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Title	Design, Fabrication and Supply of Torus Cryo Pump Housing (TCPH) with Bellows and Other Loose items
Sub-title	Section-B: Technical & management specifications, Scope of Supply and Scope of Work

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1. INTRODUCTION

ITER will be the world's largest experimental facility to demonstrate the scientific and technological feasibility of fusion power. ITER is an international collaborative project involving seven Parties (China, European Union, India, Japan, Korea, Russia and U.S.A.). ITER is being built at Cadarache, South of France. More information can be obtained from www.iter.org or www.iter-india.org websites. India is one of seven participating members and is responsible for the supply of some of the major systems and equipments for ITER. This is an 'in-kind' contribution being executed through the Indian domestic agency called ITER-India, Institute for Plasma Research. Organization responsible for managing these activities at ITER site is known as ITER Organization (IO). Being a responsible entity for assembly of TCPH to the ITER machine, IO will be technically involved along with I-I during documentation and Technical inspections including surveillances for this supply.

The Scope under this Tender Notice is for "Manufacturing and supply of Torus Cryo Pump Housing (TCPH) with FCA at Bidder's premises".

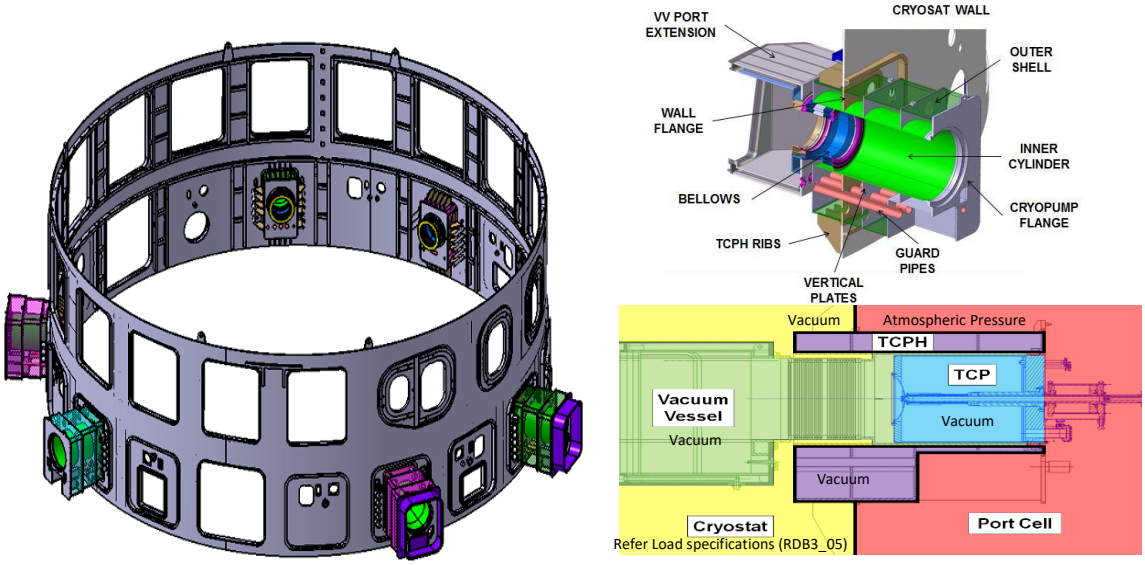

Figure 1 TCPH Assembly in Cryostat and its Components

The ITER Torus Cryo-Pump Housing (TCPH) is a penetration located on the Cryostat cylinder with main functions to accommodate and support the Torus Cryo-Pump (TCP), connect it to the Vacuum Vessel(VV), to provide tritium confinement and forms primary vacuum boundary. There are total six TCPH located at the lower port level of the Cryostat lower cylinder.

TCPH structure consists of inner cylinder to support cryopump and tritium confinement whereas the outer rectangular box structure provides Re-generation volume for TCP. Outer rectangular box and inner cylinder are connected at both ends for providing stiffness and transferring load of cryopump to the Cryostat while intermediate vertical plates are only connected with outer rectangular shell. On the VV side, the TCPH is connected to the VV Port Duct through double bellows which is welded on the TCPH inner cylinder extended L

shaped flange surface. A temporary docking flange of RH cask will be connected to TCPH during Remote Handling (RH) operation at the time of maintenance.

2. DOCUMENT ORGANIZATION

This technical specification document has associated appendices of the type: Mandatory, Informative and Reference.

Mandatory appendices are obligatory and shall be applied during execution of the contract.

The information contained within the Informative Appendices and Reference documents is to be understood as a set of guidelines provided to assist through the supply process.

List of Applicable documents are to be considered as mandatory wherever it is referred directly within technical specifications otherwise shall be consider as informative to understand the detailed requirements.

An alpha-numeric code is used for referencing documents anywhere within the Specification (e.g. II-CR-APBn_xx, RDBn_xx), where:

- AP: means Appendix
- RD: means Reference Document
- xx: are numbers to identify

Table 1 Mandatory Appendices

Appendix	Title	Filename
II-TCPH-APB3_01	TCPH Manufacturing Requirements	II-TCPH-APB3_01 _Manufacturing Requirements
II-TCPH-APB3_02	TCPH Engineering Drawings	II-TCPH-APB3_02_Engineering Drawings
II-TCPH-APB3_03	TCPH Welding Requirements	II-TCPH-APB3_03_Welding Requirements
II-TCPH-APB3_04	TCPH NDE	II-TCPH-APB3_04_NDE
II-TCPH-APB3_05	TCPH Dimensional Inspection	II-TCPH-APB3_05_Dimensional Inspection
II-TCPH-APB3_06	TCPH Vacuum Requirement and Surface Treatment	II-TCPH-APB3_06_Vacuum_Requirement and Surface Treatment
II-TCPH-APB3_07	TCPH Leak Testing	II-TCPH-APB3_07_Leak_Testing

