

## Call for Nomination

### Technical Summary

#### Final design, Manufacture and Supply of the ITER SDS Gases Utility Supply System

### 1 Purpose

This Call for Nomination is for the selection of companies to bid for the final design, manufacture and supply of the Storage and Delivery System (SDS) Gases Utility Supply System.

### 2 Background & System Description

ITER is a joint international research and development project that aims to demonstrate the scientific and technical feasibility of fusion power.

The function of the SDS Gases Utility Supply System is to store and supply flammable and inert gases at controlled pressures and flowrates to clients for the ITER First Plasma operation phase from 2025.

The gases are stored in standard industrial pressurised gas cylinders in an external gas compound, and delivered to clients via supply pipework which is routed across a seismic isolation pit into the Tritium Building. Inside the Tritium building the lines connect to valve manifolds and onwards to client interface points. The system will use standard gas cylinder equipment, instruments, pressure control valves, relief valves, and valve manifolds. In order to minimise the risk of flammable gas leaks, the lines containing flammable gases are fully welded double containment (jacketed) lines, with the annulus pressurised with nitrogen and monitored to act as a continuous leak detection method.

The isolation valves on the flammable gas supply lines are part of the instrumented safety systems, and shall isolate the supply cylinders upon detection of loss of pressure in the static nitrogen barrier, or detection of a flammable gas leak. The piping and the supports at the penetration into the Tritium building shall be designed to withstand seismic loading as well as other environmental and process loads. Equipment in the cylinder gas compound shall meet the requirements for ATEX zones 1 and 2. The piping is stainless steel, designed to the ASME B31.3 Process Piping Code and will be subject to helium leak tight testing after installation.

### 3 Scope

The scope of work is to perform the final design and supply of the SDS Gases Compound process equipment comprising:

- (i) Inert gas supply lines
  - 11-off lines which run from the Gases Compound to the Gas Supply Valve Skid in the Tritium Building
  - Lines are all in ½" OD 316L SS tubing, approximately 60m long
  - Associated valves, line components and instrumentation
  - Piping supports

- (ii) Flammable gas supply line:
- 4-off lines (H<sub>2</sub>, CO, D<sub>2</sub>, calibration gas) which run from the Gases Compound to the Gas Supply Valve Skid in the Tritium Building
  - The lines are double containment (jacketed) lines with an outer guard tube constructed with ¾” OD 316L SS tubing and an inner core tube of ½” OD 316L SS tubing. The annulus between the core pipe and the guard pipe is pressurised with a static nitrogen barrier to 10 Barg. The lines are approximately 60m long.
  - Associated valves, line components and instrumentation
  - Piping supports
- (iii) Gas Supply Valve Skid located in the Tritium Building consisting of isolation valves, instrumentation and support frame; with double containment of the components on the flammable gas lines for leak detection.
- (iv) I&C cabinets, associated cabling and interfaces to the central ITER I&C systems.

The IO shall provide preliminary design information including:

- P&IDs
- GA drawings
- Equipment list
- Line List
- Control philosophy
- Equipment datasheets
- Load specifications
- Interface definition information (e.g. to civil structures, electrical, earthing etc)

Example P&IDs of typical flammable and inert gas supply lines are provided in Appendix 1, and a general arrangement drawing is provided in Appendix 2.

The Contractor shall participate in a design review, which will be held at the ITER headquarters before the start of manufacturing. Installation of the equipment at the ITER site is not within the scope of the contract.

#### 4 Required Experience and Skills

The candidates shall need to demonstrate that they have the capabilities to successfully design and supply gas supply equipment and installations including double containment (jacketed) systems.

#### 5 Tentative Schedule

Milestone	Dates
Pre-Qualification	From June 2019
Call for Tender	From August 2019
Award / signature	Before end 2019

## 6 Candidature

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

- European Union including Switzerland (EURATOM Members),
- Republic of India,
- Japan,
- People's Republic of China,
- Republic of Korea,
- Russian Federation, or
- United States of America.

