

**Technical Specifications (In-Cash Procurement)**

**Technical Specification - HIT Engineering Services for  
B14**

Technical specification for the HIT Engineering Support Services to support execution of the Integration Cycles for Tritium building B14.

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## 1 Purpose

This Technical Specification specifies the scope of works to be provided by the Contractor to the ITER Organization Central Team (IO-CT) to support the Holistic Integrated Team (HIT) on the integration of the Tokamak Complex buildings, in particular the Tritium Building (B14).

The HIT has been established to secure the Tokamak Complex installation schedule and cost, by executing concurrent integration engineering of all Systems present in the Tokamak Complex, leading to an integrated clash free design and optimized sequence of installation taking into account constructability, testing and commissioning, maintainability and fully satisfying the functional and safety requirements.

The HIT performs the integration work in B14 by Areas in co-operation with all relevant engineers, designers and administrators from IO Engineering departments, DAs, Contractors and Suppliers on full-time/part-time basis, as needed. The HIT scope is front office integration work while the back office detailed design work and construction design responsibility remains within each participating entity.

## 2 Scope

The scope of works of the Contractor is to establish their Execution team and to support the IO-CT and the HIT management in the execution of some of the core activities of the HIT to meet its objectives in the integration of Tokamak Complex buildings, in particular B14.

## 3 Definitions

B14	Building #14 (Tritium building)
BoM	Bill of Materials
CAS	Common Assembly Sequence
CWP	Construction Work Package
CRR	Construction Readiness Review
EP	Embedded (Anchor) Plate
HIT	Holistic Integration Team
ICO	Integration Coordination Officer
IO	ITER Organization
IO-CT	ITER Organization Central Team
PBS	Product Breakdown Structure
PDS	Post Drilled System (Anchor)
PIA	Protection Important Activity
PIC	Protection Important Component
QC	Quality Class
RFI	Request For Information
SDR	Supplier Deviation Request
SIC	Safety Important Class Component
SQEP	Suitably Qualified and Experienced Person

SR	Safety Relevant
WBS	Work Breakdown Structure
WP	Work Package

For a complete list of ITER abbreviations see: [ITER Abbreviations \(ITER\\_D\\_2MU6W5\)](#).

