continuous operation, while driving and stopping the vehicle	
Setup time of operating mode, no more than	20 min	

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	Contracting Authority's Requirements	Tenderer's Offer
Equipment (PC is included in the scope of the supply under this contract, ref to PC for operator's workplace)	<p>The supply shall comprise the following items:</p> <ul style="list-style-type: none"> - Gamma radiation detection units – 2 pcs, - Collimator(s) for measurements of ground gamma survey – to be defined by the tenderer, - Data processing unit – 1 pc, - Visual and audible alarm unit – 1 pc, - Fixing elements to attach the detection units and collimator(s) to the vehicle, - Complete set of cables (including data and power cables, sockets, connectors, interface/power adapters, etc.), - Specialized software for setting up the equipment and data acquisition. 	
Power supply	From mains of AC current, 220 ±10% V, 50±5 Hz	
Waterproof	IP 54 or better for detection unit	
Shockproof	Yes	
Mean time between failures, no less than	4 000 hours	
Service life, no less than	4 years	
Number of detection units	Two	
DETECTION UNIT No.1		
Ionizing radiation	Gamma	
Detector type	Spectrometric scintillation detector	
Dimensions of detector crystal, no less than	Ø60 x 60 mm. Bigger dimensions would be an advantage	
Energy range of detected gamma radiation	From 50 keV to 3 MeV or better	
Relative energy resolution for line of 662 keV (¹³⁷ Cs), no more than	8 % or better.	

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	Contracting Authority's Requirements	Tenderer's Offer
Measurement range of ambient dose equivalent rate Hp(10) H*(10) (alternatively, personal dose equivalent rate Hp(10))	From 0.03 μ Sv/h to 0.15 mSv/h or better	
Uncertainty of measuring ambient dose equivalent rate Hp(10) when calibrated for ¹³⁷ Cs, no more than	\pm 20%	
Channels of amplitude gamma spectrum, no less than	1024	
Energy stabilization	Yes. Built-in LED, temperature or other energy stabilization of spectrometric route.	
Automatic identification of presence of radioactive sources	Yes, basing on gamma spectroscopy method (analysis of gamma spectra and identification of picks which belong to technogenic radionuclides)	
Identification of radionuclides	Yes. Natural and technogenic ones	
Gamma spectrum acquisition time, no more than	1 sec or better	
Response time when measuring dose rate of 0.1 μ Sv/h, no more than	2 sec or better	
DETECTION UNIT No.2		
Ionizing radiation	Gamma	
Detector type	Organic scintillation detector or equivalent gamma radiation detector	
Energy range of detected gamma radiation	From 50 keV to 3 MeV or better	
Measurement range of ambient dose equivalent rate Hp(10) H*(10) (alternatively, personal dose equivalent rate Hp(10))	From 0.05 μ Sv/h to 10 Sv/h or better	
Uncertainty of measuring ambient dose equivalent rate Hp(10) when calibrated for ¹³⁷ Cs, no more than	\pm 30%	
Response time when measuring dose rate of 0.1 μ Sv/h, no more than	2 sec or better	

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ENVIRONMENTAL REQUIREMENTS		
Ambient temperatures	From -20 to+45 °C	
Relative humidity	Up to 95% at ambient temperature of 35°C and lower, without condensation of moisture	
OTHER REQUIREMENTS		
Certified for use	Certification of equipment in Ukraine and/or in country of origin in accordance with the Ukrainian Legislation in force	
Metrological testing (verification)	Yes, in Ukraine Metrological testing shall be carried out by an authorized metrological centre in Ukraine	

6. WEATHER STATION

	Contracting Authority's Requirements	Tenderer's Offer
Manufacturer	—	
Model	—	
Scope of supply	1 set	
TECHNICAL SPECIFICATIONS		
Type	Small wireless weather station installed on the roof of the Mobile radiological vehicle; equipped with the optical rain gauge.	
Functions	Weather station shall display the following: <ul style="list-style-type: none"> - ambient temperature, - dew point temperature - relative humidity, - atmospheric pressure, - speed and direction of wind, - real time, - speed and amount of precipitations, - heat index, - location according to GPS. 	
Access to data	From the automated operator work place (PC) and from mobile devices	
ENVIRONMENTAL REQUIREMENTS		
Ambient temperatures	From minus 30 to +50 °C	
Relative humidity	From 0 to 100% relative humidity	
Power supply	From 5 to 30V DC current	
OTHER REQUIREMENTS		
Certified for use	Certification of equipment in Ukraine and/or in country of origin in accordance with the Ukrainian Legislation in force	

