Technical Specifications (In-Cash Procurement)

Technical Specification for Systems Engineering Support Framework Contract

.

Contents

1. Purpose

The purpose of this technical specification is to define the scope of work for the Framework Contract for Systems Engineering Support to the ITER Organization Central Integration Division.

The objective of this specification is to define the required fields of expertise and needs for ensuring satisfactory support to perform activities being under the scope of System Integration Section.

The Contractor of this Framework Contract shall provide the services needed for a duration of 2 years.

2. Scope

2.1 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 reactor.
The ITER project is an international research and development project jointly funded by its seven Members; the European Union, 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 are being supplied "in-kind" by the ITER Members. These in-kind contributions are managed by the Domestic Agencies (one per ITER Member).
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 Scope of ITER System Integration Section

System Integration Section is responsible of Systems Engineering related activities. The document Systems Engineering Management Plan (2F68EX) (reference [1]) describes ITER Systems Engineering approach. System Integration Section is also responsible of ITER functional integration.

3. Definitions & Acronyms

3.1 Selected acronyms

- CRO: Contract Responsible Officer
- DCM: Design Compliance Matrix

- ICD: Interface Control Document
- ICM: Interface Compliance Matrix
- IDM: ITER Document Management
- IO: ITER Organization
- IT: Information Technology
- MBSE: Model Based Systems Engineering
- PBS: Plant Breakdown Structure
- PCD: IO Procurement Department
- PCR: Project Change Request
- PIM: Project Issue Management
- PLM: Plant Lifecycle Management System
- PR: Project Requirement
- RO: Responsible Officer
- RPM: Requirement Propagation Matrix
- RVM: Requirement Validation Matrix
- SRD: System Requirement Document
- SIRO: System Integration Responsible Officer
- TO: Task Order
- WP: Work Package

For a complete list of ITER abbreviations see: ITER Abbreviations (ITER_D_2MU6W5) (reference [2]).

3.2 Selected Definitions

- **ITER Organization (IO)**: An international Organization and team located in Cadarache and responsible, in close partnership with the Domestic Agencies, for the construction, commissioning, operations and maintenance of the ITER facility. The IO is in particular responsible for the requirements definition, the design, the performance, the configuration management, the project schedule, the monitoring of the construction, the assembly, the commissioning and the operations of ITER.

- **Domestic Agencies (DA):** Stakeholders of the ITER project being on one hand suppliers of in-kind contributions and in another hand participating to the governance of the management of the Project. ITER members are: European Union, India, Japan, the People's Republic of China, the Republic of Korea, the Russian Federation and the United States of America.

- **Contract Responsible Officer (CRO):** IO staff responsible for management and administration of a Contract or a Framework Contract. The CRO shall ensure compliance with the terms and conditions of the Contract, as well as documenting and agreeing on any changes or amendments that may arise during its implementation or execution of the Contract and associated Task Orders. He is responsible of resource and performance monitoring, budget implementation, schedule and coordination of the services. He/she is also responsible for the validation of scope before the implementation of services under a Framework Contract as well as for the review and recommendation of the Task Orders' dedicated technical specifications.

- **Task Order Responsible Officer (TRO):** Any IO staff responsible to the technical definition and provision of input for any given Task Order. He/she is responsible to technically validate the deliverable outputs provided by the Contractor under an associated Task Order under his/her responsibility and the Task Order execution and management.

4. References

[1] Systems Engineering Management Plan (2F68EX)
[2] ITER Abbreviations (ITER_D_2MU6W5)
[3] ITER Concept Of Operations (S7T73E)
[4] Project Requirements (PR) (27ZRW8)
[5] Procedure for the Preparation, Review and Approval of SRDs (25DSU2)
[6] Design Compliance Matrix Procedure (473LQM)
[7] How to - Requirements Validation Matrix (7WT3PG)
[8] Design Interface Control Procedure (28VNJG)
[9] Working Instruction for Interface Management (3L775F)
[10] NOA-76 - Assignment of the ITER Transverse Functions Officer (TF-O) and Coordinator (TF-Co) (5FD3T)
[11] List of Transverse Functions Design Plans (SLPJRN)
[12] ITER Procurement Quality Requirements (22MFG4)
[13] Requirements for Producing a Quality Plan (22MFMW)
[14] Provisions for Implementation of the Generic Safety Requirements by the External Actors/Interveners (SBSTBM)
[15] Order dated 7 February 2012 relating to the general technical regulations applicable to INB - EN (7M2YKF)

5. Estimated duration

The duration of the Framework Contracts will be two (2) years.

