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EXTERNAL REFERENCE

Report

Technical Specification - Engineering Support on VV components

The objective of this Task Order is to provide the ITER Organization (IO) with four engineers to provide services in support of the engineering work for some Vacuum Vessel systems.

<i>Approval Process</i>			
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Change Log

<i>Title (Uid)</i>	<i>Version</i>	<i>Latest Status</i>	<i>Issue Date</i>	<i>Description of Change</i>
Technical Specification - Engineering Support on VV components (LX557H_v1_2)	v1.2	Approved	12 Feb 2015	This new version of the technical specification covers the profile of Position #3 from the original one.
Technical Specification - Engineering Support on VV components (LX557H_v1_1)	v1.1	Approved	16 Dec 2013	chap 12 conflict of interest
Technical Specification - Engineering Support on VV components (LX557H_v1_0)	v1.0	Signed	10 Dec 2013	file uploaded including comments from Philippe Mousset (email of 27/11/2013) and comments from Olli Kahla (email on 06/12/2013).
Technical Specification - Engineering Support on VV components (LX557H_v0_0)	v0.0	In Work	28 Nov 2013	

Provision for Services in Support of Engineering for ITER In-Vessel Coil System:

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1 Background and Objectives

The ITER tokamak is a complex system designed to produce 500 MW of power through nuclear fusion reactions. The major components of the tokamak are the superconducting toroidal and poloidal field coils which magnetically confine, shape and control the plasma inside a toroidal vacuum vessel. The magnet system comprises toroidal field (TF) coils, a central solenoid (CS), external poloidal field (PF) coils, and correction coils (CC). The vacuum vessel is a double-walled steel structure. Inside the vacuum vessel, the internal, replaceable components, including blanket modules, divertor cassettes, and port plugs such as the heating antennae, test blanket modules, and diagnostics modules, absorb the radiated heat as well as most of the neutrons from the plasma and protect the vessel and magnet coils from excessive nuclear radiation. The heat deposited in the internal components and in the vessel is rejected to the environment by means of the tokamak cooling water system. The entire tokamak is enclosed in a cryostat, with 80K cooled thermal shields between the hot components and the 4.5K cryogenically cooled magnets.

The objective of this contract is to provide the ITER Organization (IO) with one engineer to provide services in support of the engineering work for one Vacuum Vessel systems.

2 Scope of Work

The scope of work for the **Engineer** is presented below:

The Design Review of the In-vessel Coils (IVC) will be held in May-June 2015. During the design review preparation phase, additional design work will be carried out in the following areas:

- Brazing/welding of conductor joints.
- Possibility of replacing the CuCrZr conductor and Inconel 625 jacket of the ELM coils with different or less expensive materials.
- Alternatives study on ELM coil enclosure in a fully welded case within the same space envelope presently available.
- Field joints of VS coils

Following the design review, a direct call for tender from the ITER Organization will be launched with a planned contract signature in early 2016. The preparation for this CFT has already started and includes:

- Market survey and pre-selection of potential contractors
- Accurate cost estimation of the procurement
- Development of detailed engineering design
- The preparation of technical specification based on FDR conclusions, including qualification programme and activities, quality assurance/quality control requirements
- Review of manufacturing and quality control procedures

The expert shall provide support to these near term activities.

3 Estimated Duration

	Estimated Start	Duration of the contract	Working onsite (per year)	Missions (per year)	Working offsite (per year)
Expert	March 2015	up to 24 months (second year optional)	50 days	20 days	80 days

4 Work Description

The work description of the engineering support to be provided by the Contractor is, but not limited to, the following:

The expert support will consist in:

1. Reviewing IVC design and manufacturing procedures and writing recommendations for improvements of the manufacturing procedures
2. Supervise the prototyping work.
3. Helping in preparing a detailed technical specification for the IVC Call for Tender
4. Prepare the information about the scope of the supply
5. Prepare the information about the integration and installation
6. Prepare the document about technical requirements
7. Prepare the document about material requirements
8. Prepare the document about manufacturing requirements
9. Prepare the document about manufacturing procedures
10. Prepare the document about reliability and maintainability
11. Prepare the document about delivery and commissioning
12. Prepare the document about testing, inspection, examinations
13. Prepare the document about quality assurance.

