Proiectul „Enhancing the intervention skills of professional firefighters (EnIS)”
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TECHNICAL SPECIFICATION
” Firefighting Vehicle for Extinguishing with Water and Foam 4000-Liter Capacity”

CONTENT

1. PURPOSE OF USE

The vehicle is intended to be used by public entities belonging to governmental organization (General Inspectorate for Emergency Situations of the Ministry of Internal Affairs of the Republic of Moldova). The vehicle is designed for but not limited to response missions such as fire extinguishing, rescue operations, providing first aid, and saving individuals from heights and/or wells in urban areas.

The vehicle shall be suitable for intensive use, capable of immediate deployment for response missions, with frequent accelerations and decelerations, including on steep ramps and slopes.

The vehicle as well as the equipment and accessories installed and/or provided with the vehicle must comply with standards listed in pt. 3.10.

2. ORGANIZATION AND COMPONENTS OF THE VEHICLE

2.1. Firefighting Vehicle for Extinguishing with Water and Foam 4000-Liter Capacity.
2.2. Chassis.
2.3. Special Equipment Compartment:
  2.3.1. Firefighting System:
    2.3.1.1. Water and Foam System, consisting of:
      2.3.1.1.1. Water tank and foam concentrate tank;
      2.3.1.1.2. Pump unit with built-in automatic priming system;
      2.3.1.1.3. Foam proportioning system;
      2.3.1.1.4. Suction, connection, and discharge pipes.
  2.3.2. Control system for the pump unit;
  2.3.3. Compartment for specific accessories;
  2.3.4. The water tank, foam tank(s), pump unit, and other equipment equipping the superstructure shall be arranged to ensure a balanced weight distribution on the chassis.

3. TECHNICAL CHARACTERISTICS

3.1. **Vehicle:**
  3.1.1. Vehicle category: **N3SG** according to Moldova Vehicle and Trailer Registration Rules;
  3.1.2. The brand-new and unused vehicle chassis shall be manufacture of minimum 2026;
  3.1.3. The chassis manufacturer must have an official national representative in the Republic of Moldova, capable of ensuring maintenance and warranty for both offered the vehicle and the entire assembly (chassis + superstructure) Period of warranty minimum 5 years, and post-warranty minimum 10 years;

  3.1.4. Overall dimensions (L x W x H):
  - maximum length: 9000 mm;
  - maximum width: 2550 mm;
  - maximum height measured from the ground: maximum 3400 mm.

The height shall be established when the vehicle is fully equipped and ready for deployment, with all equipment and full tanks, as well as the full crew onboard;

3.1.5. Specific Engine Power: minimum 300 HP (generated exclusively by internal combustion engine);

3.1.6. Estimated engine life-cycle: minimum 1 000 000 km;

3.1.7. Maximum Speed: minimum 100 km/h;

3.1.8. Maximum Gradient: minimum 30 %;

3.1.9. When fully equipped, with all supplies and the crew onboard (fully operational), the vehicle shall maintain stability for safe movement on terrain with inclinations of at least 25 degrees.

3.1.10. The approach angles, departure angles, and ground clearance of the fully operational vehicle shall allow movement on unpaved roads and rough terrain:

- Ground Clearance: minimum 300 mm;
- Angle of Attack: minimum 25^0;
- Departure Angle: minimum 25^0.

3.2. **Chassis:**

3.2.1. **Engine and Auxiliary Systems**:

3.2.1.1. Emission standard: according to the EU regulations in force on the date of delivery.

3.2.1.2. Fuel type: diesel.

3.2.1.3. Fuel tank with a minimum capacity of 100 liters, AdBlue tank with a minimum capacity of 20 liters, positioned so as not to affect the ability to pass through rough terrain and protected on the side and below by a metal shield, against damage when driving off paved or unpaved roads.

3.2.1.4. Electric engine preheating system for use during stationary periods, powered by an external source.

3.2.1.5. Oil pan (sump) designed for slopes exceeding 30% protected below by a metal shield, against damage when driving off paved or unpaved roads.

3.2.1.6. Towing couplings for the maximum load of the fire truck, located at the front and rear of the chassis.

3.2.1.7. Equipped with a traction control system (ASR or equivalent).

3.2.2. The chassis must have an electric winch mounted in the front of the vehicle:

3.2.2.1. The winch shall be powered by 24 V DC of the vehicle, equipped with a remote control;

3.2.2.2. Pulling capacity minimum 8 tons;

3.2.2.3. Electric motor power minimum 5 kW;

3.2.2.4. Braking system: automatic electromechanical brake (anti-rollback);

3.2.2.5. Cable: galvanized steel, minimum 12 mm, minimum 25 m length;

3.2.2.6. Ingress protection: IP 68 minimum;

3.2.2.7. Equipped with a cover to protect it from dust, water and mud.

3.2.3. **Transmission:**

3.2.3.1. **4x4 drivetrain** with front, rear and interaxle differential locking

device;

3.2.3.2. **Automatic or automated manual** transmission, dedicated for vehicles purpose, with sufficient gear ratios to ensure movement under all driving conditions.

3.2.3.3. Front axle suspension with a stabilizer bar or pneumatic system, designed for operation on both asphalt roads and unpaved or rough terrain;

3.2.3.4. Rear axle suspension with a stabilizer bar or pneumatic system, designed for operation on both asphalt roads and unpaved or rough terrain.

3.2.4. **Wheels and Tires System:**

3.2.4.1. Tires shall be manufacture of minimum the year of procurement;

3.2.4.2. Mud and Snow (M+S) tires mounted on steel rims (including the spare tire). The tires shall have a tread suitable for both asphalt and unpaved roads;

3.2.4.3. The rear axle may have twin wheels.

3.2.4.4. The spare tire of the same type and size as those mounted on the vehicle. The vehicle shall be equipped with a mechanism to lower and raise the spare tire from its mounted position without affecting clearance, regardless of its location on the vehicle;

3.2.5. **Steering System**: Power-assisted steering;

3.2.6. **Braking System**:

3.2.6.1. Power-assisted;

3.2.6.2. Electronic Braking System (EBS or equivalent)

3.2.6.3. Acceleration Slip Regulation (ASR or equivalent);

3.2.6.4. Electronic Stability Program (ESP or equivalent)

3.2.6.5. Auxiliary braking system (retarder or equivalent);

3.2.6.6. Hill-start assist system;

3.2.6.7. Hill descent control system;

3.2.6.8. Coupling for the trailer's pneumatic braking system;

3.2.6.9. The vehicle shall not be equipped with limiter for high speeds;

3.2.6.10. The braking system must have an external connection, electric or pneumatic, which allows maintaining permanent minimum pressure system when stationary.

3.2.7. **Electrical System**

3.2.7.1. Equipped with outlets for connection to external devices;

3.2.7.2. System voltage: 24 V;

3.2.7.3. Two maintenance-free batteries;

3.2.7.4. Main switch to disconnect all vehicle consumers;

3.2.7.5. All electrical system cables shall be concealed and protected from impact during travel and shall be halogen free;

3.2.7.6. The vehicle shall be equipped with an external connector to enable stationary charging (when parked) of the batteries and other equipment requiring charging. The battery charging system shall include an electronic charger with an automatic adapter for long-term maintenance and storage;

3.2.7.7. The external 230 V AC connector shall be a male-type connector mounted on the driver's side of the vehicle. Two female connectors, each with

an attached cable of at least 10 meters, shall also be provided;
3.2.7.8. The 230 V AC circuit shall be equipped with grounding, ensuring a leakage current of maximum 30 mA, or protected by an isolating transformer. If the protection is grounding-only, a warning label next to the outlet shall read: „ATENȚIE! A SE CONECTA DOAR LA O PRIZĂ AUTORIZATĂ";
3.2.7.9. Engine startup shall not be possible while connected to an external 230 V AC power source unless the outlet has an automatic disconnect that deactivates upon engine start;
3.2.7.10. The electrical system shall support the operation of the electrical winch, specified at pt. 3.2.2.

3.2.8. **Lighting System**:
3.2.8.1. Signal headlights (chassis-mounted) with front and rear fog lights;
3.2.8.2. All vehicle headlights and lamps shall be LED only, safeguarded by a stainless-steel protective grill to prevent accidental damage.
3.2.9. **Cabin**:
3.2.9.1. The steering wheel shall be on the left side. The cabin shall be a single-piece, double advanced, closed metal type with suspension and anti-corrosion protection;
3.2.9.2. The cabin shall be manufactured and tested complying to ECE R29-3 standard;
3.2.9.2.1. Manual folding of the cabin shall be possible with a hydraulic system;
3.2.9.2.2. Equipped with 4 doors and 1+5 seats and all seats shall have seat belts in compliance with legal requirements;
3.2.9.2.3. The floor in the crew compartment shall be covered with ribbed aluminum sheet with increased level of slip protection and easy to clean;
3.2.9.2.4. The driver's seat shall have pneumatic suspension and be adjustable in at least two directions;
3.2.9.2.5. Sun visors mounted on the interior and exterior of the windshield;
3.2.9.2.6. Heated rearview mirrors with electric or manual adjustment;
3.2.9.2.7. Front and front right cabin external blind spot mirrors with electric or manual adjustment;
3.2.9.2.8. All lateral windows with electric or manual control;
3.2.9.2.9. The cabin must be equipped with one climate control system (with automatic heating and air conditioning);
3.2.9.2.10. The cabin must be equipped with an additional autonomous heating system for the cabin, using diesel fuel directly from the vehicle's tank. This feature shall be able to be used both while traveling to and from response missions and while stationary at the response site;
3.2.9.2.11. The color of the cabin shall be red, shade RAL 3000. Car wrapping (stickers or film) is not permitted;
3.2.9.2.12. Vehicle AM/FM radio with multifunction display and USB connections, integrated into the vehicle's dashboard, with a minimum of four speakers;
3.2.9.2.13. Satellite navigation system based on GPS or Galileo with

Android Auto/Apple CarPlay, with updated maps of the Republic of Moldova and Europe. With maps updating capability by the owner of the vehicle;

3.2.9.2.14. A rearview HD (1920x1080) camera that activates automatically when reversing, with integrated rear parking sensors;

3.2.9.2.15. A traffic recording camera device that records on an SD or microSD card (the card shall be delivered with the vehicle, compatible with the recording device, with a minimum capacity of 64 GB, at least Class 10+ with a minimum transfer rate of 10 MB/s), with a minimum video recording resolution of 1920 x 1080@30 fps Full HD. It shall allow video recording (including data on vehicle speed and GPS position), so the route and road traveled are monitored (regardless of whether acoustic and light signals are active). During stationary periods with the engine off, the recording function shall deactivate automatically, and it shall activate automatically when the engine starts. Necessary accessories for data download shall also be provided. Depending on the technical solution adopted for the camera device (integrated or not within the cabin's interior elements), a mounting system shall be provided to allow its use.

3.2.10. **Additional Equipment:**

3.2.10.1. **Acoustic and Optical Warning System**:

3.2.10.1.1. A light bar, minimum 1200 mm. in length and no wider than the cabin, mounted on the roof at the front top of the cabin, with blue LED strobe modules, protected by a stainless-steel grille for impact resistance, with the following specifications:

3.2.10.1.1.1. Four blue side modules and two white modules symmetrically positioned on either side of the centrally located acoustic module;

3.2.10.1.1.2. Each optical module shall contain minimum 24 LEDs, with a minimum output of 50 lumens per LED and a flash rate of at least 50 flashes per minute;

3.2.10.1.1.3. The length of each optical module shall be minimum one-third of the total light bar length (with maximum allowable dimensions after the speaker is mounted);

3.2.10.1.1.4. Polycarbonate lenses and covers for maximum visual effect and anti-fogging;

3.2.10.1.1.5. Corrosion and water-resistant protection bar.

3.2.10.1.2. The acoustic module shall include one or more speakers:

3.2.9.1.2.1. Acoustic signal generator with at least three tone options;

3.2.9.1.2.2. Peak power of minimum 150W;

3.2.9.1.2.3. External audio input with switchable capability for voice message transmission via microphone.

3.2.10.1.3. LED "flash" type optical signal system with eight blue lamps, each with at least 8 LEDs, protected by a stainless-steel grille, with the placement as follows:

- 2 lamps at the front of the cabin at radiator level;
- 2 lamps at the upper rear of the vehicle, integrated into the superstructure;

- 2 lamps on each lateral upper side integrated into the superstructure.

3.2.10.1.4. A sequence of blue LED "flash" lamps/modules with a flash frequency of minimum 50 flashes per minute integrated into the container's sides (covering minimum 50% of the container length symmetrically) emitting a minimum of 50 lumens per LED and minimum 8 LEDs/module;

3.2.10.1.5. Control box for the acoustic-optical warning system, mounted on the dashboard.

3.2.10.2. An acoustic warning device that shall produce audible sound activated by reverse gear for vehicle's reverse movement.

