

Project Integration of 55 BT Neutron Facility and Neutron diagnostics

Table of Contents

1	PURPOSE	2
2	SCOPE	2
3	DEFINITIONS	2
4	REFERENCES.....	2
5	ESTIMATED DURATION.....	2
6	WORK DESCRIPTION.....	2
7	RESPONSIBILITIES	3
7.1	Contractor's Responsibilities	3
7.2	IO's Responsibilities	3
8	LIST OF DELIVERABLES AND DUE DATES	3
9	ACCEPTANCE CRITERIA.....	4
10	SPECIFIC REQUIREMENTS AND CONDITIONS.....	5
11	WORK MONITORING / WORK MONITORING / MEETING SCHEDULE.....	5
12	DELIVERY TIME BREAKDOWN.....	5
13	QUALITY ASSURANCE (QA) REQUIREMENTS.....	5
14	CAD DESIGN REQUIREMENTS (IF APPLICABLE)	5
15	SAFETY REQUIREMENTS.....	6

1 Purpose

This document describes technical needs of IO/DG/ENGN/EDD/PPD Division, with reference to the technical oversight of design, engineering, integration and follow up activities of the Neutron Diagnostics systems.

2 Scope

The work involves the support to the ITER Diagnostic Team in the diagnostic design, integration, and interfaces management of Neutron diagnostics with all other ITER PBS and with particular emphasis to the activity on In-Vessel Neutron Calibration and Neutron Storage Area.

3 Definitions

IO: ITER Organization

DA: Domestic Agency

TRO: IO Technical Responsible Officer

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 40% at the IO work site and 60 %off site.

6 Work Description

The work involves technical knowledge particularly for neutron diagnostics and Port integration projects as well as understanding and practical use of nuclear safety rules and regulations to advance diagnostic systems. The work to be done is in collaboration with the IO Technical Responsible Officer (TRO). It involves many areas of activity that have to be documented:

1. To lead the activity on the Neutron Storage Area project, 55.BT;
2. To produce documentation and specifications regarding the transportation and storage of neutron detectors with fissile material and low yield radioactive sources;
3. To contribute to the design of the In-Vessel Neutron Calibration project 55.BV by providing documentation, specifications, interfaces documents and neutronics calculations;
4. To prepare materials for Design Reviews concerning neutron/gamma spectroscopic diagnostics systems and other systems as required
5. To manage interfaces, interface sheets and integration documents of the neutron diagnostics
6. To perform neutronics calculations for neutron/gamma systems

7. To assist Responsible Officers to specify/ follow-up nuclear safety guidelines and documents to ensure that diagnostic systems fully comply with French nuclear safety requirements
8. To participate in diagnostic review meetings and to follow-up on nuclear safety and neutronics issues
9. To review technical designs, models and reports from Domestic Agencies
10. To maintain commitment to the Protection Important Activities and to requirements of the INB order 7th February 2012 and to propagate them to the Domestic Agencies;
11. To provide other documents as required, such as reports of the activity carried out, conferences and workshops reports
12. To promote safety and quality at all times in all job site activities.

7 Responsibilities

The ITER Organization may request Contractor to travel and work at places other than ITER site. Services to be provided 40% at IO site and 60 off site.

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:

Deliverable	Due date
1	T.0 +3 months
Provide documentation for the construction of Neutron Storage Area in the zone Z4.2 GBS, cost estimation of containers and work/time plan, electrical services, safety ASN documentation update in agreement with SRO for the Group 1 Nuclear sources and detectors. Provide	

	<p>supervision to the construction preparation and construction activities in accordance with their schedule.</p> <p>Documentation and licenses procedures regarding the transportation from the DA to IO sites and to storage at IO site of neutron detectors with fissile material and low yield radioactive sources;</p>	
2	<p>Contribute to the Preliminary Design Phase of the 55.BV In-Vessel Neutron Calibration project: Identify and complete Interfaces documentation; organize and coordinate the safety records and provide safety documentation update.</p> <p>Support the progress of the Preliminary design and integration with the other PBS (Assembly, Vacuum Vessel, Remote Handling, Lower Ports and Blankets).</p>	T.0 + 6 months
3	<p>Support neutron transport calculations, investigations on the performance and shielding features of neutron and gamma diagnostic systems of ITER.</p> <p>Follow up of Documentation and licensing procedures regarding the transportation from the DA to IO sites and to storage at IO site of neutron detectors with fissile material and low yield radioactive sources.</p>	T.0 + 9 months
4	<p>Provision of specifications/requirements for storing the Group 2 Nuclear sources and detectors in the Port Integration Facility (PIF).</p> <p>Update of the safety records and safety documentation in agreement with SRO.</p> <p>Support the progress of the integration with the other PBS55 diagnostics in PIF.</p>	T.0 + 12 months

-- The start of the activity is foreseen on 15 April 2022 at the KoM.

-- Please note that there may be changes to this list of deliverables due to changes in the priority of the ITER project. If such changes occur, they will be agreed during the KOM or through other meetings in the course of the task.

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

- Education to a master degree level or equivalent
- Knowledge and working experience of nuclear systems/devices (in particular fusion systems)
- Knowledge of neutron and nuclear diagnostics;
- Experience in engineering aspects and interfaces, integration of neutron and gamma diagnostics;
- Knowledge in Schematics, Diagrams and CAD modelling;
- Knowledge and experience on neutronics calculations for nuclear diagnostics
- Knowledge of safety procedures and regulation for nuclear diagnostics systems
- Experience in specifications for system requirements management;
- Demonstrated Experience in working within international organizations;
- Ability to Technical documents generation;

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 <https://user.iter.org/?uid=KTU8HH> Software Qualification Policy.

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 \(AW6JSB v1.0\)](#)).

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

The activity described in this Technical Specifications is a PIA activity related to safety records and documentation of the 55B7 Neutron Storage as well Radioactive sources in the Port Integration Facility (PIF).