The work scope will be ordered through individual Task Orders which will define specific durations for each task ordered within the Framework Contract.

Task Orders shall be communicated to the Contractor and formalized at Task Order Level. No Task Order shall have a duration beyond the end date of the Framework Contracts.

The starting date of the services shall be after the signature of the Contract, the related task order and the Kick-Off Meeting.

6. Location of the services

The services described in this Framework Contract shall be performed at the contractor's premises. Regular meetings shall be held on-site in order:

- To report to the TRO the progress on the execution of this Framework Contract and to discuss difficulties/issues encountered for decision-taking,
- To coordinate with the different stakeholders on the different activities and to follow-up their progress.

Two different days of the week will be generally used to organize the on-site meetings. So the Contractor will have to come to ITER site twice a week on average.

The ITER Organization may request Contractor's staff to participate to additional on-site meetings depending on the project needs.

The ITER Organization may request Contractor's staff to travel and work at Domestic Agencies (DAs). In these instances there will be a provisional amount allocated in the respective Task order to cover the anticipated travel and all claims shall be made in accordance with the IO Mission Travel rules (available on request).

7. **Contractor's Team organization**

The Contractor shall be organized in order to comply with requirements as presented in this specification.

Typically:

- The Contractor shall nominate a Service Team with the qualifications guaranteeing a successful execution of tasks as prescribed by this technical specification and relevant Task Orders.
- The contractor shall have a good Technical knowledge of the main systems of ITER plant (functions, operation constraints and main interfaces).
- The Contractor shall nominate a single point of contact to the IO Contract Responsible Officer (CRO) and PCD for all commercial and contract management issues dealing with, but not limited to:
  - Management of the contract (solving of organizational issues, proposals aiming at improving efficiency, quality & cost-containment).
  - Management of the Task Orders (supervision of the expected deliveries in due time, resource flexibility & skill sharing; multi-tasking; training & coaching; collaboration ...).
  - Ensuring that the IO requirements for quality & performance efficiency will be met.
  - Regular information including monthly reporting on the Performance of each Task Order to determine the status of the activities and mitigate implementation, delay or over-cost issues; and when applicable in relation to the CIO Work Plan performance.
  - Participation to the regular committees and meetings related to Contract and Task Orders Management.
  - Management of the follow-up meeting.

The Contractor shall demonstrate that its organization takes into account the following:

- The Contractor shall clearly demonstrate that continuity is maintained through appropriate training and efficient handover during staff movements / replacements. For each Task Order, the Contractor shall provide a clear organization able to maintain the knowledge of all topics in order to ensure the continuity of the service. The Contractor shall guarantee that in case of resource replacement a hand over and overlap of at least 2 weeks is put in place (at the Contractor's cost).
- The Contractor shall demonstrate the implementation of ITER Organization safety and quality assurance/control requirements (as further detailed in this technical specification in Sections 15 and 16.
- The Contractor shall appoint one or several Contractor Coordinators which will ensure the interface with IO. The Contractor shall support and coordinate activities.

8. Framework contract Work Description

The scope of this contract is divided into **6** main Work Packages. The Contractor shall provide the deliverables described for each Work Package when specified in the relevant task order that will be launched once the Contract is signed.

The coordination of all task orders on IO side shall be the responsibility of the ITER project team. The detailed work estimate scope for the work packages and typical task orders are detailed below.

Any modification of the Work Packages shall be specified and formalized in consultation with the Contractor. An updated deliverable schedule and dates shall be then agreed.

All data used or produced in the frame of the work shall be stored in a common exchange area. The detail of the tools and best practices to be followed to ensure a smooth group work and traceability will be defined and agreed at the start of the contract.

The 6 Work Packages (WP) are the following:

1) WP1 Functional Analysis
2) WP2 Requirement Management
3) WP3 Interface Management
4) WP4 Transverse Functions
5) WP5 Transverse Technical Issue Resolution Coordination
6) WP6 Safety Engineering

For Each Work Package, one or several Task Order can be launched separately and independently.

8.1 WP1 Functional Analysis

8.1.1 Context (WP1)

ITER will not be installed, commissioned and operated in a single step and the installation will be operated in progressive stages.