3.2.10.3. **Work Area Lighting System**:

3.2.10.3.1. A perimeter lighting system, integrated within the vehicle's overall dimensions, designed to enhance visibility around all sides of the fire vehicle in all working areas at all accessory and equipment compartments. The side and rear parts of the fire truck shall have at least two LED lamps of at least 1000 lumens each, with cool white light, directed towards the ground at a 45-degree angle. The lamps shall be positioned so as not to extend beyond the container dimensions and shall be protected from water and accidental impacts by a stainless-steel grille. Lamps mounted on the top are not accepted.

3.2.9.3.3. The operation of the lighting systems from points 3.2.9.3.1. shall be carried out both from a control and command panel with a display in the cabin, according to point 3.3.3.6., and from the control and command panel in the rear compartment of the pumping unit, according to point 3.3.3.1., using dedicated "direct access" buttons, separate for each group (left side, right side, rear, and roof superstructure).

3.2.9.3.4. Cool white LED lamps (protected against water and dust according to IP67 or higher) installed inside the accessory and firefighting compartments shall ensure visibility within these areas, with automatic activation upon the opening/closing of shutters or doors. The number and positioning of lamps are to be determined by the manufacturer, based on compartment size and configuration, to provide suitable illumination for accessories, materials, controls, and other contents.

3.2.9.3.5. Telescopic mast for lighting, according to **Annex no. 2.**

3.2.10.4. The fire truck shall be equipped with a minimum metal protection shield for the engine, gearbox, transfer case, fuel tank, AdBlue tank. Additional protection will be provided for cables, pipes, elements sensitive to exposure to humidity, sun, dust, corrosion and abrasion.

3.2.10.5. Access areas for personnel in the cabin/crew compartment or on the roof of the superstructure, as appropriate, shall be illuminated and made of non-slip, corrosion-resistant materials suitable for intensive use.

3.2.10.6. Additional original chassis manufacturer's system for windshield de-icing/defogging, specially designed for use when the fire truck is stationary.

3.2.10.7. The vehicle shall not be equipped with a tachograph.

3.3. **SPECIAL FACILITIES:**

3.3.1. **Fire extinguishing installation**:

3.3.1.1. Power take-off (PTO) - driven fire pump shall be located at the rear of the vehicle and to be made out of corrosion resistant alloy according to EN 1028;

3.3.1.2. PTO fire pump unit, with an automatic priming device, with at least one stage per pressure setting (one stage for low pressure 0 - 10 bar and a second stage for high pressure 30 - 40 bar). Priming shall be achieved within a maximum of 60 seconds, at a suction height of 7.5 meters on a 4-inch (Type A) inlet;

3.3.1.3. The pump unit shall provide both low and high-pressure water discharge, as well as foam solution discharge, with a foam proportioning system that ensures a constant mixing ratio between 0.1% and 6%, with fractions/steps of 0.1%, regardless of the water flow and pressure. It shall operate with at least 3 types of foam concentrate;

3.3.1.4. The pump unit shall allow the water tank to be filled from pressurized sources (hydrants) via two Type B inlets and from non-pressurized sources via a Type A inlet;

3.3.1.5. Water discharge performance: minimum flow of 2500 l/min at 10 bars and minimum 400 l/min at 30 - 40 bar. Valve taps with a flap shall not be used;

3.3.1.6. Suction hoses equipped with a water filtration system (at least two 4-inch hose for natural water sources);

3.3.1.7. Two Type B inlets for water supply from pressurized sources, with a water impurity retention system, located on the rear side, one on the left and one on the right;

3.3.1.8. Connecting hoses, low-pressure water and foam discharge hoses:

- 2 Type B discharges placed laterally at the rear of the fire truck, one on the left and one on the right;
- 2 Type C discharges placed laterally at the rear of the fire truck, one on the left and one on the right;
- Manual depressurization systems shall be installed on the Type B and C discharge hoses;
- The fire truck shall be equipped with 6 low-pressure water discharge nozzles, 2 Type B and 4 Type C, in accordance with the requirements in **Annex no. 1**, points 45 and 46.

3.3.1.9. All inlets and discharges shall be located inside the superstructure at the lower part. They shall not exceed the lower level of the access hatches to the superstructure, to avoid interfering with the vehicle's passage capacity. Access to these shall be quick, easy, and convenient, and they shall be protected against freezing during travel/parking with aluminum hatches/blinds/covers/doors;

3.3.1.10. High-pressure hoses wound on two reels, one on each side of the fire truck (each reel shall have 3 high-pressure hose segments, one 30 m and two 15 m, with connections to the reel of the same type as those between the segments, and shall be equipped with quick couplings of reduced dimensions, so that when winding the hose, the circular shape of

the hose is not affected), with high-pressure water discharge devices (2 discharge nozzles, adapted for high pressure). The operation of the reels shall be electric and manual. The discharge nozzles shall comply with the requirements in Annex no. 1, point 47.

3.3.1.11. The high-pressure extinguishing system shall be equipped with a pneumatic purging system to remove water from the system (purging system), using air from the braking system. The pneumatic purging system shall always be connected to both the braking system and the high-pressure extinguishing system. Its operation shall be controlled by two valves: one to select between the two circuits (water and air), and one to release air from the braking system into the high-pressure system to remove water from the high-pressure hoses.

3.3.1.12. Water and foam discharge turret with adjustable jet shape (compact, conical, and dispersed as a protective curtain) mounted on the fire truck. It shall feature both manual and electronic control (with a joystick-equipped control panel located inside the cabin, as well as wireless remote control). The turret shall be capable of continuous 360° horizontal rotation or a minimum of 180° left/right relative to the driving direction, and a vertical movement range of at least -15° to +75° across the entire rotation circumference. The horizontal water jet length shall be at least 60 m at an operating pressure of 14 bar, with the turret nozzle equipped with a 26–30 mm diameter orifice. The average foam jet length shall be approximately 50 m, with a foam discharge rate of at least 10 m^3/min. In transport mode, the turret must be foldable to fit within the prescribed dimensional limits. The turret shall include a height adjustment system for the working position, and its flow rate shall be minimum 2500 l/min.

3.3.1.13. Water tank equipped with overflow, inspection cap (providing access for a person inside), and drain valve, with wave breakers and shock-absorbing system for transport. The sealing and insulation between the water tank and the bodywork shall prevent water and condensate infiltration:

3.3.1.11.1. Material type: composite type GRP or PAFS (equipped with wave breakers);

3.3.1.11.2. Capacity: 4000 liters ± 10%.

3.3.1.12. Foam tank(s) with filling and emptying capability:

3.3.1.12.1. Material type: composite type GRP or PAFS;

3.3.1.12.2. Total capacity: 400 liters ± 10% (one 400-liter tank ± 10% or two interconnected 200-liter tanks ± 10% each).

3.3.1.12.3. The foam tank(s) shall not be embedded in the water tank and shall have an inspection cap and wave breakers.

3.3.2. **Special accessories**:

3.3.2.1. The superstructure shall be modular or monobloc, independent of the cabin, with attachment to the chassis by means of a metal frame and appropriately sized buffers. The mounting supports, shelves, drawers, sliding panels (if applicable) on which the accessories are positioned shall

be made of durable materials with corrosion protection.

3.3.2.1.1. The attachment of the superstructure frame profiles shall be done using removable assemblies;

3.3.2.1.2. The roof of the superstructure shall have an increased slip resistance level (covered with corrugated aluminum sheet), reinforced to prevent buckling under the weight of the crew and shall withstand a minimum weight of 300 kg, not including the equipment placed on it;

3.3.2.1.3. The panels for the shelves shall be attached with countersunk screws to avoid injury to personnel and damage to the equipment. The use of rivets or self-tapping screws for assembly is not permitted.

3.3.2.2. **Compartments**:

3.3.2.2.1. Placement of accessory compartments: on the sides and rear, closed with anodized aluminum blinds;

3.3.2.2.2. equipped with shelves (ensuring the possibility of subsequent repositioning of shelves at different heights depending on the specific equipment), drawers, mounting supports, lighting lamps, etc., including in the crew cabin;

3.3.2.2.3. The blinds for closing the accessory compartments shall be made of anodized aluminum alloy;

3.3.2.2.4. The side panels shall be closed with blinds equipped with locks and keys, insulated against water infiltration;

3.3.2.2.5. The rear part (access to the fire pump controls) shall be equipped with an anodized aluminum blind or a top hinged hatch equipped with gas struts, with locks and keys, insulated against water infiltration, and shall provide access and operation of the fire pump unit.

3.3.2.2.6. The use of pop rivets or self-tapping screws for assembly is not allowed. The blind(s) shall be properly sealed to prevent the entry of water, mud, etc., during travel. The space in the accessory and equipment compartment shall ensure the storage of at least 3 Type B hoses, in a loop, in special supports, and shall be located near a Type B water discharge outlet, allowing for quick connection to the pumping system. Heavy accessories and units shall be positioned on the floor of the fire truck, while lighter accessories shall be placed at the top of the fire truck.

3.3.2.3. Accessories arranged in the lower part shall be located in such a way as to allow access from the ground without the need for personnel to climb inside the superstructure to gain access to various accessories.

3.3.2.4. For the accessories arranged on the upper part, hinged access hatches that can withstand the weight of two people and the handled accessories (minimum 300 kg) shall be mounted at the base of the superstructure. They shall be equipped with hydraulic struts (shock absorbers) with an automatic closing system, additionally provided with a key, with orange reflectors (LED lamps installed on the sides with flashing light to allow their highlighting/gauge in the open position are optional).

3.3.2.5. The suction hoses, the sliding ladder, the pike pole with a handle and extension, the shovel, the rake, the wildfire batter, the window ladder, etc. shall be mounted securely on the roof of the superstructure. The use of fastening systems similar to straps or leather belts for securing and fastening these items is excluded. The suction hoses and other equipment stored on the roof of the superstructure shall be secured by placing them in closed boxes (crates) equipped with a locking system (made of aluminum and illuminated inside with LED technology when opened), which shall provide protection against damage and movement during travel. The tank shall allow access for repairs or cleaning. Access to the roof of the fire truck shall be made via a ladder that shall support a minimum weight of 150 kg, made of anodized aluminum, located on the rear side of the vehicle, foldable towards the top of the truck, equipped with a locking system to keep it in the folded position.

3.3.2.6. All shelves, drawers, sliding panels and storage boxes made of metal in the composition of the superstructure shall be constructed with rounded edges. Sharp or cutting edges are not allowed. Drawers, sliding panels, shall be secured against accidental opening and shall be sized to support at least twice the weight of the accessories they shall contain.

3.3.2.7. Regardless of the solution adopted by the bidder the crew seats (excluding the driver's seat) shall be specially designed for self-contained breathing apparatus (equipped with a backrest, a reclining seat, and a headrest that accommodates the breathing apparatus and allows easy unlocking by operating a handle), and a support for a full breathing apparatus, so that it does not pose a risk to the personnel in the event of an accident. Additionally, the seats shall be made of waterproof materials resistant to stains, wear, and abrasion and shall allow for easy cleaning.

3.3.2.8. The accessories shall be secured in/on drawers, the floor, doors, or side walls with a quick locking/unlocking system. The use of fastening systems similar to straps or leather belts is excluded. The discharge hoses shall each have an individual designated location and shall be secured with textile straps with Velcro fasteners, labeled for each type of hose.

3.3.2.9. To prevent the formation of ice, a warm air heating system shall be installed in the fire pump compartment, using diesel fuel directly from the truck's fuel tank. This system shall be operable both during travel to and from intervention missions and while stationary at the intervention site.

3.3.2.10. All equipment and accessories not secured in/on drawers, floor, doors or side walls shall be compartmentalized in heavy-duty plastic boxes with handles for handling. On the boxes you shall find a list (in Romanian language) of the material goods contained (moisture-resistant format), for easier identification during the intervention. The boxes shall be numbered, and the complete inventory of the vehicle that shall be supplied shall be structured in the order of the boxes.

3.3.3. **Control and Command System**:

3.3.3.1. The main control and command panel shall be reinforced,

vibration-free, not mounted on the pump body, and of the "classic" type (without a display, located in the pump compartment). It shall be positioned at the rear of the vehicle, within the pump compartment, and capable of performing at least the following functions:

3.3.3.1.1. Starting and stopping the engine;

3.3.3.1.2. Engaging and disengaging the pump with the vehicle chassis transmission;

3.3.3.1.3. Controlling engine throttle;

3.3.3.1.4. Maintaining a constant engine throttle;

3.3.3.1.5. The use and operation of the water/foam turret mounted on the fire truck;

3.3.3.1.6. Displaying the following parameters using analog devices:

- Engine throttle;
- PTO pump speed;
- Pump working pressure;
- Vacuum required for priming the pump;
- Water temperature in the pump;
- Water level in the tank;
- Foam agent level in the tank;

3.3.3.1.7. Audible and visual signaling of the following warnings:

- Maximum water temperature in the pump;
- Cavitation occurrence;
- Overpressure in the pump;
- The water/foam turret and the telescopic lighting mast on the superstructure, as well as the access hatches to the superstructure, and the shutters, when not in march position (retracted/closed), shall be unlocked independently for each category of equipment/subassembly (lighting mast, access hatches, and shutters) upon release of the handbrake (parking) in preparation for the start of movement.

