
 <p>شرکت آهن و فولاد غدیر ایرانیان Iranian Ghadir Iron &amp; Steel Co.</p>	<b>IRANIAN GHADIR IRON &amp; STEEL COMPANY</b>  <b>DIRECT REDUCTION PLANT</b>			Date: 05/20/2026
		Rev:	2	
	<b>Document name:</b>		<b>Enquiry Document for RO System Redesign</b>	

**ENQUIRY DOCUMENT FOR RO SYSTEM REDESIGN**  
  
**FOR**  
  
**IRANIAN GHADIR IRON & STEEL COMPANY**

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## 1.Introduction

In order to advance the iron and steel industry of Iran and in line with the twenty-year plan for economic and social development, Iranian Ghadir Iron and Steel Co. established in 2006, which was made possible with cooperation of Iranian mines and mining Industries Development and renovation organization (IMIDRO) and with the share of Ghadir Investment company, Chador Malu Mining & Industrial Co. (CMIC) and Iran Alloy Steel Co.

Ghadir DRI plant with annual capacity of 1,200,000 tons sponge iron with the aim to fulfill the needs of melting and casting units of the Yazd province and other steel producers of the country established. It is located in an area of 86 hectors, with a distance of 25 kilometers from the city of Ardakan, Yazd Province and beside the Chador Malu Pelletizing Complex and Arfa Iron and Steel Co.

In order to reduce the plant water consumption, the Company intends to utilize the concentrate outlet stream of the existing RO unit in the plant (Concentrate flow rate = 15 m<sup>3</sup>/hr) as the feed water for a new RO system.

For this purpose, the Company plans to overhaul and redesign one of the existing old RO units, currently out of service, in accordance with the new operating conditions.



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## 2. SITE CONDITIONS

### 2.1. GEOGRAPHICAL CONDITION

Location	(25 kilometers from the city of Ardakan)
Altitude from sea level	1142 m
Longitude	32° 22' N
Latitude	53° 47'

### 2.2. METEOROLOGICAL CONDITION

Atmospheric pressure	866 mbar
o Dry-Bulb Temperature	-16°C Winter (minimum) -10°C Winter (Design) +45°C Summer (Maximum) +37°C Summer (Design)
Wet bulb temperature	+20°C Summer (Design)
Relative humidity	o Maximum mean 66 % o Maximum mean 11 %
Maximum rainfall intensity	
o per day	28 mm
o precipitation	60 mm/year
Seismic Condition	
o Seismic zone factor	Z = 0.3
o Soil classification type	Sc


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### 3.FEED WATER QUALITY

FEED WATER QUALITY										
M-ALK ppm	P-ALK ppm	Cl - ppm	MgH ppm	CaH ppm	TH ppm	TSS ppm	TDS ppm	EC μs/cm	PH	Flow rate m3/hr
280	0	1060	118	220	338	0	1820	2800	7.88	15

### 4. PRODUCT WATER QUALITY

PRODUCT WATER QUALITY			
Item	Parameter	Unit	Amount
1	EC	ppm	<25
2	Recovery		>75%

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## 5. SUPPLIER SCOPE OF WORK

Overhaul and Redesign of Out of Service Existing RO (Reverse Osmosis) Unit

### 5.1. GENERAL

This project covers the inspection, engineering review, overhaul, redesign, refurbishment, testing, commissioning, and performance optimization of the currently out of service existing Reverse Osmosis (RO) unit.

The supplier shall assess the current condition of the RO unit and provide all necessary engineering, materials, labor, supervision, documentation, and commissioning services required to restore and upgrade the unit to reliable operational condition based on the new feed water quality specified in section 3.

### 5.2. Scope of Supply and Services

The Supplier's scope of work shall include, but not be limited to, the following:

#### 5.2.1 Engineering and Redesign

The Supplier shall carry out complete engineering review and redesign of the RO unit as required to ensure compliance with the specified operating conditions and performance requirements.