Being in charge of ITER functional integration, System Integration Section is performing diverse functional analyses. Depending on the need, the functional analysis is related to:

. One or several project stages
. One system, a group of systems or the whole ITER facility,
. One or several functions,
. One or several operating states.

The Functional Analysis can be based on text, diagrams or a model (MBSE).

8.1.2 Objectives (WP1)

This activity consists in supporting IO System Integration Section for tasks related to Functional Analysis. A technical expertise in Functional Analysis is required.

8.1.3 Inputs (WP1)

- Technical documents related to the systems of interest
- All internal ITER procedures, how-to, templates, checklists associated with the Functional Analysis.

8.1.4 Tasks to be performed (WP1)

Typical tasks in the scope of the Functional Analysis include, but are not limited to:
- WU1.1: Organize meetings with the different project stakeholders in order to get / confirm information related to Functional Analysis.
- WU1.2: Propose and lead action plan to solve technical issues related to functional analysis. Propose technical solutions.
- WU1.3: Write or support writing of Functional Analysis document (based on text, diagram or model)
- WU1.4: Review Functional Analysis document.
- WU1.5: Support in the preparation updates of IO's procedures for the Functional Analysis activity.
- WU1.6: Support in preparation of tools, specification of IT tools to support the Functional Analysis activity.

8.1.5 Deliverables (WP1)

Typical deliverables in the scope of the Functional Analysis include, but are not limited to:
- WU1.1: Minutes of meeting.
- WU1.2: Action plan. Actions launched and weekly follow up of all open actions. Technical solutions proposal.

- WU1.3: Functional analysis of one system (sub-system, system or ITER facility) or one ITER function involving several systems.
- WU1.4: Review of Functional Analysis documents against a procedure or a check list.
- WU1.4: Procedures for the Functional Analysis activity.
- WU1.5: IT tool specification.

The deliverables will be specified in the related Task Order.

8.2 WP2 Requirement Management

8.2.1 Context (WP2)

The requirements of ITER at facility level are defined in the "Project Requirements" (PR) (reference [4]).

System Integration Section is involved in the propagation of requirements from facility level ("Project Requirements") to system level. The outputs of this task are the "System Requirement Document" (SRD) (reference [5]). Eventually, the "Requirement Propagation Matrix" (RPM) is produced to ensure the traceability of the requirements propagation.

System Integration Section is also involved in the preparation of "Design Compliance Matrix" (DCM) (reference [6]) which verifies that the design requirements are met during the design phase.

System Integration Section is responsible to issue the "Requirement Validation Matrix": RVM) (reference [7]) which provides the list of functions and requirements to be tested during commissioning.

8.2.2 Objectives (WP2)

This activity consists in supporting IO System Integration Section for tasks related to Requirement Management.

A technical expertise in Requirement Management is required, especially:
- Capacity to define clear, precise and verifiable requirements
- Capacity to perform requirements traceability
- Capacity to perform requirements verification activities
- Capacity to perform requirements validation activities
- Knowledge of requirement management tools such as DOOR

8.2.3 Inputs (WP2)

- ITER procedures, how-to, templates, checklists related to Requirement Management
- Project Requirements (PR) (27ZRW8)
- IDM folder related to SRD: 29D6G7
- IDM database (Iter documentation database)
- PLM Matrix database (for PCR impact assessment)

8.2.4 Tasks to be performed (WP2)

Typical tasks in the scope of the Requirement Management include, but are not limited to:
- WU2.1: Organize meetings with the different project stakeholders in order to get / confirm information related to requirements.
- WU2.2: Propose and lead action plan to solve technical issues related to requirements. Propose technical solutions.
- WU2.3: Write documents related to Requirement Management (SRD, RPM, DCM, RVM …).
- WU2.4: Review documents related to Requirement Management (SRD, RPM, DCM, RVM …).
- WU2.5: Perform Project Change Request (PCR) impact assessment on documents related to Requirement Management.

8.2.5 Deliverables (WP2)

Typical deliverables in the scope of the Requirement Management include, but are not limited to:
- WU2.1: Minutes of meeting.
- WU2.1: Action plan. Actions launched and weekly follow up of all open actions. Proposition of Technical solutions proposal.
- WU2.3: Documents related to Requirement Management (SRD, RPM, DCM, RVM …)
- WU2.4: Review of documents related to Requirement Management (SRD, RPM, DCM, RVM …) against a procedure or a check list
- WU2.5: List of requirement documents impacted by one PCR.