3.3.3.2. The control and command system shall include an additional non-touchscreen display, reinforced to avoid vibrations and not mounted on the pump body. It shall be located at the rear of the vehicle, within the pump compartment, automatically activating when the rear shutter of the pump compartment is opened and deactivating when it is closed. It shall display at least the following parameters:

- Pump working pressure;
- Water level in the tank;
- Foam agent level in the tank.

3.3.3.3. The command-and-control system shall allow the simultaneous use of all discharge lines.

3.3.3.4. The command-and-control system shall allow the mixing of water and foam concentrate and ensure a constant mixing ratio between 1% and 6%, with fractions/rates in increments of 0,1%, regardless of water flow

and pressure, and shall allow the cleaning of the foam proportioning system and the discharge system.

3.3.3.5. If the pumping unit cannot be coupled/decoupled from the dedicated button(s) on the control panel as per section 3.3.3.1.2., coupling/decoupling shall be carried out from the cabin by operating the power take-off coupling/decoupling control, as an emergency solution when the controls on the control panels are not functioning.

3.3.3.6. Secondary control panel with a "non-touchscreen display", located **in the cabin**, which shall ensure **at least** the following:

3.3.3.6.1. Coupling and decoupling of the pumping unit to the chassis transmission;

3.3.3.6.2. Control of engine throttle;

3.3.3.6.3. Maintenance of a constant engine throttle;

3.3.3.6.4. The use and operation of the water/foam turret mounted on the fire truck;

3.3.3.6.5. Displaying the following parameters on the screen:

- Pumping unit speed;
- Working pressure of the pumping unit;
- Water temperature in the pumping unit;
- Water level in the tank;
- Foam concentrate level in the tank.

3.3.3.6.6. Acoustic and visual signaling for the following warnings:

- Maximum water temperature in the pumping unit;
- Cavitation phenomenon occurrence;
- Overpressure occurrence in the pumping unit;
- The telescopic lighting mast on the superstructure, as well as the access hatches to the superstructure, and the shutters when not in march position (retracted/closed), upon release of the handbrake (parking), in preparation for the start of movement, independently for each category of equipment/subassembly (lighting mast, access hatches, and shutters).

3.3.3.7. Working position: accessible to the operator, allowing easy access to all controls on the pump panel, valves, etc.

3.4. Vehicle type TETRA radio terminal shall be installed in the vehicle cabin:

3.4.1. The mobile communication module for vehicles is presented in **"Annex no. 7"**;

3.4.2. The communication equipment shall include:

a) A fuse panel for all equipment, including warning devices;

b) 12V DC bipolar power outlets for communication equipment, including electrical conductors, capable of supporting a current of 20 A and delivered with paired connectors;

c) Bipolar outlets shall be installed in accessible locations and properly insulated;

d) An antenna installed on the cabin with the antenna cable placed inside, with a TNC connector.

3.5. The vehicle shall be marked on the sides and the front with the inscriptions

"POMPIERII", as well as the logos of the "General Inspectorate for Emergency Situations." Additionally, the vehicle shall be marked on the sides with the "112" logo.

3.6. The color of the superstructure shall be red, shade RAL 3000. Car wrapping (stickers or film) is not permitted. The vehicle shall be equipped with reflective plates and strips.

3.7. The inscriptions and markings will meet the requirements provided by the Government Decision no. 500/2018[1]. The exact text of the inscriptions (the name and number of the fire brigade, the type of the fire engine etc.) will be provided by the beneficiary (GIES) before the contract signing.

3.8. The vehicle shall be equipped with size lamps with flexible rubber arms, mounted at the rear of the chassis.

3.9. The vehicle and its components, including the technology, machinery, and equipment with which it is equipped, shall be brand new and shall not be refurbished and/or remanufactured.

3.10. The list of standards relevant for the requested vehicle, configuration and equipment:

- 3.10.1. EN 1846-1:2020 – Firefighting and rescue service vehicles – Part 1: Nomenclature and designation
- 3.10.2. EN 1846-2:2020 – Firefighting and rescue service vehicles – Part 2: Common requirements – Safety and performance
- 3.10.3. EN 1846-3:2020 – Firefighting and rescue service vehicles – Part 3: Permanently installed equipment – Safety and performance
- 3.10.4. EN 12769:2000 – Firefighting and rescue service vehicles – Resistance to fire
- 3.10.5. EN 14600:2005 – Firefighting and rescue service vehicles and equipment – Components for electrical and electronic installations
- 3.10.6. EN 1028-1:2002 – Fire-fighting pumps – Fire-fighting centrifugal pumps with priming devices – Part 1: Classification – General and safety requirements
- 3.10.7. EN 1028-2:2001 – Fire-fighting pumps – Fire-fighting centrifugal pumps with priming devices – Part 2: Verification of general and safety requirements
- 3.10.8. UNECE Regulation No. 29 – Uniform provisions concerning the approval of vehicles with regard to the protection of the occupants of the cab of a commercial vehicle
- 3.10.9. EN 137 – Respiratory protective devices – Self-contained open-circuit compressed air breathing apparatus with full face mask – Requirements, testing, marking
- 3.10.10. EN 14540 – Fire-fighting hoses – non-percolating lay flat hoses for fixed systems
- 3.10.11. EN 694 – Fire-fighting hoses – Semi-rigid hoses for fixed systems
- 3.10.12. EN 15182 – Hand-held branch pipes for fire service use – Part 1 to 4 (includes general requirements, selectable flow rate, etc.)
- 3.10.13. EN 15767 - Portable equipment for projecting extinguishing agents

[1] https://www.legis.md/cautare/getResults?doc_id=146535&lang=ro#

supplied by fire fighting pumps

3.10.14. EN 16712 – Foam equipment for fire service use – Includes induction, mixing and application systems

3.10.15. EN 13204 – Rescue equipment – Hydraulic rescue tools – Safety requirements and test methods

3.10.16. EN 13731 – Rescue equipment – Safety and performance requirements for power operated spreaders and cutters used in vehicle extrication

3.10.17. ECE Regulation No. 65 – Uniform provisions concerning the approval of special warning lamps for motor vehicles

3.10.18. EN 60309 – Plugs, socket-outlets and couplers for industrial purposes (used in emergency vehicles for electrical connections).

3.11. The annexes no.1 – 7 are an integral part of this Technical Specification. For all specifications and products listed in the annexes, certificates of conformity issued by the competent authorities, as well as declarations of conformity under one's own responsibility and/or test reports, shall be presented as part of the submitted offer, as applicable.

3.12. The list of manuals, schemes (electrical, pneumatic, hydraulic), technical inspection list (maintenance), list of spare parts (part number).

3.13. The bidder will provide the necessary training to the beneficiary personnel for operation and maintenance of the vehicle and all components. The training plan will be part of the offer. The bidder will also provide at least 2 monitorization visits to the manufacturing facility. The bidder will also disseminate the training materials (hard copy and electronic version (PDF or PPT format)) during the training sessions.

4. RECEPTION

4.1. The delivery of the vehicle shall be carried out no later than 12 April 2027 to the premises of the Regional Directorate for Emergency Situations of UTA Găgăuzia, General Inspectorate for Emergency Situations, located at 7 Novaia Street, Comrat municipality.

4.2. After the delivery of the vehicle and its onboard equipment, these shall undergo testing. The testing period shall last 7 days. Upon completion of the testing period, an acceptance certificate shall be signed in accordance with the legislation of the Republic of Moldova in force. Once the acceptance certificate is issued, the warranty period shall commence, during which any defects shall be reported, and the defective equipment (parts/equipment) shall be replaced free of charge.

PREPARED BY:

Deputy Head of the Regional departament for emergency situations of ATU Găgăuzia of the General Inspectorate for Emergency Situations of the Ministry of Internal Affairs of the RM
captain of the internal service
Dmitri BOLGAR

Digitally signed by Bolgar Dmitri
Date: 2025.10.22 08:11:00 EEST
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MOLDOVA EUROPEANĂ

Head of the Logistics Service of the regional departament
for emergency situations of ATU Găgăuzia of the
General Inspectorate for Emergency Situations
of the Ministry of Internal Affairs of the RM
lieutenant of the internal service
Alexandra SECRIERU

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Reason: MoldSign Signature
Location: Moldova
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Annex no. 1
to the technical specification

LIST
of Equipment and Accessories of the Firefighting Vehicle for Extinguishing with Water and Foam 4000-Liter Capacity

No	Name	MU	Quantity
	EQUIPMENT AND ACCESSORIES		
1.	**4-inch (Type A) suction coupling,** mounted at the suction point, in the case of the vehicle being supplied with water from unpressurized sources, positioned at the rear of the vehicle, without obstructing the operation of the control panel during suction	Unit	1
2.	**4-inch (Type A) blind coupling.**	Unit	1
3.	**Fixed Type B coupling** (mounted for discharge and water supply to the vehicle's tank from pressurized sources).	Unit	4
4.	**Blind Type B coupling.**	Unit	4
5.	**Fixed Type C coupling** (mounted for discharge).	Unit	2
6.	**Blind Type C coupling.**	Unit	2
7.	**2.5-meter pike pole with a 2.5-meter extension.** The pike pole shall be made of composite material (PAFS or equivalent). The pike pole shall be made of heat-treated steel, resistant to tensile stress, torsion, and bending, designed for heavy-duty working conditions.	Unit	1
8.	**Fork with a minimum of 3 teeth, with a handle.** The handle shall be made of composite material (PAFS or equivalent). The fork shall be made of heat-treated steel, resistant to torsion, bending, and extreme temperatures, secured with a system to prevent accidental detachment.	Unit	3
9.	**Shovel**: - Length: minimum 1200 mm - Weight: maximum 3 kg The handle shall be made of fiberglass-reinforced polyester (PAFS) obtained through the pultrusion process, non-conductive, and resistant to shocks, flames, water, UV damage, and low temperatures.	Unit	3
10.	**Wildfire beater with a handle.** The handle shall be made of material (PAFS or equivalent). The beater shall be made of rubber, resistant to shocks and high temperatures (200 degrees Celsius for at least 5 minutes), attached with rivets to the handle	Unit	3
11.	**Hydrant key** made of heat-treated steel, resistant to torsion, bending, mechanical shocks, and extreme temperatures. Designed for operation of the **type B portable hydrant** from the position no. 29.	Unit	1
12.	**Hydrant key** made of heat-treated steel, resistant to torsion, bending, mechanical shocks, and extreme temperatures. Designed for operation of the **GOST type portable hydrant** from the position no. 30.	Unit	1
13.	**Coffret key** made of heat-treated steel, resistant to torsion, bending, mechanical shocks, and extreme temperatures.	Unit	1
14.	**Type A coupling key** made of heat-treated steel, resistant to torsion, bending, mechanical shocks, and extreme temperatures.	Unit	2
15.	**Type B coupling key** made of heat-treated steel, resistant to torsion, bending, mechanical shocks, and extreme temperatures.	Unit	2
16.	**Type C coupling key** made of heat-treated steel, resistant to torsion, bending, mechanical shocks, and extreme temperatures.	Unit	2
17.	**Cross key with 4 heads** for opening electrical panels, lifts, gas valves, and metal boxes: large square, small square, triangle, and round with blades.	Unit	2
18.	**Hose tying cord: Type C.**	Unit	4
19.	**Suction hose support cord: Type A.**	Unit	1
20.	**Suction basket.**	Unit	1

