

Technical Specifications (In-Cash Procurement)

Technical summary note for Central Safety Systems Support Services

Technical summary note to be used in the call for nomination for the new contract for Central Safety System Support Services.

The Central Safety Systems support services contract is composed of the following lots: Lot 1: System engineering services. Lot 2: Interface and structure services. Lot 3: Prototypes and early systems development services. Lot 4: Software development services. The purpose of this contracts is to provide support services for the CSS-OS and CSS-N.

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1 Scope

The ITER Safety Control System (SCS) is the ITER Control System in charge of the execution of Safety I&C functions in order to protect people and the environment. It is composed of the Central Safety System (CSS), procured by PBS48, and of Plant Safety Systems for Occupational Safety (PSS), provided by other plant systems.

The CSS will implement part of the control logic and coordinate and supervise the locally distributed PSS.

The CSS is divided into two subsystems depending on the type of hazard to be mitigates:

- The Central Safety System for Nuclear Safety (CSS-N) addresses radiological hazards.
- The Central Safety System for Occupational Safety (CSS-OS) copes with non-radiological hazards.

The objective of this Call for Tender is to select qualified companies/consortia with extensive experience in the required fields of work to provide support services for the CSS-OS and CSS-N.

Four framework contracts may be awarded following the scope split in four lots:

- Lot 1: System engineering services.
- Lot 2: Interface and structure services.
- Lot 3: Prototypes and early systems development services.
- Lot 4: Software development services.

Candidates are free to apply for one or several lots. The Framework Contract(s) will include the scope of the lot(s) awarded and will be implemented by the means of Task Orders in order to execute the specific services.

2 Contract Basis and Execution

The Central Safety Systems Support services will be procured via Framework Contract(s). Following contract(s) award, Task Orders will be issued for the implementation of the contract(s). All Task Orders to be executed under the contract(s) are on a deliverable basis. The ITER Organization will award the Framework Contract(s) for a total period of 5 years maximum. This period will be split in a firm period of 4 years and an optional period of one year. It is envisaged that the first Task Order will commence in December 2021. The option for each contract may or may not be released at the IO's sole discretion.

3 Tentative Schedule of this Call for Tender

The indicative Call for Tender milestones are:

Call for Nomination issued	December 2020
Pre-Qualification launch	February 2021
Call for Tender launch	May 2021
Award of the Contract	September 2021
Contract signature	October 2021

4 Context

ITER will be constructed from a large number of components or “plant systems”, which will be delivered complete or in parts by the participating countries as “in kind” contributions, in compliance with contractual agreements, called Procurement Arrangement (PA), with the ITER Organization. These components will be assembled at the ITER site.

The ITER I&C System is divided in two horizontal layers, one for the Central I&C Systems (CODAC, Interlock and Safety Systems), and another for the different Plant Systems. Both are connected through different I&C networks (the general CODAC Systems Networks and the high integrity Central Safety Networks and Central Interlock Networks) besides other specific networks.

