

Technical Specifications (In-Cash Procurement)

Specialist work relating to Thomson Scattering Oversight

The work aligns with the ITER project, currently under construction in France. To study the behaviour of this device, a set of monitoring systems (called diagnostics) are required. The work involves technical expertise for two diagnostic projects: Core Thomson scattering system (55.C1) and Edge Thomson Scattering system (55.C2).

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1 Purpose

This document describes technical needs for specialist work relating to Thomson Scattering Oversight.

2 Scope

The work aligns with the ITER project, currently under construction in France. To study the behaviour of this device, a set of monitoring systems (called diagnostics) are required. The work involves technical expertise for two diagnostic projects: Core Thomson scattering system (55.C1) and Edge Thomson Scattering system (55.C2).

3 Definitions

DA	Domestic Agency
CPTS	Core Plasma Thomson Scattering
DA	Domestic Agency
ETS	Edge Thomson Scattering
IO	ITER Organization
IO-TRO	ITER Organization Technical Responsible Officer
SSD	See System Design (CAD software from IGE XAO)
PPD	Port Plug and Diagnostics Integration Division

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

4 References

Links inserted in text.

5 Estimated Duration

The duration shall be for twelve (12) months. Services to be provided outside the IO work site (“Off-Site”), with occasional visits to IO site.

No work shall commence prior to the date of final signature of the Contract.

6 Work Description

General Work Area

- Development of the project and technical strategy and methods needed to implement the Thomson scattering systems (C1, C2) on ITER;
- Maintenance of project implementation plans for all related work, and monitor and control cost and schedules for all related activities;
- Technical review of progress documentation;
- Development of necessary documentation on these systems.

This work involves many areas of activity that have to be documented:

- Meeting notes for IO meetings called by interfacing systems and review bodies;
- Draft/review minutes for IO and DA meetings;
- Draft deviation requests;
- Technical input in support of project change requests and other actions;

- Review/update interface sheets;
- Assembly procedures;
- Input documents, presentations, meeting notes related to Port integrator DA meetings;
- Input documents, presentations, meeting notes related to Interface meetings;
- Technical review notes for DA technical documents in IO IDM. Documents include technical reports, draft deviation requests, compliance and requirements matrixes etc. Several technical documents per month need to be reviewed;
- Input documents, presentations, meeting notes related to Monthly DA meetings
- Implementation reports for IO-related actions from DA meetings;
- Implementation reports for Chit resolution from IO and DA design reviews; Amended and reviewed sections of IO schedule;
- Record of progress against schedule;
- Schedule improvements and fix scheduling problems;
- Input documents, presentations, meeting notes related to meetings of DA representatives with IO experts;
- Guidance notes for DAs on execution of PA technical activities;
- Contributions to design workshops on specific topics (e.g. shutters, neutronics);
- Contribution to conferences on specific topics;
- Updated measurement requirements;
- Technical specifications for R&D tasks;
- Drafts and amended requirements-related documentation including joint documents with plasma operations;
- Project risk register updates (technical, cost and schedule);
- Annual internal review of progress (schedule, cost and risk evolution) and related documents;
- Input documents, presentations, meeting notes related to at workshops and conferences.

Travel to IO, to the DAs or other sites (including manufacturers, research laboratories and conferences) may be required to carry out the work. Note that IO site visits require prior notice of at least one (1) week.

7 Responsibilities

7.1 Contractor's Responsibilities

In order to successfully perform the tasks in this Technical Specification, 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 visitor offices at IO premises.

Site visits require prior notice of at least one (1) week

8 List of Deliverables and due dates

The deliverables are as follows:

No.	Deliverable	Dates*
D01	55.C1&C2: progress EWP for supports in the Gallery. Progress the EWP of 55.C1 and 55.C2, resolve outstanding issues relating to DA-IO interaction and track schedule to minimise delay. Criteria for completion: EWP HOP endorsed in PLM.	T0 + 03 m
D02	55.C2: hold FDR for in-vessel laser Beam Dump Assist DA in preparation of FDR for ETS in-vessel high power laser beam dump. Criteria for completion: FDR held, report approved, chits in IDM.	T0 + 04 m
D03	55.C2: Analysis of the needed modifications following on the third shutter prototype tests. Input: experimental data taken at JA-DA and their suppliers laboratories. Criteria for completion: Technical reports in IDM.	T0 + 06 m
D04	55.C2: Analysis of the data collected by JA-DA for dual laser spectral calibration. Criteria for completion: Technical reports in IDM.	T0 + 07 m
D05	55.C2: Support for the final development of beam alignment method and assessment of the performances. Input: experimental data taken at JA-DA and their suppliers laboratories. Criteria for completion: Technical reports in IDM.	T0 + 08 m
D06	55.C2: Closure of cat-1 chits of Beam Dump FDR and cat-2 closure proposal. Criteria for completion: cat-1 chits closed in IDM and cat-2 proposal report in IDM.	T0 + 10 m
D07	55.C1: Support to EUDA and their contractors for design of CPTS. Monitor interfaces, diagrams, technical analyses, design progress and technical proposals. Criteria for completion: Technical report in IDM with assessment of the development work quality and progress schedule.	T0 + 12 m
D08	Contract summary report. Including: Summary of all deliverables, with approval dates and status: List of key technical issues. Criteria for completion: Technical reports in IDM.	T0 + 12 m
* T0 – date when contract signed by both parties		
The order of delivery can be varied by mutual agreement to suit the needs of the project.		

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

10.1 Technical Experience

- At least 9 years of relevant experience in the design and operation of Thomson Scattering systems;
- Must have designed and implemented an advanced system;
- Should have direct experience in installation, commissioning of complex systems;
- Demonstrated ability in design of automated systems and mechanisms (retrieval, alignment or similar);
- Demonstrated experience in the project initiation, management, design of diagnostic systems on magnetic fusion devices;
- Recorded design on ALARA principles (material selection etc.)
- Demonstrated understanding of a maintenance programme for electro-mechanical or electro-optical equipment
- Demonstrated experience in project management and in effective Quality Assurance management

10.2 Specific skills

- Knowledge and experience working with appropriate software tools to meet the technical requirements of the post, for example IDL (Interactive Data Language) or MATLAB;

11 Work Monitoring / Meeting Schedule

Work is monitored through quarterly reports (see List of Deliverables section) and at monthly project meetings for each of the two projects.

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)

Not Applicable

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.