china eu india japan korea russia usa

Technical Specifications

For

ITER Diagnostics Support for Interferometer

china eu india japan korea russia usa

Table of Contents

iter
china eu india japan korea russia usa

1 Abstract

This document describes technical needs of ITER Diagnostics Division, with particular reference to the requirement for electron density measurement systems.

2 Background and Objectives

ITER is a major new device that is under construction at Cadarache, near Marseille, France. This device will study the potential of controlled nuclear fusion to provide energy for mankind. To study the behaviour of this device, a set of monitoring systems (called Diagnostics) are required. These systems will provide the information required to understand and control the performance of the device.

3 Scope of Work

In all operational scenarios on ITER, the real-time measurement of the line-averaged electron density is required for basic machine control. The failure of the density measurement is a risk for ITER operation.
To date designs of several density diagnostics are ongoing by each Domestic Agency, such as a toroidal interferometer / polarimeter, poloidal polarimeter, reflectometer, and thomson scattering measurement.
For seamless operation of ITER, integrations of density diagnostic is necessary and IO has a strong interest in the supplemental density diagnostics.
The objective of this contract is to provide the Diagnostics team Laser Diagnostic Expertise to support the integration of robust electron measurement systems and design supplemental diagnostics.

4 Estimated Duration

The initial duration of this contract will be 3 years. In addition, there will be an option to extend the contract for a further two years being two one year options. We estimate that the services will be required for approximately 50 working days each year, mainly at IO-site in weekly slots.

5 Work Description

- Assists in developing strategy and design of the integrated robust electron density diagnostic system on ITER;
- Draws up detailed project implement plans of the density measurement and executes related documentations;
- Assessment of necessary technologies for the supplemental electron density diagnostic and its conceptual design on ITER;
- Provide development and integration plans of the supplemental electron diagnostic and preparation for CDR/FDR;

- There is a requirement to liaise with IO Responsible Officer over the period of the contract, who will be working on other aspects of the system.

6 List of deliverables and due dates

Deliverable	Dates
Progress report	At the end of each year after starting date
Final report	At the end of the contract

7 Acceptance Criteria

This criteria shall be the basis of acceptance by IO following the successful completion of the services. These will be in the form of monthly progress reports as indicated in section 6, table of deliverables and further detailed below:

Report and Document Review criteria.
Reports as deliverables shall be stored in the ITER Organization's document management system, IDM by the Contractor for acceptance. A named ITER Organization's Contract Technical Responsible Officer is the Approver of the delivered documents.
The Approver can name one or more Reviewers(s) in the area of the report's expertise.
The Reviewer(s) 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.

8 Specific requirements and conditions

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

- At least 10 years of relevant experience in an interferometer and a polarimeter with lasers.

- Should have strong experience in design, installation and commissioning of the above diagnostics on magnetically fusion devices.

- Should have designed and implemented an advanced interferometer system.

- Demonstrated experience in the project initiation, management of diagnostic systems on magnetic fusion devices.

- Specific skills

Sufficient knowledge and experience working with appropriate software tools to meet the technical requirements, for example IDL (Interactive Data Language) or MATLAB;

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.

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 payments will be made monthly upon production of a monthly report and completed time sheet in line with the table of deliverables in section 6. Payments will only be processed upon IO approval of the reports and against receipt 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

NA (Not Applicable)