Technical Specifications (In-Cash Procurement)

**Nuclear engineering expertise for the PPTF**

This document describes technical needs for nuclear engineering expertise for the Port Plug Test Facility (PPTF, which is PBS 58) procurement follow-up.
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1 Purpose

This document describes technical needs for nuclear engineering expertise for the Port Plug Test Facility (PPTF, which is PBS 58) procurement follow-up.

2 Scope

The aim of the Port Plug Test Facility is to reduce the risk of a Port Plug failure during the ITER machine operation. The PPTF provides the capability to test the Upper and Equatorial Port Plugs before installation on the machine and after refurbishment in the hot cell facility (HC) of ITER, which is INB 174. The port plugs to be tested are the ion cyclotron heating system equatorial port plugs, electron cyclotron heating system equatorial and upper port plugs, diagnostics equatorial and upper port plugs, and test blanket modules.

The ITER Central Team (IO-CT) is responsible for the Port Plug Test Facility. The Russian Federation Domestic Agency (RF-DA) is in charge of the in-kind procurement of the PPTF. The PPTF procurement arrangement has been signed with the RF-DA.

The scope of this contract is the updating of the PPTF documentation, in particular for the nuclear test stands, which are PIC (Protection Important Components). These activities are PIA (Protection Important Activity) and are submitted to surveillance by the IO.

3 Definitions

CAD: Computer Aided Design
DA: Domestic Agency
DCIF: Design Collaboration Implementation Form
DO: Design Office
FDR: Final Design Review
HC: Hot Cell
INB: Nuclear Basic Installation (in French: Installation Nucléaire de Base)
IO: ITER Organization
IO-CT: ITER Organization – Central Team
PBS: Plant Breakdown Structure
PIA: Protection Important Activity
PIC: Protection Important Component
PPTF: Port Plug Test Facility
PSS: Pressure Suppression System
QA: Quality Assurance
RF-DA: Russian Federation Domestic Agency
SIC: Safety Important Class
TRO: Technical Responsible Officer

For a complete list of ITER abbreviations see: ITER Abbreviations (ITER_D_2MU6W5).
4 References

Links inserted in text (where applicable). Also, the current design is described in: PPTF FDR Input Package [https://user.iter.org/default.aspx?uid=PNLH5W](https://user.iter.org/default.aspx?uid=PNLH5W)

5 Estimated Duration

The duration shall be for 12 months from the starting date of the contract. Services are to be provided predominantly at the IO work site.

6 Work Description

The work involves technical involvement in the following areas:

- Support the development of the Pressure Suppression System. Collect input data, perform exploration/validation analysis, check the implementation of the requirements in the design, integrate the design in the Hot Cell environment.
- Participate to updating the Maintenance plan of the PPTF test stands in the HC (URHYDC v1.0). Such documents are produced by Cryogenmash (the main supplier of the PPTF). The purpose of this task is to support them in considering all constraints linked to the nuclear environment and the life cycle of the Hot Cell.
- Update the PPTF decommissioning plan (PMFURC v1.0).

7 Responsibilities

7.1 Contractor’s Responsibilities

In order to successfully perform the tasks in these Technical Specifications, the Contractor shall:

- Strictly implement the IO procedures, instructions and use templates;
- Strictly implement the requirements specified in Provisions for Implementation of the Generic Safety Requirements by the External Interveners (SBSTBM v1.1);
- Implement a technical control for each PIA defined in Surveillance plan for PBS 58 – PPTF – Annex 2: Detailed List of PIAs (SQ2WKc v1.2);
- Implement the Defined requirements for PBS 58 (PPTF) (N6D34S v1.3) for the PIC.
- Provide experienced and trained resources to perform the tasks;
- Provide the software to perform the Dimensioning assessment of the Pressure Suppression System;
- Contractor’s personnel shall possess the qualifications, professional competence and experience to carry out services in accordance with IO rules and procedures;
- Contractor’s personnel shall be bound by the rules and regulations governing the IO ethics, safety and security IO rules.

7.2 IO’s Responsibilities

The IO shall:

- Nominate the Responsible Officer to manage the Contract;
- Organise monthly meetings on work performed;
• Provide offices at IO premises.