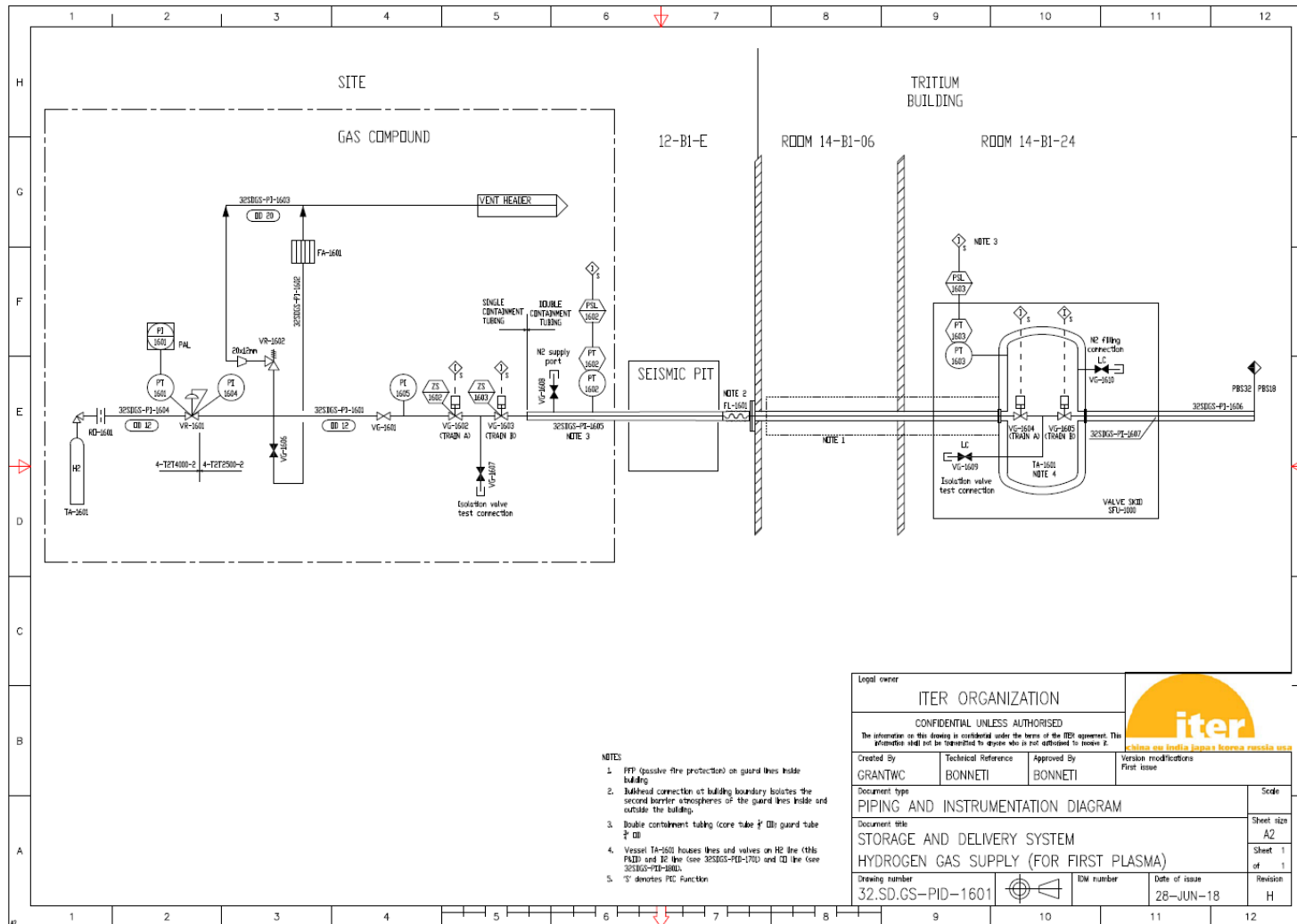
The UK is not a party in the ITER Agreement but part of EURATOM. In the scenario of a BREXIT without a withdrawal agreement between the EU and the UK (no deal BREXIT) or a further delay of the BREXIT date, then until such a date, the UK remains a full member of the EU and until that date UK entities retain the right to participate in IO procurement procedures. However, after a no deal Brexit date, any UK bidding as a prime contractor or consortium partner, will be rejected from the procurement procedures as UK entities will no longer have the right to participate in IO procurement procedures.

