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Technical Specifications

for

Development of Dust, Tritium and Erosion Diagnostics on ITER

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1 Abstract

This document describes technical needs of a diagnostic edge **Physicist for ITER**

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. The will provide all the information to show and understand the performance of the device.

The work described below is related to system- defining and assessing the performance to ensure that procurements can be carried out. Most of these procurements are at the functional specification level and hence significance experience in the fusion field is required to allow an optimum system is specified.

Specifically, the **Divertor Diagnostics** system is designed to allow an understanding of the operation of the ITER device. In particular, the study of dust build up through erosion or otherwise and tritium accumulation is of paramount importance to the functioning of the device. The level of importance of this is highlighted by the fact that the safety case for ITER needs results from this work in particular in the case of demonstrating to the nuclear licensing authority that the IO can monitor the risk using diagnostic equipment.

3 Scope of Work

The objective of this contract is to support the Diagnostics team in the evaluation and establishment of diagnostics for monitoring of target erosion, dust build up and tritium retention.

4 Estimated Duration

The duration shall up to 2 years (440 working days) from the starting date of the contract and should be carried out 100% at the ITER Cadarache site.

5 Work Description

Description of the tasks to perform:

- Evaluation and establishment of diagnostics for monitoring of dust, tritium and erosion (DTE).
- Contribute and coordinate Design and Design reviews with assistance from senior staff
- Evaluate diagnostic reports in DTE for accuracy and provide expert advice on these reports
- Provide proposals on engineering of diagnostic solutions in DTE for ITER.

- Provide support for concept design, detailed design and Final designs for ITER diagnostics generally
- Assist in the planning of the diagnostic schedule and preparation of the Diagnostic procurement arrangements
- Provide documentation as required to support the work carried out.

6 List of deliverables and due dates

Monthly progress reports.

7 Acceptance Criteria

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

1) Expert CV	70%
2) Price	30%

8 Specific requirements and conditions

The staff proposed by the bidder to carry out the work described in Section 5 must have proven experience in following areas:
- Proven experience in the development of diagnostic systems (at least 3 years);
- Proven experience in working on large tokamaks (at least 3 years);
- Proven experience working with divertor diagnostics especially those related to Tritium and Erosion (at least 2 years)
- Experience in working with CAD designers;
- Capability to work in English language.
- Able to works with partners and host to define critical needs
-Ability to work with the ITER 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

Interviews
Before any appointment is made it may be necessary to conduct interviews. ITER reserve the right to call for interviews which will be held at the ITER site in Cadarache. All associated costs for attending interviews will be for the account of the contractor.

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 asses 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.

Proposed meeting schedule		
Scope of meeting	**Deliverables completed**	**Place of meeting**
Weekly meetings	Tasks / results / other	ITER site and/or e-mail communication
Monthly progress report	Tasks overview to date	ITER site
Quarterly Reports 1 Quarterly Reports 2 Quarterly Reports 3	Tasks completed to date in line with section 5 work description	ITER site and/or e-mail communication
Final Report/closure	Final review	ITER site & 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 a Monthly Progress Report.

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.

10 Payment schedule / Cost and delivery time breakdown

Interim payments will be made monthly upon satisfactory completion and IO approval of monthly progress reports & time sheets and upon submission of a valid invoice.

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