



 شرکت پتروشیمی بند امام (پتروکیم) B.I.P.C	BIPC - Ethane Recovery Plant Contract No: 400/103		 EIED
	Inspection & Test Plan (ITP) for Refrigeration Package		 Sina Control Co <small>ENGINEERING DESIGN & MANUFACTURING CO.</small>
PO No.:C2R-PT-GEN-MA-PO-4002	Document Number VP-C2R-SCC-MA-4002-7000	Rev. 03	Page 1 of 27




Inspection & Test Plan (ITP) for Refrigeration Package

 Code1	<input type="checkbox"/> No Comment (Applicable Only for "FOR REVIEW" Documents) No comment and the document are released for Manufacturing.
Code2	<input type="checkbox"/> No Comment with Note(s) Vendor/Sub-Contractor shall correct, revise and resubmit the document. The document is released for Manufacturing if changes incorporated.
Code3	<input type="checkbox"/> Commented Vendor/Sub-Contractor shall correct, revise and resubmit the document by the date specified. The document shall be revised under the Status of "R: Revised Issue". All corrected documents shall be resubmitted before starting the Manufacturing Process.
No Code	<input type="checkbox"/> No Code (Only for "For Information" Documents and "As Built DWGs") Document has been submitted for PURCHASER's Information (FI). Consistency, completeness and correctness of document content is in Vendor/Sub-Contractor's responsibility.
Above checking results by EIED shall in no way relieve Vendor of any liability, obligation and responsibility out of the purchase order and the mutual agreement in writing.	
 EIED Energy Industries Engineering & Design co.	Date: 05.14.2024 Dept.: MA Farahani Signature:

03

 Totally Revised

05							
04							
03	28-Apr-24	R	R	A.Alishahi	M.Hozhabrian	A.Zare	Sh.Zare
02	15-May-23	R	R	A.Alishahi	M.Hozhabrian	A.Zare	Sh.Zare
01	20-Feb-23	R	R	A.Alishahi	M.Hozhabrian	A.Zare	Sh.Zare
00	18-Jan-23	F	R	A.Alishahi	M.Hozhabrian	A.Zare	Sh.Zare
Rev.	Date (DD.MMM.YY)	Status	Purpose of Issue	Prepared	Checked	approved	Authorized

	BIPC - Ethane Recovery Plant Contract No: 400/103 Inspection & Test Plan (ITP) for Refrigeration Package	 				
PO No.:C2R-PT-GEN-MA-PO-4002	<table border="1" style="width: 100%;"> <tr> <td style="width: 70%; text-align: center;">Document Number</td> <td style="width: 30%; text-align: center;">Rev.</td> </tr> <tr> <td style="text-align: center;">VP-C2R-SCC-MA-4002-7000</td> <td style="text-align: center;">03</td> </tr> </table>	Document Number	Rev.	VP-C2R-SCC-MA-4002-7000	03	Page 3 of 27
Document Number	Rev.					
VP-C2R-SCC-MA-4002-7000	03					

1 Introduction

Bandar Imam Petrochemical Company (BIPC) has defined a project, as BIPC 2nd Ethane Recovery Plant, to process C2+ feed supplied from NGL3200 plant via pipeline. The plant will be located within ISBL of Bandar Imam petrochemical complex, Mahshahr, Khuzestan Province, South West of Iran.

The plant should be designed in two independent trains (Train 1, Train 2) with common facilities to process 55,000 standard barrels per day C2+ (NGL) and deliver ethane (C2) and C3+ as main products considering 98% ethane recovery as the main target (based on available ethane in the feed).

The ethane and C3+ products should be delivered to olefin and existing NGL fractionation (NF) plants respectively. Required utilities for the project are supplied from existing facilities in the BIPC. The feed of the plant should be stored in the bank of bullet (pressurized) storage tank as a common facility for both trains.

Energy Industries Engineering and Design (EIED) is responsible for completion of the Project as EPC contractor with completed design and installation of the first train (Train 1), including common facilities for both trains, and deliver basic engineering package of the second train as future development in the Bandar Imam Petrochemical Complex.

SINA Control Engineering, Design & Manufacturing Company (here in after referred to Vendor), has been selected as the manufacturer of the Refrigeration Package of the aforementioned project.



Vendor Scope in Refrigeration Package defined as a EP Base order (Engineering, Procurement, Manufacturing & Supply) and the headlines of this proposal's scope are the followings items:

- Know-How & Basic Engineering
- Detail Engineering
- Supply and Manufacturing of Materials & Equipment
- Skids Fabrication & Delivery
- Supervision on Erection, Commissioning & Start-up (if requested)

The proposed Package contains following parts:

I. Process Part

- Identical Oil Injected Screw Compressor Units, including its necessary accessories such as:
 - Two Oil Pumps (for each Unit)
 - Two Oil Filters (for each Unit)
 - Oil Cooler (for each Unit)
 - Separator Drum (for each Unit)
- Refrigerant Air Cooled Condenser
- Refrigerant Receiver
- Economizer
- Dryer
- Refrigerant Evaporator
- Control system & Instrumentation
- Piping

	BIPC - Ethane Recovery Plant Contract No: 400/103 Inspection & Test Plan (ITP) for Refrigeration Package					
PO No.:C2R-PT-GEN-MA-PO-4002	<table border="1" style="width: 100%;"> <tr> <td style="width: 70%;">Document Number</td> <td style="width: 30%;">Rev.</td> </tr> <tr> <td>VP-C2R-SCC-MA-4002-7000</td> <td>03</td> </tr> </table>	Document Number	Rev.	VP-C2R-SCC-MA-4002-7000	03	Page 4 of 27
Document Number	Rev.					
VP-C2R-SCC-MA-4002-7000	03					

II. Utilities and facilities (inside the package)

- Utilities Distribution and interconnection System inside the package (Electrical Power, Instrument Air, Cooling Water, LP Nitrogen & Flare)

III. Common facilities

- Dedicated Control and Monitoring System
- Spare- Parts

2 Purpose

The purpose of this document is to provide the requirements of "Specification for Test & Inspection of Equipment and Package Internal parts" for the design, manufacturing and supply of Refrigeration Package and its internal accessories.