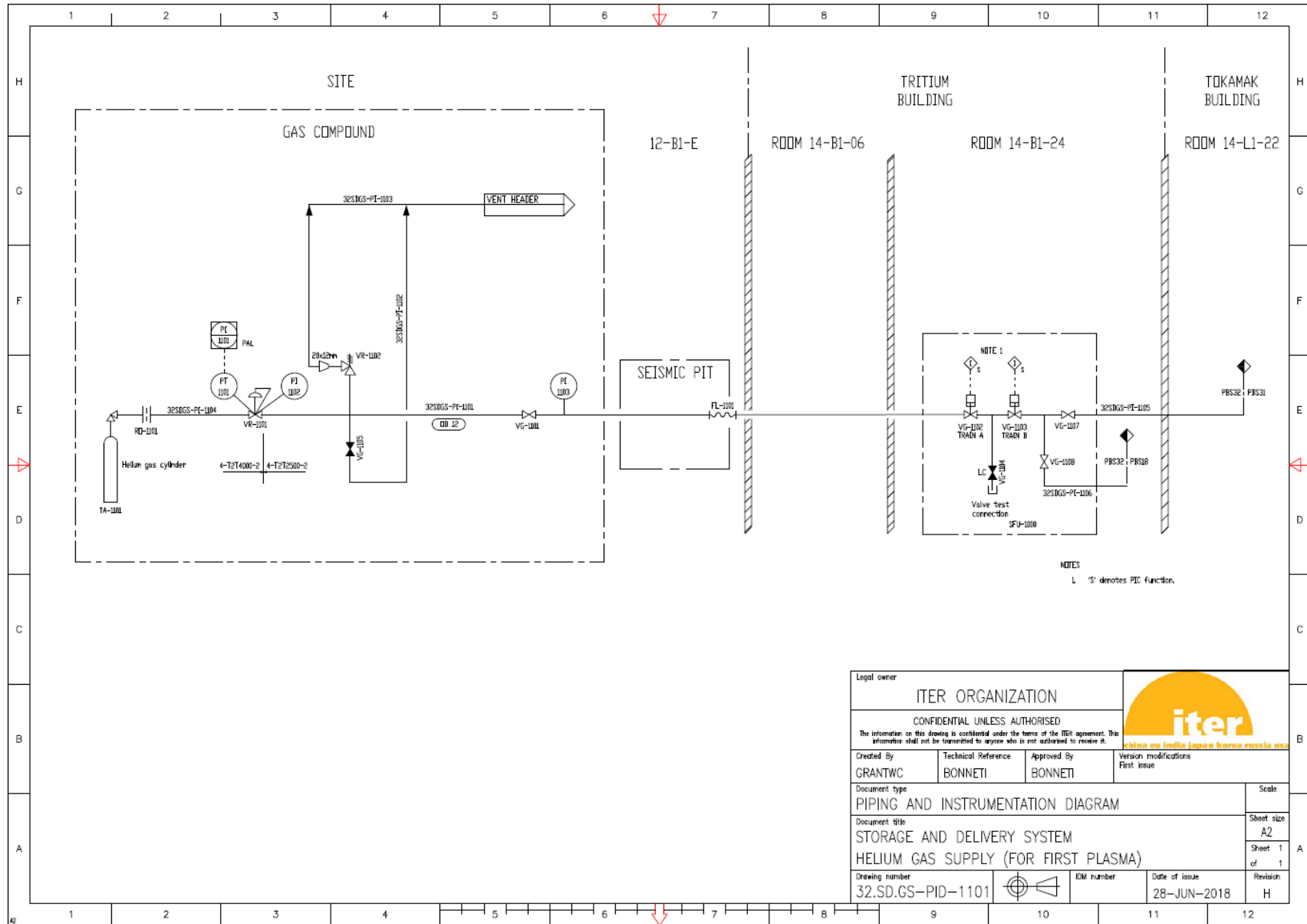
Entities can participate either individually or in a consortium. A legal entity cannot participate individually or as a consortium partner in more than one application or tender. A consortium may be a permanent, legally-established grouping or a grouping, which has been constituted informally for a specific 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 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.

7 Appendix 1 – Example P&IDs





Legal owner		ITER ORGANIZATION	
CONFIDENTIAL UNLESS AUTHORISED			
The information on this drawing is confidential under the terms of the ITER agreement. This information shall not be transmitted to anyone who is not authorized to receive it.			
Created By	Technical Reference	Approved By	Version modifications
GRANTWC	BONNETI	BONNETI	First issue
Document type			Scale
PIPING AND INSTRUMENTATION DIAGRAM			
Document title			Sheet size
STORAGE AND DELIVERY SYSTEM			A2
HELIUM GAS SUPPLY (FOR FIRST PLASMA)			Sheet 1 of 1
Drawing number	DM number	Date of issue	Revision
32.SD.GS-PID-1101		28-JUN-2018	H

8 Appendix 2 – Gases Compound General Arrangement

