



Contract for the Centralized Procurement and Preassembly of Piping Systems for ITER

ADDENDUM 5

Summary for the Diagnostic Systems

Purpose

The purpose of this Contract is the Centralized Procurement and Preassembly of Piping Systems for ITER. Addendum 5 gives the details of the piping required for the Diagnostic Systems that are included in this contract.

Background

The Pipes for Diagnostic Systems:

Diagnostic systems are required to ensure the operation of ITER throughout all campaigns and will be installed in multiple locations. In particular, many diagnostic systems will be installed in the Upper (10), Equatorial (8) and Lower (3) ports. It is also likely that several diagnostics may be allocated in 4 Upper ports above NB Cell. The assembled port plugs and diagnostic racks in the Lower ports themselves, as well as several diagnostics inside port plugs, will require active cooling during operation and will have to be baked before operation.

Figure A1 shows a specific example of the Generic Upper Port Plug with required piping network to be implemented.

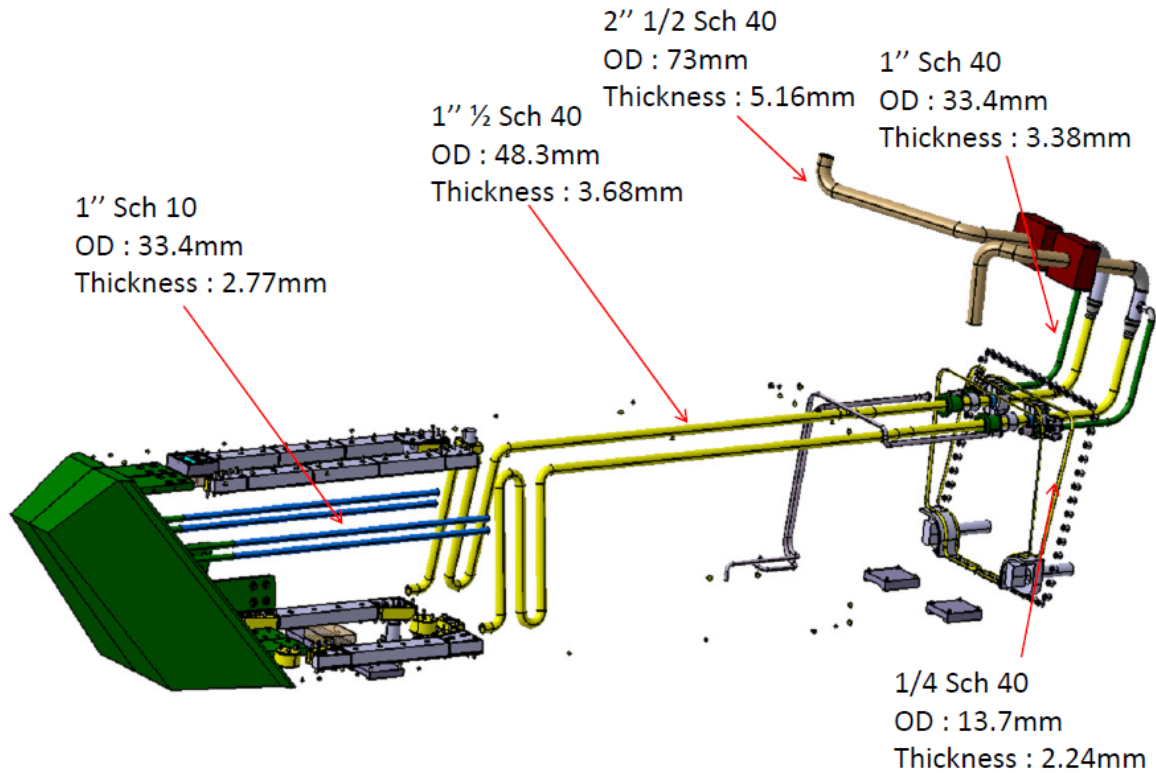


Fig. A1: View of the Generic Upper Port Plug with water cooling pipes and components.

