

Technical Specifications (In-Cash Procurement)

Engineering support in IC system integration

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Contract Technical Specifications

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1 Abstract

This document describes technical needs of the IC & LH section, with particular reference to Design Engineering work, thermal, hydraulic and thermo mechanical analysis on the Ion Cyclotron Heating and Current Drive (IC H&CD) system and its components. These needs include both design and follow up activities, as appropriate.

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 reach the target performances of this device, a set of plasma heating systems are required. These systems will deliver power to the plasma to sustain and control the performance of the device.

The work described below is related to the hardware required to physically transmit radio-frequency power into ITER, and is more specifically focused on the Integration of components in the various locations. The work will contribute to assess the aspects of fabricability, installation, maintenance.

It will deal with antenna (Fig.1) as well as transmission lines and matching systems (Fig.2).

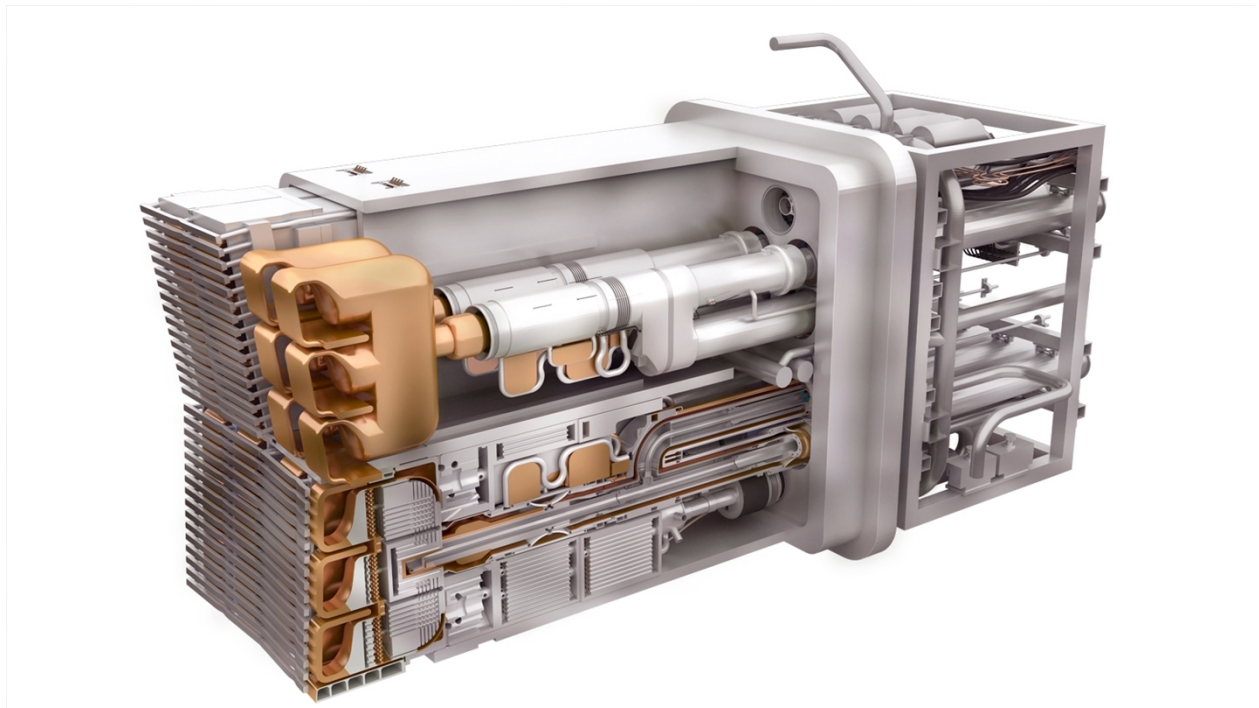


Fig.1 - Equatorial Port Plug Antenna for IC H&CD power coupling to plasma: 3.5 x 2.5 x 1.9m, 45 tons

