

## Technical Specifications (In-Cash Procurement)

### Summary Technical Specification - Metrology Equipment

The purpose of this Call for Nomination (CFN) is to identify potential companies or consortia having the capacity to supply metrology equipment to be utilized in the Building 13 Metrology Laboratory and portable metrology instruments to be utilized during construction of the ITER Tokamak Machine and its associated Plant Systems.

This Summary Specification provides an overview of the types of metrology instrumentation and associated metrology tooling envisaged for use on the project. ...

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## 1 Purpose

The purpose of this Call for Nomination (CFN) is to identify potential companies or consortia having the capacity to supply metrology equipment to be utilized in the Building 13 Metrology Laboratory and portable metrology instruments to be utilized during construction of the ITER Tokamak Machine and its associated Plant Systems.

This Summary Specification provides an overview of the types of metrology instrumentation and associated metrology tooling envisaged for use on the project. Quantities and delivery schedules will be determined in the next stages of the procedure.

## 2 Background

ITER is a joint international research and development project that aims to demonstrate the scientific and technical feasibility of fusion power. The partners in the project - the ITER Parties - 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 the South of France.

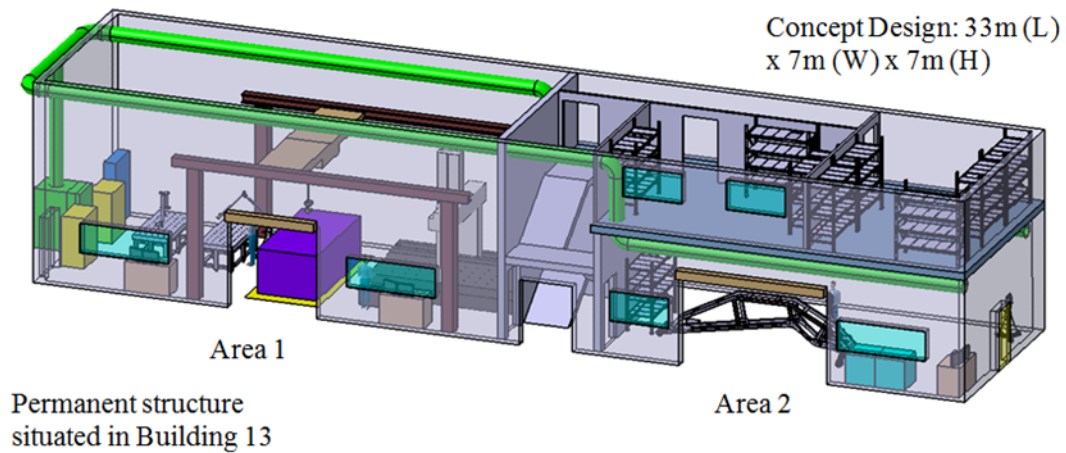
The Construction Department is responsible for all aspects of dimensional control from acceptance testing of the constituent parts through to their final operational alignment.

The ITER machine consists of many individual components and assemblies which must be accurately and precisely measured and aligned for the Tokamak machine to operate. To support high accuracy inspection and pre-alignment activities, a metrology lab is planned to be constructed in Building 13's Assembly Hall, with a conceptual design size of: 33m (L) x 7m (W) x 7m (H). This facility will house fixed metrology equipment such as a Coordinate Measurement Machine (CMM) and Surface tables plus portable measurement instruments and hand tools.

The Metrology Laboratory shall have a controlled environment (temperature, pressure, humidity) to optimise measurement accuracy provided by an integrated heating, ventilation and air conditioning (HVAC) system. The temperature within the metrology Laboratory shall be controlled at 20°C +/- 1°C, to minimize the effect of the differential expansion of materials. The rate of change of temperature shall not exceed 1°C/day and 0.5°C/hr.

Figure 1, indicates the conceptual design of the Metrology Laboratory. Area 1 is for fixed metrology equipment such as the CMM and surface tables and will include storage for small measuring instruments such as micrometers and verniers. Area 2 is for measuring larger components with portable measurement systems such as laser trackers.

Above area 2 is a storage area for portable measurement instruments like laser trackers, scanners, measurement arms levels etc. The supply of the Metrology Laboratory is outside of the scope of this CFN.



**Figure 1:** Metrology Laboratory Conceptual Layout

### 3 Definitions

<b>CFN</b>	Call For Nomination
<b>CMM</b>	Coordinate Measurement Machine
<b>HVAC</b>	Heating Ventilation and Air Conditioning
<b>IO</b>	ITER Organization
<b>ISO</b>	International Standards Organization
<b>SMR</b>	Spherically Mounted Reflector

### 4 Scope

The scope relating to this CFN is the supply of various types of metrology equipment as detailed in section 5. For fixed installation items such as a CMM and surface tables the supplier shall provide an installation and certification service to ensure proper operation of the installed items. This is to be carried out in accordance with the local rules for the building and Health and Safety requirements pertaining at the time of installation.

