Design and Supply of Venturi Tube Flowmeters for use in the ITER Magnet Feeders

Call for Nomination

Purpose

The purpose of this Contract is to design and supply the Venturi Tube (VT) flowmeters for use in the ITER magnet feeders. These VT flowmeters will be used to measure helium gas flowrates at both cryogenic (4 Kelvin) and room temperature during the operation of the ITER machine. A total of 208 flowmeters are required for the ITER Magnet System, and an additional 12 flowmeters are required for qualification in a test facility at the feeder manufacturer.

Background

ITER is a joint international research and development project which 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 F4E), 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. For details see www.iter.org.

The superconducting magnets of ITER are cooled by a forced flow of super-critical helium at a temperature of approximately 4 K. This helium is supplied to the magnets via pipework grouped into 29 separate ‘feeders’. The feeders contain all the necessary valves and instrumentation to control and monitor the various helium gas flows. This contract is for the design and supply of the Venturi Tube (VT) flowmeters for use in the magnet feeders of the ITER machine.

A technical specification has been produced by the ITER Organization which details the functional and physical requirements of the VT flowmeters. The VT flowmeter supplier will perform a detailed design according to these technical specifications. The manufacturing of the VT flowmeters will be accomplished in two phases. In the 1st phase (prototype phase) a total of 12 VT flowmeters will be manufactured, and will be incorporated into a test station operated by the feeder manufacturer in China. The 2nd phase of this contract will be initiated after the successful qualification of these 12 flowmeters. In the second phase, a total of 208 VT flowmeters are required for the manufacture of the ITER magnet feeders, 148 of which will operate at 4K, and the remaining 60 will operate at 300K.
**Scope of work**
The scope of the work shall include

- Detailed design of Venturi Tube (VT) flowmeters for use at both cryogenic (4 Kelvin) and room temperature (300 Kelvin) according to the ITER Organization supplied Technical Specification.
- Manufacture (and test) of 12 prototype VT flowmeters for qualification at the feeder manufacturer’s premises
- Manufacture (and test) of 208 VT flowmeters to be incorporated in the magnet feeders of the ITER machine.
- All manufacturing must comply with the Quality Assurance and Quality Control requirements described in section 5 of the ITER Organization supplied Technical Specification.

**Timetable**

The tentative timetable is as follows:

<table>
<thead>
<tr>
<th>Event</th>
<th>Date</th>
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<tbody>
<tr>
<td>Tender submission</td>
<td>September 2012</td>
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<tr>
<td>Contract placement</td>
<td>November 2012</td>
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<tr>
<td>First deliverable</td>
<td>March 2013</td>
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<tr>
<td>Completion of Contract</td>
<td>January 2015</td>
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</tbody>
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**Experience**

The contractor and its personnel shall have adequate experience in the design, manufacture and testing of VT flowmeters.

**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.