

Technical Specifications (In-Cash Procurement)

**Technical Specification - TDIB Engineering Support
Services**

Technical Specification for the TDIB Engineering Support Services from Oct. 2021 until
Dec. 2022

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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 continuity of the Tokamak Design Integration Board (TDIB) for the Tokamak Complex (B11, B74 and B14).

The TDIB 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.

To achieve this goal the TDIB performs the integration work by Areas and by gathering in one common place on ITER Site all relevant engineers, designers and administrators from IO Engineering departments, DAs, Contractors and Suppliers on full-time/part-time basis, as needed. The TDIB scope is front office integration work while the back office detailed design work and construction design responsibility remains within each participating entity.

The scope of works of the Contractor is to establish their execution team and to support the IO-CT and the TDIB management in the execution of some of the core activities of the TDIB to meet its objectives.

These engineering services will be performed to support and implement integration activities within Tokamak complex building.

The scope will be formalized using a Contract. The implementation of the tasks to be executed will be done using Fixed price per deliverable which will be explained in detail in Section 7.1.

2 Scope

2.1 The ITER Project

The ITER project aims to demonstrate the scientific and technological feasibility of fusion power for peaceful purposes and to gain the knowledge necessary for the design of the next stage device.

The ITER project is organized as an international research and development project jointly funded by its seven Members; the European Union (represented by EURATOM), Japan, the People's Republic of China, India, the Republic of Korea, the Russian Federation and the USA. ITER is being constructed in Europe, at Cadarache in southern France, which is also the location of the headquarters of the ITER Organization (IO).

During ITER construction, most of its components will be supplied "in-kind" by the ITER Members. These in-kind contributions are being managed through a Domestic Agency (one per ITER Member) located within the Member's own territory.

The working language of the ITER Project is English.

More details about the Project Organization, The Domestic Agencies, the IO location and other different aspects of the Organization are available on the website: www.iter.org.

2.2 Background

HIT process/cycles closed, major duties of TOKAMAK Complex Design Integration Board (TDIB) will include HIT duties prescribed in “Terms of Reference for Holistic Integration Team (HIT)” (W63ZY2, V3.2) except for duties corresponding to the scope to ensure constructability of each area in the Tokamak Complex, and verify the Common Assembly Sequence (CAS) with the 4D tool and propose solutions for optimized sequence and schedule.

TDIB shall be established to complete the following missions:

- Performs overall integration of systems within the Tokamak complex by delivering consistent, clash free and constructible layout together;
- Establishes design development in a multi-CAD environment for efficient concurrent design with two CAD systems: CATIA and AVEVA E3D together;
- Ensures that functional integration is completed by reviewing the proper implementation of the system functional and safety requirements and the transverse requirements area by area together;
- Supports consolidation the allocation and final validation of the embedded plates together with F4E;
- Ensures the reconciliation between as-built required for PBS design completion and as designed phase.

3 Definitions

CRO	Contract Responsible Officer
EIC	EWP Integration Card
EWP	Engineering Work Package
HIT	Holistic Integration Team
ICO	Integration Coordination Officer
IO	ITER Organization
IO-CMA	IO Construction Management As-Agent (Momentum Consortium)
IO-CT	ITER Organization Central Team
PIA	Protection Important Activity
PIC	Protection Important Component
QC	Quality Class
SIC	Safety Important Class Component
SR	Safety Relevant
TDIB	Tokamak Design Integration Board
TRO	Technical Responsible Officer

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 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_AG5G4	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_4JCZAQ	Terms of Reference for TOKAMAK Complex CMM Board (CMMB)
ITER_D_W63ZY2	Terms of Reference for Holistic Integration Team (HIT)

5 Estimated Duration

The overall duration of this Contract is 15 months from signature (T0).

The estimated starting date of the tasks shall be after Task Order signature. Implementation of the activities shall only start after the Kick off Meeting (T0). The expected duration of tasks is **T0 + 15 months**.

T0 shall be within 2 weeks from the entry into force of the Contract.

