

Technical Specifications (In-Cash Procurement)

Technical Specification for Call for Expertise for Machine Protection Panel and CIS Manufacturing and Functional Analysis Support

The objective of this contract is to incorporate one engineer or physicist to the Interlocks Team to provide support to the CSD Division on the management and resolution of the technical activities and actions set by the Machine Protection Panel (MPP) by elaborating and/or coordinating all the related technical documentation and taking care of the panel meeting organisation. The secondary objective is to provide support to CIS activities such as the CIS v2 upgrade and construction of ...

1 Purpose and scope of the document

This document specifies the requirements for the Call for Expertise for Machine Protection Panel and CIS Manufacturing Support.

2 Background and Objectives

The Interlock Control System or ICS is the ITER control system in charge of implementing the investment protection functions. The CSD Division is the responsible at ITER of the design, construction and commissioning of the Central Interlock System.

The primary objective of this contract is to provide support to the CSD Division on the management and resolution of the technical activities and actions set by the recently created Machine Protection Panel (MPP) by elaborating and/or coordinating all the related technical documentation and taking care of the panel meeting organisation.

The secondary objective is to provide support to CIS activities such as the construction of CIS v1 and its later upgrade to CIS v2 as well as the construction of the CIS Replica as well as generating a detailed functional analysis of the CIS for First Plasma.

The selected candidate shall work at ITER Organization premises for the whole duration of the contract.

3 Scope of Work & Services

The scope of the engineering support services requested in this specification covers the supply of the technical deliverables required by the ITER interlocks team on the following subjects:

Machine Protection Panel (MPP):

- Coordinate, together with the MPP chairman, the resolution of the technical actions identified by the Panel.
- Follow-up and maintain the MPP management tools (e.g. MPP action list, MPP SharePoint and IDM folders, etc.)
- Contribute as interlock and machine protection expert to the technical discussions related to the MPP activity.

CIS design and procurement third-party assessment:

- Contribute to the development of the CIS functional analysis, the construction of CIS v1 and next upgrade, CIS v2.
- Coordinate the activities related to the design and construction of the PIS Simulator and the CIS Replica.

Central Interlock Function definition and documentation:

- Document the central interlock functions and distribute them among the different stakeholders for their approval.

- Follow-up and manage updates and different versions of such functions.
- Generation of a CIS functional analysis for First Plasma (FP) based on the current CIS functional analysis and the MPP conclusions.

4 Estimated Duration

The duration of services under this contract shall be for one (1) year during which the deliverables 1 to 8 (see table below) shall be produced.

5 List of deliverables and due dates

The deliverable dates are strongly linked to the milestones of the following CIS sub-projects:

- CIS v1 assessment
- CIS v2 upgrade and CIS Replica procurement
- Machine Protection Panel
- Interlock function definitions and documentation
- Functional analysis of the CIS for First Plasma

The deliverables to be supplied by this contract together with the date of delivery are listed in the table below and described in detail after it.

Index	Deliverable	Dates
0	Kick-Off meeting	T ₀
1	CIS v1 Final Assessment	T ₀ + 3 months
2	MPP 2017 annual report	T ₀ + 5 months
3	CIS interlock functions 2017 annual report	T ₀ + 5 months
4	CIS functional analysis for FP v1	T ₀ + 6 months
5	CIS v2 and CIS Replica procurement plan assessment	T ₀ + 8 months
6	CIS functional analysis for FP v2	T ₀ + 12 months
7	MPP 2018 interim report	T ₀ + 12 months
8	CIS interlock functions 2018 interim report	T ₀ + 12 months

Deliverable 1: CIS v1 Final Assessment

This deliverable involves a final independent report on CIS v1 final design, construction and FAT with the assessment and validation of the defined functionality. The report shall be accompanied by an expert's proposal for improvements of future CIS versions.

Deliverables 2 and 7: Machine Protection Panel technical reports

The MPP annual and interim reports include:

- Minutes of the meetings held on the indicated periods.
- Technical and scientific material resulting from the panel work.
- Panel action resolution documentation.

- Status of the MPP action plan.

Deliverables 3, 4, 6 and 8: CIS interlock functions technical reports

The CIS interlock functions annual and interim reports include:

- Minutes of the meetings held on the indicated period related to interlock function discussions and IDM reviews of the interlock function documents generated.
- Updated list of current interlock functions under review and approved.
- List of new interlock function documents generated.

The CIS functional analysis for FP version 1 and 2 include:

- CIS functional analysis adapted to FP.
- Updated list of FP interlock functions (events/actions).

Deliverable 5: CIS v2 and CIS Replica procurement plan assessment

Final assessment before upgrading CIS v2 and the construction of the CIS Replica . This shall include but not limited to:

- Evaluation of the application of FDR panel recommendations
- Evaluation of the interlock functions to implement
- Validation of required hardware before purchase
- Evaluation of resources and construction plan of the suppliers

6 Work Monitoring / Meeting Schedule

Personnel will be expected to attend regular Group Progress Meetings as requested, and to the formal exchange of documents transmitted by emails required. Progress Meetings will be called by the ITER Organization, to review the progress of the work, the technical problems, the interfaces and the planning. Where necessary or appropriate, off-site contractor managers may be invited to participate in some progress meetings via videoconference.

The main purpose of the Progress Meetings is to allow the ITER Organization/Controls 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.

It is expected that on occasion the Contractor will be required to make a presentation to Topical Technical Meetings as well as on official Design Reviews of the Project.

7 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 \(258LKL\)](#).