II-TCPH-APB3_09	TCPH Labelling, Cleaning, Packing, Shipping and Handling	II-TCPH-APB3_09_Labelling_Cleaning_ Packing_ Shipping_and_Handling
II-TCPH-APB3_10	TCPH Engineering Analyses	II-TCPH-APB3_10_Engineering_Analyses
II-TCPH-APB3_11	TCPH Documentation and Acceptance Requirements	II-TCPH- APB3_11 Documentation and_ Acceptance Requirements
II-TCPH-APB3_12	TCPH Materials Procurement and Acceptance	II-TCPH-APB3_12_Materials Procurement and Acceptance
II-TCPH-APB3_13	TCPH Bellows	II-TCPH-APB3_13_ Bellows
II-TCPH-APB3_14	TCPH Mock Up Requirements	II-TCPH-APB3_14_Mock Up Requirements

Table 2 Informative Appendices

Appendix	Title	Filename
APB3_A	TCPH System Description	APB3_A_TCPH_System_Description
APB3_D	TCPH 3D Models	APB3_D_TCPH_3D_Model
APB1_E	Sample of Technical Specification for Material Procurement	APB1_E_PA Sample of Technical Specification for Material Procurement
APB3_F	TCPH IO Site Fabrication	APB3_F_TCPH_IO_Site_Fabrication

Table 3 Reference Documents

Ref.#	Title	ITER IDM Identifier
RDB3_01	Project Requirements	ITER_D_27ZRW8_v5.3
RDB3_02	SRD-24 (Cryostat)	ITER_D_28B2TP_v3.3
RDB3_04	ITER Load Specifications	ITER_D_222QGL_v6.0
RDB3_05	TCPH Load Specification	ITER_D_P8UMCD_v1.6

RDB3_06	Material Properties Handbook	ITER_D_29DDBF
RDB3_07	ITER Vacuum Handbook Appendix 4 Accepted Fluids Appendix 12 Leak Testing Appendix 13 Cleaning and Cleanliness Appendix 14 Passivation and Pickling Appendix 15Vacuum Baking Attachment 1 Welding	ITER_D_2EZ9UM_v2.3 ITER_D_ 2ELN8N_v1.14 ITER_D_ 2EYZ5F_v1.4 ITER_D_2ELUQH v1.2 ITER_D_ 2F457S v1.2 ITER_D_ 2DU65Fv1.3 ITER_D_ 2FMM4Bv1.2
RDB3_08	ITER Vacuum Handbook, Appendix 9 Bellows	ITER_D_2E5LJA_v1_3
RDB3_09	Summary of Material Data For Structural Analysis of the ITER Cryostat	ITER_D_ 3F863L_v1.6
RDB3_10	Instructions for Structural Analyses	ITER_D_35BVV3_v2.1
RDB3_11	TCPH Structural Analysis	ITER_D_ TF7JJV _v2.2 & ITER_D_ U7DB2R _v1.0
RDB3_14	Design Collaboration Implementation Form	ITER_D_3ERYTE_v1.6
RDB3_17	ITER Quality Assurance Program	ITER_D_22K4QX_v8.5
RDB3_20	ITER Numbering System for Components and Parts	ITER_D_28QDBS _v2.0

Table 4 List of Applicable Documents

PA Ref. No	Title	ITER IDM Identifier
3	Design Review Procedure	ITER_D_2832CF_v4.1
4	ITER Planning & Scheduling Manual	ITER_D_2DWMCW_v4.1
10	Quality Classification Determination	ITER_D_24VQES_v4.3
11	ITER Procurement Quality Requirements	ITER_D_22MFG4_v5.0
12	Requirements for Producing a Quality Plan	ITER_D_22MFMW_v4.0
13	Requirements for Producing a Manufacturing and Inspection Plan	ITER_D_22MDZD_v3.5 ITER_D_QV7GQF_v1.3
14	Procedure for management of Nonconformities	ITER_D_22F53X_v7.0
15	Procedure for management of Deviation request	ITER_D_2LZJHB_v5.5

16	Requirements for Producing a Contractors Release Note	ITER_D_22F52F_v5.0 ITER_D_QVEKNQ_v1.0
17	00 - Nuclear Regulatory Framework for INB ITER	ITER_D_2WBB8P_v3.8
18	Order dated 7 February 2012 relating to the general technical regulations applicable to INB - EN	ITER_D_7M2YKF_v1.7
19	Overall supervision plan to supplier chain for Protection Important Components, Structures and Systems and Protection Important Activities	ITER_D_4EUQFL_v6.1
20	Safety Important Functions and Components Classification Criteria and Methodology	ITER_D_347SF3_v1.8
22	PA monthly report	ITER_D_2E346G_v1.4
25	ITER CAD Manual and Procedure for the Usage of the ITER CAD Manual with Applicable	ITER_D_2F6FTX_v1.1
31	Risk Management Plan (RMP)	ITER_D_22F4LE_v6.3 & ITER_D_2PMZYP_v2.0
36	ITER Policy on Safety, Security and Environment Protection Management	ITER_D_43UJN7_v2.0
38	Provisions for Implementation of the Generic Safety Requirements by the External Interveners	ITER_D_SBSTBM v1.1
39	PBS 24 Cryostat for Defined Requirements	ITER_D_M3NUQY_v1.7
40	Propagation of the Defined Requirements for Protection Important Components Through the Chain External Interveners	ITER_D_BG2GYB_v3.3
41	Working Instruction for Manufacturing Readiness Review	ITER_D_ 44SZYP_v3.1
42	Guideline for Identification of the Protection Important Activities (PIA)	ITER_D_SBYJXD_v1.4
43	List of ITER-INB Protection Important Activities	ITER_D_PSTTZL_v2.2

- Note: Applicable documents are identified in the tender document using [PA Ref No. xx] reference.