The deliverables will be specified in the related Task Order.

8.3 WP3 Interface Management

8.3.1 Context (WP3)

System Integration Section is leading the Interface Management process on ITER project. ITER Interface Management is described in the "Design Interface Control Procedure (28VNJG)[8]) and the "Working Instruction for Interface Management (3L775F)" (reference [9]). It consists in:
. Defining the list of interfaces between two systems in an "Interface Control Document"(ICD).
. Specifying technically each interface in an "Interface Sheet" (IS).
. Verifying that key Interface Requirements are met in the "Interface Compliance Matrix " (ICM).

8.3.2 Inputs (WP3)

- ITER procedures, how-to, templates, checklists related to Interface Management
- IDM folder related to ICD: 29D8MD
- IDM database
- PLM Matrix database (for PCR impact assessment)

8.3.3 Objectives (WP3)

This activity consists in supporting IO System Integration Section for tasks related to Interface Management.

A technical expertise in Interface Management is required, especially:
- Capacity to define clear, precise and verifiable interface requirements
- Capacity to perform interface requirements verification activities

8.3.4 Tasks to be performed (WP3)

Typical tasks in the scope of the Interface Management include, but are not limited to:
- WU3.1: Organize meetings with the different project stakeholders in order to get / confirm information related to interfaces.
- WU3.2: Propose and lead action plan to solve technical issues related to interfaces. Propose technical solutions.
- WU3.3: Write or support writing of documents related to Interface Management (ICD, IS and ICM)
- WU3.4: Review documents related to Interface Management (ICD, IS and ICM)
- WU3.5: Perform Project Change Request (PCR) impact assessment on documents related to Interface Management.
- WU3.6: Support the update of IO's procedures related to Interface Management.
- WU3.7: Support the preparation of tools, specification of IT tools related to Interface Management.

8.3.5 Deliverables (WP3)

Typical deliverables in the scope of the Interface Management include, but are not limited to:
- WU3.1: Minutes of meeting.
- WU3.1: Action plan. Actions launched and weekly follow up of all open actions. Proposition of technical solutions.
- WU3.3: Documents related to Interface Management (ICD, IS and ICM) (either authoring or authoring support or review).
- WU3.4: Review of documents related to Interface Management (ICD, IS and ICM) against a procedure or a check list.
- WU3.5: List of interface documents impacted by one PCR.
- WU3.6: Procedures for the Functional Analysis activity
- WU3.7: IT tool specification.

The deliverables will be specified in the related Task Order.

8.4 WP4 Transverse Functions

8.4.1 Context (WP4)

In order to manage transverse items in a holistic way, a list of ITER Transverse Functions has been created (reference [10]):

. Transverse Function 02: Nuclear Integration

. Transverse Function 03: Penetrations

. Transverse Function 05: EM compatibility, Magnetic perturbation

. Transverse Function 06: RAMI (Reliability, Availability, Maintainability, Inspectability)

. Transverse Function 08: Embedded Plates and loads Management

. Transverse Function 10: Material Integration

. Transverse Function 11: Integrated As Built Data Management for Construction

. Transverse Function 13: Overall Structural behaviour (load control. Stress tests, etc.) (including thermal analyses)

. Transverse Function 21: Humans Factor

. Transverse Function 24: Plasma

. Transverse Function 26: Decommissioning

. Transverse Function 31: High Energy Line Break (HELB)

. Transverse Function 32: Flooding

. Transverse Function 33: Missiles

. Transverse Function 34: Confinement

. Transverse Function 36: Fire Protection

. Transverse Function 38: Seismic Interaction

. Transverse Function 37: Radwaste Management

. Transverse Function 39: Explosion

. Transverse Function 41: Global services: Heating and Conditioning

. Transverse Function 53: Evacuation/ Escape Routing

. Transverse Function 54: Common / shared support

. Transverse Function 61: Integrated Cryogenic Analysis

. Transverse Function 62: Integrated Cooling Water Analysis

. Transverse Function 63: Integrated Pulsed Power Supply Systems Analysis

. Transverse Function 64: Integrated Fuel Cycle Analysis

. Transverse Function 65: Mass management

. Transverse Function 66: Electrical Load Flow (SSEN)

. Transverse Function 67: Maintenance

. Transverse Function 68: Hardened Safety Core Components (HCC)

One Transverse Function Officer is appointed per Transverse Function and is responsible for its implementation. He/she is in charge to write the Transverse Function Design Plan associated to his/her Transverse Function which defines the activities to be performed (reference [11]) and to ensure that the define actions are correctly implemented by the different stakeholders.