7. ISOTOPE IDENTIFICATION DEVICE (with gamma and neutron channels)

	Contracting Authority's Requirements	Tenderer's Offer
Manufacturer	—	
Model	—	
Scope of supply	1. Isotope identification device - 2 pcs. 2. Calibration/reference radiation source (in case if there is no built-in source/LED for spectrometric route stabilization) – 1 pc.	
TECHNICAL SPECIFICATIONS		
Type	Handheld gamma spectrometer (isotope identification device). Spectroscopic personal radiation detector (SPDR) is not acceptable	
Ionizing radiation	Gamma and neutron	
Detector type	Spectrometric scintillation detector	
Dimensions of detector crystal, no less than	Ø30 x 30 mm	
Energy range of detected gamma radiation	From 25 keV to 3 MeV or better	
Relative energy resolution for line of 662 keV (¹³⁷ Cs), no more than	7 % or better	
Automatic identification of radionuclides	- Nuclear materials: ²³³ U, ²³⁵ U, ²³⁹ Pu; - Medical radionuclides: ¹⁸ F, ⁶⁷ Ga, ^{99m} Tc, ¹¹¹ In, ¹²³ I, ¹²⁵ I, ¹³¹ I, ¹³³ Xe, ¹⁹² Ir, ²⁰¹ Tl; - Naturally occurring radioactive materials: ⁴⁰ K, ²²⁶ Ra, ²³² Th, ²³⁸ U; - Industrial radionuclides: ⁵⁷ Co, ⁶⁰ Co, ¹³³ Ba, ¹³⁷ Cs, ¹⁹² Ir, ²²⁶ Ra, ²⁴¹ Am.	
Documented compliance to ANSI standards	Yes, ANSI N42.34	
Measurement of individual dose equivalent rate Hp(10)	From 0.01 µSv/h to 0.5 mSv/h or better	
Channels of amplitude gamma spectrum, no less than	1024	
Built-in LED and temperature system for automatic calibration	Yes. In case if there are no built-in source/LED for spectrometric route stabilization, a separate calibra-	

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	Contracting Authority's Requirements	Tenderer's Offer
	tion/reference source(s) for automated calibration shall be supplied	
Duration of routine energy calibration, no more than	20 min	
Recording gamma spectra in a non-volatile memory	Yes	
Functions	<ul style="list-style-type: none"> - Automatic identification of gamma-emitting radionuclides and radionuclide analysis; - Measurement of individual dose equivalent rate; - Indication of measured values on the built-in display; - Storing spectra in a non-volatile memory and transferring to the PC; - Radiation safety alarm; - Automatic energy stabilization; - Assistance to energy calibration of the spectrometric detector. 	
Power supply	From integrated accumulators	
Time of continuous operation at gamma background (not more than 0.5μSv/h) under non-alarm conditions, no less than	8 hours	
Total weight of all the components, no more than	4 kg	
Physical dimensions	Compact, portable, suitable for hand-held use	
Waterproof, no less than	IP54	
Shockproof	Yes	
Mean time between failures, no more than	4000 hours	
Service life, no less than	6 years	
ENVIRONMENTAL REQUIREMENTS		
Ambient temperatures	From -20 to +45 °C	
Relative humidity	Up to 95% at ambient temperature of 35°C and lower, without condensation of moisture	
OTHER REQUIREMENTS		
Certified for use	Certification of equipment in Ukraine and/or in country of origin in accordance with the Ukrainian Legislation in force	

	Contracting Authority's Requirements	Tenderer's Offer
Metrological testing (verification)	Yes, in Ukraine. Metrological testing shall be carried out by an authorized metrological centre in Ukraine	