6 Work Description

The Contractors shall support the TDIB in the following activities:

1. Support TDIB in the overall integration of systems within Tokamak complex to deliver consistent, clash free and constructible layout by area. This includes coordination of the integration cycles per area, clash detection and registration, and follow-up of the clash resolution and associated actions organization of and participation to recurrent and ad-hoc meetings and workshops, recording of meeting minutes and actions, follow-up of actions and reporting to the management.
2. Report to TDIB for the improvement and deployment of methodologies to further improve the efficiency of the integration process described above, and in particular clash detection, registration and follow up of the clash resolution process, as well as reports and dashboards required for the management of the integration cycles.
3. Support TDIB in the integration completion of the systems and interfaces, to allow completion of the full system integration physical and functionally
4. Support TDIB in the resolution of actions during and after completion of the HIT integration cycle, with periodic report issuance of remaining actions and action plan per area or per technical item.
5. Where necessary, support TDIB in the development and implementation of conceptual design of common items (transverse elements) to be supplied by IO, e.g. common supports, openings/penetrations and platforms.
6. Support TDIB and Transverse Functions officers in the analysis, integration and implementation of safety hazard mitigation measures, in particular in Fire protection, and in the implementation in the layout rules and requirements coming from other project entities (e.g. Penetrations Working Group).
7. Recommendation and/or reporting to TDIB resulting from technical analysis to be provided as requested by IO.
8. Support TDIB in workload management, reporting, and communication, as well as in planning & organization of technical meetings, preparation of memoranda and recording and archiving related work.

7 List of deliverables for payment

7.1 General

Fixed price will be defined per deliverable.

The deliverables will be issued per monthly, see 7.2.

7.2 Deliverables description

The list of deliverables defined in the scope of this contract are defined in table below:

Quantity	Deliverables	Due date
1 to 14	Monthly Reports	On the last working day of each month
1	Final Report	End date of the contract

The Contractor will then provide a monthly report of its activities:

- Progress of activities,
- Possible issues and proposals for improvements,
- Priorities and further actions.

All documents shall be submitted in English.

8 Responsibilities

8.1 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.

The IO representative shall be responsible for checking the deliverables against requirements, schedule 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 delivery of the Work Packages, to agree and define all the correction actions to take in place.

8.2 Contractor's responsibilities

The Contractor shall form and manage the execution team as further defined in Section 9 below.

The Contractor shall guaranty the efficient coordination of the services.

The Contractor shall ensure that he complies with the provisions of the Contract in particular with the following:

- The Contractor shall guaranty that 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 in charge of the training & coaching of all its resources;
- The contractor shall provide an organization suitable to perform the work as describe in this specification, ensuring in particular the correct ramp-up during the overlapping period (Phase 1);
- 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 account (hand books, export control, intellectual properties, ...);
- 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.

9 Contractor's Execution Team

For the needs of the scope of work and to ensure the 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 contractor team is led by the Technical Leader. The team shall be proposed, organized and managed solely by the Contractor based on the below expectations (see description of the profiles in Annex too):

- 1 Technical Leader (full time equivalent)
- 3 Integration Coordinators (full time equivalent)

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

In case of replacement, the contractor shall be responsible to:

- Guarantee a timely replacement of the resource with a profile of similar capabilities / skills;
- Guarantee an overlap of at least 2 months between the incumbent and the new resource.

The contractor is solely responsible for their replacement guaranteeing the same level of skills as the replaced profile and a minimum overlap of 20 working days for hand over and transfer of knowledge.

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, raise any issues encountered in the performance of the services and provide regular reporting on the overall execution services to the IO TRO.

10 Jobs Mission

The mission of the Contractor is to support the IO-CT and the TDIB team in the execution of some of the core activities of the TDIB to meet its objectives. For this purpose, the Contractor shall propose, organize and manage their team as defined in Section 9 above. The below table represents the job titles and missions of this execution team and detailed in Annex 1.

#	Title	Job Mission
1	TECHNICAL LEADER (1)	Preparation of workload management, planning and reporting for TDIB activities. Assist TDIB team in organization of technical meetings and in preparation of memoranda and recording and archiving related work.
2	INTEGRATION COORDINATOR (3)	Coordination and resolution of the physical and functional integration issues, interfaces issues and transverse functions issues for the Tokamak Complex Buildings (B74, B11, B14).

11 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.

11.1 Delivery Date Criteria

On-time delivery of Deliverables according to the dates provisionally defined in Section 6 subject to completion of all necessary activities and/or input from all other stakeholders required to maintain schedule.

11.2 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 TDIB 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.

12 IO CAD 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 Quality Assurance (QA) requirement

13.1 Overview

The Contractor should have ISO 9001 accredited quality system. Otherwise the Contractor shall have QA Program approved by the IO.

The general requirements are detailed in [ITER Procurement Quality Requirements \(ITER_D_22MFG4\)](#).

