

Technical Specifications (In-Cash Procurement)

Expert support to Heat and Imaging Instrumentation

CFE for:-

The purpose of this contract is to provide expert support to instrumentation for ITER Heat and Imaging Diagnostics.

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1 Purpose

The purpose of this contract is to provide expert support to instrumentation for ITER Heat and Imaging Diagnostics.

2 Scope

The ITER Heat and Imaging Systems comprise the suite of visible and infrared diagnostics, the Divertor Flow Monitor, the Lost Alpha Monitor and Bolometers.

The scope of this contract includes:

- Support to irradiation tests of the electronics for Heat and Imaging Systems;
- Support to creation and update of the Concepts of Operation for Heat and Imaging Systems;
- Support to selection of the COTS measurement instruments for Heat and Imaging System, in particular the cameras;
- Support to update of diagrams of Heat and Imaging Systems;
- Support to development of I&C for Heat and Imaging Systems;
- Support to follow up of technical actions for Heat and Imaging Systems;
- Support to definition of the I&C Site Acceptance Test criteria;

Part of this work is due to redesign of the heat and Imaging systems 55.G6 (equatorial port 17) as well as 55.GE and 55.B9 (equatorial port 8) due to integration of the Disruption Mitigation System. The integration of the DMS imposed changes of the camera shielded cabinet volume of 55.G6 and 55.B9, and required the camera instrument of 55.GE to be moved from the port cell to diagnostic building. This impacts the selection of the measurement instruments, the diagrams and I&C of these diagnostics.

3 Definitions

CRO	Contractor Responsible Officer
IDM	ITER Document Management system
IO	ITER Organization
IO-CT	ITER Organization – Central Team
PBS	Plant Breakdown Structure

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

4 Estimated Duration

The duration of this contract is 12 months.

5 Work Description

The work within this contract includes:

- Support to irradiation tests of the electronics for Heat and Imaging Systems;
- Support to creation and update of the Concepts of Operation for Heat and Imaging Systems;
- Support to selection of the COTS measurement instruments for Heat and Imaging System, in particular the cameras;
- Support to update of diagrams (cabling, SLD, P&ID, PFD) of Heat and Imaging Systems;
- Support to development of I&C for Heat and Imaging Systems;
- Support to follow up of technical actions for Heat and Imaging Systems;
- Support to definition of the I&C Site Acceptance Test criteria;

The progress on each of these tasks will be summarized in a Progress Report. Each progress report constitutes a deliverable (D1-D3) and will include report on progress on one or more tasks.

Where necessary, the contract shall collect the required input information by interacting proactively with IO staff and contractors.

The total amount of services required for this contract corresponds to 0.4 ppy distributed over 12 months duration of the contract.

6 Responsibilities

6.1 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.

6.2 IO's Responsibilities

The IO shall:

- Nominate the Responsible Officer (CRO) to manage the Contract;
- Organise regular progress meetings and the kick-off meeting;
- Provide required input information for the Contractor.

7 List of Deliverables and due dates

D1	Progress report #1 on tasks defined in section 5	T0 + 4 months
D2	Progress report #2 on tasks defined in section 5	T0 + 8 months
D3	Progress report #3 on tasks defined in section 5	T0 + 12 months

T0 corresponds to date of the kick-off meeting.

8 Acceptance Criteria

These criteria shall be the basis of acceptance by IO following the successful completion of the services:

- The deliverable will be in the form of report as specified in Section 7.
- The deliverable will be uploaded in the Contractor's dedicated folder in the ITER Organization's document management system IDM.
- The CRO for the contract is the Approver of the delivered document.
- The CRO can ask modifications to the report in which case the Contractor must submit a new version.

The acceptance of the document by the Approver is the acceptance criterion.

9 Specific requirements and conditions

- The contractor shall be an expert in radiation tests for visible and/or infrared cameras and similar sensitive electronics
- The contractor shall be an expert Instrumentation and Control for heat and imaging diagnostics.
- The contractor shall have experience with operation of imaging diagnostics in tokamaks.
- The contractor shall be an experienced in assessment of the design compliance with Instrumentation and Control requirements.
- The contractor shall work independently with minimum supervision to achieve the objectives and deliverables specified in this technical specification.

10 Work Monitoring / Meeting Schedule

The work will be monitored by means of Progress Meetings and through the formal exchange of documents and information by emails. Progress meetings will be held as needed and at least once per month. The Kick-off Meeting shall take place within two weeks from the contract signature.

11 Delivery time breakdown

See Section 8 “List Deliverables section and due dates”.

12 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).

13 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.

14 Safety requirements

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

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.