System Integration Section is responsible for the overall coordination of ITER Transverse Functions. A Transverse Functions Coordinator is appointed to perform this task.

8.4.2 Objectives (WP4)

This activity consists in supporting ITER Transverse Function Officers and Transverse Functions Coordinator and the Design Developers regarding Transverse Functions.

8.4.3   Inputs (WP4)

Transverse Function Design Plans.

8.4.4   Tasks to be performed (WP4)

Typical tasks in the scope of the Transverse Functions include, but are not limited to:
- WU4.1: Organize meetings with the different project stakeholders in order to get / confirm information related to Transverse Functions.
- WU4.2: Propose and lead action plan to solve technical issues related to Transverse Functions. Propose technical solutions.
- WU4.3: Propose methodology for the collection of the Transverse Functions input data (inventories, requirements, locations…).
- WU4.4: Write analysis related to the implementation of the Transverse Function (mass/flow/energy balance, simple mechanical and thermal assessments) or monitor the deployment of the Transverse Function (Key Performance Indicators, propagation matrix, compliance matrix).
- WU4.5: Perform Project Change Request (PCR) impact assessment on documents related to Transverse Functions.
- WU4.6: Support Transverse Function Officers in the writing/updating of their Design Plan.

8.4.5   Deliverables (WP4)

Typical deliverables in the scope of the Transverse Functions include, but are not limited to:
- WU4.1: Minutes of meeting.
- WU4.2: Action plan. Actions launched and weekly follow up of all open actions. Technical solutions proposal.
- WU4.3: Methodology proposal related to transverse functions implementation
- WU4.4: Documents containing analysis related to the implementation of the Transverse Function (mass/flow/energy balance, simple mechanical and thermal assessments) and to the monitoring of the deployment of the Transverse Function (Key Performance Indicators, propagation matrix, compliance matrix).
- WU4.5: List of documents impacted by one PCR.
- WU4.6: Transverse Function Design Plan drafted.

The deliverables will be specified in the related Task Order.

8.5   WP5 Transverse Technical Issue Resolution Coordination

8.5.1   Context (WP5)

System Integration Section is involved in the resolution of Transverse Technical Issues.

8.5.2 Objectives (WP5)

This activity consists in supporting IO System Integration Section for the resolution of Transverse Technical Issues.

Depending on the Transverse Technical Issue, a technical knowledge in the relevant engineering discipline will be required. Examples:
- Mechanical engineering
- Process engineering (design of fluid systems)
- Electrical engineering
- Instrumentation & Control

8.5.3 Inputs (WP5)

The inputs will be provided on a case by case basis depending of the technical issue. IO has the responsibility to provide the needed input to perform the task.

8.5.4 Tasks to be performed (WP5)

Typical tasks in the scope of the Transverse Technical Issue Resolution Coordination include, but are not limited to:
- WU5.1: Organize meetings with the different project stakeholders in order to get / confirm information related to interfaces.
- WU5.2: Propose and lead action plan. Propose technical solutions.
- WU5.3: Write Project Change Request

8.5.5 Deliverables (WP5)

Typical deliverables in the scope of the Transverse Technical Issue Resolution Coordination include, but are not limited to:
- WU5.1: Minutes of meeting.
- WU5.2: Action plan. Actions launched and weekly follow up of all open actions. Technical solutions proposal.
- WU5.3: Draft of a Project Change Request.

The deliverables will be specified in the related Task Order.

8.6 WP6 Safety Engineering

8.6.1 Context (WP6)

Nuclear Safety Division is responsible for the Nuclear Safety Demonstration of ITER. System Integration Section is performing some safety analyses which includes a significant integration aspect (either functional integration: function shared between several systems, or physical integration).

8.6.2 Objectives (WP6)

This activity consists in supporting IO System Integration Section for the activities related to safety analyses.

8.6.3 Inputs (WP6)

Accident rules and methodology defined by Nuclear Safety Division.

