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Technical Specifications (In-Cash Procurement)

BRN I-15-735 Lifting & Handling

The purpose of this contract is to provide the MAI section with specialist support, in the form of an appropriately qualified and experienced Lifting and Handling Specialist Engineer

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1 Purpose

1.1 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 Order dated 7th February 2012 concerning Basic Nuclear Installations (French acronym: INB) for Design, Construction and Operational Quality
- Order dated 12th December 2005 concerning Nuclear Pressure Equipment (French acronym ESPN)
- Decree No. 99-1046 dated 13th 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.

1.2 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.

1.3 Machine Assembly and Installation Section – The Mission

The mission of the Machine Assembly and Installation Section (MAI) is to assemble the ITER machine, to provide planning, oversight and to undertake the installation of plant systems. In detail, the MAI section is charged to:

- provide design direction and advice, and be responsible for the approval of all plant system designs from the aspect of assembly and installation;
- design assembly tools, write procedures and prepare schedules for the assembly of the Machine;
- undertake the assembly of the Machine;

- undertake the Tokamak system installations, ensuring close coordination with the relevant Department and system Responsible Officers;
- define the integrated assembly and installation plan and approve plant system installation procedures and plans,
- define and implement a global alignment and metrology plan for ITER, including an appropriate site datum network,
- define and coordinate the implementation of an Integrated Logistics Support strategy for ITER to ensure lifecycle management of plant systems, components, spares and facilities: from design, through construction, operation and maintenance,
- coordinate the global transport, reception, handling and storage of plant system components, spares and tools.

1.4 Purpose of this Contract

The purpose of this contract is to provide the MAI section with specialist support, in the form of an appropriately qualified and experienced Lifting and Handling Specialist Engineer (hereafter known as the L&H Engineer). The L&H Engineer will be deployed in close support on the ITER site, Cadarache, France, to complete the scope of work (refer Section 2).

Under this contract the L&H Engineer will provide expertise and guidance on matters related to lifting and handling of components and associated logistical considerations. With reference to the Mission Statement contained in Section 1.3 of this document, guidance could be required in support of any of the charges of the section, or in respect of any related matter defined by the Leader of the MAI Section.

2 Scope

The scope of work will be carried out in close liaison with the Leader of the MAI Section and will include the provision of advice, technical input, requirement compilation, planning and reports associated with lifting and handling activities necessary for **Site Construction** in the following areas:

1. Site reception and transfer to quarantine/storage;
2. Materials/component transfer to Worksites from storage;
3. Worksite No.1 (Tokamak Machine, Assembly and Cleaning Buildings), including:
 - Lower Cryostat
 - Sector Sub-Assembly
 - Sector Assembly
 - Establish Tokamak Assembly Datums
 - Ex-Vessel (Side Region) - Phase 1
 - Ex-Vessel (Lower Region) Phase 1
 - Ex-Vessel (Upper Region) Phase 1
 - In-Vessel Phase 1
4. Remaining Worksites (No. 2 - 6);
 - No. 2 Tokamak complex plant installation;
 - No. 3: Control Buildings, Radwaste Building, and RF Heating Building;
 - No. 4: Cryoplant (including Bridge) and Site Services Buildings;
 - No. 5: Electrical and Power Supplies Buildings;

- No. 6: Site Works (Works Access and Area Management).

Site construction comprises:

- *Site Logistics*: Site reception, offloading, unpacking, inventory, storage and handover to constructor
- *Works execution*: Assembly & sub-assembly, on-site handling, installation, installation testing;
- *Final testing*: On-site component test and performance testing.

In addition to contracts for deliveries to the worksite, it is the intention for IO to prepare a dedicated contract for Lifting and Handling to support Tier II Constructors for assembly and installation. This is intended to optimise usage and limit duplication of specialist lifting and handling equipment on the site. The Lifting and Handling Contract shall also include the operating of devices supplied by others (e.g. 2x750T cranes, 2x50T cranes in Building 13 and specialist sub-assembly) tools.

The engineer shall make recommendations and provide technical documentation suitable for incorporation into the tender process ultimately leading to this contract award.

3 Definitions

Abbreviation	Definition
CPD	Construction Process Description
DWS	Detailed Work Schedule
IO	ITER Organization
L&H	Lifting and Handling
MAI	Machine Assembly and Installation (Section)
PBS	Plant Breakdown Structure
PCR	Project Change Request
SSC	Structure, System and Component

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

4 Estimated Duration

The estimated duration of the work for the L&H Engineer shall be 220 working days (approximately one year), with options to extend twice by an additional 110 working days.

5 Work Description

Work will be carried out in close collaboration with the Leader of the MAI Section, or his authorised deputy. The approach for Deliverables and Due Dates for work to be performed by the L&H Engineer are specified in Section 8 of this document and each sub-task will be individually specified in consultation with the Leader of the MAI Section.