3 Scope

This Inspection Test Plan (ITP) covers the minimum requirements for inspection, testing and fabricating of Refrigeration Package (C2R-PK-1101), which will be installed in BIPC 2nd Ethane Recovery Plant.

Where required, Inspection Test Plan (ITP) will be finalized during the pre-inspection meeting.




Vendor is responsible for the adequacy and compliance of inspection and tests of equipment with the applicable code and standards requirements, the process conditions and/or other conditions as specified in this ITP.

The Inspection and Test Plan for equipment is an engineering document, which defines:

- The type and extent of OWNER/ MC/ CONTRACTOR Representative Involvement in each phase of fabrication, control and testing requiring an inspection.
- The resulting Vendor's contractual obligations in accordance with general purchase condition.

4 Definition

- PROJECT: Engineering, Procurement, Construction, Pre-Commissioning & Commissioning of BIPC Ethane Recovery Plant
- PLANT: BIPC - Ethane Recovery Plant located at Bandar-e-Imam – Iran
- SITE: Means areas where the PLANT will be located
- OWNER: Bandar Imam Petrochemical Company as "BIPC"
- MC: Petrochemical Industries Development Management Company as "PIDMCO"
- CONTRACTOR: Energy Industries Engineering & Design as "EIED"
- SUBCONTRACTOR: Means any person or company (other than CONTRACTOR) to whom any part of the Construction operations and relevant technical services, via concluding a contract with CONTRACTOR, has been entrusted by the CONTRACTOR.
- VENDOR: Means SINA Control Engineering, Design & Manufacturing Company or its Sub-Vendors/Manufacturers

	BIPC - Ethane Recovery Plant Contract No: 400/103		
	Inspection & Test Plan (ITP) for Refrigeration Package		
PO No.:C2R-PT-GEN-MA-PO-4002	Document Number VP-C2R-SCC-MA-4002-7000	Rev. 03	Page 5 of 27

Following terms to be used in ITP:

➤ **Hold Point:**

Hold point is a designate point during or following specific activities, which are, defined in ITP and which inspection or examination shall not proceed unless the designated parties have witnessed the inspection or examination or test, all parties were mentioned in ITP shall sign and stamp all related reports as hold point, and results all activities shall be specified clearly by term accepted/ rejected. Vendor shall notify other parties.

➤ **Witness point:**

Witness point is a designated point during or following an important activity at which inspection or examination is required in accordance with the relative procedures. Work may be proceeded through the designate witness point if the TPA inspector is not present for the previously established activity. All parties were mentioned in ITPs shall sign and stamp all related reports as the activity were mentioned inside of ITP and result of all activities shall be specified clearly by term accepted/ rejected. Vendor shall notify other parties.

➤ **Spot witness:**




Spot witness is a designate point during or following an activity at which spot inspection or spot examination is required in accordance with the relative procedure. Work may be proceeded through the designate witness point if the TPA inspector is not present for the previously established activity. The TPA inspector shall be informed officially before the activity and shall approve at least 20% of activity (20% witness).

➤ **Review:**




A designated point in the production/execution process at which stage the documents pertaining to the relevant tests and examinations should be reviewed by TPA to ensure the conformity of the job performed in accordance with the approved ITP, drawings/data sheets, procedures and contractual specifications.

➤ **Review and approved (RA):**




Review and approved (RA) means that documents reviewed by involved party shall be signed and stamped as reviewed and approved. Where a document is subjected to party approval. Work shall not proceed until related party approval is obtained.

	BIPC - Ethane Recovery Plant Contract No: 400/103		
	Inspection & Test Plan (ITP) for Refrigeration Package		
PO No.:C2R-PT-GEN-MA-PO-4002	Document Number	Rev.	Page 6 of 27
	VP-C2R-SCC-MA-4002-7000	03	




No.	Quality Related Activity	Reference Document	Reporting/ Document	Vendor /Sub Vendor	Owner/ MC	TPA	Contractor	Remark
1	Pressure Vessels (C2R-PK-1101-DR-01, C2R-PK-1101-DR-02, C2R-PK-1101-DR-03)							
	Pre-Inspection Meeting	Agenda, Project Specification, Documents: - Inspection & Test Plan (ITP) Quality Assurance Plan	MOM	H	H	H	H	
1.1	Documentation Controls							
1.1.1	Welding Procedures Including WPS,PQR,NDT & WELD MAP,NDT Procedures	ASME Sec. V, VIII, IX Specification for equipment welding	Document	H	R	R	RA	
1.1.2	Welders and NDT operators qualifications	ASME Sec. IX, ASNT or Equal Documents: - WPS&PQR	Document/Certificate	H	R	R	RA	
1.1.3	Test & Fabrication Procedures/Packing & Preservation and Marking Procedure	ASME Sec. VIII, Specifications	Document	H	R	R	RA	
1.1.4	Non-destructive testing (DP/UT/RT)& Procedures	ASME Sec. V/VIII Div.1, Appd. DWG,	Document	H	R	R	RA	
		SNT-TC-1A-2006	Qualification Certificates	H	R	R	RA	
1.1.5	Heat Treatment, Hydro/Pneumatic Test and Painting procedure	ASME Sec. VIII Div.1, Appd. DWG,	Document	H	R	R	RA	
1.2	Material Identification							

	BIPC - Ethane Recovery Plant Contract No: 400/103		
	Inspection & Test Plan (ITP) for Refrigeration Package		
PO No.:C2R-PT-GEN-MA-PO-4002	Document Number	Rev.	Page 7 of 27
	VP-C2R-SCC-MA-4002-7000	03	