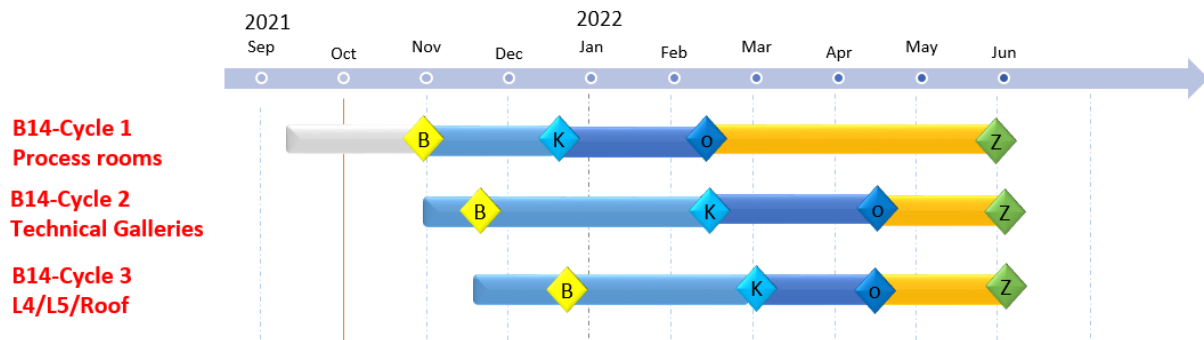
## 4 References

### 4.1 Applicable Documents

ITER_D_22MFG4	ITER Procurement Quality Requirements
ITER_D_22K4QX	ITER Quality Assurance Program (QAP)
ITER_D_22MFMW	Requirements for Producing a Quality Plan (v4.0)
ITER_D_22F53X	Procedure for management of Non-conformities
ITER_D_2LZJHB	Procedure for the management of Deviation Request
ITER_D_24VQES	Quality Classification Determination
ITER_D_27LHHE	ITER Configuration Management Plan (CMP)
ITER_D_35BVQR	Procedure on Procurement Documentation Exchange Between IO, DAs and Contractors
ITER_D_22K5JQ	Document Management Procedure
ITER_D_BG2GYB	Propagation of the Defined Requirements for Protection Important Components through the Chain of External Interveners
ITER_D_7M2YKF	Order dated 7 February 2012 relating to the general technical regulations applicable to INB - EN
ITER_D_27WDZW	Internal Regulations
ITER_D_258LKL	Quality Assurance for ITER Safety Codes Procedure
ITER_D_7LB8NY	Alert procedure on ITER construction site
ITER_D_AGC5G4	Environmental Management Plan for ITER construction site (PMAE)
ITER_D_43UJN7	ITER Policy on Safety, Security and Environment Protection Management
ITER_D_G8UMB3	In-Cash Procurement Technical and Management Documentation Exchange and Storage Working Instruction
ITER_D_W63ZY2	Terms of Reference for Holistic Integration Team (HIT)
ITER_D_WSX3GP	HIT Integration Cycle for Tokamak Complex
ITER_D_X454C2	HIT Step B - Completeness evaluation
ITER_D_XAPCGG	HIT Step J - Completeness evaluation

## 5 Estimated Duration

The current estimated duration of the Contract is 9 months starting in October 2021. Summary of the B14 HIT program split in three integration cycles is presented in Figure 1.



**Figure 1: HIT integration cycles program for B14 (schedule TBC at the kick-off). It is to be noted that the first cycle has already been executed up to Step B milestone before it was decided to be put on hold. Therefore the cycle will be re-launched directly at Step B milestone.**

## 6 Work Description

The Contractor shall support the HIT in the following activities:

1. Support HIT in the overall integration of systems within Tritium building to deliver consistent, clash free and constructible layout by area. This includes coordination of the HIT integration cycles per area, clash detection, categorization and registration, definition of corrective actions and follow-up of the clash resolution and associated actions.
2. Organization and execution of recurrent workshops, ad-hoc meetings and key milestone completeness evaluation meetings; recording of meeting minutes and actions, follow-up of actions and reporting to the management.
3. Support HIT in the assessment of the design maturity of the Systems and interfaces, and when necessary, support HIT and IO Systems in advancing the design to consolidate interfaces and to allow completion of the construction design of more mature major systems;
4. Where necessary, develop conceptual design of common items (transverse elements) to be supplied by IO and not allocated to any particular PBS, e.g. common supports, openings/penetrations and platforms;
5. Support HIT in assessment and coordination of all request for Post Drilled Systems (PDS), Embedded Plate (EP) swaps and Shared Supports.
6. Support HIT in the integration of safety hazard mitigation measures, in particular HELB and Fire, and in the implementation of the layout rules and requirements coming from other project entities (e.g. Penetrations Working Group)

The full scope and responsibilities of the HIT are described in [Terms of Reference for Holistic Integration Team \(HIT\) \(ITER\\_D\\_W63ZY2\)](#).

## 7 Responsibilities

### 7.1 IO Responsibilities

IO shall assign one IO representative, to work as sole Contractor interface. The IO representative will assess the performance and quality of the work and shall be responsible for checking the deliverables against requirements, schedule and the processes (including CAD).

IO shall make available to the Contractor all technical data and documents which the Contractor requires to carry out its obligations pursuant to this specification in a timely manner. For delays of more than two weeks in making them available, the Contractor shall advise IO representative of the potential impact on the deliverables, to agree and define all the corrective actions to take in place.

### 7.2 Contractor's responsibilities

The Contractor shall form and manage the Execution team as further defined in Section 10 below. The Contractor shall guarantee the efficient coordination of the services and that he complies with the provisions of the Contract, in particular with the following:

- The Contractor shall provide an organization suitable to perform the work as described in this specification;
- The Contractor shall be in charge of the training & coaching of all its resources;
- The Contractor shall work in accordance with the QA plan approved by IO;
- The Contractor shall perform the activities accordingly to this specification taking into account all relevant additional documents and IO processes into (hand books, export control, intellectual properties, etc.);
- All input information provided to perform the task remain property of IO and shall not be used for any other activity than the one specified in this specification;
- The Contractor shall be responsible to produce and manage, using the ITER software platform.

