EPC OF SAHIL PHASE 3 DEVELOPMENT PROJECT

COMMENT RESOLUTION SHEET

Document Title:	**SPECIFICATION FOR ON/OFF VALVES, SHUTDOWN VALVES AND BLOWDOWN VALVES**	**Company Response**
Document No. & Rev :	**P16093-30-99-39-1604 Rev-2**	☐ CODE 1 - No comments, work to proceed. ☑ CODE 2 - With minor Comments, work can proceed subject to incorporation of comments.
Contract No.: 4700021779	**Project No.: P16093** **Transmittal Ref : EPC-AON-SDP-TR-OUT-0285**	☐ CODE 3 - Major comments, work cannot proceed. ☐ CODE 4 - Exception comments, document for information only.

S.No.	Rev No.	COMMENT SECTION / CLAUSE / DRAWING REFERENCE / Page No.	COMMENTED PERSON NAME	DISCIPLINE	COMPANY COMMENTS	CONTRACTOR RESOLUTION	COMPANY COMMENTS	REMARKS
COMPANY COMMENTS ON REV 1 CRS								
1	1	CRS Sr. no. 1, 2	Bapurao Prabhu Raut	I&C	Refer Comment Inside the document	Noted		
COMPANY COMMENTS ON REV 1								
1	1	CRS	Bapurao Prabhu Raut	I&C	Correct the Title	Noted and Corrected the title of Project in CRS Heading		
2	1	Page 10, Section 4.1.1	Sujay Ashok	Piping	Datasheet for ASAB On -off valves required please check and update	Noted, P16093-14-01-40-1611, document number is mentioned for Asab On-Off Valve datasheet		
3	1	Page 20	Bapurao Prabhu Raut	I&C	For pipeline Safety factor can not be same as normal piping valves. Please specify clearly safety factor for Pipeline valves and Valve on piping.	This safety factor requirement is directly mentioned from Pipeline Shell DEP 31.36.00.30-Gen, Cluase no. 5.18.1, hence retained as it is.		
4	1	Page 20	Bapurao Prabhu Raut	I&C	Statement is not clear. Please elaborate.	As per Process Safety requirement, gearbox output torque shall be at least 1.5 times the maximum required operating torque of the valve.		
COMPANY COMMENTS ON REV C								
1	C	CRS sr. no. 1 to 8	Bapurao. Prabhu	I&C	Noted. Refer specific comment inside the document.	Noted & Updated	Noted	
2	C	Page 12, section 4.2.2	Bapurao. Prabhu	I&C	Not correct. Please check and update the title.	Noted & Updated in section section 4.2.2	Noted	
3	C	Page 13, section 4.2.3	Sujay.Ashok	Piping	Add: AGES-SP-13-001_Criticality Rating Specification	Noted & Updated in section section 4.2.3	Noted	
4	C	Page 19, section 6	Bapurao. Prabhu	I&C	Please criteria for selection of Valve / Actuator for Pipeline to be covered under this section. Please refer DEP standard. Safety margin to be mentioned.	Noted and updated in Section 5 under Part 6: General Technical Requirements- Section 6.10 Valves	Refer Comment Inside the document	
5	C	Page 20	Bapurao. Prabhu	I&C	Contractor to ensure that references mentioned inside this document are aligned with latest EDDR and actual document no / title mentioned inside the respective document.	Noted	Refer Comment Inside the document	
6	C	Page 20	Sujay.Ashok	Piping	are two datasheets for ball valves required? please clarify	Noted and datasheet references updated.	Noted	
7	C	Page 22	Bapurao. Prabhu	I&C	What is the basis to include this section. Please discuss.	This was included to specify the requirement of pipeline valves in remote areas where instrument air is not available based on Company comment on Rev B, Sr. No. 4 below	Noted	
8	C	Page 20	-	-	-	Part 6: General Technical Requirements- Section 6.10 Valves: statement changed to: MAST shall be greater than the maximum torque capability of the actuator.		
COMPANY COMMENTS ON REV B								
1	B	CRS sr. no. 6	Bapurao	I&C	Noted and also to be covered under this document as it is related to Partial stroke testing for SDVs.	Noted & Updated	Noted. Refer specific comment inside the document.	
2	B	CRS sr. no. 23	Bapurao	I&C	Noted. Also to be covered in this document	Noted & Updated	Noted. Refer specific comment inside the document.	
3	B	Page 8, section 3.2	Bapurao	I&C	Alternating ?	Noted & Updated	Noted. Refer specific comment inside the document.	