No.	Quality Related Activity	Reference Document	Reporting/ Document	Vendor /Sub Vendor	Owner/ MC	TPA	Contractor	Remark
1.2.1	Material Test certificates	EN 10204-Type 3.1, Specifications and Standard/NACE Req. If Applicable	MTC	H	R	H	W	Impact Test Shall be done As per GAD
1.2.2	Material after receipt (For pressure parts) Plates, Pipes, Flanges, Fittings.	Specifications and Standard/ NACE Req. If Applicable	Report	H	R	H	W	Impact Test Shall be done As per GAD
1.2.3	Fasteners, Gaskets.	Specifications and Standard/ NACE Req. If Applicable/MTC	Report	H	R	H	W	
1.2.4	Non-pressure parts including supports, internal etc)	Specifications and Standard	Report	H	R	W	W	Impact Test Shall be done As per GAD
1.2.5	Paint	Specifications and Standard	Report	H	R	W	R	
1.3	Fabrication							
1.3.1	Marking & cutting /Fit up/Welding for head	Approved DWG,WPS,PQR	Report	H	R	SW	R	
1.3.2	Visual & dimensional inspection, UT for head After forming	ASME Sec. VIII Div.1, Appd. DWG,	Inspection Report	H	SW	W	R	
1.3.3	RT After Forming for head	ASME Sec. V & NDT Procedure / NDT Map	REPORT	H	R	RA	R	100%
1.3.4	MT on knuckle portion(For cracks on Inside & outside surface) for head & UT for Lamination	ASME Sec. V/ VIII Div.1	Inspection Report	H	R	W	R	
1.3.5	Final dimensional control and visual check, NDT and PFHT as per drawing (if required)	ASME Sec. VIII Div.1, Appd. DWG	HT Graph& Report	H	R	H	R	

 B.I.P.C	BIPC - Ethane Recovery Plant Contract No: 400/103		 EIED
	Inspection & Test Plan (ITP) for Refrigeration Package		 Jina Control Co. ENGINEERING DESIGN & MANUFACTURING CO.
PO No.:C2R-PT-GEN-MA-PO-4002	Document Number	Rev.	Page 8 of 27
	VP-C2R-SCC-MA-4002-7000	03	




No.	Quality Related Activity	Reference Document	Reporting/ Document	Vendor /Sub Vendor	Owner/ MC	TPA	Contractor	Remark
1.3.6	Marking Transfer , cutting and Bevel check	Appd. DWG, relevant Specifications	Inspection Report	H	R	SW	R	
1.3.7	Forming, Fit up	Appd. DWG / Specifications, SCC Appd. Procedure	Inspection Report	H	R	W	R	
1.3.8	PT For LW & CW	Appd. DWG / Specifications, SCC Appd. Procedure	Inspection Report	H	R	SW	R	For back welding
1.3.9	Welding For LW & CW	Appd. DWG / Specifications, SCC Appd. Procedure	Inspection Report	H	R	SW	R	
1.3.10	Template and Gauge plate checking and releasing(If any)	Appd. DWG / Specifications	Inspection Report	H	R	W	R	
1.3.11	RT for welding joints	ASME Sec. V, Appd. DWG	Inspection Report	H	R	W	R	Film & Report
1.3.12	Shell and Head Visual and Dimensional check and marking for Nozzle	Approved DWG	Report	H	R	W	R	
1.3.13	Nozzles to pipe spooling	Approved DWG	Report	H	R	SW	R	
1.3.14	Opening and Fit up Nozzles to body.	ASME Sec. VIII Div.1, Appd. DWG	Report	H	R	H	R	
1.3.16	Welding, NDT and Repair (If any)	WPS,PQR, NDT Map, NDT Procedures	Inspection Report	H	R	W	R	
1.3.17	Welding for internal & external attachment, visual and dimensional check & Final NDT	Appd. DWG	Report	H	R	SW	R	
1.3.18	Pneumatic test of Pads	ASME Sec. VIII Div.1, Appd. Procedure	Report	H	R	W	SW	

 B.I.P.C	BIPC - Ethane Recovery Plant Contract No: 400/103		 EIED
	Inspection & Test Plan (ITP) for Refrigeration Package		 Sina Control Co ENGINEERING DESIGN & MANUFACTURING CO.
PO No.:C2R-PT-GEN-MA-PO-4002	Document Number	Rev.	Page 9 of 27
	VP-C2R-SCC-MA-4002-7000	03	




No.	Quality Related Activity	Reference Document	Reporting/ Document	Vendor /Sub Vendor	Owner/ MC	TPA	Contractor	Remark
1.3.19	PWHT and NDT and Hardness test (If any)	Appd. Procedure	Report	H	R	W	R	
1.3.19	Final Visual & Dimensional inspection (Internal & External)	Appd. DWG	Inspection Report	H	R	H	R	
1.3.20	Hydro Test	ASME Sec. VIII Div.1, Appd. Procedure	Report	H	R	H	W	
1.3.21	Drain , drying and Surface preparation & Painting	Appd. Procedure	Report	H	R	H	R	
1.4	Final Inspection							
1.4.1	Nameplate Check	Appd. DWG	Copy of Name plate	H	R	W	R	
1.4.2	Document review before releasing	Project Specifications	MDR	H	R	RA	R	
1.4.3	Preservation as per DWG	Appd procedure & DWG	Report	H	R	H	R	
1.4.4	Packing, Marking and shipping check	Project Specifications, Appd. Procedure & documents	Packing list	H	R	H	W	
1.4.5	Verification of spares, Loose Materials check	Appd. DWG & Procedure Project specification	Packing	H	R	H	R	
1.4.6	Final Release	Project specification	Issue release note	R	R	H	RA	
1.4.7	Final Book Review	Approved Final Index	MDR / Document	H	RA	RA	RA	VDB

 B.I.P.C	BIPC - Ethane Recovery Plant Contract No: 400/103		 EIED
	Inspection & Test Plan (ITP) for Refrigeration Package		 Jina Control Co. <small>ENGINEERING DESIGN & MANUFACTURING CO.</small>
PO No.:C2R-PT-GEN-MA-PO-4002	Document Number	Rev.	Page 10 of 27
	VP-C2R-SCC-MA-4002-7000	03	