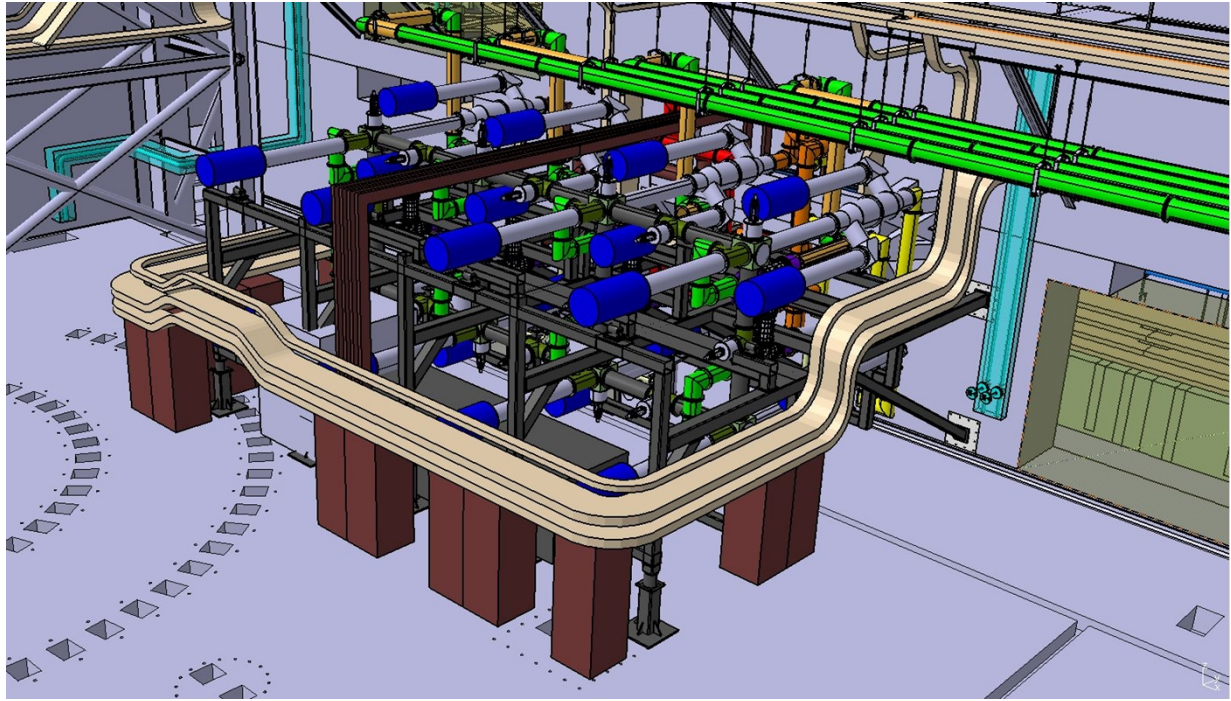


Fig.2 - IC H&CD matching units in Assembly hall: foot print is approximately 11 x 13 m

3 Scope of Work

The scope of this contract includes the supply of specialised services to perform the following activities:

- Support the IC H&CD team in the integration of the IC system,
- Support the IC H&CD team in the follow-up and assessment of the progress of the externally contracted R&D and design activities.
- Contribute to the detailed development of the IC system interfaces with other ITER components, with emphasis on the integration of system components in the different buildings.
- Perform installation, maintenance and integration analysis on the proposed designs to verify compliance with ITER requirements.
- Some interactions with other ITER teams and participations to meetings will be part of the task.
- Write technical specifications covering forthcoming design and R&D activities.
- Report activities progress to section leader and interact with IC team.

4 Estimated Duration

The contract will have an initial firm period of 2 year (440 working days).
The work will be fully based at the ITER Organization Worksite.

5 Work Description

Description of the tasks to perform:

- Prepare integration of system components:
 - Develop and check interfaces
 - Manage deviations and change requests
 - Prepare or assess installation plans
 - Prepare or assess maintenance plan, including remote maintenance
 - Elaborate and assess decontamination methods
 - System optimization and risk management analysis
- Prepare appropriate design outputs in key areas such as outlined in the above Scope of Work.
- Review technical designs, created by others, and agree/implement required changes, in collaboration with the relevant ITER staff.
- Draft and report the performed work in the required format, primarily in the form of design notes, analysis and structural integrity reports.
- Provide analytical and additional appropriate assessment with the aim of justifying the feasibility of the proposed designs, including assessment of manufacturability and inspectability.
- Carry out additional design work as may arise during the course of the contract.
- Write technical specifications for R&D and design activities.
- Promote safety and quality at all times in all job activities.

6 List of deliverables and due dates (proposed or required by ITER)

Milestone No:	Deliverables	Due date of the last deliverable
1	1 st Intermediate report	TO + 3 months
2	2 nd Intermediate report	TO + 6 months
3	3 rd Intermediate report	TO + 9 months
4	4 th Intermediate report & Report on first year	TO + 12 months
5	5 th Intermediate report	TO + 15 months
6	6 th Intermediate report	TO + 18 months
7	7 th Intermediate report	TO + 21 months
8	Final report	TO + 24 months

7 Acceptance Criteria (including rules and 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 required resource is an engineer (Masters degree) with at least 5 years of working experience in system engineering.

The successful candidate shall be fluent in English (both written and spoken) and shall have experience in the following fields:

- Experience of working with CAD Designers
- Experience in contract technical specification writing
- Experience in diverse fields of system engineering
- Ability to work in multidisciplinary, international team environment
- Experience in the fields of Nuclear Fission and/or Fusion is an advantage

9 Work Monitoring / Meeting Schedule

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 Quarterly Progress Report.

10 Payment schedule / Cost and delivery time breakdown

Interim monthly payments.

At the end of each month, the Contractor shall submit an invoice for the services rendered. This invoice will be accompanied by a duly signed time sheet. This time sheet will clearly indicate the contract reference number, the name of the assigned person, the dates and the total of the working days and the number of hours worked per day.

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 \(22MFG4\)](#).

Deviations and Non-conformities will follow the procedure detailed in IO document MQP Deviations and Non Conformities (22F53X).

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 \(258LKL\)](#).