ADNOC			EPC OF SAHIL PHASE 3 DEVELOPMENT PROJECT					TARGET REJLERS
COMMENT RESOLUTION SHEET								
Document Title:			SPECIFICATION FOR ON/OFF VALVES, SHUTDOWN VALVES AND BLOWDOWN VALVES				Company Response ☐ CODE 1 - No comments, work to proceed. ☑ CODE 2 - With minor Comments, work can proceed subject to incorporation of comments. ☐ CODE 3 - Major comments, work cannot proceed. ☐ CODE 4 - Exception comments, document for information only.	
Document No. & Rev :			P16093-30-99-39-1604 Rev-2					
Contract No.: 4700021779			Project No.: P16093		Transmittal Ref : EPC-AON-SDP-TR-OUT-0285			
S.No.	Rev No.	COMMENT SECTION / CLAUSE / DRAWING REFERENCE / Page No.	COMMENTED PERSON NAME	DISCIPLINE	COMPANY COMMENTS	CONTRACTOR RESOLUTION	COMPANY COMMENTS	REMARKS
4	B	Page 17	Bapurao	I&C	Specific design criteria for Valve / Actuator design for Pipeline SDVs to be covered.	Noted & Updated	Noted. Refer specific comment inside the document.	
5	B	Page 18	Bapurao	I&C	Please check the requirement. Refer SDV Valve scheme type 01B	Noted & Updated	Noted. Refer specific comment inside the document.	
6	B	Page 19	Bapurao	I&C	To achieve the stroking speed, first choice is to use trip SOV with adequate capacity (Cv). If this is not practical, Volume boosters, or where there is no PST facility quick exchaust valve to be included	Noted & Updated	Noted. Refer specific comment inside the document.	
7	B	Page 19	Bapurao	I&C	Vendor shall size the actuator for the maximum torque required to operate the Valve when subject to the conditions with full design pressure differential and worst case design temperature.	Noted & Updated	Noted. Refer specific comment inside the document.	
8	B	Page 25	Bapurao	I&C	References and titles mentioned inside the document to be aligned with EDDR	Noted & Updated	Noted. Refer specific comment inside the document.	
COMPANY COMMENTS ON REV A								
1	A	1	Bapurao		Contractor to ensure that IDC is performed with other disciplines (Piping, Material, Quality, etc.)	IDC was performed with other disciplines (refer attached wrench snapshot attached with CRS)	Noted	
3	A	2	Imran Anwar Ahmed Khan(IMRAN.KHAN)		update as per approved template	Document is prepared based on the COMPANY approved template.	Noted	
4	A	2	Bapurao		HOLDs to be cleared in the next revision	Noted & Updated	Noted	
5	A	2	Bapurao		Contractor to elaborate on Valve Positioner used for shutdown Valve (for Partial stroke testing requirement).	Noted & Updated	Noted	
6	A	2	Bapurao		Add under relevant section: All SDV to follow fail safe action in case of SOV power fail, instrument air fail, as this is one of the intended function of any ESD system. Positioner is used for PST, and its failure should not cause SDV to close. The design should follow existing plant setup where a relay type used in positioner, and HART SIS positioner in normal operating condition , has input of 4 mA from ESD system and passes full supply to actuator. In this configuration, if positioner loop fail/power fail happens, the actuator continues to get the supply and does not take S/D action. Relay type selection to be made by Contractor and mentioned in the specification clearly. Contractor to check with Site (O&M team) for the operation of Valve positioner for PST application during site visit and elaborate the section accordingly	Noted & Added This will be captured in Control and Safety system philosophy (Doc.No.P16093-30-99-52-1651) after site visit with respect to each location.	Noted and also to be covered under this document as it is related to Partial stroke testing for SDVs.	
8	A	7	Bapurao		How about definitions for Technical Rate and Sustainable rate ? Please check and include (Typical comment for all the project documents)	Noted & Updated	Noted	
9	A	7	Bapurao		Add missing abbreviations such as:- EPC, CDS, RDS, HP, MBOPD, MMSCFD, GOR, GDU. MOL, WAG, etc. Ensure that all the missing terms used in this document is covered under abbreviations	Noted & Updated	Noted	
11	A	8	Bapurao		Arrange the abbreviations in alphabetical order (A...Z)	Noted & Updated	Noted	
12	A	9	Sujay Ashok		Data sheets for Ball ValvesData sheet for Butterfly valvesManual valves specification	Noted & Updated	Noted	
13	A	10	Sujay Ashok		DEP 31.38.01.11	Noted & Added	Noted	
14	A	11	Sujay Ashok		Update to quality	Noted & Updated	Noted	

EPC OF SAHIL PHASE 3 DEVELOPMENT PROJECT

COMMENT RESOLUTION SHEET

Document Title:	**SPECIFICATION FOR ON/OFF VALVES, SHUTDOWN VALVES AND BLOWDOWN VALVES**	**Company Response**
Document No. & Rev :	**P16093-30-99-39-1604 Rev-2**	☐ CODE 1 - No comments, work to proceed. ☑ CODE 2 - With minor Comments, work can proceed subject to incorporation of comments.
Contract No.: 4700021779	**Project No.: P16093** — **Transmittal Ref : EPC-AON-SDP-TR-OUT-0285**	☐ CODE 3 - Major comments, work cannot proceed. ☐ CODE 4 - Exception comments, document for information only.

S.No.	Rev No.	COMMENT SECTION / CLAUSE / DRAWING REFERENCE / Page No.	COMMENTED PERSON NAME	DISCIPLINE	COMPANY COMMENTS	CONTRACTOR RESOLUTION	COMPANY COMMENTS	REMARKS
15	A	16	Bapurao		Requirement of Partial stroke testing (PST) to specified for ESD valves. Applicable Shutdown Valve shall be Capable of Partial Stoke Testing (PST): This is function test used to check periodically that the valve is operated securely without any non-conformities (such as sticking of valve disc, valve seat, damage of actuator, clogging and damaging of pneumatic piping system) and confirm that integrity and safety feature of ESD valve without stopping the process line.	Noted & Updated	Noted	
16	A	16	Bapurao		Design criteria / specification for selection of type of Actuator, Actuator color, Actuator sizing margin for Piping Valves / Pipeline valves, to be specified. Specific criteria for Pipeline Valves to be specified.	Noted & Updated	Noted	
17	A	17	Bapurao		How about normal ON/OFF Valves (e.g. XCVs, etc.)	Noted & Updated	Noted	
18	A	18	Sujay Ashok		add. valves shall comply to Data sheet for Ball valves Data sheets for Butterfly valves Piping design basis	Noted & Updated	Noted	
19	A	18	Sujay Ashok		Add amendment for coated bolts.	Noted & Updated	Noted	
20	A	18	Bapurao		Why different document nos. If so provide title of each data sheet.	Noted & Updated	Noted	
23	A	47	baraut		Contractor to check the existing Plant philosophy. Accordingly update the section in amendment.For ASAB CDS, existing philosophy is with auto / remote reset for SOVs. Contractor to verify the same from site for ASAB CDS as well as SAHIL CDS / RDS 1 and update document accordingly.	Noted. Same will be covered in Control and Safety system philosophy (Doc.No.P16093-30-99-52-1651) after completion of site visit.	Noted. Also to be covered in this document	

TARGET
ENGINEERING REVIEW STAMP
REVIEWED BY NAME : ANIL KUMAR
DESIGNATION : Engineering Manager

أدنوك
ADNOC

EPC OF SAHIL PHASE 3 DEVELOPMENT PROJECT

ADNOC Onshore Contract No.: 4700021779
ADNOC Onshore Project No.: P16093

SPECIFICATION FOR ON OFF VALVES, SHUTDOWN VALVES AND BLOWDOWN VALVES

Note: This Document is prepared based on FEED Document (Doc No. P16093-16-99-39-0605)

2	27-May-2024	AVC	JYM	SHA	Re-Issued for Purchase
1	18-Apr-2024	RSV	JYM	SHA	Issued for Purchase
C	22-Mar-2024	RSV	JYM	SHA	Issued for Approval
B	06-Mar-2024	RSV	JYM	SHA	Re-Issued for Review
A	20-Feb-2024	RPM	SKD	MEB	Issued for Review
REV.	DATE	ORIGINATOR	REVIEWED	APPROVED	DESCRIPTION

THIS DOCUMENT IS INTENDED FOR USE BY ADNOC AND ITS NOMINATED CONSULTANTS, CONTRACTORS, MANUFACTURERS AND SUPPLIERS.

