

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

**BRN I-15-750 Procedures and Working Instructions  
Support for the Site Construction Preparation and  
Coordination Activities**

The objective of this Contract is to provide the IO Technical Responsible Officer or deputy (hereafter known as the IO-TRO) with specialist support for the preparation of specific working instructions and procedures for the planning, management, and execution of ITER Machine Assembly and the Installation of Plant systems



# Procedures and Working Instructions Support for the Site Construction Preparation and Coordination Activities

## Technical Specification



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## 1. SCOPE OF WORK

The objective of this Contract is to provide the IO Technical Responsible Officer or deputy (hereafter known as the IO-TRO) with specialist support for the preparation of specific working instructions and procedures for the planning, management, and execution of ITER Machine Assembly and the Installation of Plant systems.

The scope of work to be performed will be carried out in close liaison with the TRO, engineers and planners of the Assembly and Operations (AOP) Division and with experts from other ITER Divisions as necessary.

## 2. BACKGROUND AND OBJECTIVE

### 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, DEMO, or the DEMOnstration fusion power plant.

Receiving 50MW of input power, the ITER Machine is designed to produce 500 MW of fusion power for extended periods of time. This represents ten times more than the input power needed to keep the plasma at temperature. It will therefore be the first fusion experiment to produce net energy. It will also test a number of key technologies, including heating, control, and the diagnostics and remote maintenance that will be needed for DEMO.

The main regulatory documents pertaining to the mechanical components for ITER are:

- The Quality Order dated 7 February 2012 relating to the general technical regulations applicable to INB – EN updating:
  - Order of 10 August 1984 relating to the quality of design, construction, operation and decommissioning of nuclear installations (so called quality order);
  - Order of 26 November 1999 setting general technical stipulations concerning limits and modalities of the samples and releases subject to authorization, carried out by the INB; and
  - Order of 31 December 1999 setting the general technical regulatory controls intended to prevent and limit external nuisances and risks resulting from the operating of INB.
- Decree No. 99-1046 dated 13<sup>th</sup> December 1999 concerning pressure equipment – Introduction of the pressure Equipment Directive in France (French acronym ESP/PED)

Further information can be found on the ITER website (<http://www.iter.org>) and also at the web pages of the ITER Parties that can be accessed via the ITER website.

### 2.2 The ITER Organization

ITER is a joint international research and development project for which initial construction activities have recently started.

The seven Members of the ITER Organization are 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 will be constructed in Europe, at Cadarache, in southern France, where the ITER Organization (IO) has its headquarters.

The Members of the ITER Organization will bear the cost of the project through its 10-year construction phase, and its 20-year operational phase before decommissioning. With respect to the construction of the ITER machine, most of the components will be contributed by the Members as in-kind contributions. The remaining investment will be via cash contributions from the members.

### 2.3 Assembly and Operations – The Mission

The scope of the Assembly and Operations (AOP) Division is to provide construction support for:

- The assembly of the ITER machine;
- The installation and functional testing of IO Plant Systems in Buildings and Areas on the ITER Site.

Specify requirements for special (custom) tools used in assembly and installation of the Machine and IO Plant Systems. Tools are defined and approved by PBS 22 Machine Assembly and Tooling Section and are supplied either by DA or from IO Fund.

Undertake role and responsibilities of the **Construction Manager** <sup>(1)</sup> during assembly, installation and testing at the ITER site. Specific site construction activities include materials management (site reception, offloading, unpacking, storage, handover to Constructor), execution of works (assembly, handling, installation) and testing (installation, component, performance).

Undertake role and responsibilities of the **Start-up and Testing, and Integrated Commissioning Manager** <sup>(2)</sup> subsequent to assembly, installation and testing at the ITER site.

Undertake role and responsibilities of the Operator, following the Handover of Structures, Systems and Components (SSCs) for the ITER Facility.

Provide support to Transport and Logistics associated with the delivery of components to the ITER Site.

