

National Petroleum Company (NPC)

Tender No. 38/2024/G.M

Scope of Supply

Introduction:

The NPC Risha site currently utilizes a wireless radio system for the transmission of data from natural gas wellheads to the NPC Risha Control Room which have a SCADA workstation with RSVIEW32 installed, facilitating remote monitoring and control of the wellheads process.

The existing wireless radio system comprises 5 RTU panels, each equipped with a PLC (Rockwell - MicroLogix 1500) and IO cards, alongside wireless Radio Modems (Esteem 192C) for data transmission via radio links. However, due to the extended service life of 18 years, some of the radio modems have degraded, leading to communication interruptions.

To address this issue and enhance system performance, we propose to upgrade the existing radio system using Ethernet wireless technology or superior alternatives. This upgrade will ensure reliable and efficient data transfer, facilitating seamless remote monitoring and control of the natural gas wellheads at the NPC Risha site.

Scope Of Supply:

Broadly, the scope of supply and services should encompass the following to upgrade the existing Radio wireless system

Hardware Supply:

- Comprehensive wireless system including modems, antennas, outdoor Ethernet cables, Ethernet switches, Surge Protectors and any other necessary accessories.
- All necessary panel accessories, including terminals, fuse terminals, wire labels, trunks, ...etc.
- Configuration and programming software, if needed.
- License/application fees for modem approval by TRC, if necessary.
- Any other items required to upgrade the existing wireless /RTU systems, if needed.
- Recommended spare parts list with itemized prices.

Services Supply:

- Installation and commissioning of the provided hardware at the NPC Risha site



- Configure all necessary settings for the new systems.
- Implement all program modifications/upgrades in the existing PLC system.
- Perform all necessary functional and technical testing for the newly supplied wireless and PLC systems.
- Connect all the wells to the main control room.

The below summaries the wellhead RTU which needs to be upgraded.

Technical Note: The vendor is tasked with ensuring the compatibility of the existing PLC and SCADA system with the newly supplied wireless system. Should it be necessary, the vendor is required to upgrade the existing PLC to support an Ethernet interface. Additionally, the vendor must provide the option to retain or upgrade the IO cards.

1. Control Room

The below table summarizes the main RTU components

S. No	Part #	Qty	Notes
1	Esteem 192C	1	

1. Esteem 192C to be replaced by the new wireless system.

2. ZONE-B -Compressor RTU

The below table summarizes the main RTU components

S. No	Part #	Qty	Notes
1	1764-28BXB 1764-LRP	1	
2	1769-IF4	1	
3	Esteem 192C	1	

1. The vendor should supply of new metal outdoor IP65 Enclosure including Terminals & Accessories
2. Enclosure Size 80x60x20 with suitable mounting base.
3. Tri-Loop, Safety Barrier, Power Supply, Surge will be moved from old panel to new panel.
4. Esteem 192C to be replaced by the new wireless system.
5. PLC CPU is to be replaced by a newer compatible model.
6. IO Card to be reused or replaced if necessary.
7. The vendor is responsible for the installation and wiring of the newly added components and the old components inside the new enclosure.



3. ZONE-C RTU - RH-8 ,RH-18,RH-22

The below table summarizes the main RTU components

S. No	Part #	Qty	Notes
1	1764-28BXB 1764-LRP	1	
2	1769-IF4	3	
3	Esteem 192C	1	

1. Esteem 192C to be replaced by the new wireless system.
2. PLC CPU is to be replaced by a newer compatible model.
3. IO Cards to be reused or replaced if necessary.

4. RH-20-RTU

The below table summarizes the main RTU components

S. No	Part #	Qty	Notes
1	1764-28BXB 1764-LRP	1	
2	1769-IF4	1	
3	Esteem 192C	1	

1. Esteem 192C to be replaced by the new wireless system.
2. PLC CPU is to be replaced by a newer compatible model.
3. IO Card to be reused or replaced if necessary.

5. RH-25-RTU

The below table summarizes the main RTU components

S. No	Part #	Qty	Notes
1	1764-28BXB 1764-LRP	1	
2	1769-IF4	1	
3	Esteem 192C	1	

1. Esteem 192C to be replaced by the new wireless system.
2. PLC CPU is to be replaced by a newer compatible model.
3. IO Card to be reused or replaced if necessary.



6. RH-32-RTU

The below table summarizes the main RTU components

S. No	Part #	Qty	Notes
1	1764-LRP	1	
2	1769-IF4	1	
3	Esteem 192C	1	

1. Esteem 192C to be replaced by the new wireless system.
2. PLC CPU is to be replaced by a newer compatible model.
3. IO Card to be reused or replaced if necessary.