EPC CONTRACTOR: **TARGET ENGINEERING CONSTRUCTION COMPANY LLC**	TARGET
SUB-CONTRACTOR: **REJLERS INTERNATIONAL ENGINEERING SOLUTIONS AB**	REJLERS

		Document Class	: 1
ADNOC Onshore Document No.	: P16093-30-99-39-1604	Revision	: 2
ORGINATOR Project No	: 5900702	Date	: 27-May-2024
ADNOC Onshore Project No	: P16093	Page	: **1** of **29**

Abu Dhabi Company for Onshore Petroleum Operations Ltd.شركة ابوظبي للعمليات البترولية البرية المحدودة
PO Box 270, Abu Dhabi, UAE ص ب 270 أبوظبي، الامارات العربية المتحدة
adnoc.ae
أدنوك البرية
ADNOC Onshore

SPECIFICATION FOR ON OFF VALVES, SHUTDOWN VALVES AND BLOWDOWN VALVES

Document No.	**: P16093-30-99-39-1604**	**Rev**	**: 2**
Project No. P16093	**Agreement No. 4700021779**	**Page**	**: 2 of 29**

The table below is a brief summary of the most recent revisions to this document. Details of all revisions are held on document by the issuing department.

Sr. No.	Rev. No.	Issue No.	Date of issue	Description of revision
1	A	1	20-Feb-2024	Issued for Review
2	B	2	06-Mar-2024	Re-Issued for Review
3	C	3	22-Mar-2024	Issued for Approval
4	1	4	18-Apr-2024	Issued for Purchase
5	2	5	27-May-2024	Re-Issued for Purchase

Notes: All the changes shall be marked with track changes in right hand side with Blue font

Abu Dhabi Company for Onshore Petroleum Operations Ltd,شركة ابوظبي للعمليات البترولية البرية المحدودة
PO Box 270, Abu Dhabi, UAE ص ب 270 أبوظبي، الامارات العربية المتحدة
adnoc.ae
أدنوك البرية
ADNOC Onshore

SPECIFICATION FOR ON OFF VALVES, SHUTDOWN VALVES AND BLOWDOWN VALVES

HOLDS

Sr. No.	Section	HOLD Description
1	NIL	

Abu Dhabi Company for Onshore Petroleum Operations Ltd,شركة ابوظبي للعمليات البترولية البرية المحدودة
PO Box 270, Abu Dhabi, UAE ص ب 270 أبوظبي، الامارات العربية المتحدة
adnoc.ae

SPECIFICATION FOR ON OFF VALVES, SHUTDOWN VALVES AND BLOWDOWN VALVES

TABLE OF CONTENTS

Abu Dhabi Company for Onshore Petroleum Operations Ltd, شركة ابوظبي للعمليات البترولية البرية المحدودة
PO Box 270, Abu Dhabi, UAE ص ب 270 أبوظبي، الامارات العربية المتحدة
adnoc.ae

SPECIFICATION FOR ON OFF VALVES, SHUTDOWN VALVES AND BLOWDOWN VALVES

1. INTRODUCTION

ADNOC Onshore (AON) operates four onshore assets: Bab, North East Bab, Bu Hasa, and South East including 11 oil and gas fields spanning over 12,000 km2, connected by a vast pipeline network to two export terminals in Jebel Dhanna and Fujairah. Part of Sout East (SE) asset, Sahil field is located 120 km south Abu Dhabi city and produces 104 MBOPD.

To comply with ADNOC direction of restoring 20% Technical Rate margin by 2025, Sahil Phase 3 development project intends to increase the field sustainable production to 114 MBOPD by debottlenecking the existing facilities and installing new facilities to handle 30 years field profile production forecast.

The project includes brownfield works in Sahil CDS, Sahil RDS-1 and ASAB CDS, and greenfield installation of CDS extension at Sahil comprises of gas export compressor, glycol dehydration package and a vapour recovery unit, in addition to two new underground pipelines: 16” x 47 km export gas pipeline from Sahil CDS to ASAB CDS and 20” x 5.6 km oil transfer line from Sahil RDS-1 to Sahil CDS.

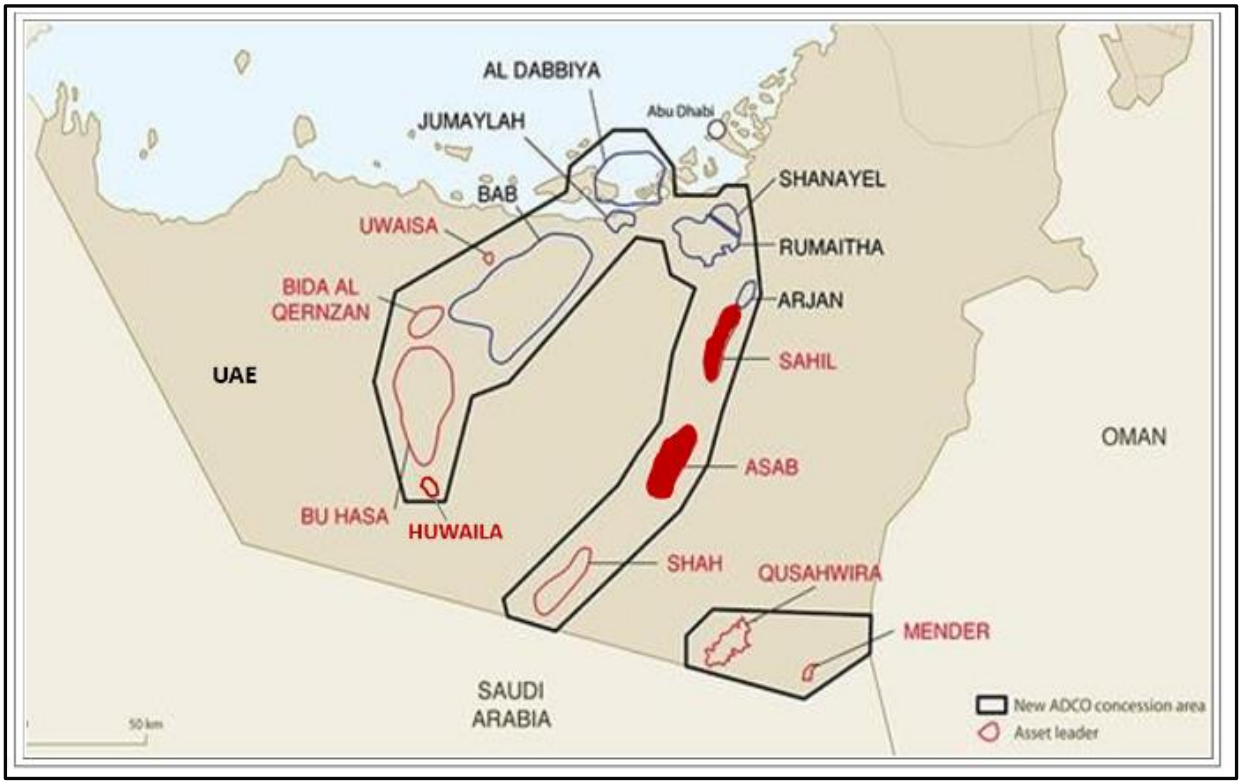

Figure 1-1 Overall Field Lay Out of ADNOC Onshore Fields

Abu Dhabi Company for Onshore Petroleum Operations Ltd,شركة ابوظبي للعمليات البترولية البرية المحدودة
PO Box 270, Abu Dhabi, UAE ص ب 270 أبوظبي، الامارات العربية المتحدة
adnoc.ae

SPECIFICATION FOR ON OFF VALVES, SHUTDOWN VALVES AND BLOWDOWN VALVES

2. PURPOSE AND SCOPE

The purpose of this specification is to define the minimum mandatory requirements for execution, functional and technical requirements for design & engineering, selection/ interoperability/ registration of the devices, fabrication, assembly, configuration, inspection & testing, packing, shipment, installation, and commissioning of On/Off Valves,Shutdown Valves and Blown Valves to be installed as a part of in SAHIL Phase 3 project.

