# *ANNEX II + III:* TECHNICAL SPECIFICATIONS + TECHNICAL OFFER

**Contract title: Purchase of robotic system and Mobile transport center p 1 /…**

**Publication reference:** 04-2020

**Columns 1-2 should be completed by the contracting authority**

**Columns 3-4 should be completed by the tenderer**

**Column 5 is reserved for the evaluation committee**

Annex III - the contractor's technical offer

The tenderers are requested to complete the template on the next pages:

* Column 2 is completed by the contracting authority shows the required specifications (not to be modified by the tenderer),
* Column 3 is to be filled in by the tenderer and must detail what is offered (for example the words ‘compliant’ or ‘yes’ are not sufficient)
* Column 4 allows the tenderer to make comments on its proposed supply and to make eventual references to the documentation

The eventual documentation supplied should clearly indicate (highlight, mark) the models offered and the options included, if any, so that the evaluators can see the exact configuration. Offers that do not permit to identify precisely the models and the specifications may be rejected by the evaluation committee.

The offer must be clear enough to allow the evaluators to make an easy comparison between the requested specifications and the offeredspecifications.

**GENERAL REQUIREMENTS**

* Any specification referring to a particular product or manufacturer, in particular to types, models and brand names, are to be understood as “or equivalent”.  Where equivalency shall be subject to technical evaluation, the respective documentation giving evidence of equivalency, and - if appropriate - an assessment by an independent recognized party shall be provided with the offer.
* The Tenderer’s offer must be accompanied by technical brochures showing in details type, dimensions, size and description of the offered material and/or technical documentation proving the required performance and parameters in order to verify the compliance with the technical specifications.
* All equipment items must carry a minimum 1-year full warranty including all parts and labour, except where stated otherwise. Tenderers must explicitly state their compliance with this requirement. During the warranty period, the Tenderer shall provide technical service and shall replace any defective part of the goods supplied with new, including labour for fitting the part and setting up and calibrating the equipment where necessary.
* The Tenderer shall indicate how the technical service will be ensured.
* All equipment items must be delivered, installed, configured and fully tested in situ at designated place of delivery. Instruction of the equipment must be provided at time of installation (offered prices should include training costs).  These services must be included as an integral component of the proposal.

Documentation and Manuals

* All equipment to be supplied shall be accompanied by a full set of manufacturer workshop maintenance and repair manuals in the Montenegrin language.

Maintenance and Support

* All equipment is required to be supplied under the terms of the 12 months Warranty period by the Tenderer, from provisional acceptance. The Tenderer shall provide or secure the provision of an established and reliable after sales and maintenance service agent guaranteeing the upkeep and repair of the equipment supplied and the rapid replenishment of spare parts at the location of use. The Tenderer shall state in detail how he proposes to meet this obligation.
* Proposal for after-sales service over 3 years has to be provided. These services are not financed by this contract and will be the subject of an agreement between the contractor and the end-user (at the cost of the end-user).
* General guidelines for design of stickers is provided in "Communication and Visibility Manual for EU External Actions".
* Each Item will have a sticker with the attached information (beneficiary to insert attachment at the time of purchase) on the body of the unit. Correct size and design of sticker will be delivered to the Contractor together with the Commencement order. Production and placement of stickers must be calculated in the price of the items.

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| **1.****Item number** | **2.****Specifications required** | **3.****Specifications offered** | **4.** **Notes, remarks, ref to documentation** | **5.****Evaluation committee’s notes**  |
| **1** | **Command vehicle with loader and robot loading platform**