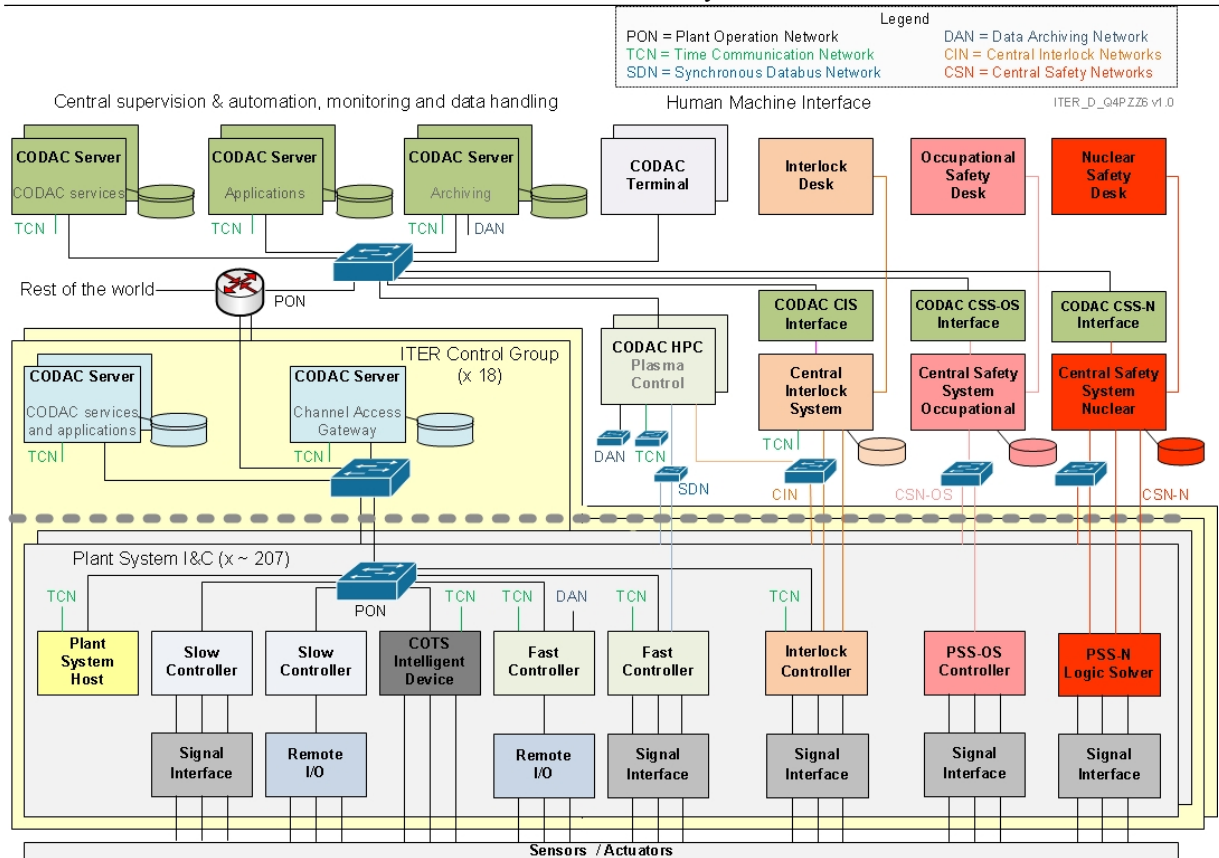
Some of these components are involved in the implementation of nuclear and occupational Safety I&C functions and therefore will be interfaced with the CSS-N and CSS-OS.

The CSS coordinates the individual protection provided by the intervention of locally distributed Plant Safety Systems (PSS) in charge of the activation of additional protections in order to remove or reduce the detected hazardous conditions. This coordination is performed via the Central Safety Network (CSN). It should be noted that the implementation of the control logic of several PSS, both nuclear and occupational safety, has been transferred to the CSS. Therefore, the CSS will combine its role of coordination of the different PSS with the implementation of control logic and the direct interface with sensors and actuators.

Both CSS-N and CSS-OS are entering manufacturing stage and early temporary systems are already operational for the integration and operation of the first PSS.

The CSS-N follow the IEC 61513 and the CSS-OS the IEC 61511.

Technical Summary



5 Scope of work

The services requested herein can be categorized as follow:

- Lot 1: System engineering services:
 - o Participation to the design of the CSS-N and CSS-OS;
 - o Support IO in the review of documentation performed by others and the participation in meetings;
 - o Writing of guidelines for plant systems and update of existing guidelines: These guidelines are addressed to other ITER plant systems having safety I&C and may cover one or many aspects such as design, manufacturing, integration or acceptance tests;
 - o Support to and review of documentation related to plant safety systems interfacing the CSS;
 - o Support the specification of I&C nuclear and occupational safety functions;
 - o Specification of nuclear and occupational safety I&C functions: Writing of overall and detailed functional specification and preparation of associated logic diagrams;
 - o Performance of human factors studies;
- Lot 2: Interface and structure services.
 - o Management of CSS interfaces.
 - o Development and/or update of physical interfaces of the CSS-N and CSS-OS components with other plant systems,
 - o Development and/or update functional interfaces between CSS-N and CSS-OS with other plant systems,
 - o Verification of the correct declaration of PBS 48 data in project databases and tools,

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- Support the preparation of engineering work packages for system installation and assessment of the constructability and maintainability of all cubicles;
 - Lot 3: Prototypes and early systems development services.
 - Draft Human Machine Interface (HMI) diagrams to be used to specify the CSS mimics;
 - Technical assessment of hardware and software products including proposals for its possible use by the CSS-N and CSS-OS;
 - Specification, design and development of testing tools to support acceptance and integration tests of ITER safety systems and components (both hardware and software);
 - Specification, design, development and testing of early CSS systems, mock-ups and prototypes using the technology selected for the ITER safety systems: Siemens S7 safety PLCs, HIMA Planar 4 and WinCC Open Architecture. The associated activities may be preparation of wiring diagrams, selection and integration of hardware, PLC and HMI programming, testing, write of engineering and user documentation, assessment of the return of experience and integration of such feedback into CSS design;
 - Lot 4: Software development services.
 - Development of standard and safety classified software for CSS-N and CSS-OS.
 - Development of technical solutions for implementing specific functionalities for CSS-N and/or CSS-OS. For example, high integrity communications between different systems, interfacing CSS-N and CSS-OS.

