



## SUMMARY

# Framework Service contract for Engineering Support to ITER CODAC Core System, Phase 2.

### **Purpose**

The ITER Organization is providing the suppliers of instrumentation and control for the plant systems with a software distribution that includes the ITER tools for the development and tests of the software. This software distribution, the CODAC Core System, is built, distributed and supported by the CODAC Section of the Control System Division. This distribution is also used for configuring the ITER central systems.

The purpose of this Contract is to provide services to assist the CODAC Section in this activity.

### **Background**

ITER is a joint international research and development project for which initial construction activities have recently started. The project aims to demonstrate the scientific and technological feasibility of fusion power for peaceful purposes. The seven Members of the ITER Organization are the European Union (represented by EURATOM), Japan, the People's Republic of China, India, the Republic of Korea, the Russian Federation and the USA. ITER will be constructed in Europe, at Cadarache, in southern France, where the ITER Organization (IO) has its headquarters. The primary objective of ITER is to show fusion could be used to generate electrical power, and to gain the necessary data to design, construct, and operate the first electricity-producing plant. It will generate 500 MW of fusion power for extended periods of time, ten times more than the energy input needed to keep the plasma at the right temperature. It will therefore be the first fusion experiment to produce net power. It will also test a number of key technologies, including the heating, control, diagnostic and remote maintenance that will be needed for a full-scale fusion power station.

The ITER Instrumentation and Control (I&C) System is the term encompassing all hardware and software required to operate ITER. It has two coarse levels of hierarchy; the Central I&C Systems and the Plant Systems I&C. The Central I&C Systems comprise CODAC (Control, Data Access and Communication), the Central Interlock System (CIS) and the Central Safety

Systems (CSS). The Central I&C Systems are “in-cash”, i.e. procured by ITER Organization (IO), while Plant Systems I&C are “in-kind”, i.e. procured by the seven ITER Domestic Agencies. It is currently estimated that there will be 209 Plant Systems I&C with associated sensors and actuators supplied via 89 Procurement Arrangements (PA) between the ITER Organization and the Domestic Agencies.

The primary goal of the ITER I&C system is to provide a fully integrated and automated control system for ITER. Standardization of Plant Systems I&C is of primary importance. Mandatory rules and recommendations for the development and component selections are documented in the Plant Control Design Handbook (PCDH) and the plant system I&C suppliers are provided with a software distribution named “CODAC Core System” supporting such rules and recommendation. This software distribution includes the prescribed operating system, Red-Hat Enterprise Linux, the control framework, EPICS, as well as all the software components for the development and test of the plants system’s I&C.

### **Scope of work**

The scope of the services covers the supply of suitable and experienced personnel to assist the Control System Division in the following tasks for the CODAC Core System distribution:

- User support services
  - First line user support by e-mail
  - Quality control of new versions
  - Training tasks at the workshops organized for users at the ITER premise or at the suppliers’ premise
  - Maintenance and development of the on-line training material.
- Software management services:
  - Maintenance of the CODAC software management process, notably for QA.
  - Contributions for improving this process
  - User support, according to the required quality level
  - Quality control of the components against required quality level
  - Maintenance of the SVN based configuration control and of QA-related tools
  - Maintenance of the Jenkins based build process
  - Preparation of new versions, monitoring and resolution of issues
  - Assistance to the package owners for integration into distribution and for tools configuration
  - Assistance to integration and customization on the ITER central systems
- Software maintenance and development services
  - Development, maintenance and support of the ITER specific components, such as the Self-Description Data (SDD) tools or the ITER Maven plug-ins
  - Enhancement and maintenance of the ITER specific modules in existing software. This includes the maintenance, development and expert support of the CS-Studio modules that are used for ITER
  - Maintenance of the user support material: documentation, training presentations, exercises

- Maintenance of the tests and execution of the test procedures for the preparation of new versions
- Handling of changes from assignment to validation applying the CODAC procedure
- Specialized services for the ITER fast controllers
  - Maintenance of the software supporting the ITER high performance networks: Time Communication Network (TCN), Synchronous Databus Network (SDN) and Data Archiving Network (DAN)
  - Maintenance of the Linux drivers for the standardized I/O boards
  - Maintenance of the EPICS device support for the standardized I/O boards
  - Quality control of these components, according to their quality level

Reference:

- CODAC Core System Overview (IDM\_D\_34SDZ5) :  
[http://static.iter.org/codac/pcdh7/Folder%201/3-CODAC\\_Core\\_System\\_Overview\\_34SDZ5\\_v4\\_3.pdf](http://static.iter.org/codac/pcdh7/Folder%201/3-CODAC_Core_System_Overview_34SDZ5_v4_3.pdf)

Due to the multiplicity of services required, the Contract will be broken down into different lots and the ITER Organization reserves the right to award this contract to more than one supplier per lot.

As a general statement, the details of the services to be provided by the contractor will be defined in the task order technical specification document. These technical specifications will be defined specifically for each Task depending on the actual requirement and will include a technical scope, the organization of the task in IO and a description of the deliverables.

**Duration of services**

The contract will be carried out over an initial period of three (3) years and an optional extension of two (2) years. The contract is scheduled to come into force in February 2016.

**Procurement Time table**

A tentative time table is outlined as follows:

Call for Nomination	Early April 2015
Receipt of nominations	Early May 2015
Issuance of Pre-qualification-	May 2015
Notification of Pre- qualification results	Early June 2015
Issuance of this Call for Tender	June 2015

<b>Tender Proposals Due Date:</b>	<b>August 2015</b>
Estimated Contract Award Date:	September-October 2015
MAC Approval	November 2015
Contract signature	November 2015
Estimated Contract Start Date:	February 2016 or earlier

### **Experience**

The contractor and its personnel shall have adequate experience in control system. This includes but is not comprehensive:

- Software development and maintenance for control systems in Linux environment
- User support and training for experimental facilities
- Development and maintenance of low-software driving hardware and communication software
- Usage of EPICS
- Quality control for high availability.

### **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 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.

### **Reference**

Further information on the ITER Organization procurement can be found at:  
<http://www.iter.org/org/team/adm/proc/overview>