

Technical Specifications (In-Cash Procurement)

Technical Specification - Structural Engineering Expert for the Holistic Integration Team

This document specifies the technical requirements and scope of work for Structural Engineering Expert to support Holistic Integration Team (HIT) in the execution of the Integration Cycles for Tokamak Complex, in particular for Tritium building B14.

This document is based on ITER_D_5EBHSG - Technical Specification - HIT Engineering Services for B14 which has already been reviewed and approved by QARO, SRO and DO. No changes have been made to the QA, CAD design and Safety requirements. The ...

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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 Tokamak Complex 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 provide structural engineering expertise to support 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
HELB	High Energy Line Break
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

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

5 Estimated Duration

The current estimated duration of the Contract is 7 months starting in November 2021. Summary of the preliminary B14 HIT program consisting of three integration cycles is presented in figure 1 below.

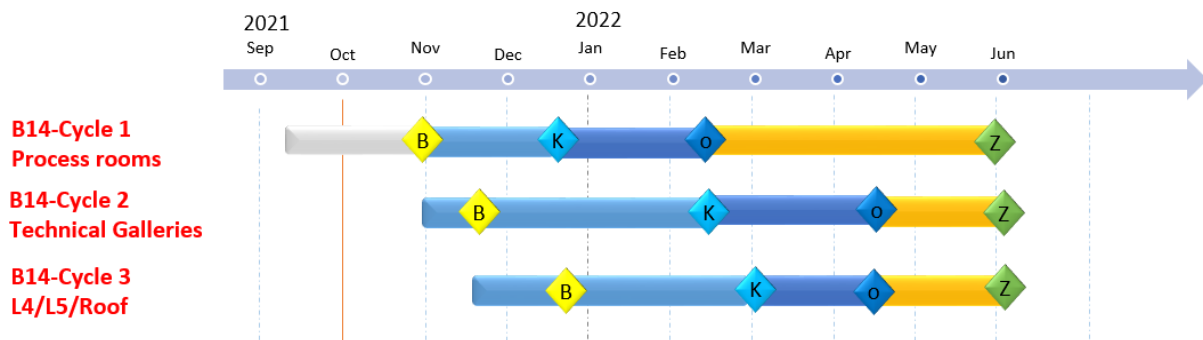


Figure 1: HIT integration cycles program for B14 (schedule TBC at the kick-off). It is to be noted that the first cycle has already been executed up to Step B milestone before it was decided to be put on hold. Therefore the cycle will be re-launched directly at Step B milestone.

6 Work Description (Project Deliverables)

The Contractor shall provide structural engineering expertise for the Holistic Integration Team and support HIT in the overall integration of systems within Tokamak Complex (in particular, Tritium building) to deliver consistent, clash free and constructible layout by area. This includes the following tasks and activities (so called “**Project Deliverables**”):

1. Submission of Quality Plan as defined in Section 11 of the technical specifications
2. Support HIT in the development of the preliminary design of common items (transverse elements) to be supplied by IO and not allocated to any particular PBS. These include, but are not limited to, common supports and structures, platforms, HELB mitigation structures etc.
3. Liaise with stakeholders to obtain necessary input data for the development of the concept and for the preliminary structural analysis of the structures.
4. Liaise with the CAD designers for the development of the concept of the structures in 3D.
5. Carry out preliminary structural analysis of the structures; provide feedback to designers for improvement of the design.
6. Prepare intermediate and/or final analysis reports for the handover to the next design phase.

The full scope and responsibilities of the HIT are described in [Terms of Reference for Holistic Integration Team \(HIT\) \(ITER_D_W63ZY2\)](#) [18].

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:

- Strictly implement the IO and HIT procedures, instructions and use of templates;
- Provide experienced and trained resources to perform the tasks;
- Contractor's personnel shall possess the qualifications, professional competence and experience to carry out services in accordance with IO rules and procedures;
- Contractor's personnel shall be bound by the rules and regulations governing the IO rules for ethics, safety and security.

8 List of Deliverables

Two (2) types of deliverables are envisaged:

1) Project Deliverables

Please see Section 6 above.

2) Monthly Progress Report

To be submitted for each month by the 15th date of the following month. Report shall cover achievements and progress of activities, possible issues and proposals for improvements, priorities and future actions. This report will be used for payment.

All documents shall be submitted in English

9 Deliverables Acceptance Criteria

9.1 Acceptance Criteria for Project Deliverables

The Contractor shall complete the required Project Deliverables in accordance with Section 6 above without delay in schedule. They shall meet or exceed the adequate level of quality reasonably expected from the normal industry practice for this type of service contract.

9.2. Acceptance Criteria for Monthly Progress Report

The monthly report must fully demonstrate that the actual Project Deliverables required under section 6 have been successfully completed by the Contractor during the relevant month.

9.3 Rules for Approver and Submission

Whether they are Project Deliverables (when they are in writing) or Monthly Progress Report, any deliverables shall be submitted in accordance with [In-Cash Procurement Technical and Management Documentation Exchange and Storage Working Instruction \(ITER D G8UMB3\)](#) and 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 Specific requirements

In order to successfully perform the tasks in these Technical Specifications the Contractor's personnel is expected to meet the following requirements:

10.1 Essential skills and experience

- Master degree in Civil or Mechanical Engineering
- Fluent in English (oral and written)
- Previous significant experience in structural design in large, complex and international nuclear project.
- Technical knowledge in piping, civil works, steel structures, cable trays.
- Quality and Nuclear Safety culture
- Extensive experience in using GT Strudl
- Full ability to navigate in CATIA v5 (for viewing and analysing the 3D mock-up)
- Fully comfortable with Excel
- Ability to write clear and structured reports

10.2 Key personality characteristics / abilities

- Work in autonomy with ability to pull for information from stakeholders
- Able to define suitable assumptions in case of missing inputs
- Able to manage with stakeholders having different objectives
- Excellent communication skills with colleagues and management
- Rigorous and pragmatic, able to daily switch from details to overview, hands-on
- Comply to procedures, use all the tools
- Teamwork oriented

11 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 \(ITER_D_258LKL\)](#).

12 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.

13 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].