<table>
<tr><td>21.</td><td>Elbow for hose.</td><td>Unit</td><td>2</td></tr>
<tr><td>22.</td><td>Distributor B-CBC made of aluminum alloy.</td><td>Unit</td><td>2</td></tr>
<tr><td>23.</td><td>Hose band for discharge hose type B.</td><td>Unit</td><td>4</td></tr>
<tr><td>24.</td><td>Hose band for discharge hose type C.</td><td>Unit</td><td>4</td></tr>
<tr><td>25.</td><td>Type B Hose, with type B “STORZ” fittings, protected on the outside by rubber. To increase mechanical resistance, the material (corrosion-resistant) from which the fittings are made shall be made from aluminum alloys exposed to pressure. The hose shall be collapsible, made from rubber-coated textile material, whose cross-section becomes circular only under internal pressure, and in an unfilled state, it can be folded and rolled flat. The inner diameter and length shall comply with the table below:
<table>
<tr><td colspan="2">Inner diameter for a type B hose</td><td colspan="2">Delivery length (meters)</td></tr>
<tr><td>Nominal</td><td>Limit deviations</td><td>Nominal</td><td>Limit deviations</td></tr>
<tr><td>76</td><td>+ 1,0 / -0,5</td><td>20</td><td>+ 1,0 / -1,0</td></tr>
</table>
The hose shall meet the conditions at hydrostatic pressure according to the table below:
<table>
<tr><td rowspan="2">Product</td><td colspan="2">Check pressure [bar]</td></tr>
<tr><td>Test pressure</td><td>Minimum burst pressure</td></tr>
<tr><td>Hose type B</td><td>25</td><td>40</td></tr>
</table></td><td>M.L.</td><td>100</td></tr>
<tr><td>26.</td><td>Type C Hose, with type C “STORZ” fittings, protected on the outside by rubber. To increase mechanical resistance, the material (corrosion-resistant) from which the fittings are made shall be made from aluminum alloys exposed to pressure. The hose shall be collapsible, made from rubber-coated textile material, whose cross-section becomes circular only under internal pressure, and in an unfilled state, it can be folded and rolled flat. The inner diameter and length shall comply with the table below:
<table>
<tr><td colspan="2">Inner diameter for a type C hose</td><td colspan="2">Delivery length (meters)</td></tr>
<tr><td>Nominal</td><td>Limit deviations</td><td>Nominal</td><td>Limit deviations</td></tr>
<tr><td>52</td><td>+ 1,0 / -0,5</td><td>20</td><td>+ 1,0 / -1,0</td></tr>
</table>
The hose shall meet the conditions at hydrostatic pressure according to the table below:
<table>
<tr><td rowspan="2">Product</td><td colspan="2">Check pressure [bar]</td></tr>
<tr><td>Test pressure</td><td>Minimum burst pressure</td></tr>
<tr><td>Hose type C</td><td>30</td><td>50</td></tr>
</table></td><td>M.L.</td><td>200</td></tr>
<tr><td>27.</td><td>Bag for keys with straps and handles</td><td>Unit</td><td>1</td></tr>
<tr><td>28.</td><td>Bandage bag for discharge hose.</td><td>Unit</td><td>1</td></tr>
<tr><td>29.</td><td>Portable hydrant type B with valves (according to EN 14339)</td><td>Unit</td><td>1</td></tr>
<tr><td>30.</td><td>Portable hydrant (GOST type, used in the post-Soviet Union countries) with valves.</td><td>Unit</td><td>1</td></tr>
<tr><td>31.</td><td>Portable LED lighting lamp with rechargeable battery, charger connected to the vehicle's electrical system, and a 230 V AC charger.
- ATEX certification or equivalent;
- Usage: handheld and mountable in a desired working position;
- The reflector is equipped with a swiveling head that can be directed to the desired direction by maneuvering it;
- Weight: maximum 2 kg (including batteries);
- Brightness: minimum 500 lumens (high) / 200 lumens (low);
- Light intensity: minimum 18,000 candelas (high) / 6,500 candelas (low);
- Light source: LED;
- Weatherproof, water and dust resistant;
- Battery life: minimum 4 hours (high) / minimum 10 hours (low);
- Batteries are included (2 per set);
- 230VAC charger (1 pcs.)</td><td>Unit</td><td>2</td></tr>
<tr><td>32.</td><td>Electric pump (24V DC/230VAC) for filling the foam tank.</td><td>Cpl.</td><td>1</td></tr>
</table>

33.	**Rubber hose bridge for 2 type B** hoses that ensures the safe passage of the fire truck. Construction material – rubber.	Unit	2
34.	**Halligan tool set 760 mm:** **Halligan tool:** forged steel tips, solid handle (steel or durable composite material), At one end, two points: - one flat, long, smooth, angled (for forcing windows and doors), the other sharp (cone-shaped and slightly curved). At the other end: two sharp and parallel claws. **Axe:** Minimum weight 2400 g. and 3000 g. (2+2 pieces), • Handle made of fiberglass or composite, • The blade made of steel, one end is an axe, and the opposite end is beveled, Axe blade width: 100 mm - 150 mm.	Set.	1
35.	**Reduction coupling A-B.**	Unit	2
36.	**Reduction coupling B-C.**	Unit	4
37.	**Sliding aluminum ladder** with an extended length between 10,500 and 11,000 mm, and a compressed length of maximum 5,000 mm.	Unit	1
38.	**Aluminum hook ladder** with a maximum length of 5,000 mm.	Unit	1
39.	**Strainer with mesh** made of lightweight metal materials or corrosion-resistant aluminum alloy.	Unit	1
40.	**A pickaxe** designed for emergency interventions related to fire extinguishing. The handle is made of composite material (PAFS or equivalent). The axe blade is made of hardened steel, resistant to impact in metal. The axe shall have a sheath with a fastening system and a strap for shoulder carrying.	Unit	2
41.	**A small axe** designed for emergency interventions related to fire extinguishing. The handle is made of composite material (PAFS or equivalent). The axe blade is made of hardened steel, resistant to impact in metal. The small axe shall have a sheath with attachment systems for a belt or strap.	Unit	5
42.	**Suction hose type A** with couplings for the pumping unit. Minimum length of 4 meters.	Unit	2
43.	**Foam generator nozzle** compatible with type B and C couplings.	Unit	1B+1C
44.	**Type B water discharge nozzle:** - manually selectable flow with a minimum of 4 rates between 0 (zero) l/min and 750 l/min at 6 bar pressure; - pistol grip for support; - the valve and the handle shall be sized for using the gun with protective gloves; - body made of composite material (polymers reinforced with glass fiber or equivalent) or aluminum alloy; - close-open valve, the valve is operated by moving back and forth, the position of the valve shall be the opposite side of the support handle; - outer ring for selecting the discharge mode, made of polyurethane, with tactile indicator to indicate the conical shape of the jet: compact, conical and dispersed like a protective curtain; - type B connection located at the back on the same axis as the nozzle, with the possibility of 3600 rotation of the gun connected to the hose; Gun weight, including type B connection: maximum 4.5 kg.	Unit	2
45.	**Type C Water Discharge nozzle:** - automatic pressure regulation system with variable flow between 0 (zero) l/min and minimum 400 l/min at 6 bar pressure; - optimized for the technique of pushing in the form of pulses; - body made of composite material (polymers reinforced with glass fiber or equivalent) or aluminum alloy; - pistol grip for support; - close-close valve, the valve is operated by moving back and forth, the position of the valve shall be on the opposite side of the support handle; - the valve and the handle shall be sized for using the gun with protective gloves; - external discharge mode selection ring, made of polyurethane, with tactile indicator to indicate the conical shape of the jet, with 3 main shapes of the jet: compact, conical and dispersed as a protective curtain; - the outer selection ring shall allow all forms of the jet to be traversed;	Unit	4

	- internal sieve to prevent large impurities from entering; - teeth cut in aluminum for the generation of fine drops; - type C connection in the back on the same axis as the nozzle, with the possibility of 360º rotation of the gun connected to the hose.		
46.	**High-pressure discharge devices (point 3.3.1.10) with the following features:** - Automatic pressure regulation system for variable flow rates of 0–150 l/min, ensuring optimal jet shape without requiring manual selection of the maximum flow rate. - Optimized for pulsed discharge technique, with operation starting from a pressure of 2 bar. - Designed to function optimally within a pressure range of 2–40 bar. - Body made of aluminum, with a type D coupling located at the rear, aligned with the nozzle. - Sliding plug valve for progressive opening and closing, made of stainless steel, reducing turbulence during partial openings and minimizing water hammer effects. - Trigger for discharge activation, located underneath, equipped with a locking mechanism for fully open or intermediate positions below 100 l/min, providing an anti-freeze function. - Detachable guard around the trigger to prevent accidental activation and protect fingers. - Outer mode selection ring, made of high-temperature- and chemical-resistant polyurethane, with tactile and color-coded indicators for jet cone shape selection. Includes three jet shapes: compact, conical, and dispersed (protective curtain). - The outer selection ring allows transitioning through the three jet shapes with a rotation of no more than 90°. - Aluminum-cut teeth for generating fine droplets, requiring no maintenance or replacement, and not considered consumables. - The outer selection ring includes an additional position for flushing, enabling the removal of small impurities without disconnecting the discharge pistol. - Storz-D type coupling with 360° rotation capability when the pistol is attached to the hose. Maximum weight of the pistol, including the type D coupling: 3 kg.	Unit	2
47.	**Submersible electric (230 V AC) pump:** - Submersion depth: minimum 16 m - Power: minimum 1100 W - Water flow rate: minimum 10 m³/h - Cable length: minimum 30 m Discharge hose: type C	Unit	1
48.	**Motor pump for dirty water,** with connections compatible with the pumping unit. Specifications: - 4-stroke engine. - Engine power: minimum 7 HP. - Equipped with a self-priming system. - Water discharge flow rate: minimum 1600 l/min. - Minimum working flow rate: 1000 l/min at a pressure of at least 2 bar. - Solid particle diameter that can be absorbed: up to 30 mm. - Maximum discharge pressure: at least 2.5 bar. - Water discharge will be performed using type B hoses. - Maximum weight: 80 kg. - Minimum suction depth: 7.5 m. - Metal frame with the ability to be transported by 2–4 operators. Includes a suction hose with a minimum length of 6 m, equipped with connections compatible with the pump's inlet connection and a strainer.	Cpl.	1
49.	**Bolt/Rebar Cutter:**	Unit	

	- length: minimum 850 mm; - weight: maximum 7 kg; - cutter head made of high-alloy chrome-molybdenum forged material; - cutting capacity: minimum 10 mm; - handles made of composite material (PAFS or equivalent), steel, or PVC, ergonomic to allow work with protective gloves; adjustable screw for grip spacing		1
50.	**Motor chainsaw with chain**, spare chain set, sharpening file, and wrench: - engine power: minimum 4.8 HP; - bar length: minimum 50 cm; - weight without cutting equipment: maximum 6.5 kg; - noise level: maximum 112 dB(A); - carburetor with self-adjustment.	Unit	1
51.	**Thermal imaging device:** - designed for use in firefighting; - detector sensor resolution minimum 384x288 pixels; - detectable temperature range minimum from -40°C to minimum 1100°C; - sensor frequency minimum 60 Hz; - optic lens protected with a germanium window; - LCD screen size: minimum 3.5 inches; - startup time maximum 5 seconds; - color display modes: at least fire, search, cold, inverted, multicolor; - freeze-frame function with color scheme change capability; - built-in laser pointer; - video recording with auto-start option upon camera activation, with storage for at least 8 hours and simultaneously 1000 photos; - USB interface for accessing, transferring, and deleting saved data; - USB cable for PC connection; - detachable handle and retractable strap with carabiner; - minimum battery life of 5 hours; - two sets of LiFePO4 batteries, safe against fire and impact; - charger with 230V AC adapter; - vehicle charger for charging the device and backup batteries simultaneously; - minimum protection rating of IP67; - drop resistance of at least 2 meters; - temperature resistance of 150°C for 15 minutes and 260°C for 5 minutes; - device weight with batteries: maximum 1 kg; rigid carrying case for transport.	Cpl.	1
52.	**Positive pressure ventilator with thermal engine:** - Minimum air flow: 45,000 m³/h; - Minimum thermal engine power: 3.5 kW; - Autonomy at maximum speed: at least 2 hours; - Frame with wheels and a foldable handle for easy handling; - Impact-resistant monoblock casing made of reinforced polyethylene or equivalent material; - Front protective grille made of composite material; - Vertical tilt mechanism with indicator, range of at least -10° to +20°; - Catalytic converter for reducing CO emissions; - Accessory for generating water mist, equipped with a type C connector; - Maximum dimensions: 60 cm x 60 cm x 60 cm; - Maximum weight: 40 kg; - Two units of flexible and foldable ducting for air direction, made from thick, tear-resistant material, equipped with a mechanism for attachment to the ventilator or other ducting, with a minimum length of 5 m; Foam production accessory with a type C connector, to be attached to the front of the ventilator, delivered with thin plastic ducting of at least 20 m in length.	Cpl.	1
53.	**Portable oscillating fire monitor (nozzle):** - nozzle with automatic pressure regulation system at 6 bars, at flows between 1000 l/min and 1800 l/min; - outer ring with at least two positions, compact or dispersed jet as a protective		

	curtain, made of polyurethane or other material resistant to high temperatures and aggressive chemicals; - lifting from 25° to 85°; - automatic oscillating system with minimum adjustable angle between -20° and +20°; - manometer for indicating the working pressure; - at least 4 flexible legs for stability, made of stainless steel or equivalent, with pointed tips for fixing to the ground; - mechanical protection against overturning or unintentional movement, which shall reduce the flow rate; - equipped with type B connection.	Unit.	1
54.	**Electric reciprocating saw** (saber type) with battery and accessories, professional range: - Capable of cutting glass, wood, and metal; - Minimum battery voltage: 18 V DC; - 2 batteries (main and spare) with a minimum capacity of 5 Ah; Accessories: 230 VAC charger, storage and transport case, and 15 blades for metal and wood.	Cpl.	1
55.	**Professional electric impact screwdriver with accessories:** - Minimum battery voltage: 18 VDC; - Battery capacity: 5 Ah; - 2 batteries (main and spare) lithium-ion batteries equipped with cooling packs, overload protection, overheating protection, deep discharge protection, and charge level indicator; - Minimum torque: 630 Nm; - Minimum speed at idle: 1850 RPM; - Minimum impacts per minute: 2000; - 1/2" external square drive system; - Socket set for screw - diameters M5-M20 in a transport case; - Maximum weight: 4 kg; Accessories: 230 VAC charger, bit set with magnetic linkage holder in a transport case.	Cpl.	1
56.	**Thermal Insulation Heat Resistant Suit** (falls under Risk Category III)	Cpl.	2
57.	**Firefighter's protective clothing (FPC):** 1. Protection of the firefighter's body from high temperatures, open flames, and thermal radiation 2. Prevention of burns, mechanical injuries, and contact with harmful liquids or vapors 3. Ensuring comfort and safety during firefighting and rescue operations **Complete set includes:** • Firefighter's jacket (turnout coat) • Firefighter's trousers (bib pants) • Firefighter's boots (thermal-resistant) • Firefighter's gloves (heat-resistant) • Fire-resistant hood (made of non-flammable fabric) • Firefighter's belt with carabiner • Firefighter's belt axe with sheath **Component details:** • Gloves: 5-layer structure; protection against heat, cuts, and water • Boots: Rubber or leather; heat-resistant soles (up to +250 °C); steel toe cap • Hood: Made of non-flammable fabric (Nomex, Kermel); covers the neck and chin • Belt with carabiner: Used for self-belay when working in smoke or at height **Turnout gear structure (three layers):** **Outer layer:**	Cpl.	10