8. MULTI-PURPOSE SURVEY METER (with alpha, beta, gamma and neutron channels)

	Contracting Authority's Requirements	Tenderer's Offer
Manufacturer	—	
Model	—	
Scope of supply	1. Multi-purpose survey meter (with alpha, beta and gamma channels) – 2 sets, 2. Neutron radiation detection unit – 1 pc, 3. Marinelli vessel – 1 pc, 4. Shielding - 1 pc, 5. Reference/calibration radiation source, if necessary – 1 pc.	
TECHNICAL SPECIFICATIONS		
Type	Handheld device	
Detection channels	Alpha, Beta, Gamma and Neutron independent channels	
Gamma detector type	Combination of scintillation detector + Geiger-Muller counter is recommended	
Detectors	Replaceable radiation detectors attached to the carrying handle/telescopic arm	
Functions	Search, localization and evaluation of RN materials: - Measurement of ambient dose equivalent and ambient dose equivalent rate $H^*(10)$ by gamma and neutrons (alternatively, personal dose equivalent and personal dose equivalent rate $H_p(10)$); - Measurement of flux density of alpha and beta emitters; - Measurement of specific/volumetric activity of radionuclides in samples (for one of the Multi-purpose survey meter to be supplied); - Natural and intrinsic back-	

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	<p>ground suppression;</p> <ul style="list-style-type: none"> - Indication of measured values on the LCD display; - Audible signalling of each registered particle in the search mode; - Audible and visual alarm when thresholds are exceeded; - Adjustable thresholds for alarm; - Recording the measurements in the non-volatile memory. 	
Equipment (to be supplied for both survey meters)	<p>The Multi-purpose survey meter shall be equipped with the following:</p> <ul style="list-style-type: none"> - set of detectors of alpha, beta and gamma radiation, - data display and processing unit, - telescopic arm (of 1 m long or more), - rechargeable battery, - battery charger, - specialized software for data treatment and analysis, - carrying case. 	
Additional equipment (to be supplied for one of the survey meters)	<p>The Multi-purpose survey meter shall be equipped with the following:</p> <ul style="list-style-type: none"> - neutron radiation detection unit, - Marinelli vessel, - Shielding, - Reference/calibration radiation source, if necessary 	
ALPHA MEASUREMENTS		
Energy range of detected alpha radiation	From 4 MeV to 7 MeV or better	
Measurement range of alpha flux density	From 10 to $1 \cdot 10^5$ part./(cm^2min) or better	
Relative measurement error, no more than	$\pm 20\%$	
BETA MEASUREMENTS		

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Energy range of detected beta radiation	From 155 keV to 3 MeV or better	
Measurement range of beta flux density	From 10 to $1 \cdot 10^5$ part./(cm^2min) or better	
Relative measurement error, no more than	$\pm 20\%$	
GAMMA MEASUREMENTS		
Energy range of detected gamma radiation	From 60 keV to 3 MeV or better	
Measurement range of ambient dose equivalent $H^*(10)$ (alternatively, personal dose equivalent $H_p(10)$)	From 0.1 μSv to 10 Sv or better	
Measurement range of ambient dose equivalent rate $H^*(10)$ (alternatively, personal dose equivalent rate $H_p(10)$)	From 0.1 $\mu\text{Sv/h}$ to 100 mSv/h or better	
Uncertainty of measuring ambient dose equivalent rate $H^*(10)$ when calibrated for ^{137}Cs , no more than	$\pm 35\%$	
Measurement range of specific (volumetric) activity for ^{137}Cs in the geometry of Marinelli vessel	From 100 to 10^5 Bq/kg (Bq/l) or better	
NEUTRON MEASUREMENTS		
Energy range of detected neutron radiation	From 0.025 eV (thermal) to 14 MeV or better	
Measurement range of ambient dose equivalent $H^*(10)$ (alternatively, personal dose equivalent $H_p(10)$)	From 0.1 μSv to 10 Sv or better	
Measurement range of ambient dose equivalent rate $H^*(10)$ (alternatively, personal dose equivalent rate $H_p(10)$)	From 0.1 $\mu\text{Sv/h}$ to 100 mSv/h or better	
PERFORMANCE		
Alarm indication	Visual and audible alarms when thresholds are exceeded. Haptic alarm is an advantage.	
Power supply	From integrated rechargeable battery	
Time of continuous operation at gamma background (not more than 0.5 $\mu\text{Sv/h}$) under non-alarm conditions, no less than	8 hours	
Weight, no more than	1.5 kg	
Physical dimensions	Compact, portable, suitable for handheld use. Comfortable carrying handle	