EN, ISO, ASME, ASTM, EJMA standards are not listed under Reference Documents, but are referred directly. For example, ISO 2768-1: General Tolerances – Part 1, ASME Section IX: "Qualification of Welding Procedure".

3. SUBJECT

The technical specification provided is applicable for Manufacturing, factory Acceptance, Delivery and acceptance at the ITER site of the TCPH components.

4. SCOPE OF SUPPLY

The scope of the basic supply includes the procurement and delivery of all the items listed in Section 4.1 (Hardware Items) and 4.2 (Non-Hardware items) mentioned in this document.

4.1. Hardware Items

The TCPH system consisting of the following items are to be supplied as a part of this tender.

Table 4 Scope of Supply

Sr. No	Items	QTY	Mass/ unit	Remark
1	TCPH Main Structure	6	~20 tons	Refer Note 2
2	TCPH Bellows	6	~400 kg	Refer Note 2
3	VV Port Extension Adaptors	6	~200 kg	To be supplied as a loose piece
4	Docking Flange	2	~2 tons	To be supplied as a loose piece

Notes:

1. All ITER Site activities including metrology, custom machining, Assembly and welding of components at site is not in the scope of Bidder.
2. Bellow restraint fixture shall be supplied with bellow in assembled condition to the TCPH. This restraint fixture shall be utilized during handling and installation at ITER site.
3. All the Jigs-Fixtures used for factory manufacturing shall remain the property of Bidder.
4. All the jigs, fixtures and rigs to be used for Inspection and final acceptance tests at ITER Site shall remain the property of purchaser.

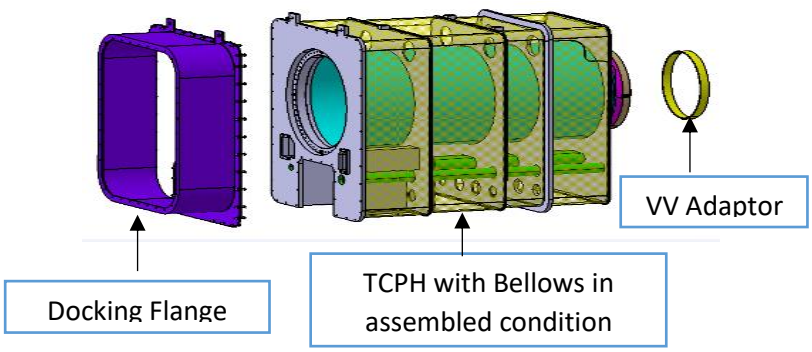

Figure 2 Scope of Supply for TCPH

4.2. Non-Hardware Items

The Bidder shall provide a set of non-hardware items described in the mandatory appendices listed in Table 1 of this document which comprises of following activities.

- All manufacturing engineering including the bellows complying with the requirements of II-TCPH-APB3_01 and II-TCPH-APB3_13.
- All engineering design and analysis for jigs, fixtures and tooling, complying with the requirements of II-TCPH-APB3_10 with consideration of assembly and metrology requirement.
- Derivation and engineering justification according to II-TCPH-APB3_10 of the Manufacturing Process, taking into account the tolerance and all other requirements of this specification.
- Preparation of manufacturing drawings, complying with the requirements of II-TCPH-APB3_02.
- Procurement of materials specified according to the material specifications in II-TCPH-APB3_12.
- All aspects of manufacturing including cutting, forming, welding, inspection, marking, and cleaning complying with the requirements of II-TCPH-APB3_03, II-TCPH-APB3_04, II-TCPH-APB3_05 and II-TCPH-APB3_06.
- Testing complying with the requirements of II-TCPH-APB3_07 and in the case of the TCPH Bellows, compliance with II-TCPH-APB3_13.
- Factory acceptance tests prior to packing and shipment complying with the requirements of II-TCPH-APB3_05 and II-TCPH-APB3_07.
- Cleaning, packing, shipping and handling complying with the requirements of II-TCPH-APB3_09.
- Liaison with the I-I for the final inspection of components in factory that are delivered to the ITER site.
- At the end of factory fabrication, delivery of a Release Note document including certificate of compliance and justification/tracking of non-conformance and the IO acceptance through a tracking sheet.
- Prepare TCPH component as per requirement of II-TCPH-APB3_09 and Load the TCPH component on transport vehicle for shipping.
- Final Acceptance of the Items shall be performed by the IO at the ITER Site with I-I and Bidder’s participation. The IO and I-I shall grant the Final Acceptance which marks conclusion of this tender.

4.3. Procurement Stages

The procurement is divided into several stages as follows. The first stage includes the Manufacturing study and engineering for all parts and mock-up to validate the welding distortions and manufacturing feasibility as per APB3_14. The final stage concludes with the delivery to the ITER site and Final Acceptance on site.

- Manufacturing Study
- Material Procurement
- TCPH Manufacturing
- Qualification, Manufacturing and Assembly of TCPH Bellows
- Factory Acceptance Test
- Final Acceptance Test on ITER Site

A list of activities (but are not limited to) for each procurement stages has been described in the Table 5. In the event the Bidder believes that additional activities are required, in order to complete the supply, the Bidder shall detail this and inform to I-I.