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| ***Parameter*** | ***Characteristics*** *(minimal requirements)* |
| **The vehicle** |
| Vehicle shall be | brand new, unused and un-refurbished, left hand drive side |
| Model year  | 2020 or later |
| **Vehicle chassis** |
| GVW | max. 33.000 kg |
| Wheel drive | 6 x 4 |
| Wheelbase | 4.700 mm – 4.900 mm |
| **Dimensions of vehicle with platform** |
| Length | max. 10.000 mm |
| Width | max. 2.500 mm |
| Height | max. 4.000 mm |
| Front approach angle  | min. 23° |
| Rear departure angle  | min. 17 ° (without bumper) |
| Ground clearance | min. 0,30 m |
| Ground clearance under axle  | min. 0,23 m |
| **Vehicle driveline** |
| Engine | Diesel cycle |
| Power - min. 290 kW |
| Emission standard - EURO 6 |
| Fuel | Low sulphur diesel, max. 10 ppm |
| Max. torque | min. 2.000 Nm  |
| Transmission | Minimum of 6 forward gears + 1 reverse gear, automated gear change, to match chassis offered, GVW and engine size (provisions for PTO) |
| Braking and stability control | Motor brake, ABS, ASR, ESP, ESS. The vehicle must also have a parking manual braking system acting at rear axle and an emergency brake.  |
| Fuel heater | Included |
| Additional fuel oil filter | With water separation |
| Front axle suspension | Twin-leaf parabolic springs, Stabiliser, Shock absorbers |
| Rear axle suspension | Twin-leaf parabolic springs, Stabiliser, Shock absorbers |
| Differential lock | Rear axle |
| Protective plate | For radiator, engine, sump and transmission |
| Steering wheel | Power assisted |
| **Vehicle cabin** |
| Cabin type | Double with 4 doors |
| LCD screen | Placed on the driver's side that shows an image of the rear-view camera. The screen is also normally visible in direct sunlight. The camera activates independently of whether the transmission is shifted in reverse. |
| Seats | For 1 driver + a minimum of one co-driver +3 in the rear of the double cabin. Driver's seat to be adjustable in height and depth, pneumatic suspension. |
| Seat belts | All seats are equipped with approved three-point seat belts according to ECE R 16. The seat belts are also mounted on the cabin body with ECE R 14 approved anchorages. |
| Remote central locking | Included  |
| Air conditioning | Manual  |
| Mirrors | Heated and electronically adjustable |
| Windscreen  | Heated |
| Airbags  | For driver  |
| Digital tachograph | Including smart cards  |
| Immobiliser | Included |
| **Vehicle - other** |
| PTO | Included |
| Gear for inflating the tires | Rubber hose for inflating the tyres with manometer |
| lift min.12 tons  |
| 2 tyre supporters  |
| Acoustic warning system | For engaged reverse gear  |
| Fog lights | Front and rear |
| Electronic speed limiter | at 90 km / h |
| Adjustable chains tested four pieces | Included |
| Fenders and side protection | Included  |
| Fuel tank | Volume min. 300 l  |
| First aid kit, triangle warning sign, warning light, fire extinguisher | Included |
| Other equipment fitted to the vehicle from the production series | Included |
| **Hook loader** |
| Load capacity | min. 18 t load capacity |
| Loader drive | Hydraulic  |
| Loader control | Via cabin controls |
| Sound and light signal in cabin when extracted arm | Included |
| Hydraulic axle stabilizers | Included |
| **Controlling section of the firefighting robot**  |
| The control section of the robot | Located in the area behind the driver and front passenger - in the rear of the team cabin |
| The control section of the robot | Having work desk with a minimum of 3 workplaces |
| All necessary equipment for controlling and monitoring the fire robot and for displaying images from cameras located on the fire robot | Included in the control part |
| The computers for monitoring and controlling the robot's operation | must be located in the control section |
| The robot monitoring and control monitor | must be mounted in the control section |
| **Telescopic mast** |
| Position | Mounted on the chassis |
| Material | Aluminum |
| Activation | Pneumatically actuated |
| Reflectors | The telescopic mast is equipped with 4 x LED reflectors, each with at least 4.500 lumens connected to the vehicle wiring.  |
| The lighting control position | On the control part of the robot control vehicle |
| Antenna mounts | Inlcuded |
| Camera to view the surroundings of the vehicle | inlcuded |
| **Platform** |
| Platform length | min. 6 m |
| Anchorage point | Included on the upper surface |
| Load capacity | Min. 14 t |
| Robot loading system | Robot loading and unloading on the platform is done when platform is on the ground |

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| **2** | **Firefighting robot**