6 Specific requirements and conditions

- Design, construction and operation of instrumented safety systems based on Siemens S7 PLC technologies for large heterogeneous facilities. (Lot 1, 2, 3, 4)
- Hardware and software integration of safety industrial control systems. (Lot 1, 2, 3)
- IEC 61508, IEC 61511 and IEC 61513 standards. (Lot 1, 2, 3, 4)
- Reliability assessment of heterogeneous safety I&C systems. (Lot 1)
- Acceptance testing of I&C safety systems. (Lot 1, 3)
- Development of safety software for S7-400 FH PLC series. (Lot 3, 4)
- Interfacing Siemens S7-400 FH series PLCs with field instrumentation. (Lot 1, 2, 3)
- Prototyping of safety related systems. (Lot 3, 4)
- Industrial SCADA for safety related systems, especially Siemens WinCC Open Architecture. Knowledge in Linux operating system. (Lot 1, 3, 4)
- Review and production of I&C cabling diagrams for safety related systems. (Lot 2)
- Knowledge in Linux operating system. (Lot 1, 3, 4)
- Software quality assurance and quality control. (Lot 1, 3, 4)

7 Quality Assurance Requirements

The organization conducting these activities should have an ITER approved QA Program or an ISO 9001 accredited quality system.

The general requirements are addressed in ITER Procurement Quality Requirements (ITER_D_22MFG4).

Prior to commencement of the contract, a Quality Plan (QP) should be submitted for IO approval in accordance with Procurement Requirements for Producing a Quality Plan (ITER_D_22MFMW). The QP should describe the organization for the contract; the skill of workers involved in the study; any anticipated sub-contractors; and giving details of who will be the independent checker of the activities.

All requirements of this Technical Specification and subsequent changes proposed by the Contractor during the execution of the Contract are subject to the Deviation Request process described in Procedure for the management of Deviation Request (ITER_D_2LZJHB). When a non-conformance is identified, the contractor are subject to the Non-conformance Report process describe in Procedure for management of Nonconformities (ITER_D_22F53X).

Documentation developed as the result of the contract should be retained by the performer for a minimum of 5 years and then may be discarded at the direction of the IO. The use of computer software to perform a safety basis task activity such as analysis and/or modelling, etc shall be reviewed and approved by the IO prior to its use, it should fulfil IO document on Working Instruction for the Qualification of ITER safety codes (ITER_D_258LKL).

8 Safety requirements

ITER is a Nuclear Facility identified in France by the number-*INB-174* (“Installation Nucléaire de Base”).

For Protection Important Components and in particular Safety Important Class components (SIC), the French Nuclear Regulation must be observed, in application of the Article 14 of the ITER Agreement.

In such case, the Suppliers and Subcontractors must be informed that:

- The Order 7th February 2012 applies to all the components important for the protection (PIC) and the activities important for the protection (PIA).
- The compliance with the INB-order must be demonstrated in the chain of external contractors.
- In application of article II.2.5.4 of the Order 7th February 2012, contracted activities for supervision purposes are also subject to a supervision and surveillance done by the Nuclear Operator.

For the Protection Important Components, structures and systems of the nuclear facility, and Protection Important Activities the contractor shall ensure that a specific management system is implemented for his own activities and for the activities done by any Supplier and Subcontractor following the requirements of the Order 7th February 2012.

Part of the activities of this framework contract will be PIA and their associated defined requirements will be defined on a case by case basis through the corresponding task orders.

9 Candidature

Participation is open to all legal persons participating either individually or in a grouping (consortium). All legal persons including all consortium members should be 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 cannot be modified later without the approval of the ITER Organization.

Legal entities belonging to the same legal grouping are allowed to participate separately if they are able to demonstrate independent technical and financial capacities. Bidders' (individual or consortium) must comply with the selection criteria. IO reserves the right to disregard duplicated references and may exclude such legal entities from the tender procedure.

In the event of a consortium, a draft of the Consortium Agreement, or letter of intent and Power of Attorney signed by all the consortium members shall be submitted together with the tender.

On 31 January 2020, the UK left the EU and Euratom with a transition period from 1st February to 31 December 2020 to be used to determine the conditions of their future relationship. Euratom is the ITER Member and the withdrawal of the UK from Euratom leads to the fact that UK is not anymore party to the ITER project.

Until the 31 December 2020, current end date of the transition period, UK entities retain the right to participate in IO procurement procedures.

10 Reference

Further information on the ITER Organization procurement can be found at:

<http://www.iter.org/org/team/adm/proc>