The supply shall include calibration certification traceable to national standards as applicable and the supplier shall operate a maintenance and recertification programme for these instruments.

As a minimum, warranties shall be for a duration of 1 year with options for periods in excess of this being provided during the tender process as requested within the associated Technical Specification(s).

Where appropriate and as specified in the Technical Specification, the supplier shall provide training in the correct use of the instruments inclusive of field check procedures and routine calibration procedures as deemed necessary by the instrument manufacturer. All training will be carried out at the ITER Site in the South of France.

The supplier shall be responsible for delivery of all items of equipment and tooling to the ITER site and for providing after-sales technical support as detailed in the Technical Specification associated to the Tender.

## 5 Description

The following types of metrology instruments and associated equipment are envisaged to be procured over the coming years to support the Construction Process of the ITER Machine.

There are two different lots: lot 1 metrology laboratory equipment and lot 2 portable metrology equipment and ancillary equipment. The Contractor can express its interest for one or both lot(s). Grouping of companies or other legal partnership can be made to procure the required scope (see section 10).

For each lot, the list of instruments is indicative; further details will be given in technical specifications sent in the call for tender.

### 5.1 Lot 1: Metrology Laboratory Equipment

- Coordinate Measurement machine with a selection of probes
- Metrology Software
- Granite Surfaces Tables
- Digital Height Gauge
- Tooling/Fixturing systems/Reference blocks/parallels etc.
- Slip Gauges
- Hand tools (Micrometers, Verniers, bore gauges, Dial Test Indicators etc.
- Tool cabinets, benches

### 5.2 Lot 2: Portable Metrology Equipment and Ancillary Equipment

- Laser Trackers (single point measurement)
- Laser Tracker (Six degrees of freedom measurement capability)
  - Touch Probe system (selection of probes)
  - Laser Scanning System
- Portable measurement Arms
  - Touch Probe system
  - Laser Scanning System
- Digital Level and measurement staff
- High Density Laser Scanner
- Photogrammetry System
- Various tripods and stands
- Spherically Mounted Reflectors (SMRs)
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## 6 Timetable

The duration of the contract is envisaged to be four years from March 2016 until March 2020.

The first delivery of assembly tooling facilitating construction of the ITER machine is scheduled for July 2017. The Metrology Laboratory is scheduled for completion and ready for equipment in the 1<sup>st</sup> quarter of 2018 with machine assembly activities commencing in the same quarter of 2018.

The first batch of metrology instruments of the portable type will be required in the 2nd quarter of 2017. The Metrology Laboratory equipment will be required as soon as the Metrology Laboratory is constructed and commissioned.

## **7 Quality Assurance requirements**

The organisation supplying metrology equipment shall have an ITER approved QA Program or an ISO 9001 accredited quality system.

## **8 Experience**

The company or consortia of companies selected shall be recognised for their knowledge and expertise appropriate to the scope of supply as identified in this technical Specification. Their core business will be the supply of metrology equipment having the necessary infrastructure in place to guarantee:

- Delivery of products of excellent quality
- Delivery of products in accordance with customer schedule requirements
- Calibration and Certification traceable to National Standards
- Accurate Installation and Commissioning of fixed metrology items
- Quality training on Metrology systems supplied
- Reliable functionality through Service and Warranty Programs
- 

## **9 Tentative Procurement Schedule**

The tentative schedule is as follows:

- Call for nomination submission: November 2016
- Tender submission: December 2016 - January 2017
- Award notification : February 2017
- Contract signature: March 2017

## **10 Candidature**

Participation is open to all legal persons participating either individually or in a grouping (consortium) which is established in an ITER Member State. A legal person cannot participate individually or as a consortium partner in more than one application or tender. A consortium

may be a permanent, legally-established grouping or a grouping, which has been constituted informally for a specific tender procedure. All members of a consortium (i.e. the leader and all other members) are jointly and severally liable to the ITER Organization.

The consortium groupings shall be presented at the pre-qualification stage. The tenderer's composition cannot be modified without the approval of the ITER Organization after the pre-qualification.

Legal entities belonging to the same legal grouping are allowed to participate separately if they are able to demonstrate independent technical and financial capacities. Candidates (individual or consortium) must comply with the selection criteria. The IO reserves the right to disregard duplicated reference projects and may exclude such legal entities from the pre-qualification procedure.