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**2SZV8S**

VERSION CREATED ON / VERSION / STATUS  
**17 Jun 2020 / 1.2 / Approved**

EXTERNAL REFERENCE / VERSION

## Technical Specifications (In-Cash Procurement)

### **BOP3 Contract Technical Summary**

Technical Summary for the launch of the Call for Nomination for BOP3 contract.

Purpose of this contract is related to installation in the main Control Room in Building 71 mainly, but also other ITER site Buildings: 32, 33, 34, 35, 36, 37, 38, 39, 41, 44, 45, 46, 47, 52, 61, 64, 67, 68, 69, 71, 74, 75 and Area 30, all these buildings are in Worksite areas 3, 4 and 5.

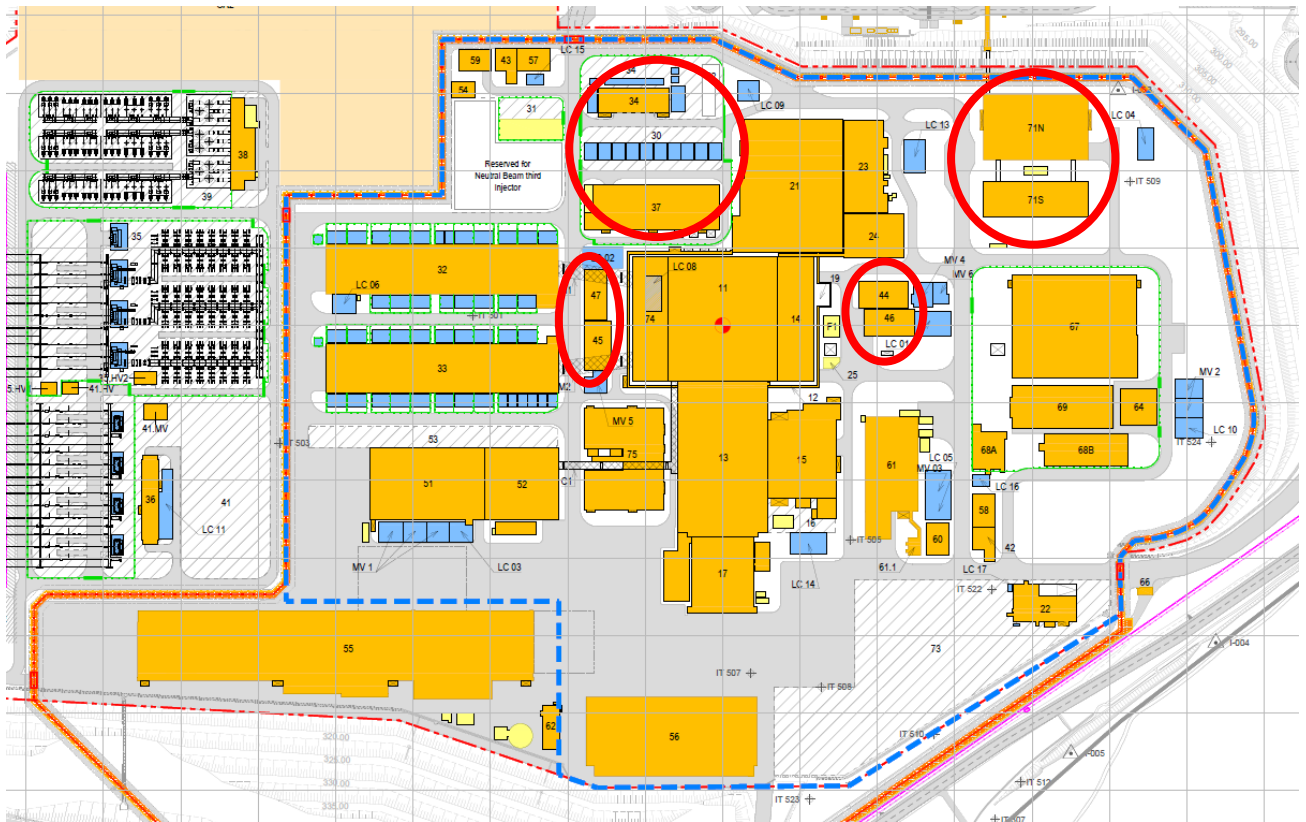
# Technical Summary for Balance of Plant (BOP) Group 3

## Purpose

The purpose of this contract is primarily related to the installation of systems in the main Control Room in Building 71, and other ITER site buildings; the ITER systems included in the scope of work of BOP 3 contract are the following:

- PBS26 - Cooling Water System
- PBS45 - CODAC
- PBS46 - Central Interlock System
- PBS48 - Central Safety System
- PBS69 - Access Control & Security Systems

The scope covered by the BOP Group 3 Contract is located in Buildings 32, 33, 34, 35, 36, 37, 38, 39, 41, 44, 45, 46, 47, 52, 61, 64, 67, 68, 69, 71, 74, 75 and Area 30, all these buildings are in Worksite areas 3, 4 and 5; all the listed buildings are mainly for interconnection cables between buildings and for the installation of access control and security systems.