<sup>(1)</sup> **Construction Manager** is the unit within the Operator for the oversight, planning and coordination of all Assembly and Installation activities. The Construction Manager takes overall responsibility for the coordination of safety of assembly and installation activities and reports to the IO Site Safety Coordinator. The Construction Manager is responsible for issuing work permits on the worksite.

<sup>(2)</sup> **Start-up and Testing and Integrated Commissioning Manager** is the unit within the Operator for the oversight, planning and coordination of all testing and commissioning activities. The Start-up and Testing and Integrated Commissioning Manager is responsible for ensuring that the overall sequence of commissioning activities is planned, prepared and performed.

## 3. OBJECTIVES

During 2013-2014 a comprehensive Site Construction Project Management Plan has been prepared defining how the construction phase of the ITER project (including the preparation for construction and machine operations) will be initiated, planned, executed, monitored, controlled, and closed:

- How management process will be developed, used and integrated
- How work will be executed
- How changes will be controlled

- How communication will be managed
- How assembly baselines, procedures and instruction documents will be managed

Each plan identifies the basic principles and conventions for the subject matter

Deliverables are identified within project lifecycle phases i.e. during preparation, mobilisation, execution etc...

Introduce new terminology not commonly used in the project up to now

The Site Construction Project Management Plan volumes are listed below and these will be 'underpinned' by more detailed Working Instructions and templates covering the following areas. (**The specific areas within the scope of this contract are shown in bold**):

0. Project Management
1. Requirements Management
2. Scope Management
3. Engineering Management
4. Schedule Management
5. Cost Management
- 6. Field Quality Management**
7. Field Configuration Management
8. Resource Management
9. Communication Management
10. Risk Management
11. Site Materials Management
- 12. Site Construction Works Management**
13. Health, Safety and Environment Management
14. Procurement & Contracts Management
15. Documentation & Data Management
- 16. Start-up, Testing, and Turnover Management**

The procedures and instructions shall cover the following stages:

**Preparation for Site Construction:** The Preparation for Site Construction is the phase of performing all the activities necessary to develop and implement the policies, methods, procedures, guidelines and criteria for the Site Construction Works.

This includes strategic planning, establishing the organisation, developing the Site Construction Worksite Plans, designing tools and equipment, performing mock-ups and trials, identifying and placing contracts, obtaining administrative procedures, performing Construction Readiness Reviews, and baselining.

**Mobilisation for Site Construction:** The Mobilisation for Site Construction is the phase of making the final preparations for Site Construction Works. This includes performing final revisions of the Site Construction Worksite Plan, issuing Authorisations and Work Permits, updating, and executing the Site Construction Project Mobilisation and Logistics Plan, holding Kick-Off Meetings, and issuing the Notice to Proceed with Site Construction to IO or DA Constructors.

**Execution of Site Construction:** The Execution of Site Construction is the phase of performing actual Site Construction Works i.e. performing the assembly, installation, and functional testing activities at the ITER Site by IO or DA Constructors. (Not including non-active and active commissioning).

The scheduling of buildings and area availability and ITER Site Construction activities will result in Site Construction Works at the ITER site commencing and completing incrementally.

At completion of the Execution of Site Construction phase the relevant scope of site construction of each Structure, System and Component (SSC) will be installed and all relevant documentation will be approved by the Nuclear Operator (IO-DG or his delegate).

**Monitoring and Controlling Site Construction:** The monitoring and controlling of Site Construction Works includes implementing the systems and processes to monitor, review, regulate and report the progress and performance of Site Construction Works in support of completion of the scope of each Worksite Plan. This also includes performing Workface Planning in support of Site Construction Works.

**Transition/Turnover to Operations:** This is the phase of performing demobilisation, executing the *Systems Start-up, Testing and Turnover Plan*, re-assigning staff, performing Turnover Training, transferring documents from Constructor to Nuclear Operator (IO-DG or his delegate), preparing As-Built Drawings, performing Closure Reviews, and documenting lessons learned.

At completion of the Transition to Operations phase the turnover of installed structures, systems and components by IO or DA Constructors to the Nuclear Operator (IO-DG or his delegate) as defined by the relevant Site Construction Worksite Plan will be completed.