No.	Quality Related Activity	Reference Document	Reporting/ Document	Vendor /Sub Vendor	Owner/ MC	TPA	Contractor	Remark
2	Exchanger (C2R-PK-1101-E-01)							
	Pre-Inspection Meeting	Agenda, Project Specification, Documents: - Inspection & Test Plan (ITP) Quality Assurance Plan	MOM	H	W	H	H	
2.1	Documentation Controls							
2.1.1	Confirmation of WPS and PQR / Weld/ NDT Map	ASME Sec. VIII-1, Sec. IX, Project Specification, Approved Procedure	Document	H	R	R	RA	
2.1.2	Confirmation of Welder's Qualification Testing	ASME Sec. VIII-1, Sec. IX, Project Specification, Approved Procedure	Document	H	R	R	RA	
2.1.3	All Inspection and Test Procedures (Such as NDT, Hydrotest, Painting, Hardness, PWHT, etc.)	Approved Procedure	Document	H	R	R	RA	
2.1.4	NDT Personnel's Qualification	Approved Procedure, ASNT-SNT-TC-1A	Certificates	H	R	R	R	
2.2	Material Identification							
2.2.1	Inspection of raw materials including plate, nozzle ,pipe, fitting, bolt & nut, paint,...	Specifications and Standard, NACE requirements (if applicable)	Report	H	R	H	R	
2.2.2	Review of Mill Certificate or Test Report Welding consumable material check (MTC type 3.1 shall be considered as verifying document)	ASME Sec. II, Part A and C Certificates Test Result MTC Type 3.1,(note 1)	MOM	H	R	R	R	*Including Impact test according to DWG

 B.I.P.C	BIPC - Ethane Recovery Plant Contract No: 400/103		 EIED
	Inspection & Test Plan (ITP) for Refrigeration Package		 Sina Control Co ENGINEERING DESIGN & MANUFACTURING CO.
PO No.:C2R-PT-GEN-MA-PO-4002	Document Number	Rev.	Page 11 of 27
	VP-C2R-SCC-MA-4002-7000	03	




No.	Quality Related Activity	Reference Document	Reporting/ Document	Vendor /Sub Vendor	Owner/ MC	TPA	Contractor	Remark
2.3	Fabrication							
2.3.1	Transfer of Material Identification Before Cutting	ASME Sec.VIII – 1 UG-94 Approved Material traceability procedure	Report	H	R	SW	R	
2.3.2	Shell & heads Dimensional check for heat exchanger	Drawing	Report	H	R	W	R	
2.3.3	Check of formed heads , Check of first Rolling	Drawing	Report	H	SW	W	R	
2.3.4	Visual & Dimensional Check of Fit-up & Welding	ASME Sec. VIII-1, ASME Sec. IX, QC Report	Report	H	R	W	R	
2.3.5	NDT	Approved Procedure & NDT MAP	Report	H	R	SW	R	RA for RT Film
2.3.6	Dimensional and Visual Check of Bundle and Insertion	Appd. DWG	Report	H	R	W	R	
2.3.7	Welding/ Expanding of Tube to Tube sheet (If Any)	Approved Drawing ASME Sec. IX Welding Document. Approved tube expanding procedure" also shall be referred.	Report	H	R	SW	R	
2.3.8	Welding Major Repair Execution (If Applicable)	Approved Repair Procedure	Report	H	RA	H	H	
2.3.9	Non Conformity and Deviation Check	---	Report	H	RA	W	RA	
2.4	Inspection of Completed Product							

 B.I.P.C	BIPC - Ethane Recovery Plant Contract No: 400/103		 EIED
	Inspection & Test Plan (ITP) for Refrigeration Package		 Jina Control Co <small>ENGINEERING DESIGN & MANUFACTURING CO.</small>
PO No.:C2R-PT-GEN-MA-PO-4002	Document Number VP-C2R-SCC-MA-4002-7000	Rev. 03	Page 12 of 27




No.	Quality Related Activity	Reference Document	Reporting/ Document	Vendor /Sub Vendor	Owner/ MC	TPA	Contractor	Remark
2.4.1	Final Visual and Dimensional Inspection (Before PWHT)	As Per DWG.	Report	H	R	W	W	
2.4.2	Post Weld Heat Treatment and Graph	PWHT Procedure	Report	H	R	W	R	
2.4.3	Hardness Test	Hardness Procedure	Report	H	R	SW	SW	
2.4.4	NDT after PWHT	--	Report	H	R	W	R	RA for RT Film
2.4.5	PMI non-CS base and weld metal	PMI Procedure	Report	H	R	SW	SW	
2.4.6	Final Visual and Dimensional Check Before Hydrotest	As Per DWG. , Project Technical Specification	Report	H	SW	W	W	
2.4.7	Air Leak Test for Tube to Tubesheet Welds (If Applicable)	Hydro Test Procedure	Report	H	R	W	W	
2.4.8	Hydrostatic Test	Hydro Test Procedure	Report	H	W	H	W	
2.4.9	Draining and Drying & Check of Cleanliness After Hydrostatic test	Hydro Test Procedure	Report	H	R	H	W	
2.4.10	Pickling and Passivation for Stainless Steel Parts (If Any)	Pickling and Passivation Procedure	Report	H	R	SW	R	
2.4.11	Surface Preparation and Inspection of Each Layers DFT Check and Painting Inspection (Adhesive, Thickness and RAL)	Painting Procedure	Report	H	R	H	SW	

	BIPC - Ethane Recovery Plant Contract No: 400/103		
	Inspection & Test Plan (ITP) for Refrigeration Package		
PO No.:C2R-PT-GEN-MA-PO-4002	Document Number	Rev.	Page 13 of 27
	VP-C2R-SCC-MA-4002-7000	03	