Table 5 Details of Procurement Stages

Procurement Stages	Tentative list of activities for TCPH manufacturing
Manufacturing study	Engineering justification according to II-TCPH-APB3_10 of the Manufacturing Process taking into account the tolerance requirement
	Checking of the models regarding the manufacturing feasibility (welding, NDE, Inspection etc.)
	Production of manufacturing drawings with tolerance, welding and other manufacturing requirement.
	Manufacturing design of the TCPH bellows by Bellows Supplier with associate restraint fixture with consideration of integration with TCPH main structure in factory.
	Submission of pre-qualification design report of TCPH bellows with associate restraint fixture to I-I for approval.
	Design of fabrication jigs & Fixtures required for Manufacturing of TCPH
	Design of test rigs for leak tests
	Development of NDT procedures (including UT examination of stainless steel welds, and if used, LPT for surface examination)
	Qualification of manufacturing processes like materials, welding, NDT, leak testing, dimensional inspection as required by ASME codes
	Proposed Manufacturing realization plan and schedule complying with the requirements of APB3_01.
	Materials and components identification and marking procedure
	Preparation and finalization of welding and NDE procedures: Welding Procedure Specifications (WPS), Welding Procedure Qualification Records (WPQR) and Weld MAP with NDT method as per II-TCPH-APB3_03 and II-TCPH-APB3_04.

	Preparation and finalization of manufacture procedure document as per II-TCPH-APB3_05, II-TCPH-APB3_06, II-TCPH-APB3_07 and II-TCPH-APB3_13.
	Preparation and finalization of Manufacturing and Inspection Plans (MIP/IP) and all other QA Documents as per quality requirements
	Transport plan as per II-TCPH-APB3_09: The Bidder shall define suitable packaging for protection to prevent distortion or shock on the TCPH components especially the TCPH bellows. The proposals, presented with 2D drawings, shall be submitted to I-I for approval.
Material procurement	Material procurement shall be according to the material specifications in II-TCPH-APB3_12 along with compliance of QA requirements
TCPH Manufacturing	Checking of manufacturing processes, welding and NDT required by code. Welding operators, the welding procedures and the NDE personnel shall be qualified incompliance with the ASME code. All vacuum requirements shall be as per the ITER Vacuum Handbook
	All aspects of manufacturing, including cutting, machining, forming, welding, inspection, integration, assembly, cleaning complying with the requirements and any additional features to perform the relevant tests.
	Qualification of welding activities (WPS, PQR, WPQ etc.). If already qualified, evidence to be provided to I-I.
	NDT personnel shall be qualified and certified according to the requirements of the construction code and relevant mandatory appendices.
	Fabrication of TCPH components
	Acceptance inspection, controls and tests, including final dimensional inspection, with and with no jigs and fixtures according to II-TCPH-APB3_05 and II-TCPH-APB3_11
	Integration of TCPH bellows with TCPH main structure by welding and NDE
	Cleaning, packing, shipping and handling complying with the requirements of II-TCPH-APB3_09.
Qualification, Manufacturing & Assembly of Bellows	Production of proof-of-principle Bellows and associated restrain fixture and performance of Qualification Tests
	Submission of Qualification Test Report to I-I for approval
	Fabrication of TCPH Bellows
	Fabrication of Bellows Restraint Fixtures
Factory Acceptance Test	At the end of factory fabrication, delivery of an End of Manufacturing report including certificate of compliance and justification/tracking of non-conformance and acceptance through a tracking sheet
	Factory Acceptance Tests (including vacuum leak test complying with the requirements) prior to packing and shipment.

	Delivery of Acceptance Data Package (ADP) files
	Factory packing according to II-TCPH-APB3_09
Final Site Acceptance Test	Acceptance leak testing and control of cleanliness at the ITER Site shall be performed by the IO. I-I and Bidder shall participate in these tests
	Dimensional inspection according to II-TCPH-APB3_05 by the IO
	At the end of Final Acceptance, Delivery of the End of Manufacturing files including certificate of compliance, build-to-print file and justification/tracking of non-conformances and I-I/IO's acceptance trough a tracking sheet. The End of Manufacturing file also includes the collection of all files and records.

5. TECHNICAL INTERFACES

The technical interfaces with other system are not provided as integration of TCPH is IO Scope and necessary provision for assembly, if any, is considered in engineering drawings and specifications. Details of IO site activities are provided in APB3_F for information.

6. TECHNICAL REQUIREMENTS

The technical requirements for TCPH are summarized in Table 6.

Table 6 Technical Requirements

Activities	Applicable code	ITER Mandatory Appendix (Supplementary to code requirement)
TCPH Engineering	ASME Sec-VIII,Div.2 , Edition 2013	II-TCPH-APB3_01,II-TCPH-APB3_02, II-TCPH-APB3_10
Material Procurement	ASME Sec-II part A Edition 2013 ASME Sec-II part C, Edition 2013	II-TCPH-APB3_12
Manufacturing Welding NDT of welds	ASME Sec-VIII, Div.2 ASME Sec-IX, Edition 2013 ASME Sec-V, Edition 2013	II-TCPH-APB3_01 II-TCPH-APB3_03 II-TCPH-APB3_04
Bellow Design & Manufacturing	EJMA 9th Edition / ASME Sec-VIII Div.2	II-TCPH-APB3_13
Dimensional Inspection (component and assembly)	ASME Sec-VIII,Div.2	II-TCPH-APB3_05
Cleaning inspection	ASME Sec-VIII,Div.2	II-TCPH-APB3_06
Leak testing	ASME Sec-VIII,Div.2	II-TCPH-APB3_07

Packing ,Shipping and Handling	-	II-TCPH-APB3_09
Factory Acceptance before Shipment and before transportation	ASME Sec-VIII,Div.2	II-TCPH-APB3_11

Note: TCPH is VQC-1A component. So, for the vacuum requirements like leak testing, surface cleaning, shall be done in accordance with ITER Vacuum handbook.

For items (such as Manufacturing tools, jigs, lifting, handling tools and bellows restraint fixture…etc.) which are not covered by the proposed Codes, technical specifications shall be proposed by Bidder for approval of I-I.

