

Technical Specifications (In-Cash Procurement)

Technical Specifications_Fusion Diagnostics Optical and Optoelectronics Engineering Consultancy

This document describes technical needs of Fusion Diagnostics Optical Design Consultancy, in support of the following ITER diagnostic systems: In Vessel Lighting, PBS 55.GL; Equatorial and Upper Port Infrared (IR) and Visible Wide Angle Viewing Systems (WAVS), PBS 55.G1 and 55.GA; In-vessel viewing system (IVVS), PBS 57; Temporary IR system in Equatorial Port 16, PBS 55.G1.E0;

**Fusion Diagnostics Optical and Optoelectronics
Engineering Consultancy**

Technical Specifications

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1 Purpose

This document describes technical needs of **Fusion Diagnostics Optical Design Consultancy**, in support of the following ITER diagnostic systems:

- In Vessel Lighting, PBS 55.GL;
- Equatorial and Upper Port Infrared (IR) and Visible Wide Angle Viewing Systems (WAVS), PBS 55.G1 and 55.GA;
- In-vessel viewing system (IVVS), PBS 57;
- Temporary IR system in Equatorial Port 16, PBS 55.G1.E0;

2 Scope

The services are for the ITER project, currently under construction in France. This device will study the potential of controlled nuclear fusion to provide energy for mankind. In order to study the behaviour of this device, a set of monitoring systems (referred to as Diagnostics) is required. These Diagnostics will provide the information required to understand the performance of the device. The work described below is related to the support to the specification, design and analysis of diagnostics in the field of optics, optomechanics and optoelectronics. This will include the feasibility study, analysis and specifications of the optical, optomechanical and optoelectronic components to achieve the measurement requirements of the diagnostic listed in Section 1 and as detailed in Section 6. The support will also include the review of reports related to optical, optomechanical and optoelectronic study, design and analysis provided by the ITER Project Domestic Agencies (DAs).

3 Definitions

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

4 References

References are inserted throughout the text.

5 Duration

The duration shall be 12 months.

6 Work Description

The tasks to be performed within this contract fall within the following categories:

- Perform feasibility studies and analysis in the fields of optics, optomechanics and optoelectronics for diagnostics;
- Develop specifications in the fields of optics, optomechanics and optoelectronics for diagnostics;
- Support definition of interfaces and diagrams;
- Provide cost estimations of optical, optomechanical and optoelectronic systems for diagnostics;
- Provide design in the fields of optics, optomechanics and optoelectronics for diagnostics;

- Support the review of technical reports related to optical, optomechanical and optoelectronic study, design and analysis provided either by the ITER Organization or by the ITER Project Domestic Agencies;

The support above shall be provided for the following ITER Diagnostics:

- In Vessel Lighting, PBS 55.GL;
- Equatorial and Upper Port Infrared (IR) and Visible Wide Angle Viewing Systems (WAVS), PBS 55.G1 and 55.GA;
- In-vessel viewing system (IVVS), PBS 57;
- Temporary IR system in Equatorial Port 16, PBS 55.G1.E0;

The ITER Organization (IO) may request the Contractor to support other Diagnostics systems.

The support to these Diagnostics in the categories listed above will be reported through monthly progress reports listed in Section 7.

7 List of deliverables and due dates

D#	Description	Due Dates
D01	Progress report No 1: support to diagnostics specified in section 6.	T ₀ + 1m
D02	Progress report No 2: support to diagnostics specified in section 6.	T ₀ + 2m
D03	Progress report No 3: support to diagnostics specified in section 6.	T ₀ + 3m
D04	Progress report No 4: support to diagnostics specified in section 6.	T ₀ + 4m
D05	Progress report No 5: support to diagnostics specified in section 6.	T ₀ + 5m
D06	Progress report No 6: support to diagnostics specified in section 6.	T ₀ + 6m
D07	Progress report No 7: support to diagnostics specified in section 6.	T ₀ + 7m
D08	Progress report No 8: support to diagnostics specified in section 6.	T ₀ + 8m
D09	Progress report No 9: support to diagnostics specified in section 6.	T ₀ + 9m
D10	Progress report No 10: support to diagnostics specified in section 6.	T ₀ + 10m
D11	Progress report No 11: support to diagnostics specified in section 6.	T ₀ + 11m
D12	Progress report No 12: support to diagnostics specified in section 6.	T ₀ + 12m

8 Responsibilities

8.1 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.

8.2 IO's Responsibilities

The IO shall

- Nominate the Responsible Officer (RO) to manage the Contract;
- Provide offices at IO premises;

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 RO. 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 7, Table of deliverables.

10 Specific requirements and conditions

- Experience in optics and optoelectronics;
- Experience with optical systems in the field of nuclear installations comparable to ITER;
- Experience with diagnostic systems comparable to those of ITER;
- Experience with plasma or high energy physics devices;
- Experience with the technical follow-up of CAD activities;
- Experience in project management
- Experience with system diagrams
- Experience with vacuum-compatible materials and processes;

Services are to be provided predominantly at the IO work site. Travel to the DA or other sites may be required to carry out the work.

11 Work Monitoring and Control Points

The work will be managed by means of Progress Meetings and through the formal exchange of documents and transmitted by emails which provide detailed progress. Work progress will be monitored through Deliverable documents. Progress Meetings will be called by the ITER Organization or the Contract TRO. They will be held as needed and at least once per month.

12 Delivery Time Breakdown

See Section 7 “List Deliverables section and due dates”. Interim payments will be made upon satisfactory completion and IO approval of deliverable reports uploaded onto IDM and upon submission of a valid invoice.

13 Quality Assurance (QA) requirement

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