

Technical Specifications (In-Cash Procurement)

**Senior Engineer for TF Structure and Coil Manufacture
Follow-up**

Specification for call for expertise for Senior Engineer for TF Structure and Coil Manufacture
Follow-up

Table of Contents

1	PURPOSE.....	2
2	SCOPE	2
3	DEFINITIONS	2
4	REFERENCES.....	2
5	ESTIMATED DURATION.....	2
6	WORK DESCRIPTION.....	2
7	RESPONSIBILITIES	3
8	LIST OF DELIVERABLES AND DUE DATES	3
9	ACCEPTANCE CRITERIA.....	3
10	SPECIFIC REQUIREMENTS AND CONDITIONS.....	3
11	WORK MONITORING / MEETING SCHEDULE	4
12	DELIVERY TIME BREAKDOWN.....	4
13	QUALITY ASSURANCE (QA) REQUIREMENTS	4
14	CAD DESIGN REQUIREMENTS (IF APPLICABLE)	4
15	SAFETY REQUIREMENTS	4

1 Purpose

In 2008, the ITER Organization (IO) and the Japan Domestic Agency (JADA) signed the Procurement Agreement (PA) for 19 Toroidal Field Coil Structures (TFCS) based on Built-to-Print Specifications. JADA and its suppliers are currently completing Phase II - Qualification and Optimization and performing Phases III - First-of-Series Manufacture and Phase IV – Series Production of this procurement. IO and JADA also have a PA for the manufacture and delivery of 8 completed TF coils.

This technical specification describes engineering services to IO in support of these two procurements.

2 Scope

Assist the IO Technical Responsible Officers (TROs) for TFCS and TFC and their teams in supporting, monitoring and checking the activities of JADA and its suppliers and the related activities of IO, in order to achieve compliance with the PA technical, quality and schedule requirements.

3 Definitions

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

4 References

Not applicable.

5 Estimated Duration

The duration shall be for 12 months, 210 working days from the starting date, defined by the Contract.

6 Work Description

1. Inspection of manufacturing of TF coil and TF coil case structures in factories in Japan and Korea as being procured under contracts to JADA.
2. Inspection of the qualification program being carried out by JADA suppliers in Japan for the reverse engineering of mounting CC clamps onto TF coils.
3. Review the complete manufacturing inspection plan (cMIP) reports from TF coil structure. Number of cMIP reports are about 300 per year. Defect list during NDT are included.
4. Review the document of Continuous External Rogowski (CER) from In-Vessel Diagnostics Section installed in TF coil, and witness installation of same at supplier factories in Korea and Japan.
5. Provide calculation of error field of TF coils from manufacturing error and assembly tolerance of 18 TF coils, and support the working group developing the TF alignment procedure.
6. Provide calculations, analyses, and conceptual designs to support the development and feasibility study of tokamak assembly procedures
7. Provide pressure equipment document of TF coil structure and TF coil
8. Attend technical exchange meetings and supplier visits related to this contract as shown in Table 6-1. Addresses of meeting locations are listed in Table 6-2.

Table 6-1 Meeting location, number and number of days

Meeting	Location	Times	Number of Days
TFCS and TFC Meeting:	QST	10	1
Inspection:	MHI	8	3
	Toshiba	5	2
	HHI	3	5
Coordination	IO	3	15

Table 6-2 Name and Address of meeting location

QST:	National Institutes for Quantum and Radiological Science and Technology, Naka Institute,
	801-1 Mukoyama, Naka, Ibaraki, 311-0193, JAPAN
MHI:	Mitsubishi Heavy Industries, LTD., Futami Plant,
	1 Minamifutami, Futami-cho, Akashi-shi, Hyogo, 674-0093, Japan
Toshiba:	Toshiba Corporation, Keihin Product Operations,
	2-4, Suehiro-cho, Tsurumi-ku, Yokohama 230-0045, Japan
HHI:	Hyundai Heavy Industries,
	1000, Bangeojinsunhwan-doro, Donggu, Ulsan 44032, Korea.
IO:	ITER Organization
	13067 St Paul Lez Durance Cedex - France

7 Responsibilities

7.1 IO Responsibilities

The IO shall appoint a TRO for the Contract, who will be the point of contact for all technical matters, and a Procurement Responsible Officer (PRO) for all contractual and commercial matters. The TRO shall organise a Monthly Meeting (which may be by phone, video conference etc) with the Contractor on work performed.

In addition, IO shall provide:

- Office accommodation if required during visits to IO Headquarters;
- Access to IDM and software required to fulfil specified functions;
- Access to requirements documents, presentations and other information explaining installation concepts on which current schedules are based (where available);
- Access to IO design and design review information and reports as available/requested;
- Any input information needed by the Contractor for production of the various Deliverables.

7.2 Contractor Responsibilities

The Contractor shall:

- Appoint a TRO for the Contract, who will be the point of contact for all technical matters, and a C-R for all matters related to this Contract; The C-R and TRO may be the same person.