No.	Quality Related Activity	Reference Document	Reporting/ Document	Vendor /Sub Vendor	Owner/ MC	TPA	Contractor	Remark
2.5	Preparation for Transportation (Packing / Marking / Shipment)							
2.5.1	Preservation & long term storage	Preservation & long term Storage procedure	Report	H	R	W	W	
2.5.2	Final Inspection , Packing & Marking Inspection & Name Plate Check	DWG, Packing Procedure	Packing List	H	W	W	W	
2.5.3	Release for Shipment (IRN)	---	Release Note	R	R	H	R	
2.5.4	Manufacturer's Inspection Data Book (QC Final Booklet)	---	Approved final data book	H	R	R	R	VDB
3	Air cooler (C2R-PK-1101-AE-01)							
	Pre-Inspection Meeting	Agenda, Project Specification, Documents: - Inspection & Test Plan (ITP) Quality Assurance Plan	MOM	H	W	H	H	
3.1	Documentation Controls							
3.1.1	Confirmation of WPS and PQR /Weld Map / NDT Maps	DWG., ASME VIII – 1 , ASME IX, Welding Document (WPS, PQR),	Document	H	R	R	R	
3.1.2	Welder's Qualification Testing	Welder Certificate, ASME VIII – 1, ASME IX	Document	H	R	R	R	
3.1.3	NDT Personnel Qualification	NDE Personal's Certificate, ASME V& NDT Personal's Certificate & ASNT SNT TC-1A	Document	H	R	R	R	

	BIPC - Ethane Recovery Plant Contract No: 400/103		
	Inspection & Test Plan (ITP) for Refrigeration Package		
PO No.:C2R-PT-GEN-MA-PO-4002	Document Number	Rev.	Page 14 of 27
	VP-C2R-SCC-MA-4002-7000	03	




No.	Quality Related Activity	Reference Document	Reporting/ Document	Vendor /Sub Vendor	Owner/ MC	TPA	Contractor	Remark
3.2	Material and Consumable Purchased							
3.2.1	Inspection of raw materials including plate, nozzle ,pipe, Tube, fitting, bolt & nut, paint,...	Approved Detail Drawings, ASME SEC.II	MTC	H	R	W	SW	EN10204-3.1 for Pressure Parts, Non pressure parts 2.2
3.2.2	Review of Mill Certificate or Test Report	Approved Certificate, ASME SEC.II,Project specification(note 1)	MOM	H	R	R	R	*Including Impact test according to DWG
3.3	Inspection of Header Box Fabrication							
3.3.1	Cutting and Edge Preparation for Welding, Edge Preparation, Visual inspection	Appd. DWG + NDT Procedure	---	H	R	SW	SW	ASME Sec. VIII-Div. 1
3.3.2	Fit-Up Alignment Check and Welding, Fit-Up, Visual & Dimension inspection	Appd. DWG	Inspection Report	H	R	SW	SW	ASME Sec. VIII-Div. 1
3.3.3	Radiographic Examination For Butt-weld Type Joints (full RT of nozzle neck to flange)	Code, NDT Procedure / Map, ASME V	RT Report	H	R	SW/RA	R	RA for RT Film
3.3.4	Ultrasonic Examination For Corner Type Joints	NDT Procedure & Welding Map	UT Report	H	R	W	SW	ASME V&VIII Div1
3.3.5	PT/MT Examination	NDT Procedure & Welding Map	PT& MT Report	H	R	W	SW	ASME V&VIII Div1
3.3.6	Visual and Dimensional Inspection	Appd. DWG	VT+DT Report	H	R	W	SW	
3.3.7	Execution of Major Repairs, When Issued NCR	Repair Procedure	Inspection Report	H	R	H	SW	

	BIPC - Ethane Recovery Plant Contract No: 400/103		
	Inspection & Test Plan (ITP) for Refrigeration Package		
PO No.:C2R-PT-GEN-MA-PO-4002	Document Number VP-C2R-SCC-MA-4002-7000	Rev. 03	Page 15 of 27




No.	Quality Related Activity	Reference Document	Reporting/ Document	Vendor /Sub Vendor	Owner/ MC	TPA	Contractor	Remark
3.3.8	Dimensional Check Before PWHT	Appd. DWG	Inspection Report	H	R	W	SW	ASME Sec.VIII, DWG
3.3.9	PWHT & Relevant Graphs	PWHT Procedure	Inspection Report	H	R	W	SW	
3.3.10	NDT after PWHT For header	NDT Procedure/Map	Inspection Report	H	R	W	SW	
3.3.11	Surface Preparation and Inspection of Each Layers DFT Check and Painting Inspection (Adhesive, Thickness and RAL)	Painting Procedure	Inspection Report	H	R	W	SW	
3.4	Tube Bundle Assembly							
3.4.1	Fined Tubes Inspection	Appd. DWG	---	H	R	SW	SW	
3.4.2	Tube Expanding / Checking of tube to tube sheet welding (if required)	Appd. DWG, Welding Document	Inspection Report	H	R	SW	SW	
3.4.3	Final Visual & Dimensional Check of Tube Bundle Assembly	Appd. DWG	Inspection Report	H	R	W	W	
3.4.4	Hydrostatic Test	Hydrostatic test Procedure, ASME VIII-1	Hydrostatic Report	H	R	H	H	
3.4.5	Check of Cleanliness/ Drain and Drying After Pressure Test	Hydrostatic Test Procedure, ASME VIII-1	---	H	R	SW	SW	
3.4.6	Name plate stamping	H	R	SW	SW	

	BIPC - Ethane Recovery Plant Contract No: 400/103		
	Inspection & Test Plan (ITP) for Refrigeration Package		
PO No.:C2R-PT-GEN-MA-PO-4002	Document Number VP-C2R-SCC-MA-4002-7000	Rev. 03	Page 16 of 27