Prior to commencement of the work, a Quality Plan which complies with [Procurement Requirements for Producing a Quality Plan \(ITER_D_22MFMW\)](#) shall be submitted to IO for approval with evidence of the above. The Contractor's Quality Plan shall describe the organisation for tasks; roles and responsibilities of workers involved in; any anticipated sub-contractors; and giving details of who are the independent checkers of the activities.

Where any deviation is requested or non-conformity has happened from the Technical Specification, Contractors Deviations and Non Conformities the [ITER Requirements Regarding Contractors Deviations and Non Conformities \(ITER_D_22F53X\)](#) and [Procedure for the management of Deviation Request \(ITER_D_2LZJHB\)](#) shall be followed.

Documentation developed as the result of this task shall be retained by the Contractor of the task for a minimum of five (5) years and then may be discarded at the direction of the IO.

IO will monitor implementation of the Contract's Quality Plan. Where necessary, IO will assess the adequacy and effectiveness of the quality system specified in the Quality Plan

through surveillance or audit. Where condition adverse to quality is found during monitoring, IO may request to the Contractor to take corrective action.

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 \(ITER_D_258LKL\)](#). Where applicable, [Software Qualification Policy \(KTU8HH v1.2\)](#) shall be taken into consideration to ensure quality and integrity of software prior to application.

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] (Please refer to [ITER_D_4EUQFL - Overall supervision plan of external interveners chain for Protection Important Components, Structures and Systems and Protection Important Activities](#)).

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

JOB CATEGORY

TECHNICAL LEADER

RESPONSIBLE TO

TDIB Leader / TDIB Coordinator

MAIN PURPOSE OF THE JOB

To support TDIB coordination, in preparation of workload management, planning and reporting.

To assist the TDIB team in organization of technical meetings and in preparation of memoranda and recording and archiving related work.

KEY DUTIES and RESPONSIBILITIES

- Assist the technical meetings, support the ICO and TDIB members in producing memoranda, and keep organized database of technical information and TDIB documents;
- Identify key issues, provide technical expertise and advice on issues arising during TDIB activities;
- Support preparation of the weekly TDIB coordination meeting and produce the reporting;
- Under the coordination of the TDIB Leader, prepare the weekly/monthly Management meeting and produce reporting;
- Under the coordination of the TDIB Leader, collect resource load/needs and prepare the planning of TBID activities considering EWP schedule and integration progress, via Primavera (or other similar tool such MS Project);
- Propose the improvement of the processes, carry out other related requests, upon request of TDIB management.

ESSENTIAL SKILLS and EXPERIENCE

- Education: Master degree or equivalent
- Relevant work experience on large complex nuclear industrial project
- Relevant work experience in integration activities between many stakeholders
- Experience in planning and Primavera P6 (or other similar tool such MS Project)
- English : Level C1
- Quality and Nuclear Safety culture

KEY PERSONALITY CHARACTERISTICS / ABILITIES

- Rigorous and pragmatics
- Dealing with complex problem solving and process improvement
- Technical processes of nuclear facilities understanding
- Good communication skills

JOB CATEGORY**INTEGRATION COORDINATOR****RESPONSIBLE TO**

TECHNICAL LEADER (from Contractor team)

MAIN PURPOSE OF THE JOB

Coordinate TDIB cell focusing on physical and functional integration issues and transverse functions issues on a dedicated building/level, or area in the Tokamak Complex (B11, B14 or B74)

KEY DUTIES and RESPONSIBILITIES

- Coordinate integration and manage clash report in compliance with IO requirements;
- Ensure the completeness of TDIB integration steps;
- Coordinate the construction issue, interfaces management and transverse functions implementation in due time before EWP release. In this work, the tasks are under responsibility of Construction, Interface manager and Transverse function officers;
- Ensure consistency and implementation of tasks between the EWP schedule and the design/layout, and provide status and proposal for resolution for EWP meeting (or also called EIC meeting);
- Keep record of all open integration issues and clashes;
- Coordinate the technical meetings for integration and clash resolution, and produce memoranda of these meetings;
- Support or produce key documents linked to TDIB integration and completion activities;
- Assist and provide assessment and key issues for the TDIB Technical weekly meeting.

ESSENTIAL SKILLS and EXPERIENCE

- Master degree or equivalent
- Experience on integration and nuclear domain
- English : Level C1
- Nuclear Safety culture

KEY PERSONALITY CHARACTERISTICS / ABILITIES

- Rigorous and proactive
- Well organized with competencies in coordination
- Good communication competencies