- Appoint an operational point of contact for the management of the Deliverables;
- Provide a suitably experienced and trained engineer to complete all aspects of Deliverables and associated documentation;
- Strictly implement the IO procedures, instructions and use IO templates, where provided;
- Organise work in an efficient way according to the workload and monthly commitments and objectives;
- Report to the IO TRO any issues during the performance of the Contract which require IO intervention or decision including potential delays in the submission of Deliverables;
- Provide monthly reports, minutes of meetings, records of decisions and other Deliverables as required in section 8;

Contractor's personnel shall be bound by the rules and regulations governing the IO ethics, safety and security – refer [2] [Internal Regulations \(27WDZW v2.2\)](#).

8 List of deliverables and due dates

All work shall be output and recorded as Deliverables in IDM.

In the event that sufficient input information is not available, or as a consequence of reprioritisation of scope, substitution of Deliverables may be agreed, with any changes regarding content, timing, or format of Deliverables being recorded on Monthly Progress Meeting minutes, signed by both the Contractor Responsible (C-R) and the IO Task Responsible Officer (TRO) or delegated Responsible Officer (RO).

The deliverables for this task are:

- **Quality Plan** if applicable.
- **Minutes of monthly progress meetings**, to be submitted 1 day after the monthly progress meeting. *The kick-off meeting shall be considered as the first monthly progress meeting.*
- **The monthly report** which shall be submitted at the end of the month, describing the work done on activities mentioned in 6.1 or alternatives as agreed in advance in writing by TRO and shall include:
 - Include IDM references of documents reviewed/produced as follows:
 - Report of review of CMIP and other reports (every 2 months)
 - Inspection Reports 2 weeks after the visit
 - Calculation Note 1 month after data arrival
 - Design Note as required
 - Summary Report
 - Specific issues requiring further action / summarise improvement opportunities;

Deliverable Ref.	Deliverable Description	Due Date
D1	Quality Plan (if applicable) Minutes of kick-off meeting Monthly report including links to the deliverables completed in the previous month.	T0 + 1
D2	Minutes of monthly progress meeting. Monthly report including links to the deliverables completed in the previous month and report on review of CMIP and other reports.	T0 + 2
D3	Minutes of monthly progress meeting.	T0 + 3

	Monthly report including links to the deliverables completed in the previous month.	
D4	Minutes of monthly progress meeting. Monthly report including links to the deliverables completed in the previous month and report on review of CMIP and other reports.	T0 + 4
D5	Minutes of monthly progress meeting. Monthly report including links to the deliverables completed in the previous month.	T0 + 5
D6	Minutes of monthly progress meeting. Monthly report including links to the deliverables completed in the previous month and report on review of CMIP and other reports.	T0 + 6
D7	Minutes of monthly progress meeting. Monthly report including links to the deliverables completed in the previous month.	T0 + 7
D8	Minutes of monthly progress meeting. Monthly report including links to the deliverables completed in the previous month and report on review of CMIP and other reports.	T0 + 8
D9	Minutes of monthly progress meeting. Monthly report including links to the deliverables completed in the previous month.	T0 + 9
D10	Minutes of monthly progress meeting. Monthly report including links to the deliverables completed in the previous month and report on review of CMIP and other reports.	T0 + 10
D11	Minutes of monthly progress meeting. Monthly report including links to the deliverables completed in the previous month.	T0 + 11
D12	Minutes of monthly progress meeting. Monthly report including links to the deliverables completed in the previous month and report on review of CMIP and other reports.	T0 + 12

9 Acceptance Criteria

Acceptance based on the review by the IO TRO of the content of each of the deliverables specified in Section 8 in accordance with the Work Description given in Section 6.

10 Specific requirements and conditions

The engineer proposed by the bidder to carry out the work described in Section 6 must have at least 15 years of proven experience in the following areas:

- Degree in Engineering, doctorate preferred;
- Ability to participate and report on technical and project meetings with Japanese, Korean and European organizations;

- Design and specification of large and heavy welded stainless-steel structures and superconducting magnets designed to operate at cryogenic temperatures, including applicable standards (ASME, etc.);
- Review of mechanical and electrical calculations and calculations reports;
- Proposal, review, implementation and control of design changes in international construction or nuclear projects;
- Technical review and assessment of manufacturing and testing documents (plans, drawings, procedures, manufacturing and inspection plans, as-built drawings) for such structures.

Since most of the supplier visits will take place in Japan (or Korea), a Japan-based expert is preferred. The engineer proposed should be fluent written and spoken English.

11 Work Monitoring / Meeting Schedule

Weekly meetings with IO.

12 Delivery time breakdown

See section 8.

13 Quality Assurance (QA) requirements

The organisation conducting these activities should have an ITER approved QA Program or an ISO 9001 accredited quality system. Alternatively the contractor may opt to follow the IO QA processes. In this case, the requirement to prepare a Quality Plan is not applicable. Specific training shall be provided by IO.

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

Prior to commencement of the task, a Quality Plan must be submitted for IO approval giving evidence of the above and describing the organisation for this task; the skill of workers involved in the study; 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 \(ITER_D_22MFMW\)](#)).

Documentation developed as the result of this task shall be retained by the performer of the task or the DA organization for a minimum of 5 years and then may be discarded at the direction of the IO. 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 \(ITER_D_258LKL\)](#).

14 CAD Design Requirements (if applicable)

Not applicable.

15 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].