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SPECIFICATION FOR LBV

نگهداشت و افزایش تولید میدان نفتی بینک

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Status:

IDC: Inter-Discipline Check
IFC: Issued For Comment
IFA: Issued For Approval
AFD: Approved For Design
AFC: Approved For Construction
AFP: Approved For Purchase
AFQ: Approved For Quotation
IFI: Issued For Information
AB-R: As-Built for CLIENT Review
AB-A: As-Built –Approved

REVISION RECORD SHEET

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CONTENTS

1.0 INTRODUCTION

Binak oilfield in Bushehr province is a part of the southern oilfields of Iran, is located 20 km northwest of Genaveh city.

With the aim of increasing production of oil from Binak oilfield, an EPC/EPD Project has been defined by NIOC/NISOC and awarded to Petro Iran Development Company (PEDCO). Also PEDCO (as General Contractor) has assigned the EPC-packages of the Project to "Hirgan Energy - Design and Inspection" JV.

GENERAL DEFINITION

The following terms shall be used in this document.

CLINET:	National Iranian South Oilfields Company (NISOC)
PROJECT:	Binak Oilfield Development – General Facilities
EPD/EPC CONTRACTOR(GC):	Petro Iran Development Company (PEDCO)
EPC CONTRACTOR:	Joint Venture of: Hirgan Energy – Design & Inspection(D&I) Companies
VENDOR:	The firm or person who will fabricate the equipment or material.
EXECUTOR:	Executor is the party which carries out all or part of construction and/or commissioning for the project.
THIRD PARTY INSPECTOR (TPI):	The firm appointed by EPD/EPC CONTRACTOR (GC) and approved by CLINET (in writing) for the inspection of goods.
SHALL:	Is used where a provision is mandatory.
SHOULD:	Is used where a provision is advisory only.
WILL:	Is normally used in connection with the action by CLINET rather than by an EPC/EPD CONTRACTOR, supplier or VENDOR.
MAY:	Is used where a provision is completely discretionary.

2.0 SCOPE

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The purpose of this specification is to define the main requirements for the design, manufacturing, testing and documentation of the 'Line Break Valve of Binak new Gas Pipeline ~~(Gas-condensate Pipeline work package)~~. Any deviation from the present specification at any stage of the project shall be subject to CONTRACTOR for approval.

3.0 NORMATIVE REFERENCES

3.1 LOCAL CODES AND STANDARDS

- IPS-E-IN-160 Engineering Standard for Control Valves
- IPS-C-IN-160 Construction and Installation Standard for Control Valves
- IPS-M-IN-160 Material Standard for Control Valves
- IPS-M-IN-280 Material Standard for Miscellaneous items
- IPS-M-PI-110 Material and equipment standard for valves
- IPS-G-IN-160 Petroleum industry-Safety valves, control valves and peripherals
- IPS-E-PI-140 Engineering Standard for Onshore Transportation Pipelines

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3.2 INTERNATIONAL CODES AND STANDARDS

- American National Standards Institute (ANSI)

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ANSI/NACE MR0175/ISO15156	Petroleum And Natural Gas Industries - Materials For Use In H2S Containing Environments In Oil And Gas Production
ANSI B16.5	Flanged connections
ANSI B16.34	Valves-flanged and buttwelding
ANSI B16.104	Control valve seat leakage
ANSI B16.37	Hydrostatic Testing of Control Valves

- American Petroleum Institute (API)

API 6D	Pipeline valves
API 6F	Fire test for valves
API 607	Fire test for soft seated quarter turn valves
API 521	Guide for pressure relief and de-pressuring system
API 598	Valve Inspection and Tests

- International Electrical Commission (IEC)

IEC 60529	Ingress protection for electrical apparatus

- American Society of Mechanical Engineers (ASME)

ASME SECT.II	Welding rods and electrodes
ASME SECT.VIII	Radiographic examination
ASME SECT.IX	Welding and brazing qualification
ASME B31.8	Gas Transmission and Distribution Piping Systems

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- National Association of Corrosion Engineers (NACE)