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| General description of FF robot | Firefighting robot is a vehicle (track-laying) for fire fighting purposes which is controlled via radio link. Vehicle is equipped at least with a water tank, foam tank, fire pump, water/foam turret, self-protection system, blade/gripper tool for lifting (gripping) and moving of heavy objects, video system and lighting system.  |
| **FF robot dimensions** |
| Length total (Gripper tool in transport position) | max. 5.800 mm |
| Length total (Gripper tool w/jaws extended) | max. 6.400 mm |
| Width total | max. 2.900 mm |
| Ground clearance (depending on track plate type) | min. 250 mm |
| Height overall | max. 2.300 mm |
| Mass overall (w/lubricants, fuel, water & foam) | max. 17.000 kg |
| **FF robot engine** |
| Engine Description | In-line, turbo-charged diesel, 4-stroke, direct injection, water cooled, electronically regulated |
| Rated power | min. 180 kW |
| Torque at rpm | min. 1.000 Nm  |
| **FF robot undercarriage** |
| Tracks  | Metal tracks 380 - 420 mm wide |
| Ground bearing pressure | 0,6 – 0,9 kg/cm2  |
| Power transmission | Hydrostatic system |
| Type | Independent for propulsion  |
| Transport speed | min. 10 km/hour |
| **FF robot control** |
| FF robot autonomy | The autonomous operation tank of the robot with a single fuel is min. 4 hours  |
| FF robot control | By a radio remote control min. 1.400 meters in the field of optical visibility  |
| **Obstacle Negotiation** |
| Grade slope  | min. 28 ° |
| Side slope | min. 18 ° |
| **Specification of Fire-fighting system – Water tank** |
| Capacity  | min. 1.900 l  |
| Filling pressure | min. 4 bar |
| **Specification of Fire-fighting system – Foam tank** |
| Capacity  | min. 450 l  |
| Filling pressure | min. 4 bar |
| Material | Glass reinforced polyester  |
| **Specification of Fire-fighting system - Firefighting pump** |
| Type  | 2-stage fire pump |
| Flow  | min. 2.000 l/min at 10 bar according to EN standard |
| Management | Remote controlled |
| Thermal protection of the pump | Inlcuded |
| Automatic air vent | Inlcuded |
| Pressure regulation | Inlcuded |
| **Specification of Fire-fighting system – Foam system** |
| Type  | Automatic dosage unit |
| Pump type  | Gear pump |
| Flow  | From 1.000 – 2.000 l/min of water flow |
| Management | Remote controlled |
| Min. two foam mixtures | Inlcuded |
| **Specification of Fire-fighting system – Water/Foam turret** |
| Position  | Roof mounted on hydraulic arm |
| Flow  | min. 1.500 l/min at 10 bar |
| Management  | Remote controlled |
| Range  | water min. 50 m, water/foam min. 40 m |
| Base rotation | 360° in both directions |
| Adjustable jet shape | full to spray jet |
| Thermal camera | Included |
| Lightning | Inlcuded |
| **Specification of Attachable Operational Equipment - Blade/Rotational Gripper Tool** |
| Rotational Gripper claws opening  | Min. 1.400 mm |
| Rotation  | 360° in both directions |
| Blade pushing capacity  | min. 9 tonnes  |
| Rotational Gripper lifting capacity  | min. 2.000 kg |
| Grip force  | min. 13.000 N |
| Protection level | Hardox - 450 plates or equivalent  |
| **Specification of Attachable Operational Equipment - Winch** |
| Winch drive  | Hydraulic motor |
| Clutch  | Manual |
| Rated pulling force  | min. 8.000 kgf |
| Rope length  | min. 25 m |
| **Specification of Attachable Operational Equipment - Video system specs** |
| Video surveillance system description | The built-in video surveillance system must allow the robot user to have a complete view of the space and area in which the robot moves or performs the specified actions. Video surveillance footage is transmitted in real time via a radio link to the robot operator in a remote and secure location. |
| Built-in video surveillance must have a minimum of | * a minimum of one camera at the front of the tool and on the hydraulic arm
* a minimum of one camera for viewing in front and behind the robot
* a minimum of one PTZ day / night colour camera with a minimum of 20x optical zoom.
* a minimum of one thermal imaging camera mounted on the water/foam turret with resolution of at least 320 x 240 pixels
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| **Sensors and detectors** |
| Sensors | Included:* Oxygen
* Temperature
* Explosive Gases
 |
| **Connections** |
| Following connections must be inlcuded | * 1 x Storz A suction socket fir an external source at the back of the machine with the possibility of closing via remote control
* 1 x Storz B hydrant socket for filling the tank at the back of the machine, manually or automatically controlled via the remote control
* 1 x Storz D socket at the back of the foam tank for filling / emptying machine.
* 1 x Storz B socket on the side of the machine for the option of connecting an additional consumer.
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| **Lightning** |
| Following reflectors must be included | The lighting of the robot surrounding is with LED reflectors on the front and back of the robot, with a minimum of one LED reflector mounted on a water/foam turret, and with a minimum of two LED reflectors on the gripper/blade tool.  |
| **Additional requirements for the commanded vehicle with loader, platform and robot** |
| Warranty period | 12 months |
| Service and warranty book | Included |
| Colour of commanded vehicle and robot | Red by RAL 3000 except the chassis, which is the standard colour of the chassis manufacturer, the wheels are black or grey in the standard colour of the chassis manufacturer.  |
| Light, sound and communication equipment | The command vehicle must have an audible signalling device capable of selecting multiple tones.  |
| Labels and markings | The following labels are included in the scope of delivery:* Forward on the vehicle grille
* On the vehicle door
* On both sides of the robot
* All signs made of reflective high quality foil
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| Fire Fighting equipment | Fire extinguisher powder ABC with min. 9 kg of extinguishing agent and CO2 extinguisher with min. 5 kg of extinguishing agent, both placed on the trailer with the robot |
| Pipes and fittings | Equipment must be on the trailer with the robot Pressure hose for connecting a fire hydrant to a robot and operating the robot in conjunction with a hydrant - 15 m in length Coupling A-B Coupling B-C  |
| Medical supplies | First aid kit |
| Lightning and signalling  | * Handheld LED Flashlight, Rechargeable, Minimum 5 hours work time
* Warning triangle
* Safety light (flashing)
* Road cone (approx. 60 cm)
 |
| Technical documentation | A complete description of the vehicle offered (as an attachment to these technical features) with the technical characteristics of the vehicle, the standard and optional equipment offered, the special equipment required, and the technical characteristics of the installed light-sound equipment, as well as a pictorial representation of the vehicle (technical sketch with all major measures - length, height, width, wheelbase, access angles) |
| Operator’s manual | For the commanded vehicle, loader and robot in Montenegrin language |
| Documentation for vehicle type approval in Montenegro | Included |
| Maintenance | The offered product must have authorized maintenance and service representative available in Montenegro |
| Training | On-site training with issued certificate delivered on Montenegrin language in Podgorica |
| Number of persons to be trained: max. 10 |
| Duration: minimum 10 working days. |

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