Prior to the start of work on each activity, the Contractor shall review the input technical information provided to it by IO for completeness and consistency, and shall advise the IO representative of any deficiencies it may find. The contractor shall not be responsible for errors in the input technical information, which could not be reasonably detected during such review. Duration of this review will be agreed between Contractor and IO representative and will have no impact on the delivery schedule.

## 8 List of Deliverables

Deliverables (to be confirmed at the Kick-off Meeting) are listed below:

- **Quality Plan:** Quality Plan in accordance with Section 12 of this Specification.
- **Monthly Report:** To be submitted for each month by the 15<sup>th</sup> date of the following month. Report shall cover progress of activities, possible issues and proposals for improvements, priorities and future actions.

All documents shall be submitted in English

## 9 Deliverables Acceptance Criteria

Deliverables shall be submitted in accordance with [In-Cash Procurement Technical and Management Documentation Exchange and Storage Working Instruction \(ITER\\_D\\_G8UMB3\)](#)

The following criteria shall be the basis of the acceptance of the successful accomplishment of the work:

### **Delivery Date Criteria**

On-time delivery of Deliverables according to the dates provisionally defined in Section 8 subject to completion of all necessary activities and/or input from all other stakeholders required to maintain schedule.

### **Report and Document Review Criteria**

Reports and Deliverables shall be stored in the ITER Organization's document management system, IDM, by the Contractor for acceptance. The HIT Leader is the Approver of the delivered documents. The Approver can nominate or delegate one or more Reviewers(s) in the area of the Deliverable's expertise. The Reviewer(s) may ask for modifications to be made to the report in which case the Contractor must submit a new version.

The acceptance by the Approver is an acceptance criterion for completion of a Deliverable.

## 10 Contractor's Execution Team

For the needs of the scope of work and to ensure compliance with the work description, the Contractor shall have to provide their execution team, which shall include all the necessary profiles with the adequate expertise and experiences. The team shall be proposed, organized and managed solely by the Contractor based on the below expectations (see description of the profiles in Annex):

- Team Leader / Integration Coordination officer (1 full time equivalent)
- Integration Coordinator officer (1 full time equivalent)
- Integration Engineer (1 full time equivalent)

In addition, and as an option:

- Structural Engineer (1 full time equivalent)

Those resources shall be available from start-up of the contract.

In case of replacement, the contractor shall be responsible to ensure a timely replacement of the resource with a profile of similar capabilities and skills, and to guarantee an overlap of at least 20 days between the incumbent and the new resource.

The Technical leader of the Contractor's team shall be the sole responsible for the communication between the IO TRO and the Contractor's staff related to the tasks to be

performed, and for raising any issues encountered in the performance of the services, and for providing regular reporting on the overall execution of the services.

## 11 Jobs Mission

The mission of the Contractor is to support the IO-CT and the HIT management in the execution of the core activities of the HIT to meet its objectives in integration of the plant systems in B14. For this purpose, the Contractor shall propose, organize and manage their team as defined in Section 10 above. The below table represents the IO's expectation on the submissions of the team members.

#	Title	Job Mission
1	Team Leader & Integration Coordination Officer	Leading of the Contractor's team and acting as the contact person for all communication related to the tasks to be performed by the team. Coordination and resolution of the physical and functional integration issues, interface issues and transverse function issues for dedicated areas in Tokamak Complex.
2	Integration Coordination Officer	Coordination and resolution of the physical and functional integration issues, interface issues and transverse function issues for dedicated areas in Tokamak Complex.
3	Integration Engineer	Supports ICOs in various integration tasks, in particular in managing of clashes and interfaces, common & shared supports, EP swaps, PDSs and penetrations.
4	Structural Engineer (OPTIONAL)	Conceptual design of the Common Supports and other Transverse Elements.

## 12 Quality Assurance (QA) requirements

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 Procurement Quality Requirements \(ITER\\_D\\_22MFG4\)](#).