The Bidder shall bring any conflicts found in this technical specification to the written attention of I-I for resolution. In this case, I-I decision shall be considered as final.

In the event of a conflict between this technical specification and the Codes and Standards, any deviation requires I-I's written agreement according to the provisions of this tender. In the absence of such statement, full compliance will be assumed.

7. SAFETY, REGULATORY REQUIREMENTS, QUALITY ASSURANCE RULES

7.1. Safety requirement (INB ORDER DATED 7th FEBRUARY 2012)

The TCPH is a SIC-1 component since it provides primary vacuum barrier and radiological confinement and a free vacuum volume for cryopump regeneration.

7.1.1. The Bidder and its sub-contractors shall take a note that:

- ITER is a nuclear facility identified in France by the number-INB-174;
- The compliance with the INB-order must be demonstrated in the chain of Bidder and its Subcontractors;
- French quality order 7th February 2012 is applicable for supply of this tender as it is classified as a protection important component (PIC) as per French regulation [PA Ref No. 18]
- All protection important activities are also subjected to supervision done by Nuclear Operator in application to article II.2.5.4 of the Order 7th February 2012.

7.1.2. For Protection Important Components (PIC), structures and systems of the nuclear facility, the Bidder shall ensure following for this tender.

- Bidder shall ensure the generic safety requirements, as described in "Provisions for Implementation of the Generic Safety Requirements by the External Interveners ITER_D_SBSTBM v1.1" [PA Ref No. 38], shall be complied in entire chain of supplier and subcontractor with a specific stipulated management system to perform protection important activities.
- The Protection Important Activities (PIA), shall be defined based on "Defined Requirements ITER_D_M3NUQY v1.7" [PA Ref No. 39] by IO at the time of defining activities in Quality Plan (QP) and Manufacturing and Inspection Plan

(MIP/IP). Bidder shall include preliminary PIA as prescribed in II-TCPH-APB3_01 in relevant QP and MIP/IP.

- Bidder shall ensure that Quality Assurance requirements are fulfilled by a system that complies in particular with the requirements of title II Order 7th February 2012, chapters 2.2, 2.3.2, 2.5.4,2.5.5, 2.6.1, 2.7.2;
- The Bidder and its Subcontractors must be informed that a "significant" event or NCR, as defined in chapters 2.6.4 and 2.6.5 of the Order 7th February 2012 shall be reported to II, IO/the nuclear operator, as soon as possible;

7.2. Regulatory requirement

The TCPH components are outside the scope of the French Decree for Pressure Equipment and the French Order for Nuclear Pressure Equipment

7.3. Quality assurance rules

Quality Assurance rules are described in Clause 9.3 of this specification.

7.4. Vacuum classification

TCPH are classified as VQC 1A.

7.5. Quality classification

TCPH are classified as QC-1.

7.6. Seismic classification

TCPH are classified as seismic class SC1 (SF).

8. RESPONSIBILITIES OF BIDDER AND I-I

The I-I is in charge of the supply of the TCPH, including manufacturing, qualification of bellows, testing at the Supplier's premises and delivery to the ITER site.

Being an operator of the ITER facility and responsible entity for assembly of TCPH to the ITER machine, IO will be technically involved during documentation and Technical inspections including surveillances.

The Bidder is the legal entity providing items or services to the I-I in accordance with this tender document.

The details of Responsibilities between Bidder and I-I is summarized in Table 7

Table 7 Summary of Responsibilities between the Bidder and I-I

Description of the Activity	**Bidder**	**I-I**
Manufacturing Study	R	A
TCPH manufacturing drawings	R	A

Bellows design study; submission of design report	R	A
Quality Plan & MIP/IP	R	A
Manufacturing Readiness Review	R	A
Materials and components procurement	R	A
TCPH manufacturing	R	A
Perform Bellows Qualification Tests; submit Qualification Test Report	R	A
Manufacture Bellows including flanges	R	A
Factory Acceptance Testing for TCPH components	R	A
Delivery to ITER Site	S	R
Final Acceptance tests at ITER Site	S	R
Equipment and Documentation Review	R	A

R = Responsible for organizing, performing and for the content,
A= Review/Comment/Accept but with no responsibility for the content, S=Support

9. MANAGEMENT REQUIREMENTS

9.1. Selection of Bidder and its Subcontractors/Suppliers:

Bidder shall perform all major activities in-house which include all assemblies and Factory acceptance test of TCPH. All welding activities shall be performed in-house. Bidder may propose to subcontract any other activities as per following mandatory requirements.

- Bidder shall ensure supplier of bellows shall have experience of manufacturing Austenitic Stainless Steel Bellows of minimum 1 metre diameter for vacuum or nuclear application.
- Bidder shall obtain written approval from I-I for its subcontractors and Suppliers before placing any order/contract with them.
- Sub-contractor/Supplier QMS assessment will be carried out by I-I after receiving associated documents.

9.2. Procurement Follow-up:

9.2.1. Manufacturing Follow-Ups

The Bidder shall ensure close oversight of production through of manufacturing follow-ups defined in Appendix-II-TCPH-APB3_01 Manufacturing requirements. Preliminary interventions defined there in shall be transmitted in MIP/IP in terms of Notification Points, Authorization-to-Proceed Points, Witness Points and Hold Points.