	Protection against flames and mechanical damage; made of aramid fibers (Nomex, Kermel, PBI, Kevlar) with anti-static thread Middle (moisture barrier) layer: Waterproof, protects from steam; membranes such as Gore-Tex Fireblocker, PU/PTFE **Inner (thermal insulation) layer:** **Provides insulation and comfort; aramid lining with breathable structure** Additional features: • Reinforced elbows, knees, and shoulders made of wear-resistant materials (Kevlar / Cordura) • Pockets for tools and radio • Adjustable cuffs, Velcro fasteners, ventilation panels • Flame-resistant seams (stitched with aramid thread) • Reflective stripes (yellow-silver) for visibility **Technical specifications:** • Flame resistance: ≥ 5 s without ignition or afterglow (after exposure to open flame, fabric must not ignite or smolder) • Thermal radiation resistance: ≥ 18 s at 40 kW/m² (time until temperature under the suit rises by 24 °C) • Convective heat resistance: ≥ 13 s (time until inner layer temperature rises by 24 °C) • Water resistance: ≥ 20 kPa (protection from steam and water) • Air permeability: ≤ 100 L/m²·s (comfort and moisture ventilation) • Set weight (coat + trousers): 3.5 – 5.5 kg (depending on fabric and reinforcements) • Operating temperature range: −40 °C to +200 °C (short-term exposure up to +300 °C) • Reflective stripes width: ≥ 50 mm (ensures visibility in smoke) • Fabric tensile strength: ≥ 450 N (durability during operation)		
58.	**Professional drone for aerial filming/inspection:** **DJI Mavic 3 Pro Fly More Combo (DJI RC)** **Camera System:** • **Main Camera:** 4/3 CMOS Hasselblad, 20 MP • **Hasselblad Natural Color Solution** for accurate color reproduction • **Aperture:** f/2.8 – f/11 • **Dynamic Range:** 12.8 stops • **Video Capabilities:** Apple ProRes 422 HQ 5.1K/50fps; DCI 4K/120fps; 10-bit D-Log • **Tele Camera:** 28× Hybrid Zoom, optimized for exploration and long-distance shots **Flight & Safety Features:** • **O3+ Video Transmission:** Up to 15 km range, high-quality 1080p/60fps live stream • **Maximum Flight Time:** Up to 43 minutes • **Obstacle Sensing:** Omnidirectional obstacle detection • **Advanced Return-to-Home (RTH)** **Intelligent Flight Modes:** • **ActiveTrack 5.0** – advanced object tracking • **MasterShots** – automatic cinematic shot sequences • **QuickTransfer** – fast media file transfer **Included in the Box:** • 1× DJI Mavic 3 Pro • 1× DJI RC Remote Controller • 1× Set of RC Remote Controller Sticks • 1× DJI RC Cable (USB Type-C) • 1× DJI RC Cable (Micro-USB) • 1× DJI RC Cable (Lightning) • 3× DJI Mavic 3 Intelligent Flight Batteries • 6× Low-Noise Propellers (pair)	Cpl.	1

	• 1× Battery Charging Hub • 1× 65W Portable Charger • 1× Mavic 3 Pro Storage Cover • 1× Mavic 3 Pro ND Filter Set (ND4/8/16/32) • 1× DJI Shoulder Bag		
59.	**Professional drone for aerial filming/inspection:** **DJI Mavic 2 Enterprise Advanced** **Main Specifications** **Aircraft** • Max Takeoff Weight: **1100 g** • Dimensions (Unfolded): **322 × 242 × 84 mm** • Max Speed: **72 kph** • Max Service Ceiling: **6000 m** • Max Flight Time: **31 min** • Max Wind Resistance: **10 m/s (Level 5)** • Operating Temperature: **-10°C to +40°C** • GNSS: **GPS + GLONASS** **Thermal Camera** • Sensor Type: **Uncooled VOx Microbolometer** • Resolution: **640 × 512 @30Hz** • Focal Length: **9 mm (Equivalent: 38 mm)** • Spectral Band: **8–14 µm** • Digital Zoom: **16×** • Photo Format: **R-JPEG** • Video Format: **MP4** **Visual Camera** • Sensor: **1/2" CMOS, 48 MP** • Lens: **24 mm (Equivalent), f/2.8** • Max Image Size: **8000 × 6000** • Video Resolution: **4K (3840×2160 @30fps)** • Digital Zoom: **32×** • Photo Format: **JPEG** • Video Format: **MP4** **Gimbal** • Type: **3-Axis (Tilt, Roll, Pan)** • Controllable Range (Tilt): **-90° to +30°** • Angular Vibration Range: **±0.005°** **Sensing System** • Obstacle Sensing: **Omnidirectional (Forward, Backward, Upward, Downward, Sides)** • Detection Range: **Up to 40 m** **Remote Controller** • Max Transmission Distance (CE): **6000 m** • Video Output: **HDMI** • Battery Life: **≈ 2.5 h** • Operating Temperature: **-20°C to +40°C** **Intelligent Flight Battery** • Capacity: **3850 mAh** • Voltage: **15.4 V** • Energy: **59.29 Wh** • Charging Time: **≈ 90 min** • Operating Temperature: **-10°C to +40°C** • Heating: **Manual and Auto Heating** **Additional Modules** • **Spotlight:** 26 W, Effective Range 30 m • **Beacon:** Visible Range up to 5 km	Cpl.	1

	• **Speaker:** 100 dB @1 m, Max Power 10 W • **RTK Module:** Positioning Accuracy – Horizontal 1 cm + 1 ppm, Vertical 1.5 cm + 1 ppm		
60.	Self-contained breathing apparatus set with 4 panoramic masks, air cylinder and transport harness.	Unit.	6 SCBA 24 masks
61.	**Spare compressed air cylinders.**	Unit.	6
62.	**TETRA handheld radio terminals.**	Unit.	6
63.	**50 m Cable** (230 V AC) on Reel	Unit.	2
64.	**Magnetic patch for stopping hazardous material leaks from tankers and metal tanks:** - Made of high-strength, flexible urethane; - Resistant to liquid flow pressure of at least 1.9 bar; - Square-shaped, equipped with four "D"-shaped rings in each corner; - Includes two straps for easy application on metal surfaces; - Supplied with a transport case featuring an industrial zipper and insulated sections to maintain durability when not in use, protecting the patch from UV light exposure. Patch Dimensions: - Length: 19–20 cm; - Width: 19–20 cm; - Thickness: 1.3–2.3 cm; - Weight: 1.5–2.1 kg. Transport Case Dimensions: - Length: 23–26 cm; Width: 23–26 cm.	Unit.	1
65.	**Magnetic patch for stopping hazardous material leaks from tankers and metal tanks:** - Made of high-strength, flexible urethane; - Resistant to liquid flow pressure of at least 1.9 bar; - Square-shaped, equipped with four "D"-shaped rings in each corner; - Includes two straps for easy application on metal surfaces; - Supplied with a transport case featuring an industrial zipper and insulated sections to maintain durability when not in use, protecting the patch from UV light exposure. Patch Dimensions: - Length: 43–47 cm; - Width: 43–47 cm; - Thickness: 1.3–2.3 cm; - Weight: 12–14 kg. Transport Case Dimensions: - Length: 49–52 cm; Width: 49–52 cm.	Unit.	1
66.	**Crowbar** 1700 mm, 7.2 kg.	Unit.	1
67.	**Crowbar** 800 mm x 19 mm.	Unit.	1
68.	**Sledgehammer, 2 kg**, handle made of fiberglass.	Unit.	1
69.	**Sledgehammer, 10 kg**, handle made of fiberglass.	Unit.	1
70.	**Carpenter's hammer** with split claw, 14" (570 g).	Unit.	1
71.	Medical Backpack (Red) – Dimensions: 65 cm x 40 cm x 30 cm	Unit.	1
72.	Rigid Stretcher: Equipped with head immobilization device, 4 fixation straps	Unit.	1
73.	KED (Kendrick Extrication Device)	Unit.	1

Note: All accessories and equipment shall be certified/approved according to EU standards and regulations. The flame-resistant protective suit falls into risk category III and is subject to the conformity assessment procedure, regulations, and conditions for applying the CE marking, corresponding to PPE

category III. Only products bearing the CE marking accompanied by the number of the EU notified certification body shall be accepted.

All equipment and accessories that are not secured in/on drawers, floors, doors, or side walls shall be arranged in compartments, in durable plastic boxes with handles for handling. The boxes shall contain a list of the materials contained for easier identification during intervention. The boxes shall be numbered, and the inventory of the complete firefighting vehicle to be provided shall be structured in the order of the boxes. Items fixed to the firefighting vehicle shall be included in an annex to the complete inventory.

Annex no. 2
to the technical specification

TELESCOPIC MAST FOR LIGHTING

The telescopic mast shall be mounted on the superstructure, between the cab or in the rear of the superstructure. The mast shall not present an obstacle for the operation of other equipment or accessories.

Minimum Technical Requirements:

- Integrated as a fixed component of the vehicle;
- Fully electro-pneumatically operated;
- Electrically controlled via a wired remote control, powered by the vehicle chassis electrical system;
- Telescopic mast cylinders made of anodized aluminum;
- Lamp rotation in the vertical plane: 360°;
- Lamp tilt in the horizontal plane: 315°;
- Equipped with two (2) LED lamps/projectors, each with a minimum output of 15,000 lumens, emitting cool white light, and featuring protection against accidental impacts. The lamps shall be powered by the vehicle's electrical system via a current inverter or another solution selected by the manufacturer based on the LED lamps/projectors;
- Working height measured from the ground: at least 5,000 mm;
- Automatic return to the transport position.

Annex no. 3
to the technical specification

LIST
of specific materials on the chassis

No	Product name	U.M.	Quantity
1.	First aid kit for vehicles	units	1
2.	Tool kit and specific accessories for the chassis	units	1
3.	Hydraulic jack that allows the replacement of a wheel on a fully loaded vehicle	units	1
4.	Reflective triangles	units	2
5.	Jack support plate	units	1
6.	Spare wheel (rim + tire) mounted on the chassis or vehicle	units	1
7.	Type P6 fire extinguisher mounted in the cabin	units	1
8.	Wheel chocks	units	2
9.	Hose with pressure gauge for inflating tires that can be connected to an air outlet mounted on the vehicle, long enough to reach any wheel	units	1
10.	Anti-slip chains for all driving wheels of the vehicle	Set	2
11.	Reflective vests	units	2

Annex no. 4
to the technical specification

EXTRICATION TOOLS SET
included in the accessories compartment

No	Product name	U.M.	Quantity
	Autonomous Rescue Set		
1.	**Cutter (Tool):** - Power Source: Powered by electric current stored in a rechargeable, mountable battery. - Control Sleeve: Positioned on the tool's handle, allowing operation without obstruction from any position at a 360º angle. - Support Handle: Allows operation and maneuvering of the tool freely at 360º without obstruction. - Cutting Capacity: At least Category I. - Cutting Opening at the Tips: Minimum 165 mm. - Theoretical Cutting Force: At least 760 kN. - Cutting Round Bar: Minimum 35 mm. - Blade Axes Inclined Relative to the Tool Axis: Yes. - Support and Transport Handle: Surrounding the entire tool for ease of carrying. - Weight Ready for Use (including rechargeable battery): Minimal weight. - Dimensions: Minimal size. - Water Use: Suitable for underwater use	Unit	1
2.	**Spreader (Tool):** - Power Source: Powered by electric current stored in a rechargeable, mountable battery. - Control Sleeve: Positioned on the tool's handle, allowing operation without obstruction from any position at a 360º angle. - Support Handle: Allows operation and maneuvering of the tool freely at 360º without obstruction. - Separation Force at 25 mm from the Tips: Minimum 43 kN. - Maximum Clamping Force: Minimum 55 kN. - Maximum Pulling Force: Minimum 50 kN. - Separation Distance: Minimum 725 mm. - Separation Force at Steel Tips: Minimum 275 kN. - Support and Transport Handle: Surrounding the entire tool for easy carrying. - Weight Ready for Use (including rechargeable battery): Minimal weight. - Dimensions: Minimal size. - Water Use: Suitable for underwater use.	Unit	1
3.	**Telescopic Ram Cylinder (Tool):** - Power Source: Powered by electric current stored in a rechargeable, mountable battery. - Control Sleeve: Positioned on the tool's handle, allowing operation without obstruction from any position at a 360º angle. - Support Handle: Allows easy positioning on both sides or inside the vehicle	Unit	1