VENDOR shall provide the Equipment/Material/Pacakge Unit in strict accordance with the conditions stated in this document and any attached documents. Exceptions, deviations and alternatives are valid only if approved in writing by CONTRACTOR / COMPANY. This document shall be read in conjunction with the Datasheets, Specifications & documents listed under reference documents in Section 4. It defines the minimum requirements for the Materials, Manufacture/ Fabrication, Inspection, Testing, Painting/Coating, Documentation, Transportation, Packing and Forwarding of piping valves to be procured for the EPC OF SAHIL PHASE 3 DEVELOPMENT project.

3. DEFINATIONS AND ABBREVIATIONS

3.1. Definitions

COMPANY	:	Abu Dhabi Company for Onshore Petroleum Operations Ltd. (ADNOC ONSHORE)
CONTRACTOR	:	Target Engineering Construction Company-Sole Proprietorship LLC.
ENGINEERING SUB-CONTRACTOR	:	Rejlers International Engineering Solution AB – Rejlers Abu Dhabi (Appointed by EPC CONTRCATOR for carrying out Detailed Engineering scope of the project)
CONTRACTOR	:	The party which carries out the detailed engineering, procurement, construction, commissioning and management of the “EPC OF SAHIL PHASE 3 DEVELOPMENT PROJECT”.
SUB-CONTRACTOR	:	The party which has a subcontract with CONTRACTOR to provide services or carries out all or part of the design, procurement, installation and testing of the systems as specified by CONTRACTOR.
PROJECT	:	EPC OF SAHIL PHASE 3 DEVELOPMENT PROJECT
PROJECT NO.	:	P16093 - The Project number shall be referred for all drawings and documents, coversheets. Agreement No.: 4700021779

EDMS	:	Contractor Electronic Document Management System, which is WRENCH
SHALL	:	Indicates a mandatory requirement
SHOULD	:	Indicates a strong recommendation to comply with the requirements of this document
SUSTAINABLE RATE	:	The rate at which a well, or processing plant, can be operated continuously for 365 days year with no adverse impact on the reservoir, or plant.
TECHNICAL RATE	:	The higher rate at which a well, or processing plant can be operated for short periods (7 days in any 30 days period) without adverse impact on the reservoir or plant.
VENDOR /SUPPLIER /MANUFACTURER	:	The party (parties) which manufactures and/or supplies materials, equipment, technical documents, or drawings and/or services to perform the duties specified by the CONTRACTOR / COMPANY. This includes all Sub vendors / tradesman &Contractors.

3.2. Abbreviations

ADNOC	:	Abu Dhabi National Oil Company (ADNOC Onshore)
BDV	:	Blow Down Valve
CDS	:	Central Degassing Station
DEP	:	Design Engineering Practice (Shell)
EPC	:	Engineering Procurement Construction
EMC	:	Electro Magetic Compatibility
EPC	:	Engineering,Procurement and Construction
EP	:	Engineering Procedure
ESD	:	Emergency Shut Down

SPECIFICATION FOR ON OFF VALVES, SHUTDOWN VALVES AND BLOWDOWN VALVES

ESDV	:	Emergency Shutdwon Valve
FAT	:	Factory Acceptance Test
FEED	:	Front End Engineering Design
FMECA	:	Failure Mode,Effects and Criticality Analysis
GDU	:	Gas Dehydration Unit
GOR	:	Gas to Oil Ratio
HP	:	High Pressure
H2S	:	Hydrogen Sulphide
HART	:	Highway Addressable Remote Transducer
HFT	:	Hardware Fault Tolerance
HIPPS	:	High Integrity Pressure Protection System
IP	:	Ingress Protection
LCD	:	Liquid Crystal Display
LED	:	Light Emitting Diode
MAST	:	Maximum Allowable Stem Torque
MOL	:	Mail Oil Line
MBOPD	:	Thousand Barrels Oil Per Day
MMSCFD	:	Million Standard Cubic ,Feet Per Day
NCR	:	Non-Conformity Record
NDE	:	Non Destructive Examination

SPECIFICATION FOR ON OFF VALVES, SHUTDOWN VALVES AND BLOWDOWN VALVES

NDT	:	Non Desturctive Testing
PDDL	:	Project Document Deliverable List
PFD	:	Probability of Failure on Demand
PQR	:	Procedure Qualifications Reports
PST	:	Partial Stroke Test
PVC	:	Poly Vinyl Chloride
QMS	:	Quality Management System
RDS	:	Remote Degassing Station
SAT	:	Site Acceptance Test
SDV	:	Shutdown Valve
SFF	:	Safe Failure Fraction
SIF	:	Safety Instrumented Function
SIL	:	Safety Integrity Level
SOV	:	Solenoid Valve
SPIR	:	Spare Parts Interchangeability Record
SSV	:	Surface Safety Valve
TD	:	Technical Deviation
TPI	:	Third Party Inspector
VDRL	:	Vendor Document Deliverable List
WAG	:	Water Alternating Gas

WPS : Welding Procedure Specifications

4. REFERENCE DOCUMENTS

4.1. Project Documentation

Document Number	Document Title
16-99-93-0650	EPC Scope of Work
P16093-30-99-97-1601	Project Quality Plan
P16093-30-99-90-1602	Project Execution Plan
P16093-30-99-90-1604	Project Interface Management Plan

4.1.1 Project Datasheets

Document Number	Document Title
P16093-16-01-40-1611	Datasheet for On-Off Valves - SAHIL CDS
P16093-16-11-40-1606	Datasheet for On-Off Valves - SAHIL RDS-1
P16093-14-01-40-1611	Datasheet for On-Off Valves - ASAB CDS
P16093-30-99-18-1614	Datasheets for Butterfly Valves
P16093-30-99-18-1627	Datasheets For Ball Valves
P16093-30-99-18-1605	Datasheets for Pipeline Ball Valves