Engineering activities shall include, but not be limited to:

Process design verification

Membrane selection and sizing

Hydraulic calculations

Pump capacity verification

Piping and valve sizing review

Instrumentation review

Electrical load verification

Control philosophy review


Skid layout optimization

Reliability and maintainability improvement

The Supplier shall prepare and submit the following documents for approval

Process Flow Diagram (PFD)

Piping & Instrumentation Diagram (P&ID)

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General Arrangement Drawings (GA)

Electrical drawings

Instrument list

Cable schedule

Datasheets for major equipment

Bill of Materials (BOM)

### 5.2.2 Mechanical Works

The Supplier shall perform all necessary dismantling, overhaul, repair, replacement, fabrication, and installation works related to the mechanical systems.

The scope may include, but shall not be limited to:

High-pressure pumps

Cartridge filters and housings

RO membranes

Pressure vessels

Valves and fittings

Interconnecting piping

Chemical dosing systems

Chemical tanks

Flow meters and pressure gauges

Pipe supports and skid structure

#### **Mechanical works shall include:**

Replacement of pressure vessels as required by the redesign.

Replacement of new RO membranes as required by the new design.


Modification and replacement of piping, fittings, valves, and related accessories affected by the redesign.

Dismantling and inspection

Cleaning and flushing

Replacement of damaged parts

Bearing and seal replacement

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Welding and fabrication

Sandblasting and painting where required

Alignment and reassembly

### 5.2.3 Electrical and Instrumentation Works

The Supplier shall inspect, overhaul, repair, modify, or replace the electrical and instrumentation systems as necessary.

The scope shall include:

MCC/control panel inspection

Replacement of defective electrical components

PLC/HMI upgrade or modification if required

Instrument calibration

Cable inspection and termination

Interlock verification

Functional testing of control systems

Instrumentation may include:

Pressure transmitters

Conductivity analyzers

Flow transmitters

Level switches

pH analyzers

### 5.2.5 Commercial Boundary and Pricing Basis

The supplier quoted price shall include:

Engineering and redesign services


Inspection and technical evaluation activities.

Servicing and overhaul labor costs.

Supply cost of all new membranes required by the redesigned system.

Supply cost of all new pressure vessels required by the redesigned system.

Supply cost of all piping and piping modifications resulting from the supplier redesign.

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Supply cost of replacement of PLC resulting from the supplier redesign.

All consumables, tools, manpower, supervision, and standard commissioning activities

Any component, equipment, piping, fitting, or accessory required due to the supplier's proposed redesign philosophy and engineering modifications shall be deemed included in the supplier's quoted price.

The supplier shall inspect and service all existing equipment with reasonable professional care

If, during servicing, overhaul, dismantling, inspection, or testing activities, any existing equipment or component is found to be damaged, defective, worn out, or non-serviceable, the supplier shall officially notify the Employer through a formal written technical report prior to replacement.

In such cases:

The Employer may directly procure and supply the required spare part or replacement item to the supplier or the supplier may supply the required item subject to Employer approval, and the related cost shall be reimbursed separately based on official commercial invoice/factorized cost documentation.

Accordingly, costs related to defective existing equipment discovered during overhaul activities are excluded from the Bidder's lump-sum tender price unless explicitly stated otherwise.

The cost of supplying seals and bearings for the overhauled pumps during the servicing process shall be borne by the supplier.

### **5.2.6 Testing and Commissioning**

The Supplier shall carry out all required inspections, testing, pre-commissioning, and commissioning activities.

Testing activities shall include, but not be limited to:

Mechanical Tests

Hydrostatic testing

Leak testing

Pump rotation check


Alignment verification

Electrical and Control Tests

Loop checking

Interlock testing

Functional testing

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PLC/HMI verification

Performance Test

The Supplier shall demonstrate that the upgraded RO unit achieves the specified:

Permeate flow rate

Product water quality

Recovery rate

Operating pressure stability

Membrane performance

A complete commissioning report shall be submitted upon successful completion of the tests

## 6. Deliverables

The Supplier shall provide the following documents :

Technical assessment report

Engineering calculations

Approved drawings

Equipment datasheets

Inspection and test reports

Calibration certificates

Operation and Maintenance Manual (O&M)

Recommended spare parts list

Final commissioning report


PLC Logic

As-built drawings:

Process Flow Diagram (PFD)

Piping and instrument diagrams (P&ID)

General Arrangement Drawings (GA)

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ANNEX A





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