	– Ability to Mount the Tube Without Removing the Fixing Head: Yes. – Laser Light for Precise Positioning: Yes. – Maximum Separation Force on the First Rod: Minimum 135 kN. – Maximum Separation Force on the Second Rod: Minimum 65 kN. – Stroke of the First Rod: Minimum 210 mm. – Stroke of the Second Rod: Minimum 190 mm. – Length with Fully Retracted Rods: Maximum 385 mm. – Length with Fully Extended Rods: Minimum 785 mm. – Weight Ready for Use (including rechargeable battery): Minimal weight. – Dimensions: Minimal size. – Water Use: Suitable for underwater use.		
4.	**Ram support**	Unit	2
5.	**Rechargeable Battery:** - Battery Type: Li-ion (Lithium-ion). - Capacity: Minimum 7Ah. - Battery Life: Minimum 490 charge cycles. - Charging Time: Maximum 70 minutes. - Weight: Minimal weight. - LED Display: Yes, displaying the operating status parameters continuously.	Unit	6
6.	**Rechargeable Battery Charger (for AC 220V):** - Power: Minimum 300W. - LED Display: Yes, showing continuous operating status parameters. - Weight (ready for use): Minimal weight.	Unit	1
7.	**Rechargeable Battery Charger (from Vehicle Chassis - DC 12-24V):** - Power: Minimum 70W. - Weight (ready for use): Minimal weight. - Length: Minimum 250 mm.	Unit	2
8.	**Interconnection Cable for Rechargeable Battery Chargers:** - **Length**: Minimum 250 mm.	Unit	1
9.	**Extension Tube for Telescopic Ram Cylinder:** - Length: Minimum 470 mm, maximum 510 mm. - Connection to the Spreader Cylinder Rod: Yes, it can be coupled to the rod of the telescopic spreader cylinder without needing to disconnect any elements.	Unit	1
10.	**Parts for Attaching the Towing Chain to the Spreader:** - Weight: Minimal weight.	Set	1
11.	**Pulling Chains:** - 1 Chain: Minimum length of 1450 mm. - 1 Chain: Minimum length of 2950 mm. - Carrying Case: Yes, included. - Weight for the Set: Minimal weight.	Set	1
12.	**Stabilization Strut:** - Support Ends: Yes. - Positioning at Any Angle: Yes. - Strap: Yes. - Hooks: Yes. - Tensioning Device with Ratchet: Yes.	Unit	2

	- Anti-Slip Profile Base Plate: Yes. - Strap Length: Minimum 4800 mm. - Axial Load: Minimum 15 kN. - Collapsed Length: Maximum 1100 mm. - Extended Length: Minimum 1750 mm. - Weight: Minimal weight.		
13.	**Driver's Airbag Protective Cover**	Unit	1
14.	**Folding Cones with LED for Marking/Flagging Intervention Area**	Unit	10
15.	**Tarpaulin for Placing Tools (2500 mm x 2000 mm)**	Unit	1
16.	**Sharp Edge Protection Covers:** - 6 covers: Minimum 250 mm x 250 mm. - 6 covers: Minimum 600 mm x 600 mm. - 3 covers: Minimum 1500 mm x 600 mm. - 1 carrying bag: Yes, included. - Waterproof: Yes, the covers are waterproof. - 9 covers with magnets for easy attachment to metal parts. - 6 covers with Velcro for protecting poles	Set	1
17.	**White/Red Barrier Tape,** 100 m	Unit	2
18.	**Protective Shield with 4 Handles**	Unit	2
19.	**Wedges and Blocks:** - 2 x 1 Step Wedge - 2 x 1 Small Wedge - 2 x 1 Large Wedge - 2 x 1 Low block - 2 x 1 High block	Set	1
20.	**Tool for Cutting Laminated Windshield** (Including Punch for Windows)	Unit	1
21.	**Angle Grinder with 2 Batteries,** Rechargeable Battery Charger from Mains (220V AC), Rechargeable Battery Charger from Vehicle Chassis (12-24V DC)	Cpl.	1
22.	**Concrete and Metal Cutting Machine:** - 2 Abrasive Discs, Diameter 350 mm; - 2 Diamond Discs, Diameter 80/350 mm; - Water Reservoir with Hose and Connection to the Cutting Machine.	Cpl.	1
23.	**Echo sounder:** Type of echo sounder: Professional multibeam or side-scan sonar Resolution and frequency: 400–1200 kHz (high-definition frequencies) Depth range: up to 50–100 m (suitable for rivers and reservoirs) Image display: 3D / photo-like sonar imaging GPS and chartplotter: For precise positioning of detected objects Interface and data recording: Ability to record logs and transfer data to a computer (for subsequent analysis and documentation) Operation at low temperatures: From -10°C (for use in winter and adverse weather conditions)	Unit	1

Annex no. 5
to the technical specification

Height and Well Rescue and Personal Protection Equipment, Provided in the Accessories Compartment

No	Product name	U.M.	Quantity
1.	**Complex Climbing Harness (Climbing Belt):** - The straps making up the belt shall be wide (at least 43mm) and semi-rigid. - The upper part of the complex belt (harness) shall be equipped with a comfort element around the shaller area, and the back shall be designed in an "X" shape with a shock-absorbing comfort element to reduce pressure points on the back, along with an ergonomic support system along the spine. - The belt's adjustments shall include at least: waist adjustment, adjustment for each leg (for thickness), and an upper adjustment for height (adjustment element for the shaller straps). - The closure shall be done using quick-release buckles that allow donning and doffing without altering the size adjustment. The harness shall be available in at least two sizes for delivery to the user. - The harness shall have 5 attachment points made of aluminum alloy: 2 front (for descent/anchoring), 1 rear (for anchoring), and 2 lateral (one left and one right). The two lateral points shall be able to fold 180 degrees onto the strap; (self-anchoring and anchoring can be done from multiple directions). - If a connection piece (carabiner) is provided between the central lumbar and sternal points, it shall be equipped with a visual indicator that reduces the risk of use without proper securing. - The metal parts shall be corrosion-resistant. - The total weight of the harness shall not exceed 2300 grams.	Unit	3

8.	**Assisted braking descender with automatic locking**: - The descender shall ensure the safety of the descent maneuvers and protection against falls, especially during rescue operations at height; - It shall be equipped with a multifunctional handle, allowing the user to unlock the rope and control the descent speed, as dictated by the user's movement of the handle; - The handle shall feature a button that controls movement on flat or slightly inclined surfaces; - The descender shall include an automatic locking system that prevents falls when the rope suddenly comes under tension. Additionally, it shall automatically lock the rope in case of abrupt operation, accidental bumping of the handle, or if the operator accidentally drops it. It shall also be equipped with a system to prevent incorrect rope installation (reversed direction); - It shall be usable for climbing ropes with diameters between 10 mm and 11.5 mm; - Maximum weight: 600 grams; - It shall support loads of at least 250 kg; - It shall be made of stainless steel and/or aluminum alloy, ensuring necessary strength, while the handle shall be made from plastic materials or other materials with similar ergonomic properties and grip.	Unit	3
9.	**Fall arrest device**: - Used to block a fall or uncontrolled descent; - It shall work on both vertically and obliquely positioned ropes, moving up and down, following the user's smooth movement; - It shall block the fall upon detecting the fall by the sudden shock installed; - It shall be installable anywhere on the rope while being attached to the user's harness; similarly, it shall be removable from the rope at any time with a deliberate action, ensuring full safety against accidental detachment during work; - The fall arrest device shall be made from stainless steel and aluminum alloys or other materials with similar properties, ensuring that its weight does not exceed 450 grams.	Unit	3
10.	**Chest blocker:** - It shall allow installation and removal anywhere on the rope and be equipped with two fixed attachment holes, one at the top and one at the bottom; - The body of the blocker shall be made from lightweight and durable materials (aluminum alloys/stainless steel or materials with similar properties); - It shall move on the rope in one direction as the user ascends, blocking movement in the opposite direction; - It shall function properly even when the ropes are wet, frozen, or dirty; - It shall be usable with ropes having a diameter between 8 and 13 mm.	Unit	3

11.	**Right/Left hand blocker:** - It shall allow installation and removal with one hand; - The body of the blocker shall be made from lightweight and durable materials (aluminum alloys/stainless steel or materials with similar properties); - Equipped with a comfortable handle with an ergonomic shape and properties that prevent the hand from slipping, while providing comfort in wet or icy conditions; - The handle shall have two different-sized holes at the bottom for attaching a pedal. Additionally, it shall be equipped with a hole at the top to allow the installation of a carabiner; - It shall function properly even when the ropes are wet, frozen, or dirty; - It shall be usable with ropes having a diameter between 8 and 13 mm; - Weight: maximum 250 g.	Unit	3
12.	**Blocker pedal:** - It shall be made from polyester/nylon webbing or another material with similar properties; - It shall be equipped with a buckle for length adjustment; - The webbing shall be reinforced in the area where the foot is placed; - Maximum weight: 150 grams; - It shall be able to support the operator's (rescuer's from height) weight under maximum safety conditions during use.	Unit	3
13.	**Energy absorber:** - It is used to reduce shock (dissipate the kinetic energy generated during a fall) to protect the user/rescuer in case of a fall; the energy generated by the fall shall be absorbed by the gradual unfolding of the stitches on the loop, starting at a force of 2.5 kN; - It shall be made from a lightweight material (polyester/nylon fabric or another material with similar properties), resistant to abrasion; - Tensile strength: at least 22 kN; - Dynamic performance: maximum braking force < 6 kN; - Weight: maximum 80 g; - It shall be equipped with elements to support the energy absorber's folds in a way that does not interfere with the user during work; additionally, it shall have attachment elements at both ends to ensure protection of the rope during attachment.	Unit	3

14.	**Linking piece (carabiner):** - It shall be compact, lightweight, and easy to handle; - Made from aluminum alloy or steel; - Automatic closing system: an element that automatically returns to the closed position after being released from the open position; - Locking system: a safety mechanism that automatically locks the automatic closing element of the carabiner; it shall include a gripping surface to attach and release the safety by rotation; - Major axis resistance: minimum 24 kN;	Unit	30

	- Resistance with the latch open: minimum 7 kN.		
15.	**Anchor plate type 3/5:** - Used to organize work by creating multiple anchor points. The holes shall have a minimum diameter of 19 mm. It shall allow the multiplication of at least 3 points into at least 5 other anchor points. Made from aluminum alloy or other materials with similar properties; - Breakage resistance: minimum 35 kN; - Maximum weight: 250 grams.	Unit	1
16.	**Double pulley (parallel):** - It shall be usable for creating pulley systems, enabling force multiplication; - It shall be made from stainless steel or alloys with similar properties and equipped with two parallel pulleys (made from stainless steel or similar alloys), with sealed ball bearings; - The diameter of the pulleys shall range from 23 to 55 mm; - Equipped with two side plates and one plate placed between the pulleys, each having a hole for attachment, allowing carabiners to be hooked either individually on each plate or all three plates simultaneously. Additionally, the central plate shall have an additional attachment hole at 180 degrees (diametrically opposite) to the other one; - It shall be usable with ropes with diameters ranging from 8 to 13 mm; - Working load: minimum 6 kN; - Own weight: maximum 350 grams.	Unit	2
17.	**Rescue pulley (with one pulley):** - This type of pulley shall be specifically designed for intensive use in rescue operations involving heavier weights; - The pulley shall operate using one or more sealed ball bearings; - It shall be equipped with two side plates, each having a hole to attach up to 3 carabiners simultaneously; - It shall allow use with ropes having diameters ranging from at least 8 to 13 mm; - Working load: minimum 7.8 kN; - Breaking strength: minimum 15 kN; - Own weight: maximum 250 grams.	Unit	4

