NOTICE OF CALL FOR TENDERS No ND-xxx

PROJECT: "Pilot Telemetering and Management System for the Electric Power Supply Demand by Residential and Small Commercial Consumers and Implementation of Smart Grids".

TECHNICAL DESCRIPTION OF THE DISTRIBUTION SUBSTATION REMOTE MONITORING SYSTEM
CONTENTS

1. SCOPE .................................................................................................................. 3

2. KEYWORDS ......................................................................................................... 3

3. OPERATING CONDITIONS ............................................................................. 3
   3.1. Environmental Conditions ......................................................................... 3
   3.2. Electrical System Characteristics .......................................................... 4
       3.2.1. Characteristics of the Medium Voltage electrical system .......... 4
       3.2.2. Characteristics of the Low Voltage electrical system.............. 4

4. SYSTEM DESCRIPTION ................................................................................. 4
   4.1 Communication Device (modem) GSM/GPRS........................................ 4
   4.2 Uninterruptible Power Supply ............................................................... 5
   4.3 Input Unit ................................................................................................. 5
   4.4 Output Unit ............................................................................................. 5
   4.5 Software (Local/Central) ........................................................................ 5

5. INSTALLATION AND SUPPORT REQUIREMENTS ........................................ 6
   5.1. Installation Requirements ...................................................................... 7
   5.2. Support Requirements .......................................................................... 7

6. SAMPLE CONSTRUCTION AND SYSTEM CONTROL .................................. 7
1. SCOPE
The technical description refers to the requirements for the construction and installation of the distribution substation Remote Monitoring System for informing the responsible departments in order to take actions.

The Controlled quantities in the substation can be:
- Shell transformer temperature (analogue figure).
- Transformer load (analogue figure).
- Voltage Loss (Digital figure).
- High water level (digital figure).
- Crossing error indication (digital figure).
- Person approach - proximity sensor (digital figure).

The central system can send orders to the system in order to perform actions such as:
- Water pump activation.
- Alarm activation.
- Fire extinguishment activation.
- Lamp / fan activation etc.

2. KEYWORDS
Distribution Substation, Remote Monitoring System, MV, LV

3. OPERATING CONDITIONS
3.1. Environmental Conditions
The system shall be suitable for indoor or outdoor installation, in the following environmental conditions:
- Maximum environmental temperature: +60°C.
- Maximum daily (24h) air temperature: +35°C.
- Maximum mean annual air temperature: +20°C.
- Minimum environmental air temperature: -25°C.
- Altitude up to 2000 meters above sea level.

The system will be suitable for installation in dusty conditions, humidity and rain and shall have at least IP53 protection.
3.2. Electrical System Characteristics

3.2.1. Characteristics of the Medium Voltage electrical system

Three-phase distribution network, three (3) conductors with grounded neutral node only on departure (without distributed neutral) either directly or through a resistor which limits the fault current to earth at 1000 A, with the following characteristics:

- Nominal voltage system Ur: 6.6 kV 15 kV 20 kV
- Maximum voltage system Um: 7.2 kV 17.5 kV 24 kV
- Frequency: 50 Hz 50 Hz 50 Hz
- Short circuit power: 160 MVA 250 MVA 250 MVA
- Shock wave resistance 1.2 / 50 µs: 60 kV 95 kV 125 kV

3.2.2. Characteristics of the Low Voltage electrical system

Three-phase distribution network, four (4) conductors (3 phases and neutral), nominal voltage 230 V (400 V, voltage between phases), frequency 50 Hz, with multiple grounded neutral conductor.

4. SYSTEM DESCRIPTION

The system shall have the «CE» mark (LV Directive and EMC Directive).

The system will consist of the following parts:

- Communication device (modem) GSM / GPRS.
- Uninterruptible Power Supply.
- Input unit.
- Output unit.
- Software (Local / Central).

4.1 Communication Device (modem) GSM/GPRS

The communication device (modem) shall have at least the following functionalities:

- GSM / GPRS 900/1800/1900 MHZ
- Class 10
• Data / Voice / SMS
• Internal sim holder
• Plug and Play
• Light Indications with LED
• RS485 serial communication
• Configuration by SMS and locally through the RS485 port

4.2 Uninterruptible Power Supply
The central device is an electronic device installed in indoor substation or outdoor substation (a pole) and is electrically power supplied with voltage 100 - 240 V AC.

The central device in case of power loss from the Transformer shall send to the central system a voltage loss message.

It should have a lithium battery (rechargeable), which can power supply the central device for at least 8 hours in order to send a message.

The guaranteed battery life shall be at least 5 years.

4.3 Input Unit
The central device has an input unit with at least:

• 2 digital inputs (High - Low)
• 2 analog inputs (0 - 30V)

4.4 Output Unit
The central device has an output unit with at least:

• 2 output relays 230V / 10A

4.5 Software (Local/Central)
The supplier shall install in a suitable server, the software for the communication between the central system and the local systems in order to receive, send and data process, to register and manage all relevant data in the system, and to create reports. The software will be able to support at least 5,000 supervised local systems.
The surveillance and reports creation software must provide at least the following functions:

- Geographical display at Google Earth map of each supervised location (Substation) through a special symbol that marks the supervised position. Alternatively, it can be determined in the notice of call for tenders, that the software will include vector maps of the road map of each surveillance area. For the latest software it should not be required to pay the use rights (beyond the initial license).

- Ability to add new positions (Substations) under surveillance with easy and user-friendly way (menu-driven).

- Any incident shall in real time create:
  o Color change of the special supervised position symbol.
  o Buzz in the central system room, which stops after recognition by the operator.
  o Display of analog quantities (e.g. substation shell temperature).

- The above information must be displayed either automatically (according to predefined and parameterized limits) or at authorized operator commands.

- Display of the last ten (10) events (FIFO method) in an event mode (list) in the screen. Through menu, the user will be able to display past event status, which in each case the preceding period is defined by the user, e.g. event status of last month. In the event status the geographical location, its type, date, time etc shall be referred.

- Automatic event and data storage for a time period specified by the user.

- The user should be able to create reports using an easy and friendly interactive program for reports creation. These reports must contain the location of incidents, their type, date, time etc.

- Activation, deactivation of the device outputs automatically or after command from an authorized user, as well as the configuration of the local systems.

- Data send, such as email to computers connected to the INTRANET of HEDNO or/and mobile phones.

- Full interface with Telemetering Centers and external programs such as GIS and Microsoft EXCEL, ACCESS etc. using e.g. OLE software.

5. INSTALLATION AND SUPPORT REQUIREMENTS
5.1. Installation Requirements

The installation of the System consists of:

- On-site installation of the local systems, i.e., central device (with the necessary equipment, SIM card, backup battery, etc.), connection with the Low Voltage, the supervised Substation etc.
- Software installation.
- Local system activation for immediate operation, including communication.
- Proper operation control of local systems (false alarm avoidance).
- Any other action that ensures the satisfactory performance of the above functions.
- Indelible nameplate of the manufacturer and the installation date of the local systems, mounted in the components box.
- Central system installation in the room of the Telemetering Centre of HEDNO and operation.

5.2. Support Requirements

The supplier should provide the following as part of the system requirements support:

- Training to all relevant staff of HEDNO.
- Operation manuals and maintenance of the local systems as well as of the equipment and surveillance software – and creation of reports in Greek.

6. SAMPLE CONSTRUCTION AND SYSTEM CONTROL

Before system serial construction and installation, the Supplier must provide a complete sample.

The sample should consist of the following:

a) Local system.

b) Central and local system Software.

c) Typical central system equipment (not necessarily complete, but sufficient enough to check the specified functions).