4.1.2 Project Specifications

Document Number	Document Title
P16093-30-99-39-1608	Specification for Instrument Installation
P16093-30-99-12-1604	Manual Valves Specification

Document Number	Document Title
P16093-30-99-12-1602	Piping Material Specification

4.1.3 Design basis and Philosophies

Document Number	Document Title
P16093-30-99-52-1601	Instrumentation & Control Design Basis
P16093-30-99-91-1603	Process Design Basis
P16093-30-99-23-1601	Piping Design Basis
P16093-30-99-91-1617	Fire Protection and Fire & Gas Detection Philosophy
P16093-30-99-89-1643	SIL Study Report
P16093-30-99-52-1651	Control and Safety System Philosophy

4.2. COMPANY and SHELL Specifications & Standards

4.2.1. COMPANY Specifications

Document Number	Document Title
ES 30-99-00-0001	Engineering Specification for Tag Plates for Field and Indoor Equipment
ES 30-99-00-0102	Corrosion and Material Selection Philosophy
ES 30-99-12-0030	Inspection and Test Plan for Piping Valves
ES 30-99-12-3208	Specification for Pipeline Valves
ES 30-99-12-3209	Specification for Piping Valves
ES 30-99-00-8517-1	Equipment / Material Critically Rating

Document Number	Document Title
ES 30-99-90-0001	Engineering Procedure for Drawing, Design and Numbering Systems
ES 30-99-90-0024	Procedure for Preparation of Vendor's Engineering Drawing and Documents
ES 30-99-91-0002	ADCO Corporate Fire Protection Philosophy
ES 30-99-37-0013	Painting and Coating of New Equipment
ES 30-99-95-0004	CAD Manual for Consultants

4.2.2. Shell DEP VERSION 41 Specifications

Document Number	Document Title
DEP 30.10.02.11-Gen	Metallic Materials-Selected Standards
DEP 30.10.02.13-Gen	Non-Metallic Materials – Selection and Application
DEP 30.48.00.31-Gen	Protective Coating for Onshore and Offshore Facilities
DEP 31.38.01.24-Gen.	Piping - Engineering and Layout Requirements
DEP 31.38.01.25-Gen	Piping - Process Design Requirements
DEP 31.36.10.30-Gen	Hydraulic Systems for the Operation of on/off Valves in Protective Functions
DEP 32.31.00.32-Gen	Instrument for Measurement and Control
DEP 32.31.09.31-Gen	Instrumentation for packaged equipment
DEP 32.36.01.18-Gen	Selection and Procurement of Actuator for ON-Off Valves
DEP 32.37.10.11-Gen	Installation of on-line instruments incorporating small bore tubing and fittings

Document Number	Document Title
DEP 32.37.20.10-Gen	Instrument Signal Lines
DEP 32.45.10.10-Gen	Instrumentation of Depressuring Systems
DEP 32.80.10.10-Gen	Safety Instrumented Systems
DEP 62.10.08.11-Gen	Inspection and Functional Testing of Instruments
DEP 63.10.08.11-Gen	Field Commissioning of Electrical Installations and Equipment
DEP 63.10.08.11-Gen	Field commissioning of electrical installations and equipment
DEP 70.10.90.11-Gen	Spare Parts
DEP 80.45.10.11-Gen	Overpressure and Under pressure – Prevention and Protection
DEP 80.47.10.30-Gen	Fire safety assessment and design for onshore installations
DEP 31.36.00.30-Gen	Pipeline transportation systems - pipeline valves

4.2.3. AGES

Document Number	Document Title
AGES-GL-13-001	Contractors QAQC Requirement.
AGES-SP-13-002	Procurement Inspection and Certification Requirement in Projects.
AGES-SP-13-001	Criticality Rating Specification

4.3. INTERNATIONAL CODES AND STANDARDS

4.3.1. American Society of Mechanical Engineers (ASME)

Document No.	Document Title
ASME B1.20.1	Pipe Threads, General Purpose (Inch)
ASME B16.5	Pipe Flanges and Flanged Fittings
ASME B16.34	Valves Flanged, Threaded and Welding End
ASME Code-Sec VIII	Boiler and Pressure Vessels Code-Pressure Vessels

4.3.2. American Society of Testing Materials (ASTM)

Document No.	Document Title
ASTM A269	Standard Specification for Seamless and Weld Austenitic Stainless-Steel tubing for General Service

4.3.3. American Petroleum Institute (API)

Document No.	Document Title
API RP 551	Process Measurement Instrumentation
API Spec 6A	Specification for Wellhead and Christmas Tree Equipment
API Spec 6D	Specification for Pipeline Valves
API Spec 6FA	Fire Test for Valves
API Spec 14A	Specification for Subsurface Safet Valve Equipment
API Std 598	Valve Inspection and Testing

4.3.4. British Standards

Document No.	Document Title
BS 5467	Electric Cables - Thermosetting insulated, Armored Cables for Voltages of 600/1000V and 1900/3300V
BS EN 10204	Metallic products – Types of inspection Documents
BS EN10497	Testing of Valves - Specification for Fire Type – Testing Requirements
BS EN 12266	Industrial Valves - Testing of Metallic Valves
BS EN 62444	Cable Glands For Electrical Installations
BS EN 50288-7	Multi-Element Metallic Cables used in Analogue and Digital Communication and Control Part 7: Sectional Specification for Instrumentation and Control Cables
BS EN 60228	Conductors of Insulated Cables
BS EN 60332	Tests on Electric and Optical Fiber Cables under Fire Conditions

4.3.5. ISA- INTERNATIONAL SOCIETY OF AUTOMATION (ISA)

Document No.	Document Title
ANSI/ISA-5.1	Instrumentation Symbols and Identification
ANSI/ISA-12.00.02	Certificate Standard for AEx Equipment for Hazardous (Classified) Locations
ISA-20	Specification Forms for Process Measurement and Control Instruments
ISA-51.1	Process Instrumentation Terminology

Document No.	Document Title
ISA-71.01	Environmental Conditions for Process Measurement and Control Systems: Temperature and Humidity
ISA-71.02	Environmental Conditions for Process Measurement and Control Systems: Power
ISA-71.03	Environmental Conditions for Process Measurement and Control Systems: Mechanical Influences
ISA-71.04	Environmental Conditions for Process Measurement and Control Systems: Airborne Contaminants
ISA-82.03	Safety Standard for Electrical and Electronic Test, Measuring, Controlling, and Related Equipment

4.3.6. International Organization for standardization (ISO)

Document No.	Description
ISO 5208	Industrial Valves - Pressure Testing of Metallic Valves
ISO 9001	Quality Management Systems – Requirements
ISO 10423	Petroleum & Natural Gas Industries-Drilling & Production Equipment- Wellhead & Christmas Tree
ISO 12490	Mechanical Integrity and Sizing of Actuators And Mounting Kits for Pipeline Valves
ISO 14313	Pipeline Transportation Systems —Pipeline Valves