18.	**Double pulley (series):** - It shall be used as a mechanical transport device on rope, for speeds of up to at least 5 m/s; - It shall be constructed from stainless steel or similar alloys and equipped with two pulleys in series (in-line, made of stainless steel or similar alloys), with sealed bearings or ball bearings; - It shall have two attachment holes, one at the top (between the two pulleys) and one at the bottom, along with additional side holes for cleaning and lubricating the pulleys; - It shall be able to support a load of at least 10 kN; - It shall be compatible with ropes having diameters between 8 and 13 mm; - Own weight: maximum 300 grams; - Efficiency: at least 70%.	Unit	2
19.	Rescue triangle	Unit	1
20.	**Static rope 100 m:** - Very resistant static rope (high resistance and low elongation). - Diameter: 10.5 - 11 mm. - Sheath slippage: 0 mm. - Elongation (50-150 kg): 3.2-3.8%. - Strength: 38-40 kN.	Unit	2
21.	**Dynamic rope 100 m:** - Diameter: 10.5 mm. - Static elongation: 7.2÷7.7%. - Dynamic elongation: 32÷37%. - Resistance to at least 9 falls. - Impact force: minimum 8.5 kN. - Sheath slippage (mm): 0. - Maximum weight: 72 g/m.	Unit	1
22.	**40L Rope Backpack – tarp extension type:** - Used for transporting and protecting climbing ropes. - Shall be made from materials resistant to mechanical actions, abrasion, tearing, moisture, and freezing. - Shall unfold into a platform with dimensions of at least 120x120 cm to ensure protection of the rope against mud, moisture, and dust when placed on the ground	Unit	1
23.	**Anchor Lanyard Steel 180 cm**	Unit	2
24.	**Anchor Lanyard Steel 130 cm**	Unit	2
25.	**Rescue Kit for Well (Winch, Tripod, Rescue Harness) (140 kg):** **Tripod:** - Extensible legs made of aluminum. - Designed for controlled lifting or lowering of people and equipment in wells or shafts. - Tensile strength: Minimum 22 kN; **Winch:** - Cable length: 25 meters. - Automatic braking device. - Working load: Minimum 140 kg. **Rescue Harness:** - Easy-to-fix straps; - Triangular shape for fast and correct positioning;	Unit	1

	- Adjustable; - Three front attachment points to avoid slipping.		
26.	**Wet diving suit (WET SUIT):** Material: Neoprene, thickness 3–7 mm; Seam type: Sealed, glued, or stitched; Waterproofing: Semi-dry — a thin layer of water enters the suit, warms up from the body, and helps retain heat; Fastener: Back zipper (YKK or TiZip) Design: Jacket with hood, trousers, or combined overalls Operating water temperature: +10 to +30 °C; Buoyancy: Positive Operating pressure (depth): Up to 40 m (at standard density) Set weight: 3–6 kg; **Main Equipment:** 1. Mask; - Material (Tempered glass, silicone skirt, polycarbonate frame) - Lens type (Single or dual lens design) - Strap (Adjustable silicone strap) 2. Fins; - Type (Adjustable (open-heel) or full-foot type) - Material (Rubber, thermoplastic, composite materials) - Strap system (Strap or spring heel system) 3. Diving gloves; - Material (Neoprene 3–5 mm, sometimes reinforced with Kevlar or rubber) - Design (Anatomical fit, sealed seams) 4. Boots or neoprene socks; - Material (Neoprene 3–7 mm, soft, vulcanized rubber sole) - Features (Side zipper, reinforced toe and heel) 5. Buoyancy Control Device (BCD); - Type (Jacket or wing/backplate type) - Materials (1000D Cordura nylon, TPU coating, stainless fittings) - Inflator pressure (up to 16 bar) - Features (Integrated weight pockets, LP inflator connector, overpressure valves) 6. Weight belt (or integrated weights in the BCD); - Type (Traditional belt with quick-release buckle or integrated weights in BCD) - Material (Nylon webbing, lead weights with protective coating) - Features (Quick-release buckle) 7. Compressed air or breathing gas cylinder – Cylinder material (Steel, aluminum, or composite (carbon fiber, fiberglass with aluminum or steel liner)) – Working pressure (200–300 bar) – Medium standard (10-15 L) – Valve type (DIN or INT standard valve with safety relief device) – Weight (3,5–15 kg, depending on volume and material) – Operating temperature range (from –40 °C to +60 °C) – Marking (Engraved marking: manufacturer, serial number, volume, working and test pressure, test date, applicable standards). 8. Regulator (primary and secondary, with pressure gauge);	Cpl.	4

	- Set composition (1st stage, 2nd stage (primary), 2nd stage (octopus/secondary), pressure gauge, LP/HP hoses) - Working pressure (Up to 300 bar (input), output pressure 9–10 bar (LP)) - Materials (Chrome-plated brass, stainless steel, technopolymer, silicone) - Features (EN 250A cold-water rated, balanced system, HP and LP hoses included) - Pressure gauge (Analog 0–400 bar gauge, shockproof, EN 250 certified). 9. Diving knife; - Purpose (Used for emergency cutting of ropes, straps, or nets, and as a general underwater tool) - Materials (Blade – stainless steel or titanium; handle – thermoplastic or rubber) - Blade length (80–120 mm) - Mounting (Mounting on thigh, arm, BCD, or hose) - Features (Half straight / half serrated edge, line cutter, locking sheath) **Additional Equipment:** 1. Pressure gauge (if not integrated into the console); - Measurement range (0–400 bar) - Type (Analog with phosphorescent dial) - Materials (Chrome-plated brass, reinforced glass) - Features (Shockproof case, HP hose, accuracy ±5 bar) 2. Depth gauge; - Purpose (Measures current and maximum dive depth) - Type (Analog or digital type) - Range (0–80 m (analog) / up to 150 m (digital)) - Accuracy (±1 m (analog) / ±0.1 m (digital)) 3. Underwater compass; - Purpose (Used for underwater navigation and orientation) - Type (Wrist, console, or handheld type) - Features (Luminescent dial, liquid-filled, rotating bezel) - Materials (Polycarbonate body, silicone seal) 4. Signaling device (whistle, buoy, or flag); 5. Underwater flashlight; - Purpose (Provides illumination in low-visibility underwater environments) - Light source (High-intensity LED) - Brightness (1000–3000 lumens) - Housing (Aluminum alloy or polycarbonate, waterproof up to 50 m) - Power source (Li-ion rechargeable battery or AA cells) 6. Bag or backpack for carrying equipment; - Materials (Water-resistant 600D–1000D nylon, reinforced zippers) - Capacity (100–120 liters) - Features (Ventilation panels, optional wheels, shoulder straps) 7. Spare O-rings, lubricant, and repair kit. - Components (Set of O-rings, silicone grease, tools, spare screws and clips) – Packaging (Waterproof plastic case)		
27.	**Dry diving suit (DRY SUIT):**	Cpl.	4

	Materials: Trilaminate (nylon + butyl rubber + nylon), vulcanized rubber, flexible PVC, neoprene with a sealed coating **Neck and wrist seals:** Latex, silicone, or neoprene (watertight) **Sealing zipper:** Metal or plastic, waterproof **Integrated boots or socks** **Equipped with inlet and exhaust valves** for regulating internal air pressure **Operating water temperature:** −2 °C to +15 °C **Pressure (depth):** Up to 60 m (depending on model) **Waterproofing:** Fully sealed (no water penetration inside) **Set weight:** 7–12 kg **Air inflation/deflation:** Valves connected to the air cylinder **Primary materials:** Trilaminate, butyl rubber, rubber, dense neoprene **Main Equipment:** 1. Undersuit hood; - Material (Neoprene 3–7 mm, thermal lycra or nylon with thermal lining) - Temperature range (from +2 °C to +30 °C) 2. Mask; - Material (Tempered glass, silicone skirt, polycarbonate frame) - Lens type (Single or dual lens design) - Strap (Adjustable silicone strap) 3. Fins; - Type (Adjustable (open-heel) or full-foot type) - Material (Rubber, thermoplastic, composite materials) - Strap system (Strap or spring heel system) 4. Diving gloves; - Material (Neoprene 3–5 mm, sometimes reinforced with Kevlar or rubber) - Design (Anatomical fit, sealed seams) 5. Boots or neoprene socks; - Material (Neoprene 3–7 mm, soft, vulcanized rubber sole) - Features (Side zipper, reinforced toe and heel) 6. Buoyancy Control Device (BCD); - Type (Jacket or wing/backplate type) - Materials (1000D Cordura nylon, TPU coating, stainless fittings) - Inflator pressure (up to 16 bar) - Features (Integrated weight pockets, LP inflator connector, overpressure valves) 7. Weight belt (or integrated weights in the BCD); - Type (Traditional belt with quick-release buckle or integrated weights in BCD) - Material (Nylon webbing, lead weights with protective coating) - Features (Quick-release buckle) 8. Compressed air or breathing gas cylinder – Cylinder material (Steel, aluminum, or composite (carbon fiber, fiberglass with aluminum or steel liner)) – Working pressure (200–300 bar) – Valve type (DIN or INT standard valve with safety relief device) – Weight (3,5–15 kg, depending on volume and material) – Operating temperature range (from –40 °C to +60 °C)		

	– Marking (Engraved marking: manufacturer, serial number, volume, working and test pressure, test date, applicable standards). 9. Regulator (primary and secondary, with pressure gauge); - Set composition (1st stage, 2nd stage (primary), 2nd stage (octopus/secondary), pressure gauge, LP/HP hoses) - Working pressure (Up to 300 bar (input), output pressure 9–10 bar (LP)) - Materials (Chrome-plated brass, stainless steel, technopolymer, silicone) - Features (EN 250A cold-water rated, balanced system, HP and LP hoses included) - Pressure gauge (Analog 0–400 bar gauge, shockproof, EN 250 certified). 10. Diving knife; - Purpose (Used for emergency cutting of ropes, straps, or nets, and as a general underwater tool) - Materials (Blade – stainless steel or titanium; handle – thermoplastic or rubber) - Blade length (80–120 mm) - Mounting (Mounting on thigh, arm, BCD, or hose) - Features (Half straight / half serrated edge, line cutter, locking sheath) 11. Air inflation system; - Composition (LP hose, quick-release connector, inflator valve, check valve) - Working pressure (up to 16 bar (low pressure)) - Connection type (Standard LP inflator connection (EN 1809 compliant)). - Materials (Compatible with most BCDs, includes manual deflation valve) **Additional Equipment:** 1. Pressure gauge (if not integrated into the console); - Measurement range (0–400 bar) - Type (Analog with phosphorescent dial) - Materials (Chrome-plated brass, reinforced glass) - Features (Shockproof case, HP hose, accuracy ±5 bar) 2. Depth gauge; - Purpose (Measures current and maximum dive depth) - Type (Analog or digital type) - Range (0–80 m (analog) / up to 150 m (digital)) - Accuracy (±1 m (analog) / ±0.1 m (digital)) 3. Underwater compass; - Purpose (Used for underwater navigation and orientation) - Type (Wrist, console, or handheld type) - Features (Luminescent dial, liquid-filled, rotating bezel) - Materials (Polycarbonate body, silicone seal) 4. Signaling device (whistle, buoy, or flag); 5. Underwater flashlight; - Purpose (Provides illumination in low-visibility underwater environments) - Light source (High-intensity LED) - Brightness (1000–3000 lumens) - Housing (Aluminum alloy or polycarbonate, waterproof up to 50 m)		

	- Power source (Li-ion rechargeable battery or AA cells) 6. Bag or backpack for carrying equipment; - Materials (Water-resistant 600D–1000D nylon, reinforced zippers) - Capacity (100–120 liters) - Features (Ventilation panels, optional wheels, shoulder straps) 7. Spare O-rings, lubricant, and repair kit. - Components (Set of O-rings, silicone grease, tools, spare screws and clips) - Packaging (Waterproof plastic case)		
28.	Rescue and transport stretcher	Unit	1

Annex no. 6
to the technical specification

ELECTRICAL GENERATOR

Minimum technical requirements:

- Mounted on a "support" frame inside the special vehicle; The generator shall be equipped with locking and fastening systems for safe operation both when stationary and during the movement of the special vehicle;
- Power in prime power mode (PRP): minimum 2,5 KVA, maximum 5 KVA;
- Inverter technology that regulates the engine speed according to load;

Soundproof housing;

- Voltage: 230 VAC;
- Engine type: 4-stroke;
- Fuel type: gasoline;
- Additionally, the generator panel shall contain:
  - Single-phase schuko outlets of 16 A: at least 1 unit;
  - 12VDC/24VDC outputs (at least 1+1 outputs);
  - Maximum weight: 20 KG;
  - Measurement and control devices: digital voltmeter, digital ammeter, digital frequency meter;
  - Over/under voltage indicator and phase load indicator;
  - Fuel level indicator;
- Thermal protection with automatic fuse;
- Automatic low oil pressure protection, with LED fault indication and automatic engine shutdown;
- Electric start (with key/button), starter, and battery;
- Emergency stop button;
- Exhaust gases protected against weather and wind, and the flexible metal ducting shall be easy to disassemble.
- Emissions standard: According to the regulation in force at the date of delivery - EU Regulation 1628/2016.

Annex no. 7
to the technical specification

TETRA RADIO TERMINALS

The communications module for vehicles shall consist of:

- One TETRA standard radio terminal for installation in vehicles;
- Six portable TETRA standard radio terminals.

I. Technical Specification

„TETRA radio terminals for installation in special vehicles"

1. Compatibility

All the terminals offered shall be compatible with the services available on the operational TETRA system infrastructure in the Republic of Moldova.