The installation activities will include:

Equipment	Building
Server Cubicles	Mainly in Buildings 71,44
I&C Cubicles	In All Plant Buildings (excluded 11,74,14,13 and 15)
FO and copper Cables	From Building 71 and 44 to all Plant Buildings

COM and I&C Cables	All Plant Buildings
HV and MV Cables	34, 37, 11 and 13
Access Control And Security devices	In All Plant Buildings (excluded 11,74,14,13 and 15)
Piping for Cooling Water System	Buildings 34, 37, 71 and Plant Bridges between B32-33 and B74
Cable Trays	Buildings 44,45,46,47 and Plant Bridges between B32-33 and B74

## Background

ITER is based on the 'Tokamak' concept of magnetic confinement, in which the plasma is contained in a doughnut-shaped vacuum vessel. The fuel - a mixture of Deuterium and Tritium, two isotopes of Hydrogen - is heated to temperatures in excess of 150 million °C, forming a hot plasma. Strong magnetic fields are used to keep the plasma away from the walls; these are produced by superconducting coils surrounding the vessel, and by an electrical current driven through the plasma.

ITER is a large research facility made of a combination of large conventional industrial equipment such as the cooling water system and challenging new high tech components such as diagnostics, superconductive magnets, etc. To ensure the future operation of all ITER subsystems a large amount of power and control cables will have to be designed, identified, routed and installed.

For more information on the ITER Project please visit our web site [www.iter.org](http://www.iter.org).

## Scope of Work

The installation works are to be performed, mainly, in the following buildings:

- Building 71 – Control Building, including also the Command Post that will be located in B71N
- Building 34 – Neutral Beam Power Supply Building
- Building 37 – Neutral Beam High Voltage Power Supply Building
- Building 44 – Emergency Power Supply Building (Train A)
- Building 45 – Emergency Power Supply Building (Train B)
- Building 46 – Medium Voltage Distribution Building LC/1A
- Building 47 – Medium Voltage Distribution Building LC/2B
- And partially in all remaining Plant Buildings

All the equipment to be installed under the contract shall be free issued by the ITER Organization (IO) to the Contractor, except for the components listed in the column “to be procured” of the table in below in this Technical Summary, which items shall be provided by the Contractor.

The preliminary bill of materials is given below and is divided into (a) equipment to be supplied and installed and (b) equipment for installation only. Also included in the scope are all the associated finishing works and the testing for mechanical and electrical completion of the installation:

Electrical completion of installation, equipment includes, but is not limited to:

- Normal inspection of each cables, wiring & termination
- Normal inspection of cable and tray support, tray (fill), grounding, integrity.
- Check of stress core installation for MV & HV cable
- Check of bend radius of cables
- Tests of continuity, megger testing (insulation) and check of performances for FO Cables

Mechanical completion of the Structural, Mechanical & Piping includes, but is not limited to:

- Verification that the piping systems, mechanical equipment and their supporting structure are installed
- Non-destructively examined
- Hydrostatically tests
- Flushed clean[SML1]

Mechanical Completion for instrumentation systems including validation of the instruments, valves and compared to the original design data to assure their (process flow) condition will be met by verifying, but is not limited to:

- All wiring check & verified
- Inspected for continuity & insulation
- Loop check for confirmation to the automatic system (with specific mock-up [SML2] on equipment)
- Hydraulic & pneumatic tubing will be cleaned[SML3], flushed and pressure tested to assure that there are no leaks and that the cleanliness meets required quality

#### Preliminary Bill of Material

Description	Install	Install & Procure
<b>Cables</b>		
HV Cables (66 kV cables)	5,8 km (12 cables)	-
MV Cables (22 kV cables)	25,7 km (156 cables)	-
LV Power < 16mm <sup>2</sup>	8 km (62 cables)	
I&C < 16 cores	180 km (1621 cables)	
I&C > 16 cores	157 km (630 cables)	
Fibre optic	205 km (872 cables)	
Ethernet/Profibus/Telecom cables	124 km (909 cables)	
<b>Cable Trays and Conduits</b>		
Solid bottom with cover Tray 100x100		2700 m
Ladder Tray 100x100		500 m
Solid bottom with cover Tray 200x100		2800 m
Ladder Tray 200x100		600 m

