

TECHNICAL SPECIFICATION ” Vehicle for Extinguishing Forest Fires”

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1. PURPOSE OF USE

The vehicle is intended to be used by public entities belonging to governmental organization (The Causeni Regional Directorate for Exceptional Situations of 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. Also, the vehicle is intended for intervention in emergency situations produced especially in hard-to-reach areas, narrow access roads, forest fires and dry vegetation, focusing on fast travel, travel on rough terrain, etc.

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. Vehicle for Extinguishing Forest Fires.
- 2.2. Chassis.
- 2.3. Special Equipment Compartment:
 - 2.3.1. Firefighting System:
 - 2.3.1.1. Water system, consisting of:
 - 2.3.1.1.1. Water tank;
 - 2.3.1.1.2. The secondary water tank;
 - 2.3.1.1.3. Pump unit with built-in automatic priming system;
 - 2.3.1.1.4. Suction, connection, and discharge pipes;
 - 2.3.1.1.5. The self-protection system.
 - 2.3.2. Control system for the pump unit;
 - 2.3.3. Compartment for specific accessories;
 - 2.3.4. The water tank, 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, type of car weighing up to 12 tons;
 - 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) Warranty period minimum 5 years or up to 150,000 km and post-warranty minimum 10 years with presentation of the warranty certificate/booklet, maintenance instructions and technical manuals.
 - 3.1.4. Overall dimensions (L x W x H):
 - maximum length: 7000 mm;
 - maximum width: 2550 mm;
 - maximum height measured from the ground: maximum 3300 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: Engine in 4 cylinders in line with the power of at least 230 HP (generated exclusively by internal combustion engine);
 - 3.1.6. Engine torque: minimum 450 Nm;
 - 3.1.7. Maximum Speed: minimum 80 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 450 mm, maximum 500 mm;
- Angle of Attack: minimum 43°;
- Departure Angle: minimum 48°.

3.2. Chassis:

3.2.1. Engine and Auxiliary Systems:

- 3.2.1.1. Engine category: add blue;
- 3.2.1.2. Fuel type: diesel;
- 3.2.1.3. Fuel tank with a minimum capacity of 150 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. Equipped with a traction control system.

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

3.2.3. **Transmission: 4x4 drivetrain, automatic.**

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. Tires shall be manufactured in the European Union and meet the following criteria:
 - 3.2.4.2.1. Truck wheels shall be single with double hub seal for mud inserts;
 - 3.2.4.2.2. MPT tread (mixed off-road) tires mounted on steel rims (including the spare tire). The tires shall have a tread suitable for both asphalt and unpaved roads;
 - 3.2.4.2.3. Each wheel shall be protected by spraying water, at least with two nozzles from the self-protection system.
- 3.2.4.3. Tire pressure control system or equivalent to adjust tire pressure for on-road / off-road conditions from the cabin. Tire pressure can be set quickly and easily using the buttons on the steering wheel/vehicle dashboard by preselection on the display;
- 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;
- 3.2.4.5. All wheels shall be equipped with mud-guards.

3.2.5. Steering System:

- 3.2.5.1. Power-assisted steering;
- 3.2.5.2. Steering column adjustable in height and angle;
- 3.2.5.3. Multifunction steering wheel on the left side.

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. Compressed air connection for auxiliary consumers;
- 3.2.6.4. Auxiliary braking system;
- 3.2.6.5. Hill-start assist system;
- 3.2.6.6. Hill descent control system;
- 3.2.6.7. All brake system piping protected against breakage, fire and heat.

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;

3.2.8. 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 cab shall be located behind the front deck and 3-point mounted, vibration damped; Cabin protection bars on all dimensional points of course stainless steel;
- 3.2.9.2. The cabin shall be a single-piece, double advanced, closed metal type with suspension and anti-corrosion protection;
- 3.2.9.3. Equipped with 4 doors and 2+4 seats (all seats shall have seat belts in compliance with legal requirements).
- 3.2.9.4. The floor in the crew compartment shall be covered with ribbed aluminum sheet with increased level of slip protection and easy to clean.
- 3.2.9.5. The cabin shall be protected on the outside by a metal frame (rollbar) which includes the nozzles of the self-protection water spray system for all sides of the cab (minimum two nozzles on each side and front);
- 3.2.9.6. Windows, doors and windshield shall have thermally insulated glass.
- 3.2.9.7. The windshield glass shall be equipped with a heating system.
- 3.2.9.8. Seats with conical backs and integrated headrests, with three-point integrated seat belts. Seats shall be made of waterproof materials resistant to stains, wear, and abrasion and shall allow for easy cleaning.
- 3.2.9.9. Sun visors mounted on the interior and exterior of the windshield;
- 3.2.9.10. Heated rearview mirrors with electric or manual adjustment;
- 3.2.9.11. Front right cabin external blind spot mirrors with electric or manual

adjustment;