2. Applicable technical requirements

2.1. Environmental Requirements

The offered TETRA terminals shall have the following environmental characteristics:

- Operating temperature: -30 / +60° C
- Humidity: ETSI 300 019-1-5 CLASS 5.2
- Shocks and vibrations: ETSI 300 019-1-5 CLASS 5M3
- Dust and water protection: minimum IP 54.

2.2. Configuration

For easy installation, the mobile terminal shall be in "dash mount" or "remote mount" configuration depending on the vehicle model and installation possibilities in the cabin.

2.3. RF

The offered TETRA terminals shall have the following RF characteristics:

a) RF band (TMO&DMO): 380-400 MHz
b) Modulation: π/4 DQPSK
c) Receiver: Class A and B
d) Power Tx terminal: minimum 10 W

2.4. TETRA services and functionalities

2.4.1. ***Voice services***

a) Group call (minimum 200 pre-programmed TMO groups);
b) Semi-duplex and full duplex individual call;
c) Emergency call;
d) Full duplex telephone call;
e) Call in DMO mode (at least 100 pre-programmed DMO groups).

2.4.2.***Additional services***

a) TPI, CLIP, DGNA, Late entry, Priority call; Tx inxibit;
b) Group scanning (minimum 10 groups);
c) Operation as a "DMO repeater";
d) Operation as "TMO/DMO and DMO/TMO gateway.

2.4.3. ***Data Services*** - SDS/SDS-TL, Status messages, IP PDS.

2.5. Mobility

a) Cell selection/reselection: type 3 or higher (according to the ETSI TETRA 300 392-2 standard);

b) Supports multiple networks (MNC) based on a list programmed in the terminal.

2.6. Security

a) The authentication keys shall be provided in a format that complies with TETRA MoU recommendations. The authentication keys shall be provided respecting the security rules established by the TETRA MoU SFPG recommendations.

b) Air Interface Encryption;

c) Encryption on the radio interface – TEA1 **(Terminals shall be supplied with the TEA1 algorithm)**;

d) Security class: class 1 (Clear), class 2 (SCK) and class 3 (DCK and CCK);

f) Disable/Enable terminals *(Remote disable/enable)*.

2.7. Other features

a) Transmission inhibition in special environments (function to prevent transmission in sensitive areas to radio frequencies).

3. Specific technical requirements for the mobile TETRA terminal

3.1. Nominal power supply conditions: 12 V DC

3.2. User interface (MMI)

a) Display

- color display, number of display colors: minimum 65K;
- backlight, flip screen, large icons and scalable text font options;
- multiple display languages, user selectable;
- indicators displayed on the display for working modes (eg: TMO, DMO, Tx inhibit, etc.);
- menu navigation with intuitive operation.

b) Keypad

- alphanumeric keypad;
- menu navigation keys;
- emergency call initiation button/key;
- button/key for group selection;
- volume button/key.

c) Phonebook

- phonebook (tel. no. + private no. up to. 1000 contacts);
- easy calling (e.g. by searching in the phone book, the last dialed numbers, etc.)

d) Interfaces:

- for connecting audio accessories;
- multifunctional interface for programming/data transmissions/AT commands.

3.3. Integrated GPS receiver

a) The TETRA mobile terminal shall be equipped with an integrated GPS receiver with the following specifications:

- satellites received simultaneously: minimum 10;
- sensitivity: min. – 152 dBm;
- precision/accuracy: max 5 m.

b) The TETRA mobile terminal shall support the ETSI LIP protocol.

c) The TETRA mobile terminal shall support simultaneous location data transmission (from the user's point of view) using the TETRA Packet Data service.

4. Accessories and installation kit

For each terminal the Seller shall provide accessories and installation kit. These shall include:

- standard microphone with PTT and fixing support;
- speaker with connecting cable and fixing support;

- power cable with fuse and suitable connectors (adapted to practical situations);
- fixing support in the vehicle;
- omnidirectional car antenna, band 380...400 MHz, VSWR<1.5 in the band of interest, impedance 50 ohms, type of fixation on the body, provided with an installation kit (fixation, RF cable, connectors, etc.);
- converter from 24V DC to 12V DC (if the voltage available on the vehicle requires it);
- active GPS antenna integrated on the same support as the UHF antenna, band 1.5...1.6GHz, VSWR<1.5 in the band of interest, impedance 50 ohm, type fixing on the vehicle chassis body, provided with an installation kit (fixing, RF cable, connectors, etc.).

5. Terminal installation:

- The contractor shall carry out the installations of mobile TETRA terminals;
- The installation shall be based on a prototype installation agreed between the Contractor and the Beneficiary;
- The installation of the equipment (radio terminal and accessories), the DC power supply solution, the RF and DC cable routes, the power supply solution, shall be established/carried out on the basis of solutions coordinated with the Beneficiary as well as with the manufacturer (official representative) of the vehicle so as not to affect the warranty for the vehicle;
- All installations shall allow easy access to the radio unit of the terminal so that the beneficiary can program the terminal without being removed from the vehicle.

II. Technical Specification

„Portable (handheld) TETRA radio terminals"

1. Interoperability

All the terminals offered shall be compatible with the services available on the operational TETRA system infrastructure in the Republic of Moldova

2. Applicable technical requirements

2.1. Environmental Requirements

The offered TETRA terminals shall have the following environmental characteristics:
- Operating temperature: -30 / +70° C
- Humidity: ETSI 300 019-1-7 CLASS 7.3E
- Shocks and vibrations: ETSI 300 019-1-7 CLASS 5M3
- Dust and water ingress protection: IP 65/66/67

2.2. RF

The offered TETRA terminals shall have the following RF characteristics:

a) RF band (TMO&DMO): 380-400 MHz
b) Modulation: π/4 DQPSK
c) Receiver: Class A şi B
d) Power Tx terminal: adjustable in steps up to **1.8W (class 3L)**;

2.5. TETRA services and functionalities

2.5.1. ***Voice services***

a) Group call (minimum 200 pre-programmed TMO groups);
b) Semi-duplex and full duplex individual call;
c) Emergency call;
d) Full duplex telephone call;

e) Call in DMO mode (at least 100 pre-programmed DMO groups).

2.5.2. ***Additional services***

a) TPI;
b) CLIP;
c) DGNA;
d) Late entry;
e) Priority Call;
f) Group scanning (minimum 10 groups in scanning);
g) Operation in "repeater" mode;
h) Operation in "gateway interface" mode.

2.5.3. ***Data Services***

a) SDS/SDS-TL;
b) Status messages
c) IP PDS;
d) AT Commands.

2.6. Mobility

a) Cell reselection: type 3 or higher;
b) Supports multiple networks (MNC) based on a list programmed in the terminal.

2.7. Security

a) The authentication keys shall be provided in a format that complies with TETRA MoU recommendations. The authentication keys shall be provided respecting the security rules established by the TETRA MoU SFPG recommendations;

b) Air Interface Encryption;

c) Encryption on the radio interface – TEA1 **(Terminals shall be provided with the TEA1 encryption algorithm)**.

d) Security class: class 1 (Clear), class 2 (SCK) and class 3 (DCK and CCK);

f) Disable/Enable terminals *(Remote disable/enable)*.

2.8. Other features

a) Transmission inhibition in special environments (function to prevent transmission in sensitive areas to radio frequencies).

3. Connectivity

3.1. Wi-Fi

- supported IEEE Standards 802.11 a, b, g, n, ac;
- Wi-Fi bands: 2.4GHz and 5GHz;
- authentication and encryption;
- security TLS 1.2.

3.2. Bluetooth

- supported versions: at list Bluetooth 4.0, and 2.1;
- headset profile (HSP), fast PTT with accessories.

4. User interface (MMI)

a) Display

- color screen with the possibility of rotating the image;
- color display minimum 1.7 inches;
- backlight, flip screen, large icons and scalable text font options;
- multiple display languages, user selectable;
- indicators shown on the display for working modes (eg: TMO, DMO, etc.);
- menu navigation with intuitive operation.

b) Keypad

- alphanumeric keypad;
- menu navigation keys;
- emergency call initiation button/key;
- button/key for selecting group and volume;
- user configurable one touch buttons and keys;
- keypad lock.

c) Phonebook

- phonebook (tel. no. + private no. up to 1000 contacts);
- easy dialing (e.g. by searching in the phone book, the last dialed numbers, etc.)

d) Audio & programming interface/data transmissions

- audio amplifier and speaker (the amplifier and speaker shall have sufficient power to ensure the terminal is usable in noisy environments);
- audio mode: loudspeaker/discrete (loud/discrete) selectable from the MMI. The audio volume shall be controllable from the MMI;
- possibility of using audio accessories;
- multifunctional interface for programming/data transmissions;
- supports Over-The-Air Programming.

5. Integrated GPS receiver

a) The portable TETRA terminal shall be equipped with an integrated GPS receiver with the following specifications:

- satellites received simultaneously: minimum 8;
- sensitivity: min. – 163 dBm;
- precision/accuracy: max 5 m (50% probability);

b) Active GPS antenna, integrated in the TETRA antenna or in the terminal;

c) The TETRA portable terminal shall support ETSI LIP.

6. Battery

a) Battery type: Lithium-Ion or Lithium-Polymer;

b) Capacity: minimum 1950 mAh;

c) Autonomy for mode 5/5/90 (Tx/Rx/Standby): ≥ 18 hours.

7. Accessories

Each terminal shall be supplied with the following accessories:

- compact RF Antenna;
- handsfree accessory with integrated microphone, loudspeaker and PTT button, equipped with a rotating clip for attachment to the lapel;
- clip for fixing the portable terminal to the belt;
- dual charger for simultaneous charging of terminal and battery (EU plug);
- vehicle charger;
- spare battery with specifications according to point 6.

III. Terminal programming and general requirements for all TETRA radio terminals

(for vehicle and handheld terminals mentioned)

1. Programing

1.1 The programming of the TETRA terminals shall be possible by the Beneficiary through a PC/laptop equipped with a USB port.

1.2 A programming set shall be provided for the entire quantity of TETRA mobile terminals. This shall contain all the necessary elements for programming the TETRA

mobile terminals provided, namely:

- USB programming cable;
- programming application (including radio software versions);
- the license/hardware key for the programming application (if applicable);
- for the programming application, the User Guide shall be delivered, which shall include the description of how to install and operate the application, in English;

For TETRA terminals, an instance of the software application and/or hardware device shall be provided for uploading the authentication/encryption keys **(only if the TETRA radio communication system administrator does not have such software/hardware products)**, so that the keys authentication/encryption can be loaded by the Beneficiary on any of the types of terminals provided. If uploading authentication/encryption keys is done with a software application, it shall work on any PC/laptop with Windows 10/11 64-bit operating system.

2. **General requirements**

2.1 The terminals shall be programmed by the Beneficiary with the support of the Seller, in collaboration with the administrator of the TETRA radio communication system, in which they are to be integrated. The Bidder undertakes that, at the Beneficiary's request, it shall provide technical assistance free of charge, whenever necessary, during the entire programming period of the terminals, including the phase of entering the authentication/encryption keys, respectively of registering the terminals in the TETRA infrastructure.

2.2 The delivered products shall be new and unused. Equipment declared by the manufacturer as EoS (End of Sale) or EoL (End of Life), or to be declared as EoS or EoL in the year of purchase, shall not be accepted.

2.3 Any software/firmware license required for the operation of the equipment according to the technical specifications within this specification shall be provided and included in the equipment price

2.4 Any material or accessory, device or sub-assembly and any other similar materials, which are necessary for the correct installation and operation at the parameters specified in this specification shall be considered a priori requested, and the equipment shall be delivered with all of them.

2.5 A user manual in English shall be provided for each portable terminal.

3. Warranty

The warranty for the supplied equipment, including its accessories, is a minimum of 24 months from the date of final acceptance.

4. Abbreviations for all TETRA radio terminals:

AL - Ambience Listening
ARL - Automatic Resource Location AVL -
Automatic Vehicle Location
CLIP - Calling Line Identification Presentation
DGNA - Dynamic Group Number Assignment
DMO - Direct Mode Operation
DTE - Data Terminal Equipment
ETSI - European Telecommunications Standards Institute GC
- Group Call
GPS - Global Positioning System IC
- Individual Call

IP - Internet Protocol
ISCOM - Istituto Superiore delle Comunicazioni e delle Tecnologie deirinformazione (Italian Ministry of Communications Laboratory)
LIP - Location Information Protocol MCC - Mobile Country Code
MNC - Mobile Network Code
MoU - Memorandum of Understanding PC - Personal Computer
PDS - Packet Data Services
PEI - Peripheral Equipment Interface PIN - Personal Identification Number PTT - Push To Talk
PSU - Power Supply Unit RF - Radio Frequency Rx - Receive
SDS - Short Data Services
SFPG - Security and Fraud Prevention Group ST - Technical Specification
SwMI - Switching and Management Infrastructure TEA - Tetra Encryption Algorithm
TETRA - Terrestrial Trunked Radio TL - Transport Layer
TMO -Trunk Mode Operation TPI - Talking Party Identification Tx - Transmit
URL - Uniform Resource Locator V+D - Voice + Data
VSWR - Voltage Standing Wave Ratio
WAP – Wireless Application Protocol