#### 4. ESTIMATED DURATION

The Contract shall be for 220 working days, over 12 months.

#### 5. WORK DESCRIPTION

The procedures and working instructions to be prepared under this contract shall be limited to prioritised documents related to on-going / critical document preparation and planning tasks.

The procedures and working instructions shall define the IO's detailed requirements and needs, and shall provide a clear basis for the adaptation of any future Construction Management contractor's generic documentation to the ITER specificities.

ITER has chosen *Primavera* as its scheduling tool.

ITER has chosen Intergraph *SmartPlant Materials, SmartPlant Construction, and SmartPlant for Owner Operators* as the system to support the execution phases of the work.

The procedures and working instructions shall be compatible with these tools and build upon the processes being defined during the initial rollout of these systems.

The work will require detailed investigation and review of existing documentation, industry standards and best practices.

Briefing materials will be prepared as necessary to explain concepts, progress etc., to the IO-TRO.

The IO will provide necessary support to the Contractor in the form of input materials, access to existing documentation, and access to subject matter experts. The Engineer full-time presence at the ITER site is necessary for the effective performance of the duties.

Each work task will be individually discussed in consultation with the IO-TRO and a deliverable date will be agreed.

## 6. LIST OF DELIVERABLES AND DUE DATES

The table below identifies the preliminary/indicative listing of deliverables:

Del.	Area	Description
1	6 Quality	Preparation of Assembly and Inspection Plan
2	6 Quality	Preparation of General Surveillance Plan
3	6 Quality	Planning of Field Quality Control
4	6 Quality	Preparation of Quality Control Checklists
5	6 Quality	Qualification of Tools and Equipment
6	6 Quality	Control of Measuring and Test Equipment
7	6 Quality	Control of Field Inspections and Tests
8	12 Works	Workface Planning
9	12 Works	Work Packaging and Assessment of Readiness
10	12 Works	Pre-installation Test and Inspection
11	12 Works	Works Execution
12	12 Works	Installation Test and Inspection
13	16 Start-up	System and Site Start-up, Testing & Turnover Plans
14	16 Start-up	System and Site Start-up, Testing & Turnover Procedures
15	16 Start-up	System and Site Start-up, Testing & Turnover Readiness Reviews
16	16 Start-up	Mechanical and Electrical Completions
17	16 Start-up	Performing Component Testing (Static)
18	16 Start-up	Performing In-System and Inter-System Connections
19	16 Start-up	Performing System Functions Testing
20	16 Start-up	Reviews of Testing Results
21	16 Start-up	Management of Design Problems during Start-up, and Testing
22	16 Start-up	Performing Turnover
23	16 Start-up	Start-up and Testing Phase Closeout
24	16 Start-up	Management of Punchlists

A bi-weekly report shall be provided, reflecting the status of the specified deliverables for that month and the number of days actually worked.

## 7. ACCEPTANCE CRITERIA

All deliverables and bi-weekly reports will be subject to the approval of the IO-TRO mentioned in the Contract or his authorized deputy.

## 8. WORK MONITORING / MEETING SCHEDULE

Completion of work items will be confirmed by the IO-TRO or his authorized deputy. For longer tasks an interim monitoring point may be defined.

**Additional deliverables, or changes to the list of deliverables, shall be discussed and agreed in advance.**

## 9. REQUIRED QUALIFICATIONS AND EXPERIENCE

The Engineer shall have the following qualifications and experience:

- Minimum of of 5 years (but preferably 7 years) proven experience in roles associated with the:
  - Preparation of construction related technical procedures, instructions, templates, project planning documents.



- Implementation of management and reporting systems and processes including the preparation of user guidance, and process charts in the areas of quality, works, testing and commissioning.
- Minimum of 5 years (but preferably 7 years) demonstrable practical experience of Project Management, Construction Management, Quality Management, and Project Engineering techniques.
- Minimum of 5 years of experience for the use of SmartPlant and Primavera or similar industrial standard software's.
- Fluent in the English language, written and spoken.
- Good planning, organisation, communication and negotiation skills.