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Technical Specifications (In-Cash Procurement)

Supply of Safety Valves for the ITER fluid systems

This is the technical summary for call for nomination of supply of safety (PIC) valves for the ITER fuel cycle fluid systems



Supply of Safety Valves for the ITER fluid systems

Summary Technical Specifications



1 Background

Situated in Southern France, adjacent to the French CEA Cadarache site, the ITER facility covers approximately 190 hectares and is designed to study the fusion reaction between the hydrogen isotopes tritium and deuterium. The Tritium Plant of ITER will support the tritium and deuterium fuelling needs of this ambitious undertaking. It will also supply other gases to the facility including hydrogen, neon, krypton, xenon, argon, nitrogen, diluted oxygen and carbon monoxide. ITER is nuclear facility (non-fission) operated under the French regulatory agency for such facilities. In order to increase overall reliability, support design and procurement of the system and reduce life cycle costs, the Tritium Plant and other systems at ITER will, where possible, utilise standard components and qualify them to specific environmental conditions. The type of standard components envisaged includes, instrumentation, electronic components, valves and fittings.

2 Purpose

The aim of this call for tender is to establish a framework contract (or contracts) with one or more providers to supply ITER and its subcontractors with tritium-compatible valves which are qualified for normal and off-normal operating and maintenance conditions.

The Supplier(s) must perform material procurement, manufacturing, testing, documentation and delivery to ITER according to strict quality requirements established by requirements from the French nuclear regulator (designed by the regulator as “protection important activities”).

3 Scope of Supply

The framework contract includes two types of tasks:

First task:

- Submit to ITER product technical data and information so that ITER may evaluate whether or not products can be qualified through analysis or testing. In the latter case, the Supplier will provide ITER sample valves for qualification tests.

Second task (once qualified)

- Supply qualified valves to ITER together with manufacturing documentation under Supply Order(s) to be issued by the ITER Organization

Detailed scope associated with these tasks will be clarified later in technical specifications.

Of interest for this tender are valves with the following characteristics (which could be subject to changes under the final technical specifications):

**Valve type:**

Isolation valve (on-off valve, no throttling)

Fluid:

ASME B31.3 category M fluid service

Hydrogen and its isotopes including tritium (beta radioactivity). May also include other non-corrosive gases such as neon, krypton, xenon, argon, nitrogen, diluted oxygen and carbon monoxide.

It is of interest if valves are also adequate to carry liquid water (including tritiated water which is corrosive and radioactive)

Fluids are free of dust and particulate

Nominal bore diameter: $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$ and 1 inch**Valve Material:**

Body: 300 series stainless steel (e.g. 304 or 316)

All wetted surfaces: Metal or VESPEL (or equivalent). High density polyethylene may also be considered

Pressure Range:

Vacuum to 15 barg

Temperature Range:

0 to 200 °C

Leak Tightness (at 0 °C, 1 bara):External: $10^{-10} \text{ Pam}^3/\text{s}$ Through seat: $10^{-7} \text{ Pam}^3/\text{s}$ **Seismic:**

Qualified or qualifiable to biaxial peak acceleration: horizontal 1g, vertical 5.5g, range:0 to 50Hz, 4% damping

Must maintain leak tightness requirements during and following this event

Both valves which maintain their position and those which can be operated during this event are of interest

Static Magnetic field: $\leq 19 \text{ mT}$ **Radiation field:**

None beyond tritium and 41-Ar

Ambient conditions:

Mostly inside glovebox under slight vacuum and very low humidity, but must also work with 100% humidity during off normal condition,

Can be installed also outside building under shed, therefore wind, dust and solar flux to be taken into account

Lubricants:

None

Service life:

20 years or 10,000 cycles between service/replacement

Maintenance:

Valve seal: Both replaceable and non-replaceable valve seals are of interest

Actuator: Both replaceable and non-replaceable are of interest

Other: Maintenance free other than valve seal and actuator

**Tubulation:**

Smooth or Cajon VCR. Conflat-type flange may also be considered.

Actuator:

Manual, electric, or pneumatic

Include position indicator switch

No restriction on actuator materials, but halogen-free is preferred

4 Contract Duration

It is envisaged that under the scope of the framework supply contract, valves will be supplied to the IO between 2020 and 2033 and hence have a duration of 10 years and extensible if needed. The detailed conditions will be clarified in contract draft to be included in the call for tender package.

5 Schedule

Action	Tentative date(s)
Call for Nomination	August 2019
Pre-Qualification	September 2019
Call for tender	October 2019
Tender submission	November 2019
Contract Award	January 2020
Start of contract	January 2020

6 Experience

The potential tenderers should have experience with:

- 1) Design, manufacture and supply of standard (catalogue) highly leaktight and highly reliable stainless steel valves.
- 2) Design, manufacture and supply of valves in hydrogen applications.
- 3) Design, manufacture and supply of valves according to the European Pressure Equipment Directive 2014/68/EU and/or French ESPN (*Équipements Sous Pression Nucléaires*, i.e. pressurized nuclear equipment) directive
- 4) Meeting nuclear facility quality requirements such as those followed in the French nuclear industry

7 Candidature

Participation is open to all legal entities established in an ITER Member State, which are:

European Union including Switzerland (EURATOM Members)
 Republic of India
 Japan
 People's Republic of China
 Republic of Korea
 Russian Federation



United States of America

The UK is not a party to the ITER Agreement but to EURATOM Treaty. The draft Withdrawal Agreement between the EU and the UK provides that the provisions of the EURATOM treaty continues to apply to and in the UK for a transition period following its withdrawal from the EU and EURATOM. If the Withdrawal Agreement is not ratified (a no-deal Brexit) the EURATOM Treaty ceases to apply to and in the UK on the withdrawal date.

Until the Withdrawal Date, the UK remains a full member of the EU and EURATOM and until that date UK entities retain the right to participate in IO procurement procedures. In case they are selected, a Brexit clause is included in the contract. Likewise during the Transition period UK entities may participate in IO procurement procedures.

After the end of the Transition Period, when the Euratom Treaty ceases to apply to and in the UK, any UK entities bidding as a prime contractor or consortium partner, will be rejected from the IO procurement procedures. UK entities will no longer be recognised as entities of an ITER Member and will no longer have the right to participate in IO procurement procedures, unless the UK has entered into an Agreement with Euratom. Where UK entities can demonstrate a unique and specific competence in a certain field the IO, with approval of the ITER Council, may also allow them to participate in a procurement procedure.

Entities can participate either individually or in a consortium. A legal entity 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 prior 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 references and may exclude such legal entities from the pre-qualification procedure.