8.6.4 Tasks to be performed

Typical tasks in the scope of the Safety Engineering include, but are not limited to:
- WU4.1: Organize meetings with the different project stakeholders in order to get / confirm information related to the safety analysis.
- WU4.2: Propose and lead action plan to solve technical issues related to safety analysis Functions. Propose technical solutions.
- WU4.3: Propose approach for the collection of the input data for safety analysis.
- WU4.4: Perform a safety analysis and draft the corresponding report (according to the accident rules and methodology defined by Nuclear Safety Division).

8.6.5 Deliverables (WP6)

Typical deliverables in the scope of the Safety Engineering include, but are not limited to:
- WU4.1: Minutes of meeting.
- WU4.2: Action plan defined. Actions launched and weekly follow up of all open actions. Technical solutions proposed.
- WU4.3: Proposal of an approach for a safety analysis.
- WU4.4: Safety analysis report.

The deliverables will be specified in the related Task Order.

8.7 General tasks for all activities

The Contractor will be required to carry out a number of general tasks. These include but are not limited to:
- Review of the task's input content and, if needed, clarification with the TRO and other IO relevant Members (technical input, requirements definition and propagation, interfaces, codes & standards, deliverables, schedule, resources…);
- Development of the detailed work implementation plan including schedule & deliverables.
- Reporting the relevant activities in the Work Plan;
- Progress monitoring and associated documentation: reporting to the Contractor's management team, including regular meetings;
- Creation of monthly service status per Task Order, which include the Key Performance Indicators linked to the delivery and invoicing of the activities;
- Highlighting of errors or areas of possible improvements, and suggestion of corrective actions (solutions, organization…);

- Preparation of the Contractor's staff regarding IT tools used at ITER (PLM Matrix, JIRA, Confluence, IDM etc.);
- Advising CIO staff and ROs about methodological tools and requirements that have to be put in place as part of the services being rendered;
- Checking that the ITER QA system is respected by his Staff;
- Compliance with all relevant IO procedures.

9. Responsibilities and Resources Profile

9.1   IO Responsibilities

The IO shall assign one IO representative, to work as sole Contractor interface for the coordination of the full Framework Contract (CRO)

The IO shall assign one IO representative, to work as sole Contractor interface for the supervision of each specific Task Order.

The IO representative(s) will assess the performance and quality of the work.

The IO representative shall be responsible for checking the deliverables against requirements, schedule and processes.

The 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 the IO representative of the potential impact on the delivery of the task deliverables, to agree and define all the correction actions to be taken in place.

9.2   Contractor's responsibilities

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 services remain property of IO and shall not be used for any other Work Package than the one specified in this specification (unless explicitly stated by IO);
– 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 described in this specification with the skills adapted to the defined work;
– the Contractor shall work in accordance with the QA plan approved by IO;
– the Contractor shall perform the tasks accordingly to this specification taking into account all relevant additional documents and IO processes (hand books, export control, intellectual properties, etc.).

Prior to the start of work on each task, the Contractor shall review the input technical information provided by IO for completeness and consistency, and shall advise the IO representative of any deficiencies he 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 the IO representative and will be integrated in the delivery schedule.

9.3   Resource Profile

All Task Orders under this Framework Contract are under a deliverable-based scheme.
The technical services to be supplied by the Contractor will generally require personnel with generalist experience capable of adapting quickly to the ITER-specific processes and practices. This can be achieved by adequate suitable training provided by the Contractor and successful industrial experience covering as much as possible, several multi-discipline project

phases (design, construction, installation etc.) and areas (system engineering, nuclear engineering, nuclear safety etc.).

Each resource shall be associated with a reference *technical profile* (P1 to P3) as detailed in the next subsections.

The table below provides an estimation of the link between the work packages (WP1 to WP6) and the reference technical profiles (P1 to P3).

	P1	P2	P3
WP1 Functional Analysis	30%	60%	10%
WP2 Requirement Management	30%	60%	10%
WP3 Interface Management	30%	60%	10%
WP4 Transverse Functions	10%	60%	30%
WP5 Transverse Technical Issue Resolution Coordination	0%	50%	50%
WP6 Safety Engineering	30%	40%	30%

9.3.1 P1 typical profile

- At least 2 years' experience in the activities in complex international projects
- Basic knowledge of the systems engineering / design control processes ;
- Basic knowledge of the ITER architecture / main systems (or main systems of a nuclear facility);
- Ability to work effectively in a multi-cultural environment;
- Ability to prepare concise and clear report in English;
- Proficiency in office software suite for the efficient and effective communication, study & analysis, report generation, presentation;