4.3.7. NATIONAL ASSOCIATION OF CORROSION ENGINEERS (NACE)

Document No.	Description
NACE MR0175 / ISO 15156	Petroleum And Natural Gas Industries — Materials for Use in H2S-Containing Environments in Oil and Gas Production

4.3.8. IEC Standards

Document No.	Description
IEC 60079	Explosive Atmospheres
IEC 60189	Low-Frequency Cables and Wires with PVC Insulation and PVC Sheath
IEC 60331	Tests for Electric Cables Under Fire Conditions
IEC 60332	Tests On Electric and Optical Fiber Cables Under Fire Conditions
IEC 60529	Degrees Of Protection Provided by Enclosures (IP Code)
IEC61000	Electromagnetic Compatibility (EMC)
IEC 61508	Functional Safety of Electrical / Electronic / Programmable Electronic Safety-Related Systems
IEC 61511	Functional Safety - Safety Instrumented Systems for The Process Industry Sector
IEC 62381	Automation Systems in The Process Industry - Factory Acceptance Test (FAT), Site Acceptance Test (SAT), And Site Integration Test (SIT)

4.4. ORDER OF PRECEDENCE

All design and construction shall be performed in accordance with the Specifications, Standards, Codes, Regulations, latest Shell DEPs, etc. listed in the Contract. In any areas of conflict, the order of precedence of different applicable standards, specifications and project specifications shall follow the order:

- The laws, standards, and Regulations of United Arab Emirates
- ADNOC HSE Standards, HSE manuals and policies.

- Project Specific documents.
- ADNOC Onshore applicable Specifications, Amendments and Codes/Standards
- ADNOC Onshore applicable Specifications, Codes and Standards.
- Shell DEPs Version 41.
- International Oil & Gas Industry Codes, Standards, and Recommended practices.
- Internationally recognized oil and gas industry sound practices.

In the event of any conflict of data or requirements in any of the project applicable specified documents and standards in which some of the requirement could be of more stringent, then the Subcontractor/ Vendor shall carefully scrutiny on the most stringent requirements with regards, to the safety, environmental, economic and legal aspects.

5. AMMENDMENT TO ADNCO ONSHORE ENGINEERING STANDARD – SPECIFICATION OF SHUTDOWN VALVES FOR HIPPS AND SAFETY FUNCTION (DOC.No.ES 30-99-39-0021)

Shut down Valve shall be designed following ADNOC Onshore specification “Specification Shutdown Valves for HIPPS and Safety Function”, document no.ES 30-99-39-021 with following modification/amendments

Section	Amendment
Part 1: Introduction Section 1.3:Definition	Follow Part 3 (Section 3.1 Definition) of this document (Doc.No.P16093-30-99-39-1604)
Part 2: Codes and Standards Section 2.1: General	Follow Part 4 of this document (Doc.No.P16093-30-99-39-1604)
Part 2: Codes and Standards Section 2.2: ADNOC ONSHORE Specification,Procudure,Codes and Standards	**Delete the following** • “Surface Safety Valves Operated by Wellhead Control Panels”, Doc.No.30-70-39-002 In Specification of Shutdown Valves for HIPPS and Safety Function Doc.No.30-99-39-0021
Part 3: Environmental Conditions	For Environmental Condition refer Part 8 of Project Specification document i.e Instrumentation & Control Design Basis Doc.No. P16093-30-99-52-1601
Part 5 : Scope of Work and Services Section 5.1 General	**Add the following** Shutdown Valves and Blow Down are On/Off considered for emergency service. **Emergency Shut Down Valves (ESDV)** Emergency Shut Down Valves are operated in emergency situation to minimise inventory available to

SPECIFICATION FOR ON OFF VALVES, SHUTDOWN VALVES AND BLOWDOWN VALVES

Section	Amendment
	a fire or loss of containnment by closing the incoming supply of flammable/toxic material to a unit/facility and sectioning the facility into manageable fire areas. **Blow Down Valve (BDV)** Emergency Shut Down Valves are operated in emergency situation to minimise the hazard caused by an upset by removing gaseous inventory to flare or vent. **On/Off Valve (XCV)** On/Off Valves can also be used for the following purpose: **Inventory Isolation** Inventory isolation are operaated, usually in an inventory available to a fire or loss of containment volumes of lfammable or toxic liquid. **Pipeline Sectioning / Isolation** Pipeline Valves are installed to divide pipeline maintaintance or for operational purpose. **Process Service** Process service is defined as any valves that are required as part of the normal operation of the plant/facility but have no emergency functions dependent on them. These are typically used for sequencing, routing,feed selection,selection of equipment items or process streams. Valves that are only actuated due to their size exceeeding reasonable limits for normal operation, such as large maintentance isolation valves will also fall into this category
Part 6: General Technical Requirements- Section 6.10 Valves	**Add the Following** Valves shall comply to the Instrument datasheet for On/Off Valves SAHIL CDS Doc.No.P16093-16-01-40-1611 & P16093-16-11-40-1606 (ASAB RDS-1),P16093-14-01-40-1611 (ASAB CDS) Piping Material Specification Doc.No.P16093-30-99-12-1602 Datasheet for Ball Valves Doc.No. P16093-30-99-18-1627.

SPECIFICATION FOR ON OFF VALVES, SHUTDOWN VALVES AND BLOWDOWN VALVES

Section	Amendment
	Datasheet for Pipeline Ball Valves Doc.No. P16093-30-99-18-1605. Datasheet for Butterfly Valves DocNo.:P16093-30-99-18-1614. Piping design basis Doc. No. P16093-30-99-23-1601
Part 6: General Technical Requirements- Section 6.10 Valves	**Add the Following** Pipeline valve bodies shall be gate, plug or ball types designed and tested in accordance with ISO 14313. Valves in pipelines that require to be pigged shall be full-bore types providing uninterrupted circular cross-section passage through the valve. Valves in lines to be pigged shall have metal seats or seats that are protected from contact with pigs. For quarter-turn valves, MAST shall be greater than the maximum torque capability of the actuator. The actuator manufacturer shall select an actuator proportional to the valve size. The valve manufacturer shall apply a safety factor of at least 1.5 to the valve drive train design between the operator and the obturator, based on the maximum output torque or force of the actuator. Piepline valves shall be designed in accordance with Shell DEP 31.36.00.30-Gen - Pipeline transportation systems - pipeline valves
Part 6: General Technical Requirements- Section 6.11 : Material Selection	**Add the Following** Refer to the Instrument datasheet for On/Off Valves SAHIL CDS Doc.No.P16093-16-01-40-1611 & P16093-16-11-40-1606 (ASAB RDS-1),P16093-14-01-40-1611 (ASAB CDS) Piping Material Specification Doc.No.P16093-30-99-12-1602 Datasheet for Ball Valves Doc.No. P16093-30-99-18-1627. Datasheet for Pipeline Ball Valves Doc.No. P16093-30-99-18-1605. Datasheet for Butterfly Valves Doc No.:P16093-30-9918-1614. Piping Design Basis Doc.No.:P16093-30-99-23-1601. Bolts and nuts shall be coated with Xylan 1070 or Takecoat 1000