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	and attachment to clothing is an advantage.	
Shockproof	Yes	
Waterproof	Protection grade of main components: - IP 5X or better - for gamma radiation detectors, - IP 2X or better - for alpha and beta radiation detectors.	
Mean time between failures, no less than	4000 hours	
Service life, no less than	6 years	
ENVIRONMENTAL REQUIREMENTS		
Ambient temperatures	From -20 to +45 °C	
Relative humidity	Up to 95% at ambient temperature of 35°C and lower, without condensation of moisture	
OTHER REQUIREMENTS		
Certified for use	Certification of equipment in Ukraine and/or in country of origin in accordance with the Ukrainian Legislation in force	
Metrological testing (verification)	Yes, in Ukraine. Metrological testing shall be carried out by an authorized metrological centre in Ukraine	

9. SET FOR COLLECTING SAMPLES

	Contracting Authority's Requirements	Tenderer's Offer
Manufacturer	—	
Model	—	
Scope of supply	2 pcs	
TECHNICAL SPECIFICATIONS		
Functions	Collection and transportation of samples for laboratory analysis: - Air samples, - Liquid samples, - Solid/bulk samples (e.g., soil)	
Components	The set should include the following or equivalent items: - pipettes for suspicious liquids; - containers for suspicious liquids; - swab and container for solvents; - container for hazardous powder substances; - set of plastic containers; - PTFE containers for liquid and solid substances; - hermetically sealed container for chemical and biological hazardous substances; - plastic case.	

10. BACKPACK FOR RADIONUCLIDE IDENTIFICATION AND SOURCE LOCATION

	Contracting Authority's Requirements	Tenderer's Offer
Manufacturer	—	
Model	—	
Scope of supply	2 sets	
TECHNICAL SPECIFICATIONS		
Type	Portable monitor of RN materials in backpack	
Detection channels	Gamma, neutron independent channels	
Gamma channel	Spectrometric scintillation detector	
Neutron channel	Alternatives to ³ He counters are an advantage	

Annex “Specifications”

Functions	Contracting Authority's Requirements	Tenderer's Offer
Functions	Search, localization and evaluation of RN materials: <ul style="list-style-type: none"> - Automatic identification of gamma-emitting radionuclides and radionuclide analysis; - Measurement of individual dose equivalent rate; - Indication of measured values on the built-in display; - Indication of the direction to the found RN materials (radiation sources); - GPS positioning; - Internal mapping; - Assistance to localization of multiple RN materials (radiation sources) via user interface (incl. the calculation of estimated location for radiation source(s)); - Radiation safety alarm; - Recording the measurements in conjunction to the time and place in the non-volatile memory; - Automatic energy stabilization. 	
Energy range of detected gamma radiation	From 30 keV to 3 MeV or better	
Energy range of detected neutron radiation	From 0.025 eV to 14 MeV or better	
Measurement range of individual dose equivalent rate Hp(10)	From 0.01 μSv/h to 100 μSv/h or better	
Uncertainty of measuring individual dose equivalent rate Hp(10) when calibrated for ¹³⁷ Cs, no more than	± 30%	
Channels of amplitude gamma spectrum, no less than	1024	
Relative energy resolution for line of 662 keV (¹³⁷ Cs), no more than	7.5 % or better	
Alarm indication	Visual and audible alarms when thresholds are exceeded. Haptic alarm is an advantage.	
Power supply	From integrated accumulators	

Annex “Specifications”

	Contracting Authority's Requirements	Tenderer's Offer
Battery and battery life	Battery life should be greater than 6 hours under no alarm conditions for instruments	
Weight, no more than	10 kg	
Physical dimensions	Compact, suitable for use as a backpack.	
Shockproof	Yes	
Waterproof, no less than	IP56	
Mean time between failures, no less than	4000 hours	
Service life, no less than	6 years	
ENVIRONMENTAL REQUIREMENTS		
Ambient temperatures	From -20 to+45 °C	
Relative humidity	Up to 95% at ambient temperature of 35°C and lower, without condensation of moisture	
OTHER REQUIREMENTS		
Certified for use	Certification of equipment in Ukraine and/or in country of origin in accordance with the Ukrainian Legislation in force	
Metrological testing (verification)	Yes, in Ukraine. Metrological testing shall be carried out by an authorized metrological centre in Ukraine	