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NACE TM0284	Standard Test Method - Evaluation Of Pipeline And Pressure Vessel Steels For Resistance To Hydrogen-Induced Cracking

- American Society for Testing and Materials (ASTM)

ASTM A488	Steel Casting, Welding Qualification of Personnel and Procedures
ASTM E 113	Standard Recommended Practice for Ultrasonic Testing by the Resonance Method
ASTM E 142	Standard Method for Controlling Quality of Radiographic Testing
ASTM E 165	Standard Recommended Practice for Liquid Inspection Method
ASTM E 446	Standard References Radiographic for Steel Casting
ASTM A435	Ultrasonic testing
ASTM 1457	Specification for PTFE moulding and extrusion materials

Vendor shall state the additional Codes and Standards if necessary. The latest published issue or amendment shall apply unless otherwise stated.

3.3 THE PROJECT DOCUMENTS

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Piping Material Specification	BK-GNRAL-PEDCO-000-PI-SP-0001
Specification For Painting	BK-GNRAL-PEDCO-000-PI-SP-0006
Process Basis of Design	BK-GENRL-PEDCO-000-PR-BD-0001
Specification For Instrumentation	BK- GENRL-PEDCO-000-IN-SP-0001
Spec. For Hazardous Area Classification	BK- GENRL-PEDCO-000-SA-SP-0002
Pipeline Material Specification	BK- GENRL-PEDCO-000-PL-SP-0001
Instrument & Control System Design Criteria	BK-SSGRL-PEDCO-110-IN-DC-0002
Instrument & Control System Design Criteria	BK-PPL-PEDCO-320-IN-DC-0002
Instrument & Control System Design Criteria	BK-GCS-PEDCO-120-IN-DC-0002
Symbol & Legend For PFD and P&ID	BK-SSGRL-PEDCO-110-PR-PI-0001

Instrument Earthing Typical Diagram	BK-PPL-PEDCO-320-IN-DG-0001
Symbol & Legend For PFD and P&ID	BK-PPL-PEDCO-320-PR-PI-0003
Process Flow Diagram For pipelines	BK-PPL-PEDCO-320-PR-PF-0001
P&ID - Gas Pipeline (to Siahmakan G.I. Station)	BK-PPL-PEDCO-320-PR-PI-0001
P&ID - Condensate Pipeline (to Binak PU)	BK-PPL-PEDCO-320-PR-PI-0002
D02 ~~Specification For Manual Valves~~	~~BK-GNRAL-PEDCO-000-PI-SP-0009~~
Specification For Pipeline Valves	BK-GNRAL-PEDCO-000-PL-SP-0006
Project Spare Part Supply Procedure	E&D-QC-SP-1

3.4 ENVIRONMENTAL DATA

Refer to "Process Basis of Design; Doc. No. BK- GNRAL-PEDCO-000-PR-BD-0001"

4.0 ABBRAVIATIONS

NISOC	:	National Iranian South Oil Company
AFC	:	Approved For Construction
AFD	:	Approved For Design
FAT	:	Factory Acceptance Test
GOV	:	Gas Operated Valve
D02 TSO	:	Tight shut-off

5.0 ORDER OF PRECEDENCE

In case of any conflict between the contents of this document or any discrepancy between this document and other project documents or reference standards, this issue must be reported to the CLIENT. The final decision in this situation will be made by CLIENT.

6.0 TECHNICAL SPECIFICATION

6.1 GENERAL REQUIREMENTS FOR VALVE

All valves shall be manufactured, tested and supplied in accordance with the American Petroleum Institute (API) Specification 6D, with additions and modifications as indicated in the following sections of this specification.

Isolating valves to be installed in pipelines which will be pigged shall be full bore through conduit gate valves or full bore ball valves.

Ball valves of size 10" and larger shall be trunnion mounted and be equipped with a secondary seal system to provide shut-off in the event of the primary seal.

Specific requirements for valves are detailed on the Valve Data Sheets, which accompany this Specification. Valve Data Sheets shall contain information such as line sizes, design requirements (pressure, temperature, process fluid) and specific material or design features required.