Abu Dhabi Company for Onshore Petroleum Operations Ltd,شركة ابوظبي للعمليات البترولية البرية المحدودة
PO Box 270, Abu Dhabi, UAE ص ب 270 أبوظبي، الامارات العربية المتحدة
adnoc.ae

SPECIFICATION FOR ON OFF VALVES, SHUTDOWN VALVES AND BLOWDOWN VALVES

Section	Amendment
Part 6: General Technical Requirements- Section 6.12 : Actuator	**Replace** "The torque developed by the actuator for Shutdown valves at any point in the stroke shall be 2 times the valve torque at minimum supply pressure (air/hydraulic): **With the following** "The torque developed by the actuator for shutdown valves at any point in the stroke shall be designed in accordance with Shell DEP 32.36.01.18 and Shell DEP 31.36.10.30 at minimum and maximumsupply pressure (air/hydraulic)
Part 6: General Technical Requirements- Section 6.12 : Actuator	**Add the Following** Applicable Shutdown Valve shall be Capable of Partial Stoke Testing (PST). This is function test used to check periodically that the valve is operated securely without any non-conformities (such as sticking of valve disc, valve seat, damage of actuator, clogging and damaging of pneumatic piping system) and confirm that integrity and safety feature of ESD valve without stopping the process line.
Part 6: General Technical Requirements- Section 6.12 : Actuator	**Add the Following** Positioner is used for PST and its failure should not cause SDV to close. The design should follow existing plant set up.
Part 6: General Technical Requirements- Section 6.12 : Actuator	**Add the Following** Positioners for PST shall be smart devices that are capable of initiating a valve stroke from normal position to a predetermined value, returning the valve to its normal position and recording and time-stamping the resulting actuator pressure/valve position/time profiles for transmission to ICSS via HART communication. Valve position feedback to the positioner shall not rely on mechanical connection between the positioner and the valve stem (non-contact sensing). PST function shall be as per Emergency Shutdown Philosophy (Doc.No. P16093-30-99-91-1612) and Instrumentation & Control Design Basis (Doc. No. P16093-30-99-52-1601).
Part 6: General Technical Requirements- Section 6.12 : Actuator	**Add the following:**

SPECIFICATION FOR ON OFF VALVES, SHUTDOWN VALVES AND BLOWDOWN VALVES

Section	Amendment
	All SDV to follow fail safe action in case of SOV power fail, instrument air fail, as this is one of the intended function of any ESD system.
Part 6: General Technical Requirements- Section 6.12 : Actuator	**Add the following:** Actuator sizing The two main sizing factors are Valve fail-safe stroking time and Valve operating torque. The actuators shall be sized to operate the valve within the required fail-safe stroking time and with maximum differential pressure across the valve. Stroking time In general, the full stroking time to safety position should not exceed 1 second per inch of valve body diameter for valves ≤ 20", with a maximum time of 15 seconds. To achieve the stroking speed, first choice is to use trip SOV with adequate capacity (Cv). If this is not practical, Volume boosters, or where there is no PST facility quick exhaust valve to be included. Vendor shall size the actuator for the maximum torque required to operate the Valve when subject to the conditions with full design pressure differential and worst case design temperature. Where installed in fire risk areas, valves shall be specified as Fire-Safe to API 6FA. Fire protection shall include actuators/cables/air piping and all the associated equipment to maintain the valve operational integrity for a minimum of 30 minutes when exposed to a hydrocarbon fire as specified in UL 1709. Actuator sizing margin shall be as per SHELL DEP 32.36.01.18 - Selection and procurement of actuators for on-off valves. Actuator colour shal be in accordance with COMPANY Engineering standard 30-99-37-0013 - Painting and Coating of New Equipment
Part 6: General Technical Requirements- Section 6.12 : Actuator	**Add the following:** Pneumatic cylinder spring-return actuators shall be selected where pneumatic supplies are available, unless the valve has only a maintenance function, in which case electric actuators may be used.

SPECIFICATION FOR ON OFF VALVES, SHUTDOWN VALVES AND BLOWDOWN VALVES

Section	Amendment
	For sites where no instrument air supply is available and the valve is required to respond to a trip, two options are available for spring-return actuation: - Where valve operation is infrequent and release of pipeline gas from the actuator during valve closure can be accepted, gas-over-oil hydraulic actuation may be used. Pipeline gas shall not be used directly in the actuator cylinder. - For locations where the release of pipeline gas is unacceptable, high-pressure pneumatic actuators using air bottles may be provided.
Part 6: General Technical Requirements- Section 6.13 : Valve and Actuator Assembly	**Delete the following :** “Replacement of Cylinder,piston or piston/cylinder seals should be possible in-situ, without removal of the actuator.
Part 6: General Technical Requirements- Section 6.14 : Tubing & Fittings	**Replace:** “All the components shall be adequately sized and selected for the purpose for which they are intended.” **With the following** “The VENDOR shall adequately size and select all the components for the purpose of which they are intended. Tube size and material shall be selected based on the hydraulic operation pressure.” And Delete: “The instrument air tube OD shall be ¼“or ½“X 0.049“WT.”
Part 6: Preparation for shipment & preservation	**Add the following:** Preservation shall be in accordance with SHELL DEP 70.10.70.11-Gen. Packing and Transportation are the vendor full responsibility and Vendor must take into consideration international requirements for transportation by either land & sea freight or air freight. The vendor shall prepare the procedure and send to COMPANY for review. In addition Valves must be protected against oxidization by means of special ling —lasting grease and plastic plugs sealedwith silicone rubber or taped,