8 List of Deliverables and due dates
The main deliverables are provided in the table below.

<table>
<thead>
<tr>
<th>D #</th>
<th>Description</th>
<th>Due Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>D1</td>
<td>Collection of the <strong>Input data for the Pressure Suppression System</strong>. Upload it in the IDM for review and approval. The reviewers of the technical documents need to be coherent with the <strong>Sign-Off Authority (SOA) for Project Documents (2EXFXU)</strong>.</td>
<td>T0 + 2 months</td>
</tr>
<tr>
<td>D2</td>
<td>Preparation of the <strong>Dimensioning assessment of the Pressure Suppression System</strong>. Upload it in the IDM for review and approval. The reviewers of the technical documents need to be coherent with the <strong>Sign-Off Authority (SOA) for Project Documents (2EXFXU)</strong>.</td>
<td>T0 + 8 months</td>
</tr>
<tr>
<td>D3</td>
<td>Preparation of the <strong>PPTF maintenance plan in the HC</strong>. Upload it in the IDM for review and approval. The reviewers of the technical documents need to be coherent with the <strong>Sign-Off Authority (SOA) for Project Documents (2EXFXU)</strong>.</td>
<td>T0 + 11 months</td>
</tr>
<tr>
<td>D4</td>
<td>Produce an update of the <strong>PPTF Decommissioning Plan</strong>. Upload it in the IDM for review and approval. The reviewers of the technical documents need to be coherent with the <strong>Sign-Off Authority (SOA) for Project Documents (2EXFXU)</strong>.</td>
<td>T0 + 12 months</td>
</tr>
</tbody>
</table>

9 Acceptance Criteria
The deliverables will be posted in the Contractor’s dedicated folder in IDM, and the acceptance by the IO will be recorded by their approval by the designated IO TRO. These criteria shall be the basis of acceptance by IO following the successful completion of the services. These will be in the form of reports as indicated in section 8, Table of deliverables.

10 Specific requirements and conditions
Design and Development of equipment designs for nuclear facilities;
Operational experience of procedures in nuclear environment;
Knowledge of a bi-phasic flow software (e.g. Relap, Melcor, Cathare, Astec);
Experience relevant to all techniques in deliverables list;
Experience in manufacturing of large mechanical components for nuclear facilities;
Experience in mechanical engineering and analysis;
Experience in thermo-hydraulics;
Experience in vacuum;
Experience in application of appropriate industrial Codes and Standards of nuclear/non-nuclear equipment;
Experience in 3D and 2D drawings interpretation;
Monitoring and reporting of status of projects;
Generation of technical, administrative, and managerial documents;
Communication with international local and remote teams in context of nuclear fusion research or similarly complex research and engineering environment;
Organization, taking minutes and action tracking of international meetings;
Technical document generation;
System requirements management.

11 Work Monitoring / Meeting Schedule
Work is monitored through reports on deliverables (see List of Deliverables section) and at regular project meetings.

12 Delivery time breakdown
See Section 8 “List Deliverables section and due dates”.

13 Quality Assurance (QA) requirements
The organisation conducting these activities should have an ITER approved QA Program or an ISO 9001 accredited quality system.
The general requirements are detailed in ITER Procurement Quality Requirements (ITER_D_22MFG4).
Prior to commencement of the task, a Quality Plan must be submitted for IO approval giving evidence of the above and describing the organisation for this task; the skill of workers involved in the study; any anticipated sub-contractors; and giving details of who will be the independent checker of the activities (see Procurement Requirements for Producing a Quality Plan (ITER_D_22MFMW)).
Documentation developed as the result of this task shall be retained by the performer of the task or the DA organization for a minimum of 5 years and then may be discarded at the direction of the IO. The use of computer software to perform a safety basis task activity such as analysis and/or modelling, etc. shall be reviewed and approved by the IO prior to its use, in accordance with Quality Assurance for ITER Safety Codes (ITER_D_258LKL).

14 CAD Design Requirements (if applicable)
For the contracts where CAD design tasks are involved, the following shall apply:
The Supplier shall provide a Design Plan to be approved by the IO. Such plan shall identify all design activities and design deliverables to be provided by the Contractor as part of the contract.
The Supplier shall ensure that all designs, CAD data and drawings delivered to IO comply with the Procedure for the Usage of the ITER CAD Manual (2F6FTX), and with the Procedure for the Management of CAD Work & CAD Data (Models and Drawings 2DWU2M).
The reference scheme is for the Supplier to work in a fully synchronous manner on the ITER CAD platform (see detailed information about synchronous collaboration in the ITER
15 Safety requirements

ITER is a Nuclear Facility identified in France by the number-INB-174 (“Installation Nucléaire de Base”).

For Protection Important Components and in particular Safety Important Class components (SIC), the French Nuclear Regulation must be observed, in application of the Article 14 of the ITER Agreement.

In such case the Suppliers and Subcontractors must be informed that:

- The Order 7th February 2012 applies to all the components important for the protection (PIC) and the activities important for the protection (PIA).
- The compliance with the INB-order must be demonstrated in the chain of external contractors.
- In application of article II.2.5.4 of the Order 7th February 2012, contracted activities for supervision purposes are also subject to a supervision done by the Nuclear Operator.

For the Protection Important Components, structures and systems of the nuclear facility, and Protection Important Activities the contractor shall ensure that a specific management system is implemented for his own activities and for the activities done by any Supplier and Subcontractor following the requirements of the Order 7th February 2012 (PRELIMINARY ANALYSIS OF THE IMPACT OF THE INB ORDER - 7TH FEBRUARY 2012 (AW6JSB v1.0)).

Compliance with Defined requirements for PBS 55 - Diagnostics (NPEVB6 v2.0) or its flowed down requirements in SRD-55 (Diagnostics) from DOORS (28B39L v5.2) is mandatory.