11. PERSONAL ELECTRONIC DOSIMETERS

	Contracting Authority's Requirements	Tenderer's Offer
Manufacturer	—	
Model	—	
Scope of supply	1. Personal electronic dosimeters – 6 pcs., 2. Spare parts for 3 years of operation (accumulator batteries) – 1 set (to be defined by the tenderer)	
TECHNICAL SPECIFICATIONS		
Energy range of registered gamma radiation	From 60 keV to 3.0 MeV or better	
Measurement range of individual dose equivalent rate $H_p(10)$	From 0.1 μ Sv/h to 1 Sv/h or better	
Measurement range of individual dose equivalent $H_p(10)$	From 1 μ Sv to 9.9 Sv or better	

Annex “Specifications”

	Contracting Authority's Requirements	Tenderer's Offer
Weight, no more than	0.15 kg	
Dimensions	Compact, suitable to be worn on a belt or to be carried in a pocket for hands free operations	
Alarm indication	Visual and audible alarms when thresholds are exceeded. Haptic alarm is an advantage.	
Functions	<ul style="list-style-type: none"> - Indication of measured values on the built-in display; - Adjustable thresholds for alarm; - Recording the measurements in the non-volatile memory. 	
Power supply	From accumulator battery	
Battery and battery life	Accumulator batteries shall provide more than 2000 hours of continuous operation	
Shockproof	Yes	
Waterproof, no less than	IP54	
Mean time between failures, no less than	4000 hours	
Service life, no less than	6 years	
ENVIRONMENTAL REQUIREMENTS		
Ambient temperatures	From -20 to +45 °C	
Relative humidity	Up to 95% at ambient temperature of 35°C and lower, without condensation of moisture	
OTHER REQUIREMENTS		
Certified for use	Certification of equipment in Ukraine and/or in country of origin in accordance with the Ukrainian Legislation in force	
Metrological testing (verification)	Yes, in Ukraine. Metrological testing shall be carried out by an authorized metrological centre in Ukraine	

12.AUXILARY EQUIPMENT FOR POST-DETECTION ACTIVITIES

	Contracting Authority’s Requirements	Tenderer’s Offer
Scope of supply	1. Set of lights (searchlight and a tower for it, hand lamp, emergency light, head light, etc.) – 1 set (to be defined by the tenderer), 2. Warning signs (500 pcs. minimum) and safety tapes to mark the boundaries (areas) of contamination with toxic and radioactive substances – 1 set, 3. Portable device for placement of safety tapes/ warning signs – 1 set, 4. Photo/video cameras to ensure gathering of evidences and incident investigation – 2 pcs.	

13.VISIBILITY OF NORWEGIAN FINANCING

	Contracting Authority’s Requirements	Tenderer’s Offer
Visibility of Norwegian financing	Any equipment delivered under the contract should be clearly identified and should have metallic plates or indelible labels containing the flag of Norway and the phrase “Provided with support from the Government of Norway” in Ukrainian and in English.	

14. DOCUMENTATION

	Contracting Authority's Requirements	Tenderer's Offer
DOCUMENTATION		
Technical specifications/ conditions	In Ukrainian	
Conceptual design of Mobile radiological complex	In Ukrainian and English	
Programme and procedures of factory acceptance test	In Ukrainian and English	
Vehicle documents	In Ukrainian and English	
Passports/logbooks for Mobile radiological complex	In Ukrainian Passport/logbook shall contain the following data: - Completeness, - Placement of equipment, - Electric connection diagram, - Fuel and special liquids consumption, - Intended service life, etc.	
Passports/logbooks for technical means	In Ukrainian	
User's manuals for technical means	In Ukrainian	
Documents attesting certification of equipment in Ukraine and/or in country of origin	In Ukrainian and English	
Declarations of compliance for technical means	In Ukrainian and English	
Certificates of metrological testing (verification) for measuring instruments (issued by an authorized metrological centre in Ukraine)	In Ukrainian	
Safety data sheet for decontamination solutions	In Ukrainian	
Training documentation	In Ukrainian	
Transportation documentation	In Ukrainian and English	

15. DELIVERY TERMS AND CONDITIONS

	Contracting Authority's Requirements	Tenderer's Offer
DELIVERY TERMS AND CONDITIONS		
Terms of Delivery	DDP, Incoterms 2010	
Place of Delivery	Pr. Peremohy 58, 93120, Lisichansk, Luhansk region, Ukraine	
Delivery Time	≤ 270 calendar days after the date of contract signature	
PRESERVATION AND PACKAGING		
Packaging	Protection for transportation, handling and reliable storage without re-preservation within 1 year upon delivery.	