SPECIFICATION FOR ON OFF VALVES, SHUTDOWN VALVES AND BLOWDOWN VALVES

Section	Amendment
	while flanges shall be closed with laminated discs and rubber gaskets. Valve must be dispatched in the open position, labeled and complete with all accessories and ready for installation. Before valves are packed, the manufacturer / packer must make sure that all foreign bodies or traces have been removed. Valves will be packed vertically to prevent damage to the actuator.
Appendix - II: Quality Assurance and Third Party Inspection and manufacture's Inspection and Test	**Add the following:** **Inspection Requirements** The VENDOR Inspection and Test Plan shall show the planned activities; resources and events serving to implement and record the implementation of the VENDOR Quality system relevant to the goods, The inspection and test interventions point of H, W, M, A or R shall be applied to the Inspection and Test Plan with the definition as per as per AGES-GL-13-001 Contractors QAQC Requirement and AGES-SP-13-002 Procurement Inspection and Certification Requirement in Projects. **Criticality Rating & Inspection Class** The Criticality Rating for the On-Off valves, Shutdown Valves and Blowdown valve shall be 1 with Inspection Class I and Material certification requirements in accordance with EN10204 type 3.2 and detailed as follow: - Type 3.2 For Body, Bonnet, Flange, Seat & Plug, - Type 3.1 for Trim parts / Actuator, - Type 2.2 for other parts. **Test and Material Certificates** The requirements for material and test certificates are defined within this document and referenced specifications. PURCHASER reserves the right to request Certificates for any inspections listed on the VENDOR Inspection and Test Plan. Test certificates are required for all shop tests for both VENDOR's and sub-SUPPLIER's goods. All certificates shall be

SPECIFICATION FOR ON OFF VALVES, SHUTDOWN VALVES AND BLOWDOWN VALVES

Section	Amendment
	fully identified with the Equipment Tag Number, Description, Material Grade and COMPANY Purchase Order Number and shall include a description of the test method and the full results. Material certificate shall also be referred to original Foundry or Forge and original Manufacturer's name and location. VENDOR shall maintain suitable control of all materials used. **Traceability** Material traceability is required to ensure that the principal components of equipment and all significant bulk material can be identified against material certificates issued by the original VENDORs. It shall be the responsibility of the VENDOR to obtain the above certificates, suitably verified if appropriate as required by the VDRL. All co-ordination and expediting of the sub-SUPPLIERs to comply with these requirements shall be the responsibility of the VENDOR. The VENDOR shall be responsible for ensuring his material control system is operating in such a manner that all principal component materials are traceable to their relevant original material certificates. **Manufacturing Record Book** The Manufacturing Record Book is a compilation of Production record documents; All Data Books must have a Table of Contents detailing all sections and total number of pages. A separate Manufacturing Record Book shall be supplied for each tagged item. All pages within the Manufacturing Record Books must be clearly marked on both front and spine with: - Project Title & Purchase Order Number - Equipment/Material Description - Item or Tag Number - Page Number (where practicable) - Volume Number (if applicable) Manufacturing Record Book shall be prepared in accordance with project procedure/specification.

SPECIFICATION FOR ON OFF VALVES, SHUTDOWN VALVES AND BLOWDOWN VALVES

Section	Amendment
	The MRB shall contain at least and not limited to the following items; - Material Requisition including data sheets - Purchase Order "PO" (un-priced) - As built drawings and shall be provided with review, appraisal, validate and approval provisions - Engineering and design calculations provided with review, appraisal, validate and approval provisions. - Inspection and Test Plans - Welding logs and Weld Maps - Welding Procedure Specifications (WPS's) and Procedure Qualifications Reports (PQR's) - Non-Destructive Test Procedures - NDT scope of work and NDT log/register - Hydro test / pressure Test Procedure - Heat treatment procedure - Heat Treatment Plan - Painting / coating records and test certificates - Material Test Certificates summary and traceability log/register supported with Material Test Certificates - Testing Procedures - Functional test and SIL certificates - Sub-Orders Index and Orders - Inspection Release Notes - Master log/register of NCR's and Analysis of NCR's - Technical Deviation(s) - Packing & handling procedure - Final product certificates such as "Certificate of Conformity" - Close out report including all Quality concerns and all lessons Learned covering both positive and negative aspects. All prior approved documents must show the signed acceptance stamp of the PURCHASER. The Manufacturing Record Book shall be complete for final inspection and submitted to the Inspector prior to material dispatch. Following Inspectors acceptance,

Section	Amendment
	the VENDOR shall dispatch one complete hard copy set of the Manufacturing Record Book with the goods, and the remaining copies shall be dispatched to the PURCHASER. **Installation / Operation / Maintenance Manuals** VENDOR shall provide adequate information to enable equipment to be installed, tested, set to work, and maintained on site. **Spare Parts Lists** VENDOR shall include a separate quotation for recommended Insurance Spare Parts, 1 Year's Operation Spare Parts and 2 Year's Operation Spare Parts on the Company E-SPIR form. Spare parts shall comply with all the requirements for the main equipment requisitioned. VENDOR shall include recommended spare parts for all auxiliary equipment and accessories. VENDOR shall include the equipment identification for which the part is intended, reference number and the relevant drawing. **Certified Final Documents and As Built** VENDOR shall provide Certified Final documents as specified herein. VENDOR's authorized Engineer shall mark the documents "FINAL" and sign and date the documents to confirm that these are final VENDOR documents or final Sub-SUPPLIER documents, incorporating all PURCHASER comments, and that the documents accurately describe the design.

6. LANGUAGE and ENGINEERING UNITS

6.1. General

All drawings, data, documents, and nameplates shall be written in the English language and units of measurement shall comply with System International (S.I)

6.2. Engineering Units

For Engineering Units refer to the Process Design Basis - Doc. No. P16093-30-99-91-1603.

SPECIFICATION FOR ON OFF VALVES, SHUTDOWN VALVES AND BLOWDOWN VALVES

7. COMPLIANCE TO SPECIFICATIONS

7.1. Adherence to Specifications

VENDOR's offer is deemed to be in full compliance with all specifications applicable in this project. Any exemption or deviation that is not possible to be met due to technical constraints shall be submitted with reasons/justification as an itemized list for COMPANY /CONTRACTOR review and approval.

Compliance with this specification and standards referenced therein does not relieve VENDOR of his responsibility to furnish units of proper design workmanship and materials to meet the specified operating conditions and duties.

7.2. Design Life

The construction design life shall be thirty (30) years for mechanical devices and 10 years for electronic devices.

8. Attachments

Attachment – 1: Specification of Shutdown Valves for HIPPS and Safety Function (ADCO Doc.No.30-99-39-0021)

Abu Dhabi Company for Onshore Petroleum Operations Ltd,شركة ابوظبي للعمليات البترولية البرية المحدودة
PO Box 270, Abu Dhabi, UAE ص ب 270 أبوظبي، الامارات العربية المتحدة
adnoc.ae

SPECIFICATION FOR ON OFF VALVES, SHUTDOWN VALVES AND BLOWDOWN VALVES

8.1. ATTACHMENT-1: SPECIFICATION OF SHUTDOWN VALVES FOR HIPPS AND SAFETY FUNCTION (DOC.NO.30-99-39-0021)