Primary sub-tasks are listed as follows:

- *Compilation of input data*: The L&H Engineer shall develop existing studies identifying, categorising and classifying lifting and handling activities envisaged as part of Site Construction;
- *Establish a range of (typical) lifting and handling equipment foreseen and develop requirements and constraints associated with each element or group of elements, (spatial/loading requirements, operational restrictions, etc.);*

- Identify existing constraints that may have significant impact to lifting and handling activities (e.g. underground services, likely site congestion, etc.);
- Propose lifting and handling methodologies considering input data and constraints;
- Assist other MAI engineers in provision of advice and recommendations re. lifting arrangements for major components (e.g. specific lifting arrangements and requirements to be imposed on the components) and contribution to MAI logistics studies;
- Provision of technical recommendations regarding the lifting and handling tender package;
- Participation in the preparation of any contracts with lifting and handling related scope;
- Participation in the preparation of schedules to determine the sequential order of activities, assigning planned durations to assist the schedules in defining start/finish times and required resources;
- Attendance and active participation in design and construction reviews for Structures, Systems and Components (SSCs);
- Preparation and review of documents in the English language, including documents in connection with manufacturing, construction, testing for the components concerned;

6 Responsibilities

The Leader of the MAI Section will be the point of contact for all technical matters.

The IO shall provide:

- Office accommodation;
- Computing facilities and ITER laptops, access to IDM and software required to fulfil specified functions;
- Component CAD models or access to the CAD models in ENOVIA / CATIA;
- Requirements documents and presentations explaining installation concepts on which current schedules are based (where available);
- Access to IO design and design review information and reports as available/ requested

This work shall be site-based at Cadarache, France.

7 List of Deliverables and Due Dates

Within 1 week of the signature of the Contract, a draft workplan, listing planned Deliverables and associated timescales for delivery by the L&H Engineer, shall be provided by the Contractor, for agreement with the Leader of the MAI Section. Any changes to Deliverables are to be recorded on monthly reports, signed by both the L&H Engineer and the Leader of the MAI Section.

Planned Deliverables shall be scheduled and prioritised in accordance with the Detailed Work Schedule (DWS) for MAI, available at the time of kick-off meeting (refer Section 12) and shall be prepared as described below:

1. Compilation of base data:
 - Lifting and handling activities;
 - Lifting and handling methods and tools;
 - Site constraints.

2. Engineering studies and recommendations:
 - For specific components;
 - Lifting and handling plans.

3. Contribution to overarching documents, compiled by IO, typically including:
 - Provision of documented expert advice;
 - Construction Process Descriptions (CPDs);
 - Logistics plans;
 - Project risk register;
 - Tender and contract documentation;
 - Safety registers;
 - Requirements matrices.

4. Documented assessments of information provided by others:
 - For constructability, installation and assembly;
 - Of the impact (technical/schedule) of Project Change Requests (PCRs) on assembly and installation.

8 Acceptance Criteria

IO shall review and provide comment for any Deliverables prepared by the L&H Engineer as part of the contract associated with this Specification. In the event a resubmission is required, the L&H Engineer shall perform all the necessary modifications or iterations to the Deliverables and resubmit a revised version for IO acceptance.

Deliverables shall be considered complete after IO has issued formal acceptance.

9 Specific Requirements and Conditions

9.1 Confidentiality

The L&H Engineer shall perform all duties under this contract in strict confidence.

9.2 Qualifications and Experience

To effectively complete the work will require a qualified engineer with suitable proven technical skills and previous training commensurate with the role outlined. The suitability of the L&H Engineer for assigned activities shall be demonstrated in Contractor submissions.

In particular, the following prior experience is identified as necessary to complete this contract:

- A university degree in Mechanical Engineering or a related discipline, or combination of qualifications and experience acceptable by ITER;
- Recent relevant experience (a minimum of 10 years) associated with lifting and handling, logistics and plant/component installation for major projects;
- Demonstrated ability to develop innovative solutions to complex logistical problems;
- Fluent in the English language, written and spoken;
- Knowledge of Quality Assurance systems and their practical application
- Good planning, organisation, communication and negotiation skills.

The L&H Engineer is expected to prepare well written documents and present/compile data in high quality English, checked by a native speaker for clarity, grammar and spelling, which are suitable for senior management approval and use by ITER, Domestic Agencies and contractors.

10 Work Monitoring / Meeting Schedule

The L&H Engineer shall report progress to the Leader of the MAI Section, or his delegate, each week. A summary Progress Report shall be provided by the L&H Engineer on a monthly basis for approval of the Leader of the MAI Section. The Progress Report shall include detailed status of each Deliverable.

11 Delivery Time Breakdown

A kick-off meeting shall be convened one week after the signature of the contract for the purpose of confirming the background documentation and requirements defining the work. The site-based L&H Engineer shall be required to attend.

A signed summary report shall be provided monthly, for countersignature by the Leader of the MAI Section, recording activities undertaken and the days actually worked.

The Deliverables shall be completed within 1 year from commencement of the L&H Engineer. Should the options to extend the contract be instructed, new sets of Deliverables shall be agreed with the L&H Engineer and instructed accordingly by the IO.

12 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 Contractor and its Subcontractors are 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 contractors and subcontractors.
- 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 Subcontractor following the requirements of the Order 7th February 2012 [1].