

Technical Officer on the ITER Magnetics Diagnostics (Discrete sensors)

Technical Specifications

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1 Abstract

This document describes technical needs for a Technical Officer on the ITER Diagnostics for the discrete inductive sensors.

2 Background and Objectives

ITER is a major new device that is under construction in Cadarache in Provence, France. This device will study the Fusion concept on a scale previously unequalled on earth.

To study the behaviour of this device, a set of monitoring systems (called Diagnostics) are required. They will provide all the information to show and understand the performance of the tokamak.

The work described below is related to system defining and preparation for procurement.

3 Scope of Work

The objective of this engineering contract is to provide an individual to assist the Responsible Officer for Magnetics in the preparation of the design review of magnetics sensors, specifically discrete inductive sensors.

4 Estimated Duration

The duration shall be 6 months from the starting date of the contract and is specifically based at the IO.

5 Work Description

Description of the tasks to perform:

Prepare the supporting documents for the review of all discrete sensors towards a conceptual design review (CDR). These include design description, risk assessment, compliance analysis and other engineering documentation. Contribute to the definition of the sensor interfaces with other systems.

Supervise example CAD designs of representative sensors to represent the concepts. Contribute to the generation of appropriate load specifications for the sensors. Perform basic thermal and EM analysis (hand calculations) to assess the structural integrity of the sensors.

The documents to be updated or generated include a design description document (DDD) for this group of sensors, appropriate Interface Control Document (ICD) drafts, specific contributions to functional breakdown and risk assessment as well as presentations for the CDR.

6 List of deliverables and due dates

Subtask	Deliverable	Dates
1	Progress report	3 months after starting date
2	Final report	6 months after starting date

7 Acceptance Criteria

The selection will be done taking into account the following criteria and an interview:

- | | |
|--------------|-----|
| 1) Expert CV | 60% |
| 2) Price | 40% |

8 Specific requirements and conditions

Role - Technical Programme Expert

- Able to work with partners and host to define critical needs
- Ability to work with the organisation's processes to achieve the best results
- Ability to align work priorities with overall project schedule
- Excellent technical writing skills
- Excellence in communication and influencing
- Attention to detail
- Excellent inter-personal skills
- Ability to be consistent and work well under pressure
- Works with a team of highly motivated scientists to achieve goals and objectives
- Interface to virtual partner teams across the globe
- Responsible and accountable for delivery
- Ability to comprehend technical issues and to ensure they are appropriately addressed by others

Decision Making

- Applies knowledge and judgement to ensure that the most appropriate decisions are agreed

Specific skills

The person should ideally have experience of:

- Design of magnetic sensors for fusion devices
- Calibration of magnetic measurements
- Commissioning / basic use of magnetic sensors for the running of fusion devices
- Fault finding and correction of faults in production or use of such sensors
- Basic electromagnetic and thermal analysis
- Technical specification for instrumentation

- The ITER design, in particular the cryostat / PF environment, vessel interfaces...

Experience

The staff proposed by the bidder to carry out the work described in Section 5 must have proven experience in following areas:

- Design of diagnostic systems (at least 5 years);
- Design, commissioning or use of magnetic diagnostics or instrumentation;
- Basic EM and thermal analysis;
- Working with CAD designers;
- Working in English language;
- Technical writing in English.

Qualifications

Qualification to PhD or equivalent experience in one of the following disciplines is required; engineering, mechanical, electrical, experimental physics, optical engineering, nuclear engineering.

9 Work Monitoring / Meeting Schedule

Meetings and progress reports

The work will be managed by means of Progress Meetings and/or formal exchange of documents transmitted by emails which provide detailed progress. Progress Meetings will be called by the ITER Organization, to review the progress of the work, the technical problems, the interfaces and the planning.

The main purpose of the Progress Meetings is to allow the ITER Organization/Diagnostics Division and the Contractor Technical Responsible Officers to:

- a) Allow early detection and correction of issues that may cause delays;
- b) Review the completed and planned activities and assess the progress made;
- c) Permit fast and consensual resolution of unexpected problems;
- d) Clarify doubts and prevent misinterpretations of the specifications.

In addition to the Progress Meetings, if necessary, the ITER Organization and/or the Contractor may request additional meetings to address specific issues to be resolved.

For all Progress Meetings, a document describing tasks done, results obtained, blocking points must be written by the engineer. Each report will be stored in the ITER IDM in order to ensure traceability of the work performed.

Every 3 months, the Contractor shall submit to ITER Organization a Progress Report to be issued five working days before the each Progress Meeting so that the report can be reviewed prior to, and discussed at, that Meeting.

The quarterly Progress Report shall illustrate the progress against the baseline work plan and indicate variances that should be used for trending. Performance indicators suitable to measure the progress of the work as compared to the approved work plan shall also be reported in the Monthly Progress Report.

10 Payment schedule / Cost and delivery time breakdown

Interim monthly payments.

11 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 document [ITER Procurement Quality Requirements \(22MFG4\)](#)

Prior to commencement of the task, a Quality Plan [Quality Plan \(22MFMW\)](#) 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.

Prior to commencement of any manufacturing, a Manufacturing & Inspection Plan [Manufacturing and Inspection Plan \(22MDZD\)](#) must be approved by ITER who will mark up any planned interventions.

Deviations and Non-conformities will follow the procedure detailed in IO document [MQP Deviations and Non Conformities \(22F53X\)](#)

Prior to delivery of any manufactured items to the IO Site, a Release Note must be signed [MQP Contractors Release Note \(22F52F\)](#).

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, it should fulfil IO document on Quality Assurance for ITER Safety Codes [Quality Assurance for ITER Safety Codes \(258LKL\)](#).

12 References / Terminology and Acronyms