SUMMARY

Call For Nomination IO/CFN/12/7-0058/JTR

Framework contract to Build Large Scale Use Cases for Diagnostics Plant I&C

Purpose

The purpose of the requested support is to assist the CODAC section and diagnostics division by supplying suitable Fast Controllers and expertise in their configuration and setup in use cases targeted to contribute for CODAC DWS milestones, related to for data acquisition, processing and streaming. The added value experience and expansion to the ITER CODAC Fast Controller Catalogue will be made available to Domestic Agencies through the Plant System Design Handbook and its annex document, the Plant I&C Support and the CODAC Core System support. Diagnostics use case implementations, which will representative for many different diagnostics plant systems will serve the ITER Domestic Agencies for their specific applications.

Background

ITER Instrumentation and Control (I&C) Systems comprise the complete control, interlock and safety systems required to operate the ITER Tokamak, under construction in Cadarache, France. ITER I&C system has two layers, central coordination and local plant systems. The central systems are “in-fund”, i.e. procured by the ITER Organization (IO), while plant systems are “in-kind”, i.e. procured by the seven ITER Domestic Agencies (DAs). An estimated number of 89 contracts, called Procurement Arrangements (PA), including plant system I&C is being signed by the ITER Organization and the Domestic Agencies. The signatures are distributed in time, covering the period of 2011 – 2017 (for the practical purpose of this Framework contract). Each Procurement Arrangement may include multiple plant system I&C with a current total estimate of 220. The Domestic Agencies is contracting out the detailed design and manufacturing of the plant systems, including their plant system I&C, to local industry. In order to ensure the integration and maintainability, the instrumentation and control of plant systems need to be standardized to very high level of compatibility. One of the key elements in the standardization effort is the interface of the plant system with the central CODAC (Control, Data Access and Communication) control system. An important element in the ITER standardization strategy is a set of I&C software tools, called CODAC Core System. The Control System Division is maintaining a set of hardware catalogues of I&C items which the CODAC Core System is supporting.
The CODAC Fast Controller Guidelines and Fast Controller Catalogue are an essential step to reach a good level of standardization in plant I&C. These documents are available to all organizations and entities who have signed a Procurement Arrangement to build an ITER plant system. The fast controller catalogue references all the fast controller hardware necessary to develop and manage the construction phase of the plant system I&C. It contains chassis in different form factors, IO cards, network interfaces and provides information about the available software components for these components. The fast controller catalogue will play an important role during all life cycle phases of the plant system I&C from specification, design, manufacturing and factory and acceptance testing.

Scope of work

The supply of Fast Controllers according to ITER CODAC standards requires various services to be provided. Within the Framework contract, the Control System Division will issue Task Orders covering well defined use cases for a fast controller application. Each Task Order has a variable length, explained below but with maximum length of 3 years, covering the building, supply and maintenance phases.

With respect to CODAC Core System the building and supply phases cover the specification of requirements for Linux and EPICS support, the planning, designing and developing of repository level software, the provision of health management, and finally acceptance testing. Also covered are the maintenance over a period of 3 years from the issue of the Task Order to maintain concurrency with the new releases of CODAC Core system.

The task concerning CODAC/plant I&C interfaces cover the interfaces to the Data Archiving Network (DAN), the Synchronous Data Network (SDN), the Time Communication Network (TCN) and other ITER CODAC fast controller interfaces. Also the interfaces required maintenance to ensure compliance with new releases of CODAC Core System.

The diagnostic plant system I&C support covers manufacturing specifications, obsolescence management, maintenance of plant I&C components, and diagnostic use case implementations.

One Contractor's professional and senior staff member is required to visit ITER site in the beginning of each Task Order, for Kick-off meeting and to get training in latest development of CODAC Control System in view of fast controller integration and testing. Part time expert resources are expected to be pulled in when needed. The services to be provided by the successful tenderer will include the following tasks:

- Building or assembling ITER CODAC Fast Controllers or the electronic components used in them.
• Installation and industrial integration of the above Fast Controllers in the ITER CODAC Control System and in the relative Diagnostics plant system large scale prototypes
• Providing the ITER CODAC Core System compatible software for the above components in view to reach its DWS milestones in due time
• Deliver the documentation, test plan and test report for the above software and hardware components
• Provide the system integration expertise in Diagnostic use case large scale prototype setup in view of their usage in Diagnostics Procurement Arrangements
• Provide maintenance, calibration service and component life cycle management services to the delivered Fast Controllers, components and their supporting software

Duration of Contract

The Contract is scheduled to come into force in the second quarter of 2013 for the initial duration of three (3) years, with the possibility to extend the contract duration by two further periods each of one year.

Procurement Time table

A tentative time table is outlined as follows:

<table>
<thead>
<tr>
<th>Event</th>
<th>Date</th>
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<tbody>
<tr>
<td>Call for Nomination release</td>
<td>December 2012</td>
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<tr>
<td>Receipt of nominations</td>
<td>January 2013</td>
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<tr>
<td><strong>Issuance of Pre-Qualification Questionnaire</strong></td>
<td>February 2013</td>
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<tr>
<td>Clarification questions related to the PQQ (if any)</td>
<td>February 2013</td>
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<tr>
<td>Response to Questions from ITER Organization</td>
<td>February 2013</td>
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<tr>
<td><strong>Receipt of Prequalification Application</strong></td>
<td>March 2013</td>
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<tr>
<td>Notification of Prequalification results</td>
<td>March 2013</td>
</tr>
<tr>
<td><strong>Issuance of Call for Tender</strong></td>
<td>March 2013</td>
</tr>
<tr>
<td>Clarification questions related to this Call for Tender</td>
<td>April 2013</td>
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<tr>
<td>Response to Questions from ITER Organization</td>
<td>April 2012</td>
</tr>
<tr>
<td><strong>Tender Proposals Due Date:</strong></td>
<td>April 2013</td>
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<tr>
<td>Tender Evaluation &amp; Notification of results</td>
<td>May 2013</td>
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<tr>
<td>Estimated Contract Award Date:</td>
<td>May 2013</td>
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<tr>
<td>Estimated Contract Start Date:</td>
<td>May 2013 2012</td>
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Experience

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

- Experience in integration of industrial control systems (> 1,000 inputs/outputs);
- Experience in integration of high-throughput image acquisition systems (>10 Gbps);
- Experience in integration of various form factor standard, like MTCA.4, ATCA, PXI;
- Experience in the field of instrumentation;
- Maintenance of industrial control systems and computer equipment for a duration greater than 5 years;
- Knowledge of the technologies specified in the ITER standardization document, in particular Linux, EPICS, industrial computer form factors derived from the PCI-Express specification;
- Knowledge on communications and timing network protocols, such as 10 and 40 Gb/s Ethernet and IEEE-1588-2008;
- Knowledge on FPGA and GPU based data acquisition systems and their signal interfacing;
- Experience of programming multitasking applications;
- Experience of programming high data throughput systems;
- Experience of installing industrial rack mounted systems, D-rails, patch panels and such;
- Experience of manufacturing and configuring batches of identical industrial computer systems;
- Skilled organization and staff in terms of Quality Assurance (possession of ISO 9001 and/or CMMI);
- Ability to provide professional staff as needed on ITER site.

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.

Reference

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

HTTP://WWW.ITER.ORG/ORG/TEAM/ADM/PROC/PAGES/WELCOME