Prior to commencement of the task, a Quality Plan 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 (see [Procurement Requirements for Producing a Quality Plan \(ITER\\_D\\_22MFMW\)](#)).

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, in accordance with [Quality Assurance for ITER Safety Codes \(ITER\\_D\\_258LKL\)](#).

Quality Plan delivered in HIT Support Services ("HIT II") contract ([XH56BU](#)) in accordance with Section 11 of this Specification remains extant and applicable for this contract extension.



## 13 CAD Design Requirements

For the contracts where CAD design tasks are involved, the following shall apply:

The Supplier shall provide a Design Plan to be approved by the IO. Such plan shall identify all design activities and design deliverables to be provided by the Contractor as part of the contract.

The Supplier shall ensure that all designs, CAD data and drawings delivered to IO comply with the Procedure for the Usage of the ITER CAD Manual ([2F6FTX](#)), and with the Procedure for the Management of CAD Work & CAD Data (Models and Drawings [2DWU2M](#)).

The reference scheme is for the Supplier to work in a fully synchronous manner on the ITER CAD platform (see detailed information about synchronous collaboration in the ITER [GNJX6A](#) - Specification for CAD data production in ITER Contracts.). This implies the usage of the CAD software versions as indicated in CAD Manual 07 - CAD Fact Sheet ([249WUL](#)) and the connection to one of the ITER project CAD data-bases. Any deviation against this requirement shall be defined in a Design Collaboration Implementation Form (DCIF) prepared and approved by DO and included in the call-for-tender package. Any cost or labour resulting from a deviation or non-conformance of the Supplier with regards to the CAD collaboration requirement shall be incurred by the Supplier.

## 14 Safety requirements

ITER is a Nuclear Facility identified in France by the number-INB-174 (“Installation Nucléaire de Base”).

For Protection Important Components and in particular Safety Important Class components (SIC), the French Nuclear Regulation must be observed, in application of the Article 14 of the ITER Agreement.

In such case the Suppliers and Subcontractors must be informed that:

- The Order 7th February 2012 applies to all the components important for the protection (PIC) and the activities important for the protection (PIA).
- The compliance with the INB-order must be demonstrated in the chain of external contractors.
- In application of article II.2.5.4 of the Order 7th February 2012, contracted activities for supervision purposes are also subject to a supervision done by the Nuclear Operator.

For the Protection Important Components, structures and systems of the nuclear facility, and Protection Important Activities the contractor shall ensure that a specific management system is implemented for his own activities and for the activities done by any Supplier and Subcontractor following the requirements of the Order 7th February 2012 [20].

## **Annex 1 – The Expected Profiles to be proposed by the Contractor for their Execution Team**

### **TEAM LEADER & INTEGRATION COORDINATION OFFICER**

**Responsible to:** HIT Leader / HIT Coordinator

#### **Main purpose of the job:**

To lead the Contractor's team and act as the contact person for all communication related to the tasks to be performed by the team. To coordinate the execution of the HIT integration cycles per area to produce clash free final layout for all systems properly integrating all system functional and safety requirements as well as transverse functions.

#### **Key duties and responsibilities :**

As Team Leader:

- Ensures efficient execution of all tasks and duties of the Contractor's team;
- Acts as the contact person for all communication between IO TRO and the Contractor's staff related to the tasks to be performed.

As Integration Coordination Officer:

- Coordinates all the physical and functional integration activities on a dedicated area in the Tokamak Complex (Tritium Building) during execution of the HIT integration cycle.
- Manages running of regular clash detections, categorization, registration and definition of corrective actions. Follows up the clash resolution and associated actions.
- Organizes and chairs recurrent workshops and ad-hoc meetings to discuss and agree on corrective actions with the stakeholders, and records meeting minutes and actions.
- Organizes key milestone completeness evaluation meetings defined in the HIT integration cycle process to assess the maturity of the Systems and interfaces, and implementation of safety requirements.
- Anticipates construction phase issues in the design phases to ensure constructability of the design considering also the requirements for testing and commissioning. In this work the Integration Coordination Officers are supported by Constructability Engineers assigned by the HIT Leader;