No.	Quality Related Activity	Reference Document	Reporting/ Document	Vendor /Sub Vendor	Owner/ MC	TPA	Contractor	Remark
3.5	Steel Structure, Fan Ring , Plenum and Side Frame							
3.5.1	Visual and Dimensional Inspection	Appd. DWG	VT+DT Report	H	R	W	SW	
3.5.2	NDT (10% PT or MT) (Random Inspection)	NDT Procedure	Inspection Report	H	R	W	SW	
3.5.3	Visual & Dimensional Check Before Galvanizing or Painting and Preassembly	Appd. DWG	Inspection Report	H	R	W	SW	
3.5.4	Painting, Galvanizing	Painting Procedure & Spec.	Inspection Report	H	R	W	SW	
3.5.5	Final Inspection Prior to Shipment	Appd. DWG	Inspection Report	H	R	W	SW	
3.5.6	Trial assembly for one bay for steel structure	Appd. DWG	---	H	R	W	SW	
3.6	Air-Side Component Inspection (Fan and Driver Assembly, if any)							
3.6.1	Dimensional Inspection	Data Sheet & Certificates	---	H	R	SW	SW	
3.6.2	Visual Inspection	Data Sheet & Certificates	---	H	R	SW	SW	
3.6.3	Balance Test for Pulley and Wheel	Data Sheet & Certificates	---	H	R	R	R	
3.6.4	Dynamic Balance for Fan blade, Hub	Data Sheet & Certificates	---	H	R	R	R	

 B.I.P.C	BIPC - Ethane Recovery Plant Contract No: 400/103		 EIED
	Inspection & Test Plan (ITP) for Refrigeration Package		 Jina Control Co. ENGINEERING DESIGN & MANUFACTURING CO.
PO No.:C2R-PT-GEN-MA-PO-4002	Document Number	Rev.	Page 17 of 27
	VP-C2R-SCC-MA-4002-7000	03	




No.	Quality Related Activity	Reference Document	Reporting/ Document	Vendor /Sub Vendor	Owner/ MC	TPA	Contractor	Remark
3.7	Electric Motor Inspection							
3.7.1	Intrinsically Safe Certificates Manufacturer And Mechanical Protection Degree Certificate (If required)	Certificates	---	H	R	R	R	
3.7.2	Visual and Dimensional Check	Motor GAD, Certificates	---	H	R	W	SW	
3.7.3	Type Test (Performance Test) (if required)	Project Motor Specification, data Sheet & Certificates	Report	H	R	R	R	
3.7.4	Routine Test (If Required)	Project Motor Specification, data Sheet & Certificates	---	H	R	R	R	
3.7.5	Run in Test (Noise and Vibration Check at shop FSK)	Project Motor Specification, data Sheet & Certificates	Report	H	R	SW	SW	
3.7.6	SAT test at site	APPD. Procedure	---	H	R	H	SW	
3.7.7	Inspection of Vibration Switches	data Sheet & Certificates	Report	H	R	W	SW	
3.8	Preparation For Shipment							
3.8.1	Preservation & Storage	Preservation & Storage procedure	Report	H	SW	W	W	
3.8.2	Final Inspection Before Shipment	Name Plate, Appd. DWG	---	H	R	W	W	

	BIPC - Ethane Recovery Plant Contract No: 400/103		
	Inspection & Test Plan (ITP) for Refrigeration Package		
PO No.:C2R-PT-GEN-MA-PO-4002	Document Number	Rev.	Page 18 of 27
	VP-C2R-SCC-MA-4002-7000	03	




No.	Quality Related Activity	Reference Document	Reporting/ Document	Vendor /Sub Vendor	Owner/ MC	TPA	Contractor	Remark
3.8.3	Packing / Marking / Spare Part/Pre-shipment	Appd. DWG, Packing and Marking Procedure	Packing List Spare Part List	H	R	W	W	
3.8.4	Issue Release Note for Shipment	---	IRN	H	R	W	W	
3.8.5	QC Final Booklet	Document and reports	---	H	R	R	R	VDB
3.8.6	Spare parts checking (If any)	H	SW	W	W	
Note 1: In case of lack of original certificate, sampling shall be done by TPA								
4	Pipes, Flanges & Fittings For Piping work							
	Pre-Inspection Meeting	Agenda, Project Specification, Documents: - Inspection & Test Plan (ITP) Quality Assurance Plan	MOM	H	W	H	H	
4.1	Material Identification							
4.1.1	Review of Material test certificates	MTC	Report	H	R	RA	W	
4.1.2	Dimensional & Visual	Specifications and Standard	Report	H	R	W	W	
4.1.3	RT for welded Pipes & Fittings if applicable	Specification, Relevant Standards	Report	H	R	R	W	

 B.I.P.C	BIPC - Ethane Recovery Plant Contract No: 400/103		 EIED
	Inspection & Test Plan (ITP) for Refrigeration Package		 Sina Control Co ENGINEERING DESIGN & MANUFACTURING CO.
PO No.:C2R-PT-GEN-MA-PO-4002	Document Number	Rev.	Page 19 of 27
	VP-C2R-SCC-MA-4002-7000	03	




No.	Quality Related Activity	Reference Document	Reporting/ Document	Vendor /Sub Vendor	Owner/ MC	TPA	Contractor	Remark
4.1.4	Surface preparation & painting	Appd. DWG, Appd. Procedure	Report	H	R	W	W	
4.2	Documentation Controls							
4.2.1	NDT Procedures: RT, PT, Hydro/Pneumatic test etc.	Approved P&ID, ASME Sec. V/VIII Div.1, Procedural write ups	Report	H	H	R	R	Approved P&ID, ASME Sec. V/VIII Div.1
4.2.2	Review Welding procedures: Review of weld plan with sketch, WPS: Qualification requirements & proposed parameters, PQR: welding parameter followed and test results, Qualification of welders/welding operators, Welding consumables	Piping drawing, Approved P&ID	Document	H	H	R	R	ASME Sec. IX
4.3	Fabrication							
4.3.1	Fit up and welding inspection: Groove design & alignment	Piping drawing	Report	H	R	W	SW	10%
4.3.2	DP Test of Socket welds joints	Piping DWG, OPT Procedure	Report	H	R	RA	R	
4.3.3	RTI of Butt weld joints	Appd. DWG, PMS. PR	Report	H	R	RA	R	ASME B31.3
4.3.4	Final Visual & Dimensional Inspection	Assembly Appd. DWG	Report	H	R	W	W	