Detail definition is as mentioned below:

- A Notification Point (NP) is a milestone where the Bidder is required to notify I-I, that it has completed a specific task or a specific deliverable and is proceeding to the next task or to the next action on the specific deliverable. A NP is meant to enable I-I personnel to follow the progress of the contract and possibly to witness a critical manufacturing step at the Bidder's premises. The Notification shall be sent by the Bidder to I-I at least 10 working days prior to the scheduled manufacturing step. A NP shall not affect the production flow of the Bidder that shall continue the work even without a reply from I-I and/or IO.
- An Authorization-To-Proceed Point (ATPP) is a milestone where the Bidder is required to notify I-I, that it has completed a specific task or a specific deliverable and must wait for an authorization from I-I before proceeding to the next task or to the next action on the specific deliverable. The I-I shall grant the Authorization to Proceed on the basis of clearly identified Quality Control data and Acceptance test results to be provided by the Bidder. The I-I shall have 7 working days to review the Bidder's data and to notify the decision. In case of authorization, the Bidder shall proceed to the next task or to the next action on the specific deliverable. In case of rejection, the Bidder shall develop a recovery plan and submit to I-I for review and approve within 5 working days of submission. In case of justified objection by I-I for proposed recovery plan, bidder shall have 5 working days to answer. An ATPP shall only affect the specific task or the specific deliverable it is associated with and shall not interfere with the execution of other tasks of the production or other deliverables of the same kind.
- A Hold Point (HP) is a milestone where the Bidder is required to notify I-I, that it has completed a specific task or a specific deliverable and must stop the associated processes until a HP Clearance is issued. The HP Clearance shall be issued on the basis of clearly identified Quality Control and data and acceptance test results to be provided to I-I at the time of the request. I-I shall have 10 working days to confirm or reject. In case of clearance, the Supplier shall resume its activity. In case of rejection, the Supplier shall develop a recovery plan that shall be submitted to I-I for acceptance. I-I shall provide acceptance within 15 working days to accept or reject the recovery plan. In case of justified objection by I-I for proposed recovery plan, bidder shall have 5 working days to answer.
- A Witness Point (W) is a milestone which identifies an operation to be witnessed. Adequate notice shall be given to the IO, in order to allow the IO to participate to the operation.
- A Surveillance Point (S1) identifies an operation that requires 100% inspection.
- A Surveillance Point (S2) identifies an operation that requires random inspection or spot checks.
- Review (R) identifies a document or report to be reviewed.

In addition to these notifications, I-I/IO or I-I/IO appointed TPI (Third party Inspection agency) may request additional notifications or conduct additional inspection surveillance and quality audits.

In case of concerns regarding the quality of production, I-I shall have the right to request the bidder to carry out on-the-spot checks in addition to the checks foreseen in the technical specifications. In such a case, the actual date(s) of the on-the-spot checks shall be determined by agreement between the Parties.

9.2.2. Periodic Reviews

(i) The Bidder shall organize Reviews and Status / Quality Control Reviews at various stages as defined in table 8 below. This review may focus on the different manufacturing stages or particular areas of production. If required, I-I will appoint necessary group for review including IO personnel.

Table 8 Review and Inspection

Sr. No.	Type of Review	Remarks
1	Manufacturing Readiness Review Meeting and approval of quality plan & MIP/IP	MRR procedure shall be as per the IO guidelines ITER_D_ 44SZYP [PA Ref No. 41]
2	Approval of manufacturing models and drawings	II-TCPH-APB3_02
3	Bellows test and qualification	Acceptance as per II- TCPH-APB3_13
4	Inspection and Testing readiness Review (Before shipment to ITER site)	Acceptance as per II-TCPH-APB3_11

For each such reviews Bidder shall submit detailed report to I-I for review and approval. I-I may request additional data with regard to acceptance of these milestones.

9.2.3. Periodic Reports and Meetings

(i) Bidder shall prepare detailed manufacturing and delivery schedule on Primavera (latest version)/MS Project and shall submit monthly schedule progress updates as per guidelines provided in ITER_D_2DWMCW [PA Ref No. 4] in line with agreed delivery milestones of contract.

(ii) The bidder shall prepare monthly progress report for works carried out under this contract. The report shall be submitted as per guide lines provided in "PA Monthly Report", ITER_D_2E346G [PA Ref No. 22] and shall be submitted on 25th calendar day of each month. However, any activities that can cause delay shall be report immediately to I-I.

(iii) In addition to the above reports Bidder shall also provide additional information or documents if requested by I-I.

(iv) Project progress meetings shall be conducted as per mutual convenience. The frequency such meeting shall vary throughout the progress of tender, typically once in a month through Video/Tele conferencing or in-person discussion at I-I or Bidder

premises. Minutes of each such meeting shall be prepared within (seven) 7 days by Bidder and subsequently sent for agreement with I-I.

9.3. Right of Access

9.3.1. Right access to I-I and IO

The bidder shall inform I-I of all locations where contract is executed. Bidder shall further ensure that contracts include the rights of on-the-spot access to specified locations subject to the following provisions in this section.

- The bidder shall ensure that I-I's and IO's representatives are granted access to the premises of the bidder and its sub-contractors in order to witness on-site tests and critical fabrication operations, and to participate in periodic review meetings.
- The bidder shall ensure that I-I's and IO's representatives are granted access to the premises of the bidder and its sub-contractors at all reasonable times in order to carry out on-the-spot checks in addition to the tests foreseen in the technical specifications.
- The bidder shall grant access rights to I-I, IO and regulatory body representatives to its facilities and records and those of its sub-contractors for the purpose of Quality Requirements.
- In case of marked up interventions in the Manufacturing and Inspection Plan, it is the bidder's responsibility to ensure that adequate notice is given to I-I and IO. However, the bidder shall not bear any costs of such travel arrangements.
- I-I shall agree with the bidder in advance of the appointed I-I and IO representatives who will participate in activities described in the preceding sections. The appointed I-I and IO representatives must always be accompanied by the bidder's representatives on their visits to the bidder's and/or its sub-contractor's premises unless otherwise agreed by the Parties. I-I and IO representatives shall be bound by appropriate confidentiality obligations to be agreed in advance.