Valves shall be Full Bore (FB) as indicated on the Valve Data Sheet. Full Bore Valves shall be suitable for the passage of all types of pipeline scraper, sphere and inspection pigs. The bore size of full bore valves shall be as specified on the Data Sheet.

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Valve Seat Leakage shall be Class VI. This class is generally associated with metal seat, unbalanced single-port, single seat control valves or balanced single-port designs with exceptional seat and seal tightness.

The vale shall be suitable for pig running.

6.2 VALVE DESIGNED PRESSURE AND TEMPERATURE RATING

Pressure and temperature rating shall be in accordance with API 6D section 7.2 or as specified in the Valve Data Sheet.

Valves shall be TSO and capable of sealing with any pressure up to and including the maximum rated pressure of the valve on one side and atmospheric on the other.

Valves excluding check valves shall be capable of sealing at these pressures in either direction. Valves shall be designed to withstand a sustained internal vacuum of 1 (one) barg (i.e. full vacuum) in both open and closed positions.

6.3 GENERAL REQUIREMENTS FOR GAS OVER OIL ACTUATORS

The gas-over-oil actuator shall basically comprise of the following components:

- Actuating control box
- Actuator cylinders
- Gas-over-oil tank
- Hand pump with pertinent change-over valve
- Metering valve
- Sensing tank and double check valves.
- Double check valves to be considered.

The actuator shall have modular design and shall employ scotch yoke mechanism preferably with 90° rotation.

The actuator design shall be of cylinder type suitable for direct mounting on the valve as specified in Requisition. The actuator shall be capable of withstanding all envisaged line vibrations and movements.

All accessory equipment, such as; hand pump, limit switch, etc. shall be mounted, fully piped, connected and supplied with the actuator.

The actuator shall be equipped with suitable mechanical valve position indicator.

Two gas-over-oil pressure tanks which have different hydraulic oil levels is required. The difference between two oil level surfaces must be at least equal to the amount of oil required for a complete valve travel.

All actuator parts shall have suitable surface treatment to protect them against corrosion. All pneumatic and hydraulic components of the control system shall be made of corrosion resistant materials, such as; stainless steel and PTFE.

Self-control circuits shall be equipped with suitable control device for operating speed adjustment.

The actuator shall be equipped with suitable travel/torque protective hydraulic circuit to prevent any damage to the valve or actuator due to the excess torque, in case of valve travel blockage.

Hydraulic / pneumatic / Valve closing, opening operation description shall be specified by vendor.

Two gas-over-oil accumulator tanks (one for open and one for close actuation) complying with relevant accessories and circuit shall be considered.

D02 The automatic actuator should be designed to close the valve in the event of pipeline failure and subsequent rapid rate of change of pressure in the pipeline but should not be affected by normal operational pressure fluctuations.

6.4 GAS OVER OIL ACTUATOR LOCAL CONTROL SYSTEM

The actuator shall be gas over oil double acting type. The actuator shall be supplied with emergency hand pump, local push buttons or lever, local position indicator and emergency power gas storage tank for complete operations (one open & one close stroke).

The actuator should be provided with a suitable hand-operated control valve for local operation of the valve.

The actuator shall also have a hydraulic pump to enable local manual operation of the valve when there is no gas pressure available in the line.

The actuator shall be totally self-contained unit and shall be provided with suitable hermetically sealed solenoid operated valves for remote open/close operation. The solenoid valve shall be equipped with mechanical manual reset device.

The Line-Break valve actuator shall be suitable for automatic line-break detection and shall also be equipped with provision for local emergency actuation of the valve for application in gas pipe-lines.

The line-break detection circuit shall basically consist of; shuttle valve, metering valve, sensing tank, control cylinder, etc. to sense the rate of pressure drop. The system shall have provision to prevent erroneous actuation functioning, caused by either; a sudden pressure fluctuation within a range smaller than the designated pressure value or a graduate pressure fluctuation within a larger range by means of a suitable mechanism around the control cylinder.

The actuator system shall include the following features:

- Line-break detection and consequent automatic operation, by means of pipe-line gas pressurizing the hydraulic oil actuating system.

- Provision for local manual open/close operation by means of hydraulic hand pump.