3.2.9.12. All lateral windows with electric or manual control;

3.2.9.13. The cabin must be equipped with one climate control system (with automatic heating and air conditioning);

3.2.9.14. 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;

3.2.9.15. The color of the cabin shall be red, shade RAL 3000. Car wrapping (stickers or film) is not permitted;

3.2.9.16. Vehicle AM/FM radio with multifunction display and USB connections, integrated into the vehicle's dashboard, with a minimum of four speakers;

3.2.9.17. 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;

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

3.2.9.19. 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.

3.2.10.4. The fire truck shall be equipped with a minimum metal protection shield for the engine, gearbox, transfer case, fuel 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. 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 one stage of pressure setting at least 0 - 10 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 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;

3.3.1.4. Water discharge performance: minimum flow of 2500 l/min at 10 bars. Valve taps with a flap shall not be used;

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

3.3.1.6. 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;

3.3.1.7. 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 4 water discharge nozzles, 2 Type C and 2 Type D, in accordance with the requirements in **Annex no. 1**, points 42 and 43.

3.3.1.8. 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;

3.3.1.9. Water discharge turret with adjustable jet shape mounted on the fire truck. It shall feature manual 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. In transport mode, the turret must be foldable to fit within the prescribed dimensional limits.

3.3.1.10. **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:

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

3.3.1.10.2. Capacity: 3000 liters $\pm$ 10%.

3.3.1.11. **The secondary water tank** for the self-protection system with the possibility of feeding and emptying, both from external water sources through a type B inlet, and from the main water tank, shall have a capacity of 400 lt. $\pm$ 10%, and shall be made of GRP or PAFS. The water supply from the main tank shall be carried out, by self-propulsion, by operating a button from the driving station or by the control panel in the pump compartment.

3.3.1.12. **The self-protection system** shall have a minimum of 8 sprinkler nozzles under the truck, positioned so as not to influence the ability to cross rough terrain and protected against damage when driving off paved or unpaved roads. The actuation of the upper and lower self-protection system shall be done, individually, from two buttons with protection cover for accidental pressing, positioned in the cabin, at the driving station, and in the pump compartment on the control panel. The self-protection system shall work both while driving and while parked, both with the engine on and off.

3.3.1.13. The positioning of the water tanks, the PTO pump and the other equipment that equips the superstructure, shall ensure the optimal distribution of loads on the axles and an improvement of the behavior of the truck on the road.

3.3.1.14. All valves (regardless of their type) shall be marked with nameplates.

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 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.
- 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 shovel, the rake, the wildfire batter, 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 and front passenger seat) shall be specially designed for self-contained breathing apparatus (equipped with a backrest, 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 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;

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 turret and the access hatches to the superstructure, and the shutters, when not in march position (closed), shall be unlocked independently for each category of equipment/subassembly (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.

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

3.3.3.4. 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.

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

- 3.3.3.5.1. Coupling and decoupling of the pumping unit to the chassis transmission;
- 3.3.3.5.2. Control of engine throttle;
- 3.3.3.5.3. Maintenance of a constant engine throttle;
- 3.3.3.5.4. The use and operation of the water turret mounted on the fire truck;
- 3.3.3.5.5. 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.
- 3.3.3.5.6. 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 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 (access hatches, and shutters).

3.3.3.6. 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. 3**";
- 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. 500/2018¹. 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

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

- 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 supplied by firefighting pumps
- 3.10.14. ECE Regulation No. 65 – Uniform provisions concerning the approval of special warning lamps for motor vehicles
- 3.10.15. EN 60309 – Plugs, socket-outlets and couplers for industrial purposes (used in emergency vehicles for electrical connections).
- 3.11. The annexes no.1 – 3 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. Terms and Conditions of Delivery

4.1. Delivery Terms

Delivery will be made according to the INCOTERMS 2020 clause - DDP (Delivered Duty Paid) - free destination, customs cleared, at the beneficiary's premises in the Republic of Moldova. The seller will bear all costs and risks related to transport, handling, customs duties and other expenses until the goods are delivered to the final destination.