	BIPC - Ethane Recovery Plant Contract No: 400/103		
	Inspection & Test Plan (ITP) for Refrigeration Package		
PO No.:C2R-PT-GEN-MA-PO-4002	Document Number	Rev.	Page 20 of 27
	VP-C2R-SCC-MA-4002-7000	03	




No.	Quality Related Activity	Reference Document	Reporting/ Document	Vendor /Sub Vendor	Owner/ MC	TPA	Contractor	Remark
4.3.5	Packing / Marking / Spare Part/Pre-shipment	Appd. DWG, Packing and Marking Procedure	Packing List Spare Part List	H	SW	W	W	
4.3.6	Issue Release Note for Shipment	---	IRN	R	R	H	R	
5	Manual Valves							
	Pre-Inspection Meeting	Project spec. and approved vendor documents Spec./ Data Sheet	MOM / ITP	H	H	H	H	
5.1	Material Identification							
5.1.1	Material (casting)	ASTM and MSS SP-55	MTC. 3.1/ Lab Report	H	RA	R	R	
5.1.2	Material (Round bar)	ASTM A and B series	MTC. 3.1/ Lab Report	H	RA	R	R	
5.1.3	Material (accessories)	ASTM / ASME	Certificate	H	SW	SW	SW	Bush - O Ring- Packing- Gasket - Nut - Bolting
5.2	Fabrication							
5.2.1	Final Assembly (Visual & Dimensional check)	PSM Drawings	PSM Report	H	R	W	W	
5.2.2	RT for Casting Body	Related Standard/ Procedure	PSM Report	H	R	RA	RA	
5.2.3	PT For Weld & Satellited	Related Standard/ Procedure	PSM Report	H	R	SW	SW	

	BIPC - Ethane Recovery Plant Contract No: 400/103		
	Inspection & Test Plan (ITP) for Refrigeration Package		
PO No.:C2R-PT-GEN-MA-PO-4002	Document Number VP-C2R-SCC-MA-4002-7000	Rev. 03	Page 21 of 27




No.	Quality Related Activity	Reference Document	Reporting/ Document	Vendor /Sub Vendor	Owner/ MC	TPA	Contractor	Remark
5.2.4	Hydrostatic Shell Test	API 598	PSM Report	H	R	SW	SW	30%
5.25	Seat Leakage Test	API 598	PSM Report	H	R	SW	SW	30%
5.2.6	Surface Preparation/ Blasting & Painting	Project Specification	PSM Report	H	R	R	R	
5.3	Final Inspection							
5.3.1	Packing & Marking Inspection	PSM Procedure/ Related Standard	PSM Report	H	RA	H	H	
5.3.2	Released Not.	Packing List / ITP	I.R.N	H	R	H	H	
5.3.3	Review Final Data Book	Final Book Index	Final Data Book	H	R	R	H	VDB
6	Instruments and Controls							
6.1	Control Panel & PLC Panel							
6.1.1	Verification of components, Rating 100%	Appd. DWG	Report	H	R	W	W	
6.1.2	Completeness of wiring	Appd. DWG	Report	H	R	W	W	
6.1.3	Dimensional Check, Component Arrangement	Appd. DWG	Report	H	R	W	W	

	BIPC - Ethane Recovery Plant Contract No: 400/103		
	Inspection & Test Plan (ITP) for Refrigeration Package		
PO No.:C2R-PT-GEN-MA-PO-4002	Document Number	Rev.	Page 22 of 27
	VP-C2R-SCC-MA-4002-7000	03	




No.	Quality Related Activity	Reference Document	Reporting/ Document	Vendor /Sub Vendor	Owner/ MC	TPA	Contractor	Remark
6.1.4	Functional check of circuit	Appd. DWG	Report	H	R	W	W	
6.1.5	HV (For Power circuit only)	Appd. DWG,	Report	H	R	W	W	
6.1.6	FAT Test	Appd. Procedure	Report	H	W	H	H	
6.1.7	Final documents	Review & verification of documents	Report	H	R	RA	R	
6.1.8	Release note	Packing List	IRN	R	R	H	R	
6.2	Instruments							
6.2.1	Pressure gauge	Calibration Reports, Approved Data Sheet	Document	H	R	RA	R	
6.2.2	Temperature gauge, Temperature element & Thermo-well	Calibration Reports, Approved Data Sheet	Document	H	R	RA	R	
6.2.3	Pressure transmitter, Differential Pressure transmitter, Temperature transmitter, Level transmitter	Calibration Reports, Approved Data Sheet	Document	H	R	RA	R	
6.2.4	Solenoid Valve, Junction Box & Cables	Test Certificate, Approved Data Sheet	Document	H	R	RA	R	
6.3	Pressure safety valve							
6.3.1	Material TC	Approved Data Sheet	Document	H	R	RA	R	

	BIPC - Ethane Recovery Plant Contract No: 400/103		
	Inspection & Test Plan (ITP) for Refrigeration Package		
PO No.:C2R-PT-GEN-MA-PO-4002	Document Number	Rev.	Page 23 of 27
	VP-C2R-SCC-MA-4002-7000	03	