9.3.2 P2 typical profile

- Engineering degree or higher technical education level
- At least 5 years' experience in the activities in complex international projects
- Intermediate knowledge of systems engineering and design control methods;
- Intermediate knowledge of the ITER architecture / main systems (or main systems of a nuclear facility);
- Ability to work effectively in a multi-cultural environment;
- Ability to prepare concise and clear report in English;
- Ability to coordinate technically the solving of technical issues which involve a limited number of engineering disciplines / stakeholders;
- Proficiency in office software suite for the efficient and effective communication, study & analysis, report generation, presentation;

9.3.3 P3 typical profile

- Engineering degree or higher technical education level
- At least 15 years' experience in the activities in complex nuclear international projects
- Advanced knowledge of systems engineering and design control methods;
- Advanced knowledge of the ITER architecture / main systems (or main systems of a nuclear facility);
- Ability to work effectively in a multi-cultural environment;
- Ability to prepare concise and clear report in English;
- Ability to coordinate technically the solving of complex technical issues;
- Proficiency in office software suite for the efficient and effective communication, study & analysis, report generation, presentation;

10. Typical deliverables and due dates

The deliverables will be defined in each specific task order.

All formal deliverables shall be stored in the exchange area of the Framework Contract and follow the workflow agreed in at the Kick of Meeting.

11. Acceptance Criteria

11.1 All deliverables to be "materialized" by a report in IDM

Even if deliverables are not documents (running platform, trainings, demonstrators, data for a database etc.), every main deliverables shall be "materialized" by a report in IDM.

Depending on the type of deliverables, it can be a "working instruction", a "minutes of meeting"), etc.

Type of report and content shall be agreed between IO and the Contractor at the start of the Work Package.

11.2 All deliverables document to be stored in IDM

All the deliverables produced in the scope of this Framework Contract shall be stored in IDM in a dedicated folder (folder will be communicated at the start of the Work Package), based on the following mandatory work-flows (depending on templates) and access will be provided to the Contractor.

11.2.1 Workflow for document following IO's template

For document using an IO form or an IO template (i.e. a document created in the IO document management system and showing the IO logo and details): the document should be stored in IDM (native format) implementing the following work-flow:

- Author: Contractor. By signing in IDM, as author, the Contractor certify that he has properly implemented its own QA process and that the document is ready to be delivered to IO
- Reviewer: According to the corresponding IO work-flow and procedures
- Approver: According to the corresponding IO work-flow and procedures

11.2.2 Workflow for document following Contractor's template

For document using a Contractor template / form (i.e. a document created in the Contractor document management system and showing the Contractor logo and details): the document should be stored in IDM as follows:
- The document should be stored in IDM with the following method:
  - in PDF format
  - with the native format of the file
  - with a clear demonstration of the Contractor's internal review process
  - attaching in the metadata of the document the native version (word, excel, …)
  - using signatory instead of author
  - using an automatically generated IO cover-sheet
  - filling in the abstract with the following: "Document submitted for IO Acceptance"
- Signatory: Contractor representative
- Reviewer: According to documents contents and in particular impacted unit in interface
- Approver: Task Order Responsible Officer (Approval stands for an acceptance)

11.3 Review time

The maximum time for IO acceptance or comments in IDM is 10 working days after the storage (+IDM email) of the deliverables in IDM.
However, for documents longer than 20 pages, IO must be given sufficient notice and time to properly review the document through a pre-review.
A pre-review shall be used to submit any long document in advance.

11.4 Changes

In case of non-compliance/non-conformity of a deliverable or a set of deliverables, the Contractor shall correct them and re-submit them for review and acceptance; resubmission shall be at Contractor's cost.

11.5 Contractor compliance with the scope

In the event of the Contractor not complying with the scope and/or with the work and/or with the definition of the typical Required Profile as they are described for each Work Package in sub-sections of the section 8 of the present document and for the dedicated Task Orders, the ITER Organization reserves the right to inform the Contractor of such erroneous or incorrect actions in writing. In such instances, ITER Organization reserves the right to instruct the Contractor to re-perform any work necessary to make good any erroneous work or services of his own volition, and at the contractor's own cost. Such re-work will not be reimbursable and will be executed in a manner so as not to affect adversely on the progress of other parallel contract scope activity by the contractor.