4.2. Place of delivery:

Republic of Moldova, Causeni city, Mihail Kogălniceanu street no. 11, beneficiary's headquarters.

4.3 Delivery time:

The period of implementation of the acquisition from the date of signing the contract, complete delivery of the goods will take place **no later than 01.11.2026**.

5. Estimated value of the goods to be purchased:

470,000 (four hundred seventy thousand) EURO. Excluding VAT

5.1 The project in question was included in the Decision of the Government of the Republic of Moldova No. 246 of 08.04.2010 on the application of tax and customs facilities related to the implementation of ongoing technical and investment

assistance projects, which fall under the scope of international treaties to which the Republic of Moldova is a party, by supplementing Annex No. 1 to the Decision with point 293648, AMP ID 87211686077.

MADE:

Deputy Head

of the Causeni Regional Directorate for Exceptional Situations of the GIES of the MIA

lieutenant colonel of the s/intern

Igor CALANCEA

Head of the interventions service

of the Causeni Regional Directorate for Exceptional Situations of the GIES of the MIA

lieutenant major of the s/intern

Ghenadie FLOREA

Head of the logistic service

of the Causeni Regional Directorate for Exceptional Situations of the GIES of the MIA

lieutenant of the s/intern

Irina CALDAROV

COORDINATED:

Deputy Head

of the Directorate-General for Interventions

of the GIES of the MIA

lieutenant colonel of the s/intern

Alexandru SUSARENCO

Head of the Logistics Department

of the GIES of the MIA

colonel of the s/intern

Vlad GOLBAN

LIST
of Equipment and Accessories of the Vehicle for Extinguishing Forest Fires

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.	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	4
8.	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	4
9.	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	4
10.	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
11.	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
12.	Coffret key made of heat-treated steel, resistant to torsion, bending, mechanical shocks, and extreme temperatures.	Unit	1
13.	Type A coupling key made of heat-treated steel, resistant to torsion, bending, mechanical shocks, and extreme temperatures.	Unit	2
14.	Type B coupling key made of heat-treated steel, resistant to torsion, bending, mechanical shocks, and extreme temperatures.	Unit	2
15.	Type C coupling key made of heat-treated steel, resistant to torsion, bending, mechanical shocks, and extreme temperatures.	Unit	2
16.	Hose tying cord: Type C.	Unit	4
17.	Suction hose support cord: Type A.	Unit	1
18.	Suction basket.	Unit	1
19.	Elbow for hose.	Unit	2
20.	Distributor B-CBC made of aluminum alloy.	Unit	1
21.	Distributor C-DCD made of aluminum alloy.	Unit	2
22.	Hose band for discharge hose type B.	Unit	2
23.	Hose band for discharge hose type C.	Unit	4
24.	Hose band for discharge hose type D.	Unit	4
25.	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><th colspan="2">Inner diameter for a type B hose</th><th colspan="2">Delivery length (meters)</th></tr><tr><th>Nominal</th><th>Limit deviations</th><th>Nominal</th><th>Limit deviations</th></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><th rowspan="2">Product</th><th colspan="2">Check pressure [bar]</th></tr><tr><th>Test pressure</th><th>Minimum burst pressure</th></tr><tr><td>Hose type B</td><td>25</td><td>40</td></tr></table>	Inner diameter for a type B hose		Delivery length (meters)		Nominal	Limit deviations	Nominal	Limit deviations	76	+ 1,0 / -0,5	20	+ 1,0 / -1,0	Product	Check pressure [bar]		Test pressure	Minimum burst pressure	Hose type B	25	40	M.L.	100
Inner diameter for a type B hose		Delivery length (meters)																					
Nominal	Limit deviations	Nominal	Limit deviations																				
76	+ 1,0 / -0,5	20	+ 1,0 / -1,0																				
Product	Check pressure [bar]																						
	Test pressure	Minimum burst pressure																					
Hose type B	25	40																					
26.	Type C 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><th colspan="2">Inner diameter for a type B hose</th><th colspan="2">Delivery length (meters)</th></tr><tr><th>Nominal</th><th>Limit deviations</th><th>Nominal</th><th>Limit deviations</th></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><th rowspan="2">Product</th><th colspan="2">Check pressure [bar]</th></tr><tr><th>Test pressure</th><th>Minimum burst pressure</th></tr><tr><td>Hose type C</td><td>25</td><td>40</td></tr></table>	Inner diameter for a type B hose		Delivery length (meters)		Nominal	Limit deviations	Nominal	Limit deviations	52	+ 1,0 / -0,5	20	+ 1,0 / -1,0	Product	Check pressure [bar]		Test pressure	Minimum burst pressure	Hose type C	25	40	M.L.	100
Inner diameter for a type B hose		Delivery length (meters)																					
Nominal	Limit deviations	Nominal	Limit deviations																				
52	+ 1,0 / -0,5	20	+ 1,0 / -1,0																				
Product	Check pressure [bar]																						
	Test pressure	Minimum burst pressure																					
Hose type C	25	40																					
27.	Type D 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><th colspan="2">Inner diameter for a type C hose</th><th colspan="2">Delivery length (meters)</th></tr><tr><th>Nominal</th><th>Limit deviations</th><th>Nominal</th><th>Limit deviations</th></tr><tr><td>25</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><th rowspan="2">Product</th><th colspan="2">Check pressure [bar]</th></tr><tr><th>Test pressure</th><th>Minimum burst pressure</th></tr><tr><td>Hose type D</td><td>30</td><td>50</td></tr></table>	Inner diameter for a type C hose		Delivery length (meters)		Nominal	Limit deviations	Nominal	Limit deviations	25	+ 1,0 / -0,5	20	+ 1,0 / -1,0	Product	Check pressure [bar]		Test pressure	Minimum burst pressure	Hose type D	30	50	M.L.	200
Inner diameter for a type C hose		Delivery length (meters)																					
Nominal	Limit deviations	Nominal	Limit deviations																				
25	+ 1,0 / -0,5	20	+ 1,0 / -1,0																				
Product	Check pressure [bar]																						
	Test pressure	Minimum burst pressure																					
Hose type D	30	50																					
28.	Progressive hose pack backpack (for 2 D type hoses)	Unit	5																				
29.	Bag for keys with straps and handles	Unit	1																				
30.	Bandage bag for discharge hose.	Unit	1																				