The actuator shall be provided with suitable limit switches for remote indication of the valve extreme positions.

When the actuator closes the valve due to line-break detection, it shall be latched in the close position and shall be only opened locally.

Nitrogen capacity Tank requirement shall be considered and announce by vendor if required.

CLIENT shall confirm the actuator setting before manufacturing.

6.5 GAS OVER OIL ACTUATOR WITH LOCAL/ REMOTE/ESD CONTROL SYSTEM

The ESD actuator shall be suitable for automatic shutdown of the valve and shall also be equipped with provision for local actuation of the valve for application in gas pipe lines.

The ESD circuit shall consist of low and/or high gas operated pressure switches, manual reset, etc.

The actuator system shall include the following features:

- ESD detection system and automatic operation consequently by means of pipe line gas pressurizing the hydraulic oil actuating system.

- Provision for local manual open/close operation by means of hydraulic hand pump.

The actuator shall be provided with suitable situation status indication of the valve extreme positions when the actuator closes the valve.

6.6 NAMEPLATES

The following information included in the Actuator's nameplate shall be:

- Model or Type No.

- Output Torque
- Output Speed
- Pneumatic / hydraulic Supply Details in barg (bara)
- Maximum Safe Working Pressure
- Serial No.
- Lubricant
- Customer's Order No./Date

6.7 PAINTING

Painting system made of primary and final coats shall be as per SUPPLIER standards and transmitted to CONTRACTOR. Supplier shall verify that its standard painting system suits environmental conditions. Also the project specification for Painting (BK-GNRAL-PEDCO-000-PI-SP-0006) for protective paint and coating shall be studied by supplier. All surface preparations and painting shall be completed at vendor's workshop.

Pipeline Material Specification BK- GENRL-PEDCO-000-PL-SP-0001
H.R. Noted.

7.0 VA

Materials to be used shall be in accordance with project ~~piping material specification.~~ NACE MR0175/ISO 15156 shall be considered where specified in project data sheet and project piping material specification.

Generally for application in sour gas services, as indicated in individual data sheets, material of body, trim and all other wetted metal parts in contact with the sour gas shall meet the requirements of NACE, MR-01-75, latest edition. For other services, the following requirements shall apply as a minimum.

7.1 VALVE BODY

Valve body shall be cast carbon steel, at least to ASTM A216 grade WCB material.

7.2 VALVE TRIM

Valve trim material (including the ball in ball valves) shall be ~~carbon st~~ ~~grade WCB with hard chrome or electro less nickel plated, minimum pla~~

Stainless Steel at least to AISI 316L with hard Stellite 6
H.R. as per NISOC comment, this sentence has been replaced with "refer to piping material spec".

7.3 VALVE STEM

Stem shall be forged, 13% chromium steel.

8.0 INSPECTION AND TESTING REQUIREMENTS

8.1 GENERAL

According to IPS-M-IN-280 Part 2 Items 4.6.1 and 4.6.2 plus following Items:

- All LBVs equipment shall be subject to inspection at all stages of Manufacture by the CLIENT's duly authorized agents and/or Representatives.
- All inspections will be made at the Manufacturer's works prior to shipment.
- The VENDOR shall provide a full test procedure for the CLIENT's approval which details each test thoroughly in a logical sequence also test procedure shall include a schematic of testing arrangement with details of instrumentation Used during test.
- Inspection and testing shall be performed in accordance with written procedure Prepared by the VENDOR and approved by the CLIENT.
- The VENDOR shall be responsible for the prevision of all test and calibration equipment, utilities (e.g. power, air, and water) supplies and the recording of all test results on approved test record sheets.
- All valves shall be tested to ensure that the bench set is as per Manufacturer's data.
- Accessories shall be calibrated / tested at the same time to verify Full functionality.
- All hydro-static test certificates for valves shall be Available during valve inspection.
- Inspection and witnessed tests by the CLIENT and third parties shall not relieve the VENDOR of any guarantees, responsibilities or obligations to provide satisfactory equipment.
- The VENDOR shall provide quality records appropriate to all inspection and test Activities. The records shall be referenced against appropriate activities within the Inspection and test plan.
- Visual inspection will be required for all instruments, confirming that the equipment Supplied meets the relevant specifications, design codes and data sheets.
- Inspection will be required on all aspects of the Vendor's documentation in Relation to any 'as built' drawings, applicable certification and test/material Certificates.
- Test certificates should refer to the serial number of the equipment tested and must bear the purchaser's name and manufacturer's name and seal. The certificate should be approved by the purchaser before shipment instructions are given.
- VENDOR shall collate all such quality records and certification for submission to the CLIENT as certification dossier. Note that, where necessary, Certificates shall be stamped as approved by the third party inspector.

