

TECHNICAL SUMMARY

Framework Service Contract for Manufacture of Mechanical Components and Associated Tests for ITER Diagnostic Equipment

Purpose

The main purpose of this framework contract is to provide the ITER Port Plugs & Diagnostics Integration Division with mechanical components and associated tests to support the development and manufacturing of the diagnostic systems in ITER.

Due to the diversity of the required components, the ITER Organization reserves the right to award this contract to more than one contractor.

Background

The ITER Project is an international effort aimed at demonstrating the scientific and technological feasibility of fusion energy. ITER is specified as a Nuclear Facility INB-174. It has to be highly reliable, efficient and safe device built to produce a predefined output quantity and quality of scientific data.

Monitoring and controlling the ITER device using diagnostics is crucial for successful operation. Design, construction and planning for operation of these diagnostics are now well underway. There are about fifty diagnostics systems in ITER which are needed to cover the reliable routine operation, advanced operation and physics exploitation. These diagnostics are broken up in to categories including magnetics, neutrons, bolometer, optical, microwave and operational systems.

Many of the diagnostics directly interface ITER Vacuum Vessel or Port Extensions and contribute to keep both the vacuum containment and the tritium confinement. Integration constraints and diagnostic requirements will impose to develop novel concepts or fit existing concepts to ITER environmental conditions. Those will require prototyping and testing.

Scope of Work

ITER Organization Port Plugs & Diagnostics Integration Division shall coordinate the manufacture of mechanical components and the achievement of tests through the execution of design work. According to the maturity of the designs contemplated for the equipment or components to be tested. Some detailed designs might also be required.

The scope of the work requested in this specification covers the services of experienced manufacturers in Ultra High Vacuum components, with ability to tackle technical challenges such as fabrication and assembly of complex features (MI cables junction boxes, setup and weld cable end joints, fabricate braze joints, seal cables into vacuum test rig and perform full range of withstand voltage tests at various pressure levels, etc.). The scope of the work includes:

- Welding / Brazing / Diffusion Bonding / Thermal / Electro magnetics testing;
- Machining (Milling, Cutting, Drilling, Spark erosion, 3D printing, etc.) Austenitic Stainless Steel (304 or 316), Nickel Based Alloys, Titanium, Copper, etc.;
- Designing (3D or 2D CAD model) from CATIA conceptual models provided by ITER Organization;
- Permanent or temporary assembly of mechanical components;
- Helium Leak Testing (leak rate $< 1 \times 10^{-10}$ Pa.m³.s⁻¹) on welded joints or particular assemblies;
- Thermal and electromagnetic testing;
- Radiography of welded joints;

Duration of Services

The Contract is scheduled to come into force in the 1st half of 2017 for a firm duration of four (4) years, with an option to extend for a further period of 2 years.

Experience

The selection process will be based on the following past experiences and facilities:

- Supplying of Ultra-high vacuum mechanical components or systems;
- Machining of UHV mechanical components;
- Metallic assemblies using welding, e-beam welding and brazing;
- CAD design;
- Machining facilities;
- Test facilities;

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 cannot be modified later without the approval of the ITER Organization. Legal

entities belonging to the same legal grouping are allowed to participate separately if they are able to demonstrate independent technical and financial capacities. Bidders' (individual or consortium) must comply with the selection criteria. IO reserves the right to disregard duplicated references and may exclude such legal entities from the tender procedure.

Reference

Further information on the ITER Organization procurement can be found at:

<http://www.iter.org/org/team/adm/proc>