31.	Portable hydrant type B with valves (according to EN 14339)	Unit	1
32.	Portable hydrant (GOST type, used in the post-Soviet Union countries) with valves.	Unit	1
33.	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.)	Unit	2
34.	Rubber hose bridge for 2 type B hoses that ensures the safe passage of the fire truck. Construction material – rubber.	Unit	2
35.	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
36.	Reduction coupling B-C.	Unit	2
37.	Reduction coupling C-D.	Unit	4
38.	Strainer with mesh made of lightweight metal materials or corrosion-resistant aluminum alloy.	Unit	1
39.	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
40.	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
41.	Suction hose type A with couplings for the pumping unit. Minimum length of 4 meters.	Unit	2
42.	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	2

	- 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 360° rotation of the gun connected to the hose.		
43.	Type D Water Discharge nozzle: - automatic pressure regulation system with variable flow; - 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; - internal sieve to prevent large impurities from entering; - teeth cut in aluminum for the generation of fine drops; - type D connection in the back on the same axis as the nozzle, with the possibility of 360° rotation of the gun connected to the hose.	Unit	4
44.	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
45.	Collapsible Water Tank (minimum volume 1000 Liters) suitable for installation of the suction hoses of the motor pump	Unit	1
46.	Bolt/Rebar Cutter: - 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	Unit	1
47.	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	2
48.	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
49.	Self-contained breathing apparatus set with 4 panoramic masks, air cylinder and transport harness.	Unit.	4 SCBA 16 masks
50.	Spare compressed air cylinders.	Unit.	4
51.	TETRA handheld radio terminals.	Unit.	6
52.	Crowbar 1700 mm, 7.2 kg.	Unit.	1
53.	Crowbar 800 mm x 19 mm.	Unit.	1
54.	Sledgehammer, 2 kg , handle made of fiberglass.	Unit.	1
55.	Sledgehammer, 10 kg , handle made of fiberglass.	Unit.	1
56.	Carpenter's hammer with split claw, 14" (570 g).	Unit.	1
57.	Medical Backpack (Red) – Dimensions: 65 cm x 40 cm x 30 cm	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

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
10.	Anti-slip chains for all driving wheels of the vehicle	Set	2

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: $\pi/4$ 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 inhibit;
- 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: $\pi/4$ DQPSK
- c) Receiver: Class A și 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. Programming

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 dell'informazione
(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