8.2 HYDROSTATIC TEST

valves having bodies, bonnets and cover plates made of carbon steel, low alloy and high alloy (stainless) steel, cast Iron and ductile Iron shall be hydrostatically tested as per recognized standard ANSI B-16.37.

Pressure measuring instruments used in testing shall be of the indicating or recording type.

It is recommended that gages and recording instruments have a range of approximately double of the test pressure.

8.3 PERFORMANCE TEST

A factory acceptance test, FAT, shall be carried out prior to the equipment shipment. During this test, vendor shall demonstrate the compliance of the equipment with the approval and finalized documents and shall test each function and task individually. FAT shall include but not be limited to the following tests:

- Visual inspection to
  - Verify that all equipment parts are included with properly identified tag plates and are in full compliance with the related documents.
  - Check that all documents have been supplied and are consistent with the equipment under test.
  - Check that the connections and terminators are correct and tightly secured.
- Performance test to
  - Check calibrations
  - Check functions

9.0 SPARE PARTS AND SPECIAL TOOLS

The VENDOR shall provide lists of recommended spare parts, which shall include the original part numbers with prices for commissioning, start-up and two years operation. All spare parts shall be identified individually.

Spare parts for commissioning and start-up; a qualified and complete list based on PROJECT SPARE PART SUPPLY PROCEDURE (Doc. No. E&D-QC-SP-1).

Spare parts for two years operation; a qualified and complete list based on PROJECT SPARE PART SUPPLY PROCEDURE (Doc. No. E&D-QC-SP-1).

The VENDOR shall be able to provide spares back up and support for the plant life of at least 20

years.

D02 SPIR form shall be approved by ~~COMPANY~~ CLIENT prior to procurement.

10.0 SPECIAL TOOLS

The Vendor shall provide any special tools required for the satisfactory operation and maintenance of his equipment. A complete list of special tools shall be provided by the Vendor at enquiry stage.

11.0 GUARANTEE AND MAINTENANCE

The Vendor shall guarantee the satisfactory performance of the system in accordance with project material requisition. This guarantee shall be performed through a letter of acceptance. In addition, The Vendor shall guarantee the availability of all spare parts and replacement parts that are required by any equipment item supplied for 10 years of operational period.

Vendor shall guarantee that he is able to support and supply spare parts for the supplied hardware, software and firmware for at least 15 years from the date of shipment. If the Vendor believes that parts of the system will be withdrawn from sale after 15 years, he shall provide a statement detailing the equipment to be withdrawn, the timing and how updated parts can replace the withdrawn parts.

11.1 MAINTENANCE DURING GUARANTEE

The guarantee period shall be eighteen (18) months from the date of delivery or twelve (12) months from the installation date of each equipment/packages at site. For the reason that the process units and facilities might be executed by different temporal schedule, SAT may be carried out unit by unit, consequently the period guarantee of the relevant hardware and software will be started after completion of each respected unit and facility.

During the guarantee period, the Supplier shall provide onsite service personnel, at request, for maintenance, fault detection, repair and/or replacement within 48 hours. The Supplier may utilize the recommended/start up spare parts supplied, to maintain the system. The Supplier shall replace all such spare parts used at no cost and in duly time.

11.2 MAINTENANCE AFTER GUARANTEE

The Supplier’s proposal shall include details of all standard maintenance agreements available from the vendor that are suitable for the systems (hardware, firmware and software). The CLIENT shall be under no obligation to select all or some of the agreements detailed and shall be free to negotiate a unique maintenance agreement with the Supplier.