Description	Install	Install & Procure
Conduit D=100		3200 m
Conduit D=75		6300 m
Conduit D=50		6400 m
Conduit D=34		12000 m
Conduit D=25		12500 m
<b>Instrumentation &amp; Control (I&amp;C) and Electrical Components</b>		
Pressure Gauge	7	
Pressure Transmitter	4	
Temperature Gauge	4	
Temperature Transmitter	9	
Differential Pressure Switch	3	
Flow Transmitter	5	
Level transmitter	1	
Other Instrument Transmitters	3	
Valve Positioner, Position Switch, Open/Close Command	15	
Low Voltage Motor Control Centers (MCC) Class IV 400 V (3700x800x2125)	1	
Local Control Panels (LCPs) for pump-motor control Class IV 400 V (300x200x500)	3	
Heat Tracing panel Class IV 400 V (2100x400x1825)	1	
Server Cubicles (1200x800x2200)	69	-
I&C Cubicles (800x800x2200)	137	
SIC - I&C Cubicles (800x800x2200)	10	-
Junction Box	5	
Central I&C Network Panel	13	
Radio base station antenna	1	
Emergency Phone	27	
Phone outside	38	
Public Address Loudspeaker	305	
Outdoor cameras of General Views (OGV)	28	
Infrared projectors for cameras	3	
Indoor Cameras	23	
IP video Intercom	2	
Badge Reader	74	
Scrambled keypad	3	
Alarm buzzers	20	
Door release buttons	8	
Turnstiles	2	
Motion Detectors - Dual Technology & IR curtain	35	

Description	Install	Install & Procure
Glass Break and Glass wall break detector	30	
Key Boxes	2	
Opening detectors - Magnetic - Manholes monitoring with Junction box	254	
Doors Opening detector	125	
Video Wall (12 screens)	3	
Guards Workstations (Complete, Gate) for security peripherals and licences if any)	28	
Light signals	19	
Main Control Room Furniture	100 seats (desks, chairs, movable drawers, etc)	
Command Post Furniture	5 Seats (shaped desks, cupboards and chairs)	
Instrument tubing (including fittings)	150m	150m
Instrument supports	100	100

DN	Specification	Install	Install & Procure
<b>Stainless Steel Piping</b>			
20	ASTM A312 TP 304L, SMLS, ANSI B36.19, SCH-40S	15 m	
25	ASTM A312 TP 304L, SMLS, ANSI B36.19, SCH-40S	35 m	
40	ASTM A312 TP 304L, SMLS, ANSI B36.19, SCH-40S	15 m	
150	ASTM A312 TP 304L, SMLS, ANSI B36.19, SCH-40S	133 m	
200	ASTM A312 TP 304L, SMLS, ANSI B36.19, SCH-40S	223 m	
<b>Line Components: Valve</b>			
25	LIFT CHECK VALVE #150, BW	1	
40	LIFT CHECK VALVE #150, BW	2	
200	CHECK VALVE #300	3	
80	AIR RELEASE VACUUM BREAKER VAVLE #150, FL	1	
50	AIR RELEASE VACUUM BREAKER VAVLE #300, FL	1	
25x50	PRESSURE RELIEF VALVE #300, FL	1	
50x80	PRESSURE RELIEF VALVE #150, FL	1	
25	ELECTRICAL ACTUATED GLOB VAVLE #150, BW	1	
40	ELECTRICAL ACTUATED GLOB VAVLE #300, BW	2	
150	ELECTRICAL ACTUATED GLOB VAVLE #150, BW	2	
150	ELECTRICAL ACTUATED GLOB VAVLE #300, BW	1	
200	ELECTRICAL ACTUATED GLOB VAVLE #300, BW	4	
150	ELECTRICAL ACTUATED BALL VAVLE #300, BW	1	
200	ELECTRICAL ACTUATED BALL VAVLE #300, BW	1	

