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EXTERNAL REFERENCE / VERSION

Technical Specifications (In-Cash Procurement)

Analysis of the diagnostic ports and documentation follow-up

CFE for:

The objective of this engineering contract is to work with the ITER Diagnostic Team in the structural analysis that supports the diagnostic ports design, with particular emphasis on the structural integrity, assessment of loads acting on port components and integration of diagnostics in the ports, as well as review and documentation of related activities in analysis documents, IDM and PLM.

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1 Purpose

The objective of this engineering contract is to work with the ITER Diagnostic Team in the structural analysis that supports the diagnostic ports design, with particular emphasis on the structural integrity, assessment of loads acting on port components and integration of diagnostics in the ports, as well as review and documentation of related activities in analysis documents, IDM and PLM.

2 Scope

The work involves the support the ITER Diagnostic Team in the structural analysis that supports the mechanical design of diagnostic ports (in-vessel and ex-vessel), with particular emphasis on the structural integrity, assessment of loads acting on port structures and components and integration of diagnostics and their services in the ports, as well as review and documentation of related activities in analysis documents, IDM and PLM.

3 Definitions

CM	Configuration Model
DA	Domestic Agency
DM	Detail Model
FDR	Final Design Review
IDM	ITER Document Management
IO	ITER Organization
IO-TRO	ITER Organization Technical Responsible Officer
MRR	Manufacturing Readiness Review
PBS	Plant Breakdown Structure
PDR	Preliminary Design Review
SLS	System Load Specifications

For a complete list of ITER abbreviations see: [ITER Abbreviations \(ITER_D_2MU6W5\)](#).

4 References

Links inserted in text (where applicable).

5 Estimated Duration

The duration shall be for 12 months from the starting date of the task order. Services are to be provided off the IO work site, with visits on-site for meetings as and when necessary and requested by IO.

6 Work Description

The work involves technical expertise in the diagnostics design and requirements follow-up, expertise in structural analysis of diagnostics in ITER, as well as understanding and implementation of interfaces for diagnostics integrated in the tokamak infrastructure (ports, buildings). The work involves many areas of activity that have to be documented:

- Structural analysis of integrated port systems (in-vessel and ex-vessel) and their subsystems (diagnostics, services, interfacing systems);
- Record of analysis progress against schedule;
- Preparation of technical documents and analysis reports for the diagnostic systems for their design reviews and/ or manufacturing;
- Update, review or create SLS for diagnostic ports and systems (see Fig. 1 for an example of the integrated diagnostic ports in ITER);
- Defined and justify interfacing loads for diagnostic integrated within ports;
- To assist Responsible Officers to follow-up analysis and integration-related documentation in IDM and PLM to ensure that documents are timely prepared, uploaded for review and approved.

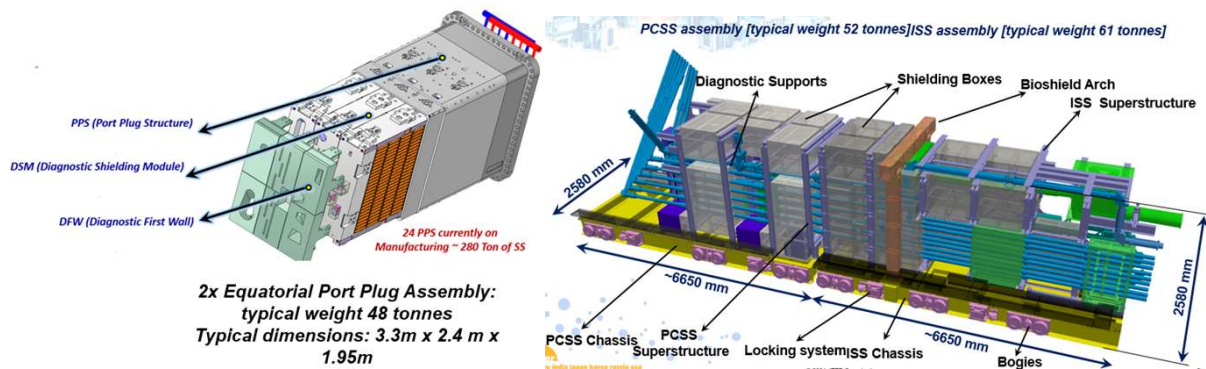


Figure 1. Typical integrated diagnostic port inside ITER infrastructure: left – inside vacuum (port plug); right – outside vacuum (interspace and port cell structures).

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;
- Provide experienced and trained resources to perform the tasks;
- 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 a monthly meeting(s) on work performed;
- Provide offices at IO premises.

8 List of Deliverables and due dates

The main deliverables are provided as follows:

D #	Description	Due Dates
D1	Perform assessment of integrated ports and systems inside them by performing structural analysis and loads definition. Prepare and upload relevant technical documentation in IDM and PLM for upcoming Design Reviews of integrated ports and diagnostic systems scheduled in Q1-2023. Discuss them with analysis experts and make sure that they are timely reviewed.	T0 + 3 months
D2	Perform assessment of integrated ports and systems inside them by performing structural analysis and loads definition. Prepare and upload relevant technical documentation in IDM and PLM for upcoming Design Reviews of integrated ports and diagnostic systems scheduled in Q2-2023. Discuss them with analysis experts and make sure that they are timely reviewed.	T0 + 6 months
D3	Perform assessment of integrated ports and systems inside them by performing structural analysis and loads definition. Prepare and upload relevant technical documentation in IDM and PLM for upcoming Design Reviews of integrated ports and diagnostic systems scheduled in Q3-2023. Discuss them with analysis experts and make sure that they are timely reviewed.	T0 + 9 months
D4	Perform assessment of integrated ports and systems inside them by performing structural analysis and loads definition. Prepare	T0 + 12 months

and upload relevant technical documentation in IDM and PLM for upcoming Design Reviews of integrated ports and diagnostic systems scheduled in Q4-2023. Discuss them with analysis experts and make sure that they are timely reviewed.

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

- Experience in writing SLS for complex integrated systems;
- Experience in structural analysis of mechanical systems and assemblies;
- Experience in writing technical specifications or requirement documents;
- Experience in technical documentation management for complex integrated systems;
- 3D and 2D schematics definition;
- Design organization;
- Technical document generation;
- Technical risk analysis.

11 Work Monitoring / Work Monitoring / Meeting Schedule

Work is monitored through reports (see List of Deliverables section).

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 [Software qualification policy \(ITER_D_KTU8HH\)](#).

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 [GNJX6A](#) - Specification for CAD data production in ITER Contracts.). This implies the usage of the CAD software versions as indicated in CAD Manual 07 - CAD Fact Sheet ([249WUL](#)) and the connection to one of the ITER project CAD data-bases. Any deviation against this requirement shall be defined in a Design Collaboration Implementation Form (DCIF) prepared and approved by DO and included in the call-for-tender package. Any cost or labour resulting from a deviation or non-conformance of the Supplier with regards to the CAD collaboration requirement shall be incurred by the Supplier.

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.

This task is PIA.

The supplier must comply with the all requirements expressed in “Provisions for implementation of the generic safety requirements by the external actors/interveners” (ITER_D_SBSTBM).