#### **Essential skills and experience:**

- Master degree or equivalent
- Relevant work experience on large complex nuclear industrial project
- English : Level C1
- Quality and Nuclear Safety culture
- CATIA v5 basic skills (for viewing and analysing the 3D mock-up)

#### **Key personality characteristics / abilities:**

- Excellent people management and communication skills.
- Rigorous and pragmatic
- Managing processes and procedures
- Integration topic management
- Understanding of technical processes of nuclear facilities

## INTEGRATION COORDINATION OFFICER

**Responsible to:** Team Leader

### Main purpose of the job:

To coordinate the execution of the HIT integration cycles per area to produce clash free final layout for all systems properly integrating all system functional and safety requirements as well as transverse functions.

### Key duties and responsibilities:

- Coordinates all the physical and functional integration activities on a dedicated area in the Tokamak Complex (Tritium Building) during execution of the HIT integration cycle.
- Manages running of regular clash detections, categorization, registration and definition of corrective actions. Follows up the clash resolution and associated actions.
- Organizes and chairs recurrent workshops and ad-hoc meetings to discuss and agree on corrective actions with the stakeholders, and records meeting minutes and actions.
- Organizes key milestone completeness evaluation meetings defined in the HIT integration cycle process to assess the maturity of the Systems and interfaces, and implementation of safety requirements.
- Anticipates construction phase issues in the design phases to ensure constructability of the design considering also the requirements for testing and commissioning. In this work the Integration Coordination Officers are supported by Constructability Engineers assigned by the HIT Leader;

### Essential skills and experience:

- Master degree or equivalent
- Relevant work experience on large complex nuclear industrial project
- English : Level C1
- Quality and Nuclear Safety culture
- CATIA v5 basic skills (for viewing and analysing the 3D mock-up)

### Key personality characteristics / abilities:

- Rigorous and pragmatic
- Managing processes and procedures
- Integration topic management
- Understanding of technical processes of nuclear facilities
- Excellent communication skills.

## INTEGRATION ENGINEER

**Responsible to:** Team Leader

### Main purpose of the job:

To support Integration Coordination Officers in coordinating the physical and functional integration activities in designated areas in the Tokamak Complex buildings.

### Key duties and responsibilities:

- Supports ICOs in various integration tasks, in particular in managing of interfaces, common & shared supports, EP swaps, PDSs and penetrations.
- Participates in clash analysis and definition of corrective actions and in the management of the clash register.
- Supports ICOs in preparation of reports on cycles status and key issues.
- Identification of issues and main clashes and pushing forward for solutions.
- Provide assistance to HIT CAD designers for implementation of actions and resolution of clashes
- Review of input data provided by IO PBS

### Essential skills and experience:

- Education: Bachelor Degree or equivalent
- Relevant work experience on large complex nuclear industrial project
- Quality and Nuclear Safety culture
- English : Level C1
- CATIA v5 basic skills (for viewing and analysing the 3D mock-up)

### Key personality characteristics / abilities:

- Integration topic management
- Delivery focused without compromising quality
- Adaptive and reactive
- Good communication skills

## **STRUCTURAL ENGINEER**

### **(OPTIONAL)**

**Responsible to:** Team Leader

#### **Main purpose of the job:**

To produce preliminary design activities associated with transverse elements that interface with the civil works.

#### **Key duties and responsibilities:**

- Preliminary design of common supports and other transverse element structures not covered by any IO System (PBS)
- Production of preliminary design calculations, catalogues, BoD and reviews
- Liaise with HIT CAD Designers and coordinators for efficiency of the HIT
- Provide assistance to CAD designers for resolution of clashes
- Review of input data provided by IO PBS
- Preparation of technical input data at preliminary design level for the next design phase

#### **Essential skills and experience:**

- Education: Degree or equivalent in Civil / Mechanical Engineering
- Experience in Tokamak Complex Design or similar
- Quality and Nuclear Safety culture
- English : Level B2

#### **Key personality characteristics / abilities:**

- Delivery focused without compromising quality
- Understanding of impact of mechanical structures on the civil works interface.
- Adaptive and reactive
- Good communication skills