No.	Quality Related Activity	Reference Document	Reporting/ Document	Vendor /Sub Vendor	Owner/ MC	TPA	Contractor	Remark
6.3.2	Seat leakage & Hydro test	Approved Data Sheet	Report	H	R	RA	H	
6.4	Control Valve							
	Pre-Inspection Meeting	Project spec. and approved vendor documents/ Spec./ Data Sheet	MOM / ITP	H	H	H	H	
6.4.1	Material Identification							
6.4.1.1	Material (casting)	ASTM and MSS SP-55	MTC. 3.1/ Lab Report	H	R	R	R	
6.4.1.2	Material (Round bar)	ASTM A and B series	MTC. 3.1/ Lab Report	H	R	R	R	
6.4.1.3	Material (accessories)	ASTM / ASME	MTC. 3.1/ Lab Report	H	R	SW	SW	Bush - O Ring- Packing- Gasket -Nut - Bolting
6.4.1.4	Control Valve Accessories(Positioner,...)	Data Sheet	Certificate	H	R	W	W	
6.4.2	Fabrication							
6.4.2.1	Final Assembly (Visual & Dimensional check)	PSM Drawings	PSM Report	H	R	W	R	
6.4.2.2	RT for Casting Body	Related Standard/ Procedure	PSM Report	H	R	RA	R	
6.4.2.3	PT For Weld & Satellited	Related Standard/ Procedure	PSM Report	H	R	SW	R	

	BIPC - Ethane Recovery Plant Contract No: 400/103		
	Inspection & Test Plan (ITP) for Refrigeration Package		
PO No.:C2R-PT-GEN-MA-PO-4002	Document Number VP-C2R-SCC-MA-4002-7000	Rev. 03	Page 24 of 27




No.	Quality Related Activity	Reference Document	Reporting/ Document	Vendor /Sub Vendor	Owner/ MC	TPA	Contractor	Remark
6.4.2.4	Hard Facing	Data Sheet/ ASTM/ASME	MTC	H	R	R	R	
6.4.2.5	Hydrostatic Shell Test	API 598/ 6D	PSM Report	H	R	SW	SW	30%
6.4.2.6	Seat Leakage Test	ANSI-FCI 70-2 / API 598	PSM Report	H	R	SW	SW	30%
6.4.2.7	Functional Test (Travel , Stroke Time & CV Test)	Project Specification/ Manufacture Standard	PSM Report	H	R	H	W	
6.4.2.8	Surface Preparation/ Blasting & Painting	Project Specification	PSM Report	H	R	R	R	
6.4.3	Final Inspection							
6.4.3.1	Packing & Marking Inspection	PSM Procedure/ Related Standard	PSM Report	H	RA	H	H	
6.4.3.2	Released Not.	Packing List / ITP	I.R.N	H	R	H	R	
6.4.3.3	Review Final Data Book	Final Book Index	Final Data Book	H	R	R	R	VDB
7	Compressor Packages Assembled skid							
7.1	Mechanical Seal air leak test/ hydro-test	Manufacturer Standard	Certificate	H	R	R	R	
7.2	Functional test of lube oil system During SAT	Manufacturer Standard	Report	H	R	R	R	

	BIPC - Ethane Recovery Plant Contract No: 400/103		
	Inspection & Test Plan (ITP) for Refrigeration Package		
PO No.:C2R-PT-GEN-MA-PO-4002	Document Number	Rev.	Page 25 of 27
	VP-C2R-SCC-MA-4002-7000	03	

No.	Quality Related Activity	Reference Document	Reporting/ Document	Vendor /Sub Vendor	Owner/ MC	TPA	Contractor	Remark
7.3	Compressor Bare Shaft Test Run	Manufacturer Standard	Document	H	R	R	R	
7.4	Vibration Test & Leak Test of Compressor bare shaft	Manufacturer Standard	Document	H	R	R	R	
7.5	OEM inspection Certificate including: performance, Hydro-test and material of Oil pump.	Manufacturer Standard	Document	H	R	R	R	
7.6	Motor Run Test and Winding Resistance Test	Manufacturer Standard	Report	H	R	R	R	Measurement of locked rotor-current at reduced voltage – checking of direction of rotation –No load tests –high voltage tests(motor windings) – installation resistance test (motor)
7.7	Dimensional Check" & "Hydro-Test for Oil separator, Oil filter, compressor suction filter and oil coolers	Manufacturer Standard	Report	H	R	R	R	
7.8	hydrostatic/pneumatic test for exchanger and pressure vessels, inside of Compressor Package Skids.	Manufacturer Standard	Report	H	R	R	R	
7.9	Painting and Checking name plate	Manufacturer Standard	Report	H	R	R	R	

	BIPC - Ethane Recovery Plant Contract No: 400/103		
	Inspection & Test Plan (ITP) for Refrigeration Package		
PO No.:C2R-PT-GEN-MA-PO-4002	Document Number	Rev.	Page 26 of 27
	VP-C2R-SCC-MA-4002-7000	03	

No.	Quality Related Activity	Reference Document	Reporting/ Document	Vendor /Sub Vendor	Owner/ MC	TPA	Contractor	Remark
7.10	Compressor performance & Mechanical running test	API 619 Performance Test	Report	H	R	R	R	
7.11	Compressor's casing & Rotor material test certificate	Manufacturer Standard	Certificate	H	R	R	R	
7.12	FAT Test	Visual Check, Dimensional Check, Nameplate and Tagging Check, Field Equipment Check (Including Instruments, JBs, Wiring, Loop Test)	P&ID, Relevant Manufacturer and OEM standard	H	R	R	R	
7.13	Compressor whole skid test performed during SAT	Manufacturer Standard and Test Procedure	Report	H	R	H	H	
7.14	Final Quality Book ,Test Report	Review & verification of documents	PO Specification, Relevant Standards, OEM standard	H	R	R	R	VDB
8	Final GA& PID check of whole Refrigeration Package							
8.1	Final GA& PID check of whole Refrigeration Package Before package Commissioning activities	Approved G.A. P&ID,...	MOM	H	W	W	H	

	BIPC - Ethane Recovery Plant Contract No: 400/103		
	Inspection & Test Plan (ITP) for Refrigeration Package		
PO No.: C2R-PT-GEN-MA-PO-4002	Document Number	Rev.	Page 27 of 27
	VP-C2R-SCC-MA-4002-7000	03	

H	Hold Point	R	Review
W	Witness	TPA	Third Party Agency
SW	Spot Witness	MTC	Material Test Certificate
RA	Review approve		