5 Responsibilities

5.1 Contractor's Obligations

The Contractor will provide personnel as required who is fully dedicated to performing the Services.

The Contractor agrees not to remove or reassign the personnel for the duration of the task, without the prior approval of the IO. Notwithstanding the foregoing, the Contractor shall not be held responsible for any individual decision to leave or to seek reassignment.

Contractor's personnel will be bound by the rules and regulations governing IO safety and security.

In case of non EU personnel, it is required for the employees to obtain their French working visa prior their arrival in France.

5.2 Obligations of IO

IO shall make available to Contractor's Personnel dedicated and located on IO site at Cadarache:

- Procedures, information and data and any other information for the Contractor to perform its functions under this Scope of Work;
- User facilities on equipment (including communication lines and computers) with adequate capacity necessary for a proper execution of the Services by the Contractor; computers, software and all data produced during the contract shall remain property of the ITER Organisation.
- A safe work area which meets the requirements which are generally made for such an area for the satisfactory execution of the Services.

6 Deliverables and Due Dates

Deliverables:

- Technical specification for the IVC Call for Tender
- The expert will review deliverables in ITER IDM, the document database ITER. He will record his recommendation or comments in ITER IDM.
- Memos related to his/her findings and observations for the work supervision

7 Specific Requirements and Conditions

The Contractor agrees that it shall require the person assigned to perform the services hereunder to abide by the following nondisclosure conditions:

- To not disclose, deliver, or use for the benefit of any person other than the IO, or its authorized agents, any restricted or confidential information or material he or she receives from the IO, other than material or information previously in the records of the Contractor or obtainable prior to such disclosure, delivery, or use, from third parties or from the public domain, or required to be disclosed by law or court order;
- To adhere to any reasonable policies or instructions provided by the IO as to the classification, use or disposition of any restricted or confidential information or materials;
- To not use any restricted or confidential information or material for personal gain.

The Contractor further agrees to take such reasonable steps as may be needed to ensure that the terms of the nondisclosure statements are observed during and after the termination of the Services.

8 Acceptance Criteria (including rules and criteria)

Monthly reports shall contain a description of the work carried out in the corresponding Task. All communications between the Contractor and the IO shall be in English language and all measures shall be given in the metric system SI. This includes all reports, documentation, correspondence and labelling. All the reports shall be properly bound. Text and tables of the Final Report in MS-Word shall also be delivered electronically to the IO.

9 Technical Requirements

The expert should have the following competences:

- Senior technician
- Some fusion experience is desirable
- At least 10-15 year's practical experience in superconducting and or resistive magnets
- At least 10 years of industrial experience in managing complex and highly integrated magnet system
- Experience in working with international customers
- Ability to work effectively in a multi-cultural environment in English language
- Ability to work in a team
- Ability to organize and monitor activities
- Good planning and organisational skills

10 Travel Expenses

The ITER Organization may request Contractor's staff to travel and work at places other than ITER site. Travel mission expenses are claimed by the Contractor according to the following:

- a) Only economy class flights are reimbursed by ITER Organization
- b) Subsistence expenses reimbursement rate for Contractor's employee shall not exceed the respective per diem rates
- c) Travel by train (first class) when agreed by ITER Organization
- d) Travel by car reimbursement rate is 0.50 € / km when flight or train are not available

All claims for mission travel will be reimbursed only when supported by original invoices and flight tickets.

11 Payment schedule / Cost and delivery time breakdown

Invoices will be paid monthly, based on working days worked and according to the resources allocated to the Contract in the month, supported by accepted deliverables.

Time for acceptance of the deliverables and written reports by the IO Responsible Officer shall be 15 calendar days.

12 Conflict of interest

The company that is awarded this contract and the experts provided in this contract shall not be eligible to participate to the future tenders for the supply of the ITER In-vessel coil systems and its components.