A connection pipe for the port plug cooling is defined as a pipe going from the Tokamak cooling water interface to the DSM through the port plug closure plate. The diagnostics inside the port plugs may require a separate piping to be supplied to the individual cooling circuits through the closure plate. For the Lower port rack cooling, the pipes will go through the feedouts next to the Port Closure Plate and along the wall parallel to the Divertor Cooling pipes towards the Diagnostic Racks.

Some details of the Generic Equatorial Port Plug and Lower Port Rack Connection Pipes are given in Fig. A2 and Fig. A3, respectively.

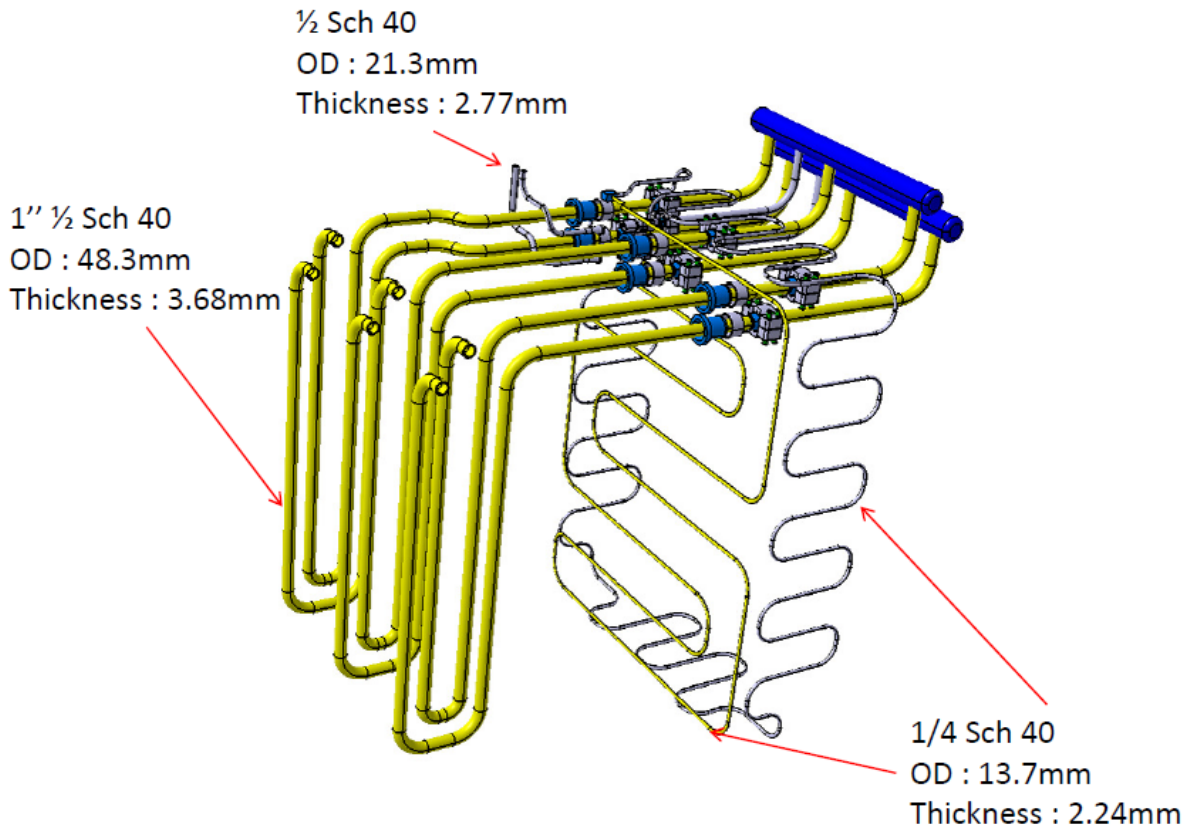


Fig. A2: View of the Generic Upper Port Plug with water cooling pipes and components.