9.3.2. Right of access of the Third Party Inspection Agency (TPIA), French Safety Authorities and/or Agreed Notified Body / Notified Body

- For the supply of items under this tender, the bidder shall ensure that TPIA (Appointed by I-I and IO) are granted free and appropriate access to its and its sub-contractors facilities, where this item is being manufactured and to the records for surveillance, inspection, (including unscheduled inspections) or audit as requested by them in accordance with the applicable national laws and regulations. Where possible, such access shall be coordinated in advance with I-I.
- For the supply of items under this tender, the bidder shall ensure that the French Safety Authorities and/or Agreed Notified Body are granted free and appropriate access to its and its sub-contractors facilities, where this item is being manufactured and to the records for surveillance, inspection, (including unscheduled inspections) or audit as requested by them in accordance with the applicable national laws and regulations. Where possible, such access shall be coordinated in advance with I-I and IO.

9.4. Quality Assurance requirements:

- The bidder shall ensure the quality of all components and services to meet all requirements of this specification and associated appendices of this tender document.

In case of any clarification required with reference to requirements of this tender, the bidder shall request I-I for clarification prior to proceeding with the work.

- The bidder's Quality Assurance (hereinafter referred to as "QA") Programme subject to approval by I-I shall be applied to all the work under the tender. A list of the documentation associated with I-I's Quality Requirements is given in Table - 1

Table-1: I-I Quality Requirements

I-I Quality Requirements	IO Quality Documents
1. Prior to commencement of contract work : ▪ Obtain I-I approval of a dedicated Bidder/Subcontractor's/ supplier's "Quality Plan"	Quality Plan ITER_D_22MFMW [PA Ref No. 12]
2. Prior to start of manufacturing: ▪ Obtain I-I and IO approval of Bidder/Subcontractor's/ supplier's "Manufacturing and Inspection Plan (MIPs/IPs)"	Manufacturing and Inspection Plan ITER_D_22MDZD [PA Ref No. 13]
3. During manufacture: ▪ Update Quality Plan as necessary and seek II and IO re-acceptance for Bidder/Subcontractor's Quality Plan ▪ Notify I-I and IO representatives of any Inspection Points as marked up on the "MIP/IP" ▪ Complete the relevant entries in the "MIP/IP" as work progresses.	
4. During contract implementation: ▪ Issue "Deviation Request" and "Non-Conformance Reports" as necessary	Deviation Request ITER_D_2LZJHB [PA Ref No. 15] and Non-conformance Reports ITER_D_22F53X [PA Ref No.14]
5. Prior to delivery: ▪ Complete the "Contractor Release Note"	Contractor Release Note ITER_D_22F52F [PA Ref No. 16]

- Specific Quality documentation requirements for manufacturing are given in II-TCPH-APB3_11 of this tender document.
- Quality Plans are produced by the bidder and its sub-contractors/suppliers to describe how they will implement the Quality Requirements specified in tender.
- MIPs/IPs are used to monitor Quality Control and acceptance tests and shall be produced by the bidder and its sub-contractors/Suppliers and sent to I-I for intervention mark-up and approval from I-I and IO.

- The bidder shall ensure that its sub-contractors shall only start implementing any contract with a Quality Plan and MIP/IP in place that has been approved by I-I.
- I-I and/or IO shall designate appropriate inspector/s to perform inspections of the bidder and its sub-contractors to verify compliance with Protection Important activities (PIA). These inspections will be performed in accordance with the MIPs/IPs and Quality Plan. The inspectors may be I-I/IO personnel or specialised inspectors contracted for that purpose.

9.5. Licensing requirements

Bidder shall commit to apply all rules and implement all necessary actions imposed by French Law applicable to the ITER organisation.

If and when the IO establishes rules and regulations after signature of contract in order to comply with regulatory requirements, the bidder shall ensure to confirm to these.

9.6. Change Management

- All requirements of this tender and subsequent changes and deviations proposed by either of the I-I or the bidder during the course of execution of the contract will be controlled with Deviation Request ITER_D_2LZJHB [PA Ref No. 15] and Non-conformance Reports ITER_D_22F53X [PA Ref No. 14].
- Proposed changes and deviations will be jointly assessed by the I-I, IO and the bidder.
- Proposed changes and deviations will be implemented by the bidder after getting it approved by I-I and IO.

9.7. Information and Documentation Requirements

9.7.1. General Documentation Requirements

(i) The bidder shall prepare the following documents in the English:
  - Intellectual Property provisions, if any,
  - day-to-day correspondence and administration between the Parties,
  - All documents that are necessary to determine the progress and status of work and validate the capabilities of involved suppliers,
  - All QA and safety related documentation,
  - All other documentation necessary to verify the sound management of the manufacturing and supply under this tender.

(ii) The working language of the tender will be English.

(iii) The bidder shall issue, manage and control its documents and records in accordance with Quality Plan.

(iv) The bidder shall ensure that all documents and records are uniquely identified and traceable by tender references, including subsequent revisions, and are made accessible to I-I.

9.7.2. Design Documentation Requirements

The bidder shall ensure that all manufacturing drawings prepared by the bidder or its suppliers shall comply with the ITER CAD Manual (latest version) [PA Ref No. 25]. Bidder shall prepare all drawings in CATIA (Version V5 R23). Typical approval cycle of manufacturing design steps is as explained below.