11.3 FACTORY ACCEPTANCE TEST (FAT)

D02 Prior to advising the CONTRACTOR and ~~COMPANY~~ CLIENT that the equipment is ready for the Factory Acceptance Test (FAT), the VENDOR shall have completed his own 100% in-house test

of each cabinet/panel. On successful completion of this, the VENDOR shall then undertake the FAT.

D02 The CONTRACTOR and ~~COMPANY~~ CLIENT will wish to witness the FAT prior to releasing the equipment for shipment. The VENDOR shall be responsible for conducting the test and providing all necessary facilities, test equipment and personnel.

Factory acceptance test (FAT) shall be performed to demonstrate that the valves performs as per specification, including any site specific configuration.

Each different type of input (e.g. fire/gas detectors) shall be tested through use of an actual field/interface device, where practicable. Simulators may be used by the agreement of the Principal.

Each output shall be demonstrated through the simulation of inputs, thus proving logic and outputs.

FAT will be performed against a procedure, provided by Vendor, and subject to Principal approval. Test results shall be accurately recorded, including any simulators used and any ad hoc tests performed.

11.4 DRAWINGS, DATA, AND CERTIFICATION

After placement of purchase order, at least vendor shall submit final drawing for each LBV which shall specially include the following:

- Face-to-face dimensions of the valve
- Height of the completely assembled valve
- Dimensions of clearance space required for maintenance work
- Weight of the completely assembled valve
- Any other special mounting requirement.

All documents shall be provided in English.

12.0 PACKING AND SHIPMENT

12.1 GENERAL

Shipment authorization will be given by inspection release certificate after all pending points raised during acceptance tests have been resolved.

Refer to the relevant Package Specification for general requirements for preservation, storage and shipment of Package equipment. The following section provides additional detail specifically relevant to instrumentation systems associated with the Package.

12.2 PACKING AND PRESERVATION

Instrumentation items installed on the Package shall be adequately protected, suitable for shipment and storage at site, prior to dispatch from the Supplier's Works. Typically, it is suggested that instruments be protected with bubble wrap securely taped over delicate components and then enclosed by a fabricated wooden cover securely fastened but easily removable for site commissioning and operation. Any fragile items that cannot be adequately protected in their installed location shall be removed from the Package and packed separately. Any such items, and their location on the Package, shall be carefully identified to facilitate re-installation at site.

Any panels or instrument items that are removed from the Package for shipment shall be wrapped in waterproof material and be placed in crates having an internal waterproofed lining and padding.

All instrument items shall be protected from vibrations and shocks normally expected during handling, loading/unloading and shipment.

In particular the following considerations and action shall be taken.

- All tap mounted instruments shall also be dismantled and packed separately.
- All opening taps, etc. shall be closed for the time of shipment and site storage.
- All main moving part shall be locked.
- All glasses shall be protected against shock.

Suppliers shall identify any fragile equipment (e.g. control panels), that needs to be stored in a temperature and/or humidity controlled environment prior to installation and/or during shipment.

The packing shall also be suitable for storage of the Package equipment for up to 18 months in the harsh outdoor environment described. The packing shall be adequate to resist the humidity, temperature extremes and corrosion conditions to be expected in the various site locations.

13.0 SITE SUPERVISION

D02

When specified in the Purchase Order, the VENDOR shall provide representatives to assist the ~~COMPANY~~ CLIENT during installation, commissioning and initial start-up for all aspects of the equipment.

14.0 TRAINING

14.1 TRAINING PHILOSOPHY

VENDOR shall provide formal training both on site and at the VENDOR's facility for nominated personnel.

The course structure and syllabus shall be submitted to the CONTRACTOR for review and approval. The course pre-requisite experience and technical expertise shall be advised to the CONTRACTOR prior to the start of the course.

14.2 TRAINING COURSE DOCUMENTATION

For each trainee who shall attend a training course, a copy of the complete training course, notes, and drawings shall be provided to the trainee eight weeks prior to the commencement of the training course. The copies shall be retained by the trainees on completion of the training course and shall be the property of CONTRACTOR.