16. TRAINING COURSE: OPERATION, MAINTENANCE AND REPAIR

	Contracting Authority's Requirements	Tenderer's Offer
TRAINING		
TRAINING COURSE		
Place of training (training room to be provided by the Recipient)	Lisichansk unit of Luhansk border detachment of SBGS: Pr. Peremohy 58, 93120, Lisichansk, Luhansk region, Ukraine	
Duration of training course	3 days	
Language of training course	Ukrainian	
Number of trainees, up to	30 persons	
Themes to be covered	<ul style="list-style-type: none"> - Operating principles of all the units of Mobile radiological complex, - Detailed analysis of all the units of the Mobile radiological complex; - Use and operation of all the units of the Mobile radiological complex, - Measurement techniques, - Techniques of decontamination and applicable detergents, - Periodic metrological verification of measuring instruments, - Maintenance, - Minor repairs. 	
Theoretical part duration, no less than	1,5 days	

Annex “Specifications”

Practical part duration, no less than	1,5 days: practical training at Recipient’s training room	
Instructional video	Optional	
Verification	Test, written form	
TRAINING COURSE DOCUMENTATION		
One certificate per trainee	In Ukrainian and English	
List of materials to provide per trainee	- Set of training materials; - User’s documentation; - Training materials on one CD/DVD.	
Results of test after training should be delivered to the Contracting Authority and Recipient	Yes	

17. WARRANTY AND POST-WARRANTY SERVICES

	Contracting Authority’s Requirements	Tenderer’s Offer
WARRANTY AND POST-WARRANTY SERVICES		
Duration of warranty period	≥ 24 months	
Place of warranty repairs and maintenance	Ukraine	
Presence of official representative of the manufacturer or authorised service centre in Ukraine	Yes, the official representative of the manufacturer or authorised service centre shall be available in Ukraine for: - Warranty and post-warranty maintenance and repair of vehicle, - Warranty and post-warranty maintenance and repair of radiation monitoring instruments.	
Technical support during warranty and post-warranty period	- Technical support by email or telephone in Ukrainian/English to solve any technical problems (software failure, anomalous behavior, minor improvements concerning process, functional capabilities of data processing, etc.) and rectify any system-disabled state. - Consultancy support in relation to the periodic metrological verification by email or telephone in Ukrainian/English.	

Annex “Specifications”

After-sales service	Compulsory after-sales service to be provided under a separate agreement with the Recipient shall include the following: - Maintenance and post warranty repair of the Equipment on the territory of Ukraine; - Rapid provision of spare parts and consumables.	
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18. TIME SCHEDULE

No.	Action	Period of completion	Tenderer's Offer
1.	Submission of documents: - Technical specifications/conditions; - Conceptual design of Mobile radiological complex.	Within 45 calendar days after the signing of Contract	
2.	Submission of documents: - Programme and procedures of factory acceptance tests, - User's manuals for technical means.	2 weeks before the scheduled factory acceptance testing	
3.	Submission of documents: - Vehicle documents, - Passport/logbook for the Mobile radiological complex, - Passports/logbooks for technical means, - User's manuals for technical means, - Documents attesting certification of equipment in Ukraine and/or in country of origin, - Declarations of compliance for technical means, - Certificates of metrological testing (verification) for measuring instruments (issued by an authorized metrological centre in Ukraine), - Safety data sheets for decontamination solutions, - Transportation documentation.	2 weeks before the scheduled shipment and supplied with equipment	
4.	Submission of documents: - Training programme, - Training course documentation.	2 weeks before the scheduled training	
5.	Equipment delivery	Within 270 calendar days after the signing of Contract	

Annex "Specifications"

6.	Training of personnel	Within 20* calendar days after the delivery of equipment	
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Note: *) The personnel training must be carried out not later than within 20* calendar days after the delivery of Mobile radiological complex. The actual dates of training shall be confirmed by the Recipient and Contracting Authority no later than ten (10) days before the training course.

Authorized person on behalf of the Tenderer:

Name: _____

Title: _____

Signature: _____

Date: _____