The Manufacturing Design shall be carried out by the Bidder in following steps:

- Models at maturity Final Design, together with drawings needed for additional information (e.g. general assembly drawings, interface tolerances, etc.), shall be provided by the I-I;
- The Bidder shall prepare manufacturing models, based on the Models at Final Design provided by the I-I;
- Bellows Supplier shall design the TCPH Bellows and associated restrain fixture and submit design to I-I for approval;
- Bellows Supplier shall produce a proof-of-principle bellows, qualify the design by testing and submit the Qualification Report to I-I approval;
- Manufacturing Design Models of TCPH and associated Bellows shall be checked and approved by the I-I;
- The Supplier shall prepare manufacturing drawings for the TCPH and Bellows based on the approved Manufacturing Design Models;
- The Supplier shall start manufacturing based on these manufacturing drawings, following a Manufacturing Readiness Review.
- The Supplier shall submit final as built drawings and models to I-I.

9.7.3. Quality Records

Quality Control and Acceptance Test records shall be maintained according to the procedures defined in Appendix II-TCPH-APB3_11 of this tender. Availability of the required data to I-I shall be a pre-requisite for granting Authorizations to proceeding Point, Witness Point and Hold Point clearances.

9.7.4. Document Acceptance Requirements:

The Bidder has responsibility for the documents requested in this tender, therefore the Bidder shall review and approve any such document, before sending it to the I-I; The I-I returns the documents, marked as accepted or approved. Documents sent for information require no further decision (neither acceptance nor approval). But in case of major issue found in the content, I-I may raise the concern which required to be considered for incorporation in document.

Being an operator of the ITER facility and responsible entity for assembly of TCPH to the ITER machine, IO will be technically involved during documentation review process along with I-I.

Unless specifically mentioned in this tender, Standard document review cycle shall apply for all documents unless specifically mentioned.

- The I-I shall have fifteen (15) working days from the receipt of the Bidder's documents to review, comment and/or approve them, as the case may be;
- The Bidder shall have eight (8) working days from the receipt of commented documents to update and resubmit them to I-I; and
- The I-I shall have eight (8) working days from the receipt of Bidder's submission to review and return the documents.

9.7.5. Data Management Requirements

The large amount of data generated during the execution of this contract shall be handled electronically and entered into I-I database. The structure of this database shall be defined by Bidder in agreement with I-I for storage of information related to this tender.

Proprietary or confidential data entered in the database shall be kept strictly confidential by Bidder and the I-I, and in no circumstances shall be communicated or made accessible to other Bidders. Data consistency checks shall be implemented to facilitate Bidder and I-I oversight.

Data flow from Bidder to I-I shall be through the issue of notification for each time when data entered in to database by Bidder in form of documents, records, notification/Hold point clearance, Deviation requirest, Non-confirmity report etc .

Note that all fabrication historical data shall be electronically archived following the I-I requirements and templates with reference to the component identification.

The Bidder shall not communicate directly with IO. Any communication with IO shall take place by I-I. If any situation arieses during execution of this contract,I-I will co-ordinate with IO and Bidder.

In respect of contents of communication the Bidder shall take note of the following especially when any document is to be seen by an I-I/IO personnel.

Important Note:

The "TCPH" is an 'in-kind' contribution by India. There is every likelihood that the word 'credits', 'IUA', 'kIUA' or their conversions to Euro will be encountered by the bidder in private or public documents, presentations, formal and informal talks and in casual encounters during visits. These words/phrases are not at all related to actual financial aspects of the 'in-kind' procurement. They are an intricate way of measuring scope on a technical basis for ease in distribution among ITER Parties. Using such information as a basis for costing will be misleading. I-I would like to bring this warning to the notice of the bidder.

Furthermore, all and any information related to cost or financial aspects shall be exchanged only between pre-identified authorized personnel of ITER-India and the bidder. No communication, direct or indirect or any indication to that effect is allowed between the bidder (or his subcontractors) and any person (staff or contractor) of ITER Organization or any other Domestic Agency. Bidder must observe this condition strictly for the entire period of engagement and beyond.

9.8. Transportation of TCPH components

Bidder shall be responsible for following with respect to transportation of TCPH components.

- The Bidder shall ensure that the Items to be delivered are safely and properly packaged and fulfil the specific requirements regarding handling and packaging detailed in Mandatory Appendix II-TCPH-APB3_09 (Packing, Shipping and Handling).
- The Bidder shall be responsible for loading operation at factory (FCA at Bidder's premises) for transportation of components to ITER site.
- Transportation of TCPH will be carried out tentatively in two batches that is 2 TCPH in first batch and 4 TCPH in second batch. The 60(sixty) calendar days free storage shall be considered after completion of final component of the respective batch (refer clause No. 1.18 of section-A(II)).
- Any objection in this respect shall be intimated in advance.

9.9. Delivery of TCPH Component:

All TCPH Assembly and Loose components shall be delivered as per details mentioned in Section A of this tender document.

9.10. Acceptance and Transfer of Responsibilities

Factory and site acceptance of TCPH shall be carried out as per the procedure given in II-TCPH-APB3_11 (Documentation and Acceptance Requirements).

- Ownership of TCPH shall be transferred to the I-I upon completion of loading activity at factory as set out in II-TCPH-APB3_11 (Documentation and Acceptance Requirements) of this tender.
- The transfer of ownership to the I-I/IO shall not relieve the bidder of its obligations under this tender in case of non-conformities of the Items for the duration of the enforceable warranty as set out in given in Warranty clause.

9.11. Risk Management

- Bidder shall submit the risk plan covering all the activities to execute this contract to I-I within the 60 days from the date of award of contract for the approval. Risk management plan ITER_D_22F4LE [PA Ref No. 31].
- The bidder shall implement all possible measures for risk reduction and mitigation following a graded approach and shall provide progress reports to I-I on a quarterly basis in accordance with the standard template to be agreed between I-I and the bidder. Risk Register standard template ITER_D_2PMZYP9 [PA Ref No. 31].
- If and when conditions to trigger specific risk reduction and mitigation measures occur, the bidder shall inform I-I promptly. The Parties shall consult on the appropriate actions to be taken and on their consequences for the execution of this tender.