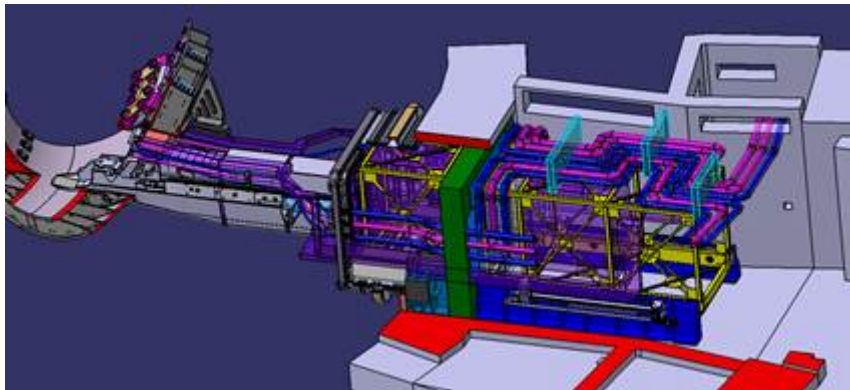


Fig. A3: Details of Piping network in the typical Diagnostic Lower port.

The Tables in Annex A1 define the preliminary specifications for the Diagnostic Pipes. Please note that there are some other piping requirements, in addition to the port structure cooling: windows, diagnostic feedouts above or below Upper Ports, pipes to encapsulate diagnostic lines-of-sight etc. Note that some Domestic Agencies may potentially be interested in the centralized piping solution. However, their participation is subject to further discussions.

The typical Pipe technical specifications are the following:

- The Pipe structural material (e.g., SS-316L or equivalent grade for EN standard) will be used.

- Only one type of thermal insulator will be used.
- Only one design code will be used (e.g., RCC-MR)
- Pipe diameters and schedules given in Annex A1 are preliminary and will be optimized taking into account the following data:
 - Operating and design pressure
 - Operating and design temperatures
 - Maximum expected flow-rates
 - Maximum acceptable pressure drops
 - Composition and mass of the fluids
 - Standardization of the pipe characteristics will be applied (i.e. same characteristics for same functions).

The procurement will include also pipes supports and pipes protective grids. One valve per each pipe will also be necessary (characteristics to be defined).

The Tenderer, awarded and having signed the Contract shall be denominated as the Contractor.

Scope of work

The contractor shall execute the following activities, in compliance with the French Quality Order of 7 February 2012, in compliance with the applicable ESP-ESPN classification and conformity requirements, and under the direct supervision of the selected NB or ANB, where applicable:

1. propose solutions to optimize the piping design introducing modularity and prefabrication, using spools, skids, protection grids, support structures and thermal insulator, as driven by the IO assembly requirements;
2. apply best value for money criteria to evaluate subtier suppliers and manufacturers of piping materials and components and to submit a list to IO for approval;
3. procure the piping, fitting, protection grids and valves according to the IO Technical Specifications and selected codes & standards (ASME and/or RCC-MR), based on quantity estimates provided by IO. ;
4. procure the thermal insulator according to the IO Technical Specifications;
5. execute the prefabrication or pre-assembly of the piping in skids or spools with supporting structures as proposed by the Contractors and accepted by IO following the IO assembly schedule
6. execute piping examination and testing, NDE inspections and hydrotestings according to the selected codes & standards (ASME and/or RCC-MR);
7. provide packaging, temporary storage and shipping of piping materials and preassembled spools from workshops to ITER site at Cadarache;
8. provide the necessary certification of conformity.

Estimated Duration and Timetable

The duration of the Contract will be approximately 5 years from the date of the signature.

The ITER Organization explicitly reserves the right to decide whether or not to extend the Contract for other piping systems.

The tentative timetable of the applicable Call for Tender procedure is as follows:

- Call for Pre-qualification October 2013
- Call for Tender December 2013
- Tender submission January 2014
- Contract award March 2014
- Task Order placement for Diagnostic pipes Dec 2016
- The final input data for Diagnostic pipes will be available in July 2016.