12. Specific requirements and conditions

12.1 Working language

The working language of the ITER Project is English. Meetings shall be conducted in English. Software human interfaces, comments in code, emails, etc. shall be written in English. <u>All documents shall be written in English</u>. All personnel in direct interaction with ITER staff shall be fluent in English (written and spoken).

12.2 IT requirements

The remote location of the IT users implies additional collaboration enablers and organization, which are part of the general services to be provided by the Contractor. These enablers are identified in this Section. The possible associated cost shall be included in the rates / prices for the given location.

The Contractor shall comply with the following Infrastructure requirements. No remote tasks shall be started prior the formal agreement by IO.

	IT user location: Less than 1500 km from Cadarache	IT user location: Less than 1500 km from a Domestic Agency place
Connection Type	Through Remote desktop services or equivalent technology	Through Remote desktop services or equivalent technology to DA replicated DB
IO Offices	IO Enovia DB Remote Workstation	IO Enovia DB DB replication
DA Offices	Remote Connection	Remote Connection
Contractor Offices	RDS + Firewall	RDS + Firewall

	Location 1: IT user location: Less than 1500 km from Cadarache	Location 2: IT user location: Less than 1500 km from a Domestic Agency place *
Connection Type	Through Remote desktop services or equivalent technology	Through Remote desktop services or equivalent technology to DA replicated DB
Provides Working Place in the ITER	N/A	N/A
Supplies (Electrics, Water, Printing)	Contractor	Contractor
Responsible for connections capacity and Bandwidth	Contractor	Contractor
Provides the workstation	Contractor	Contractor
Remote desktop services or equivalent technology	IO	Contractor
RDS Connection + Firewall	IO	Contractor
Monitor/keyboard/ mouse	Contractor	Contractor
Mail / Phone	Contractor **	Contractor **
Access to IO video-conference	Contractor **	Contractor **

* The replicated databases are located in the Domestic Agencies premises at the following places:
. Hefei, China
. Gandhinagar, India
. Naka, Japan
. Daejeon, South Korea
. Moscow, Russia
. Oak Ridge, Tennessee, United States

Prior to the work being performed in Location 2, the Contractor is fully responsible and liable to obtain all necessary agreements with the associated Domestic Agency to guaranty the connection to their replicated databases. In the case that no agreement could be reached, then the Contractor may propose alternative solutions based on its own volition and financial investment. Such solution shall be assessed by IO prior implementation to guaranty all technical conditions can be met.

** Special solution will be implemented to ensure efficiency in the process of booking meetings with several participants of the 2 organizations (IO and Contractor)

The Contractor shall be responsible for implementing the requirements marked "Contractor" indicated in Tables above.

13. Work Monitoring / Meeting Schedule

13.1 Work monitoring

In some cases the Contractor may be required to undertake several tasks simultaneously and re-priorities services.

Regular progress meetings shall be conducted between the Contractor and the IO RO, if needed other meetings may be needed after mutual agreement. The format and frequency of the Contractor's progress report and the format shall be agreed between IO and the contractors and may vary depending on task urgency and criticality, needs of follow-up, etc.

13.2 Changes

The list of deliverables can be changed only by amendment to the Task Order.

Should the deliverables content and priority be adjusted, ITER Organization and the Contractor shall arbitrate together in order to reach appropriate measures. The changes and decisions shall be recorded and formalized (e.g. using minutes of meetings).

14. Delivery time breakdown

The delivery of deliverables will be established on a monthly basis, as the deliverables track a continuous activity made of numerous various topics.

15. Quality Assurance (QA) requirement

The organization 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 (reference [12]).

Prior to commencement of the task, a Quality Plan must be submitted for IO approval giving evidence of the above and describing the organization for this task; the skill of workers; 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 (reference [13]).

Documentation developed as the result of this task shall be retained by the performer of the task for a minimum of 5 years.

16. Safety requirements

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

The supplier must comply with the all requirements expressed in "Provisions for implementation of the generic safety requirements by the external actors/interveners" (reference [14]).

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 (reference [15]) 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 (reference [15]).

The Protection Important Activities will be identified in the Task Orders.

17. Handover

At the end of the contract, a specific service could be asked to the contractor to ensure the Handover of the activities to IO or IO contractors. This activity consists in the support and in the coaching during 3 weeks of a defined group of persons to be able to ensure the continuity of the activities identified in the 6 work packages of the contract. A last report of this activities shall be produced supporting the handover.