Locations of the RTUs

Site Name	Latitude	Longitude	Antenna Height (m)	Altitude (m)
Control Room	32 35 46.35 N	039 02 39.86 E	5	849
Compressor	~100 meters from the control room and line of sight is available			
RH-8, 18, 22	32 34 43.27 N	039 01 43.83 E	5	863
RH-20	32 36 12.56 N	039 02 36.73 E	5	840
RH-25	32 34 34.59 N	039 02 26.78 E	5	856
RH-32	32 36 51.21 N	039 02 27.38 E	5	837

A 6-meter pole exists on each site and can be used by the vendor for the installation of Antennas or other relevant components.



Technical Requirements:

Broadly, the vender should encompass the following technical requirements:

1. Ethernet RF Technology or Superior Wireless Communication Solution:

Procure the necessary hardware and equipment for the upgraded wireless communication system. This may include Ethernet RF devices, antennas, transceivers, routers, and any other relevant components.

2. Industrial-grade Networking Equipment:

Provide industrial-grade networking equipment to support the upgraded wireless system, including switches, routers, access points, and other networking devices. Ensure compatibility with the chosen Ethernet RF technology or wireless communication solution.

3. Fees for Relevant Licenses and Approvals:

Provide a quotation for any applicable fees associated with licenses or approvals required for the proposed system.

4. Installation Materials and Accessories:

Source all required materials and accessories for the installation of the upgraded wireless system, such as mounting hardware, cables, connectors, enclosures, and weatherproofing materials. Ensure that these materials are suitable for the environmental conditions at the NPC Risha site.

5. Software and Firmware:

Obtain the necessary software and firmware for configuring, programming, and managing the upgraded wireless system. This may include configuration software for Ethernet RF devices, firmware updates, and monitoring tools for network management.

6. Integration with Existing Infrastructure:

Ensure seamless integration of the upgraded wireless system with the existing infrastructure at the NPC Risha site. This includes compatibility with existing Rockwell PLCs, IO cards, SCADA, control room systems, and other relevant equipment.

7. System Design and Engineering Services:

Engage the services of qualified engineers to design and engineer the upgraded wireless system. This may involve conducting site surveys, developing system architecture diagrams, and creating installation plans.

8. Installation and Commissioning:

Provide installation services for deploying the upgraded wireless system at the NPC Risha site. This includes mounting hardware, installing antennas, running cables, configuring networking equipment, and commissioning the system for operation.



9. Training and Documentation:

Offer training for personnel responsible for operating, maintaining, and troubleshooting the upgraded wireless system. Develop comprehensive documentation, including user manuals, technical specifications, and maintenance procedures.

10. Testing and Validation:

Conduct thorough testing and validation of the upgraded wireless system to ensure its performance, reliability, and compatibility with existing infrastructure. This may involve functional testing, performance testing, and interoperability testing.

11. Support and Maintenance Services:

Provide ongoing support and maintenance services for the upgraded wireless system. This should be included with the project warranty support for 1 year.

12. PLC Specifications

The below table contains the required specification's for the new PLC/s that will replace the old system/s

GENERAL TERMS & CONITIONS		
#		Description
1	Geneal Specification	
1.1	PLC	PLC should be modular by plugging additional modules
		include math and logic functions
		CPU should retain memory after a power loss by the means of non-volatile memory
		CPU should be capable of scanning and updating I/O, executing logic and analogue functions and support communication interfaces to achieve required performance)
		Support of standard IEC 6113103 programming languages
		Support for international standards such as CE, UL Listed, EN 61000-6-2, EN 61000-6-4...Etc.
		Support for operating temperature -20...+65 °C
		Support for operating temperature 5...95% noncondensing
		The CPU should include a real-time clock/calendar
		Analog inputs detection of fault (like line-break...etc.)
		Power supply voltage range -24 VDC
		Power supply for the PLC cabinet -220VAC
		IO terminal block should be removable to allow replacement without disturbing of field wiring



		The controller should be DIN rail mounted, with front access to all controls, indicators, and communication ports
		Each IO Cards (Digital/Analogue)- shall be fused protected with LED
1.2	Communication	Support for Ethernet/IP Protocol
		Support for Modbus RTU
		Support multiple data communication by using open communication protocols
2	General Conditions	
2.1	General requirements	All relevant documents (panel drawings, single-line diagrams, PLC ladder diagram, and point-to-point wiring diagrams shall be provided
		A past reference of a project with similar ethernet wireless setups
		All supplied materials/systems shall be from well-known reputed manufacturers and with USA/EU Origin
		Proprietary Protocols /Software (owned by single organization) will not be allowed
		A Separate Recommended spare list shall be provided with breakup prices
		PLC-Engineering software and all accessories, (programming cables ...etc.) shall be quoted as optional item
		Program Software with license certificate and all accessories shall be provided and registered for the End User -National Petroleum Company (NPC)
		The project delivery time shall be with a period of a maximum of 6 weeks
		Warranty should not be less than 1 year



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