Experience

The potential tenderers shall have proven experience in the following areas:

- Design of large and complex cooling systems for Nuclear Power Stations according to ASME codes & standards and in compliance with the French regulations (QO 1984, ESP/ESPN for Pressure Equipment);
- Supply of piping systems and piping supports for nuclear island and/or for auxiliary circuits according to ASME and/or RCC-MR codes & standards and in compliance with the French regulations (QO 1984, ESP/ESPN for Pressure Equipments). Pre-fabrication and fabrication of piping systems, modules, spools, skids, and supporting structures in qualified workshops in compliance with the French regulation (QO 1984, ESP-ESPN for Pressure Equipments) and under the control of NB and ANB

Particular interest shall be paid to the Tenderers that have or plan to have workshop nearby or in close proximity (< 50 km) to IO site at Cadarache.

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.

Annex A1

Present characteristics of the Diagnostic Pipes (i.e. pre-conceptual design)

*(Note: these data might evolve during the progress of the pipes design and, therefore, are given here as “preliminary”;
they do not represent any commitment for IO)*

<i>Purpose of the pipe</i>	<i>Length, m</i>	<i>Schedule, inch/ Diameter, mm</i>	<i>Designed for:</i>	<i>Comment</i>	<i>IO needs</i>	<i>DA needs *</i>
Equatorial Port Plug DSM cooling / baking	80	1”1/2 Sch 40 OD 48.3 mm Thick. 3.68 mm	Max. flow rate: 7.0 kg/s Pressure drop (max. for the port plug assembly): 1.35 MPa	Main pipes for DSM cooling	X	
Equatorial Port Plug DSM cooling / baking	240	1”1/2 Sch 40 OD 48.3 mm Thick. 3.68 mm	Max. flow rate: 7.0 kg/s Pressure drop (max. for the port plug assembly): 1.35 MPa	Main pipes for DSM cooling		X
Equatorial Port DFW cooling/ baking	80	1” Sch 10 OD : 33.4mm Thick. : 2.77mm	Max. flow rate: 3.0 kg/s Pressure drop (max. for the port plug assembly): 1.35 MPa	Pipes for DFW cooling	X	
Equatorial Port	8	1”	Max. flow rate: 0.6	In- and Outlet	X	

Plug structure cooling/ baking			kg/s Pressure drop (max. for the port plug assembly): 1.35 MPa			
Equatorial Port Plug structure cooling/ baking	32	1"	Max. flow rate: 0.6 kg/s Pressure drop (max. for the port plug assembly): 1.35 MPa	In- and Outlet		X
Upper Port DSM/DFW cooling / baking	30 (DFW) 55 (DSM)	OD 33.4 (DFW) OD 48.3 (DSM)	Max. flow rate (per port): 5.7 kg/s Pressure drop (max. for the port plug assembly): 1.35 MPa	Ports above NB Cell	X	
Upper Port Plug DSM cooling / baking	140	OD 48.3	Max. flow rate (per port): 5.7 kg/s Pressure drop (max. for the port plug assembly): 1.35 MPa	Regular Upper Ports		X
Upper Port Plug DFW cooling / baking	80	OD 33.4	Max. flow rate (per port): 5.7 kg/s Pressure drop (max. for the port plug assembly):	Regular Upper Ports		X

			1.35 MPa			
Upper Port Plug structure cooling / baking	50	OD 21.34	Max. flow rate (per port): 5.7 kg/s Pressure drop (max. for the port plug assembly): 1.35 MPa	Regular Upper Ports		X
Lower Port Rack cooling / baking	150	1"	TBD; similar to the divertor or GEPP cooling numbers	Diagnostic rack cooling only		X
Windows and feedouts	70 20 20 20	160 mm ID 100 mm ID 60 mm ID UPP feedout match	Primary windows to withstand 2 bar pressure differential		X	
Diagnostic cooling/ baking	80	1" Sch 10 OD : 33.4mm Thick. : 2.77mm			X	
Diagnostic cooling/ baking	200	1" Sch 10 OD : 33.4mm Thick. : 2.77mm				X
Pipes to encapsulate lines-of-sight **	100	TBD; no special structural requirements			X	
Pipes to encapsulate lines-of-sight **	600	TBD; no special structural requirements				X

*Subject to further discussions and agreement with DAs. DA supplies are not guaranteed at this time.

**The need to be assessed.