DN	Specification	Install	Install & Procure
40	MANUAL ACTUATED BALL VALVE #150, BW	2	
150	MANUAL ACTUATED BALL VALVE #150, BW	2	
150	MANUAL ACTUATED BALL VALVE #300, BW	3	
200	MANUAL ACTUATED BALL VALVE #150, BW	2	
200	MANUAL ACTUATED BALL VALVE #300, BW	2	
25	MANUAL ACTUATED GLOBE VALVE #150, BW	19	
25	MANUAL ACTUATED GLOBE VALVE #300, BW	11	
200	MANUAL ACTUATED GLOBE VALVE #150, BW	2	
<b>Line Components: Valve</b>			
200	T-TYPE STRAINER	3	
<b>Mechanical Components</b>			
Plate Type Heat Exchangers (Design Standard ASME Section VIII, Div-1, API662, PED/ESP) (2225 W x 895 D x 2615 H 4367 kg weight)		1	
Horizontal Centrifugal Pumps (Design Standard API 610/ISO13709/ HIS) (2765 W x 1302 D x 1070 H 2308 kg weight)		3	
Pressurizer (900 mm diameter 2045 mm height 995 kg weight)		1	
Water Polishing Unit		1	

For the above equipment, the contractor is responsible for providing and installing consumables and accessories, including but not limited to:

- Terminals and Connections,
- Cable/Wiring Core Ferruling,
- Labels,
- Conduit,
- Cable Glands,
- Earthing and Bonding,
- Welding materials.

The Contractor shall be responsible for the following activities:

- Provide any required temporary works including, but not only, the means of protection and the tools needed to properly manage and perform the different stages of work in the buildings and on site,
- Perform the complete installation (including the thermal insulation and the final coating if necessary),
- If required provide scaffolding,
- Perform final installation tests (mechanical & electrical completion) and verifications,

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- Issue all necessary documentation for the works, such as Quality Plan, Health and Safety plan, Workface planning (Installation sequence and Level 4 Schedule) and the List of documents to be issued for the execution of the works.
  - Issue the As-Built documents,
  - Provide support during commissioning phase with a minimum number of resources (as required).

All above mentioned site works shall be performed by the Contractor within ITER Site at Saint Paul-lez-Durance in France.

Note that the above information is preliminary only and the complete and final scope will be presented in the Technical Specifications issued at the Call for Tender stage of the procurement.

## Interfaces with other companies

There will be other contractors working on the ITER site around the Buildings and also inside the Buildings involved in these installation activities.

To manage the coactivity and the Installation schedule IO is currently working with a Construction Management-as Agent (CMA). The CMA shall oversee these tasks:

- Site coordination (including permit to work)
- Material management,

## Timetable

The tentative timetable for this procurement is as follows:

Call for Nominations	September 2020
Issue of Pre-Qualification	October 2020
Invitation to Tender	December 2020
Tender Submission	February 2021
Contract Award	May 2021
Start of the Works	October 2021

The contract duration is estimated to be between 30 and 36 months for the whole of the installation works, including testing and preparation of the final documentation.



## Nuclear and Quality Requirements

The ITER Organization is the nuclear operator of the ITER nuclear fusion facility (INB 174) under French nuclear law.

The Contractor shall install piping components in conformance with ASME B31.3-2010 Category M fluid and appropriate ASTM standards and for part of the scope to comply with ESP and ESPN French regulations. The Contractor will have to provide a Quality Assurance System required for installing of nuclear components. He shall comply with the defined requirements associated with those components as well as the French Order of 7th February 2012 establishing the general rules for basic nuclear installations. The Quality requirements imposed by the ESP and ESPN regulations, the defined requirements and the French Order of 7th February 2012 will be detailed at the Call for Tender stage.

**Protection Important Components** (PIC) related to Nuclear Safety are to be installed under this contract.

The Protection Important Activity (PIA) list to be performed by this contract will be given in the Call for Tender phase.

## Confidentiality Requirements

This Contract involved management by the Contractor of ITER RESTRICTED information. This confidentiality clause specifies contractor's obligations.

The contractor shall, under its responsibility, protect the information it has to hold or know under this contract.” The Contractor shall detail in a procedure that shall be approved by IO how he intends to ensure protection of ITER RESTRICTED information. This document shall take into account the following:

- Information handled or delivered by the Contractor as ITER RESTRICTED must not be uploaded on any deliverables portal (e.g. IO/IDM) without the approval of the IO/Security Officer.
- Each Contractor’s staff who needs an access to ITER RESTRICTED information stored on the systems of ITER Organization shall sign a Confidentiality Commitment prior granted access.

At execution time, the Contractor and the IO/RO with the IO Security Officer shall together assess which level of protection shall apply to each deliverables.

The Documentation control system put in place by the Contractor shall integrate with the ITER RESTRICTED management aspects.