

+Call for Expertise: エキスパート募集

IO References: IO/24/CFE/10030272/ADO

“PLC frameworks extension and Magnetics diagnostics I&C integration support”

(PLC フレームワークの拡張と磁器計測 I&C 統合支援)

IO 締め切り 2024 年 12 月 17日(火)

概要：

イーター機構（IO）では、上記タスクの支援をいただく作業を ITER 参加極の企業・機関等から募集します。応募を希望される企業・機関等は、所定の期限までに応募書類を直接 ITER 機構の下記担当までご提出下さい。

○ 今回の募集に関する書類は以下の通りです。

- ・ 招待状
- ・ 技術仕様書
- ・ 履歴書（CV）テンプレート
- ・ 見積もり提案書テンプレート
- ・ 誓約書
- ・ 守秘義務に関する誓約書(契約締結時に署名されること)

○ 応募者は、以下の申込用紙を ITER 機構に直接送付願います。

- ・ 履歴書（ITER 機構の招待状と技術仕様書で規定した要求事項と基準を満足していることを示す経験について明記されていること）
- ・ 誓約書（署名入り）
- ・ 見積もり提案書

（※提出書類は pdf ファイル 1 本にまとめて送付願います。）

○ 応募書類の提出先

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○はじめに

この事前情報通知 (PIN) は、供給契約の審査および実行につながる公開入札調達プロセスの最初のステップです。この文書の目的は、作業範囲と入札プロセスに関する技術的内容の基本的な概要を提供することです。

○背景

ITER プロジェクトは、欧州連合 (EU) (EURATOM を代表とします)、日本、中華人民共和国、インド、韓国、ロシア連邦、米国の 7 カ国が共同出資する国際的な研究開発プロジェクトで、ITER 機構 (IO) の本部 (HQ) があるヨーロッパ、フランス南部のサン・ポール・レ・デュランスで建設されています。

ITER プロジェクトの組織面および技術面の詳細については、www.iter.org を参照してください。

○作業範囲

「PLC フレームワークの拡張と磁器計測 I&C 統合支援」と題した本契約の目的は、技術仕様書に記載されたサービスの提供を調達することです。詳細は技術仕様書 2024 年 10 月 17 日付けの ITER_D_ADLMZW v1.1 (本 PIN 文書の附則 I) を参照下さい。

○調達プロセスと目的

目的は、競争入札プロセスを通じて供給契約を落札することです。

この入札のために選択された調達手続きは公開入札手続きと呼ばれます。

オープン入札手順は、次の 4 つの主要なステップで構成されています。

➤ ステップ 1-事前情報通知 (PIN)

事前情報通知は公開入札プロセスの第一段階です。IO は、関心のある候補企業に対し、10 作業日までに担当調達担当官に以下の情報を提出し、競争プロセスへの関心を示すよう正式に要請します。

-候補会社の名称

-登録国

-連絡先の名前、電子メール、タイトル、電話番号。

特に注意:

関心のある候補企業は、IO Ariba の電子調達ツール「IPROC」に登録してください (まだ登録していない場合)。手順については、<https://www.iter.org/fr/proc/overview> を参照してください。

Ariba (IPROC) に登録する際には、お取引先様に最低 1 名の担当者の登録をお願いします。この連絡担当者は、提案依頼書の発行通知を受け取り、必要と思われる場合は入札書類を同僚に転送することができます。

- ステップ 2-入札への招待
関心のある候補企業の完全登録後、提案依頼書 (RFP) を「IPROC」に掲載します。この段階では、担当の調達担当者に関心を示し、かつ IPROC に登録している関心のある候補企業は、RFP が公表された旨の通知を受けることができます。その後、RFP に詳述されている入札説明書に従って提案書を作成し、提出します。

このツールに登録されている企業のみが入札に招待され、登録されている企業は、自社の名前でのみ提案を提出できます。

- ステップ 3-入札評価プロセス
入札者の提案は、IO の公平な評価委員会によって評価されます。入札者は、技術的範囲に沿って、かつ、RFP に記載された特定の基準に従って作業を実施するために、技術的遵守を証明する詳細を提供しなければなりません。
- ステップ 4-落札
認定は、公開されている RFP に記載されている、コストに見合った最適な価格または技術的に準拠した最低価格に基づいて行われます。

○概略日程

概略日程は以下の通りです：

マイルストーン	暫定日程
IOWeb ページと DA との連絡により 事前指示書 (PIN) の発行	2024 年 11 月 25 日
関心表明フォームの提出	2024 年 12 月 5 日
IPROC での提案リクエスト (REP) の発行	2024 年 12 月 16 日
IPROC で入札提出	2025 年 1 月 13 日
入札評価と契約授与	2025 年 1 月 29 日
契約調印	2025 年 2 月 10 日
契約開始	2025 年 2 月 E

○契約期間

予想される契約期間は、12 か月です。

○経験

入札者は、IO の技術的要件に沿った期待される支援を提供するにあたり、その知識と経験と能力があることを英語で示す必要があります。ITER での使用言語は英語です。流暢でプロレベルが必要です（スピーキングとライティング共に）。

○候補

参加は、個人またはグループ/コンソーシアムに参加するすべての法人に開放されます。法人とは、法的権利及び義務を有し、ITER加盟国内に設立された個人、企業又は機構をいいます。

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どのコンソーシアムメンバーも IPROC に登録する必要があります。

【※ 詳しくは添付の英語版技術仕様書「**PLC frameworks extension and Magnetics diagnostics I&C integration support**」をご参照ください。】

ITER 機構のウェブサイト

<http://www.iter.org/org/team/adm/proc/overview> からもアクセスが可能です。

「核融合エネルギー研究開発部門」の HP : <http://www.fusion.qst.go.jp/ITER/index.html> では ITER 機構からの各募集 (IO 職員募集、IO 外部委託、IO エキスパート募集) を逐次更新しています。ぜひご確認ください。

PRIOR INFORMATION NOTICE (PIN)

IO/24/CFE/10030272/ADO

‘PLC frameworks extension and Magnetics diagnostics I&C integration support’

Procurement Officer in charge:

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Abstract.

The purpose of this PIN is to provide prior notification of the IO’s intention to launch a competitive Call for Expertise process in the coming weeks. This PIN provides some basic information about the ITER Organisation (the “IO”), the technical scope for this tender, and details of the tender process.

1 Introduction

This Prior Information Notice (PIN) is the first step of a Call for Expertise Procedure leading to the award and execution of a Service Contract.

The purpose of this document is to provide a basic summary of the technical content in terms of the scope of work, and the tendering process.

2 Background

The ITER project is an international research and development project jointly funded by its seven Members being, 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 is being constructed in Europe at St. Paul–Lez–Durance in southern France, which is also the location of the headquarters (HQ) of the ITER Organization (IO).

For a complete description of the ITER Project, covering both organizational and technical aspects of the Project, visit www.iter.org.

3 Scope of Service

The purpose of this Contract titled “**PLC frameworks extension and Magnetics diagnostics I&C integration support**” is to procure the provision of services described in the Technical Specifications ref. **ITER_D_ ADLMZW v1.1 dated 17 October 2024** (Annex I to this PIN document).

4 Procurement Objective & Process

The objective is to award a Contract through a competitive bidding process.

The procedure is comprised of the following four main steps:

➤ Step 1 - Prior Information Notice (PIN)

The Prior Information Notice is the first stage of the process. The IO formally invites interested candidate companies to indicate their interest in the competitive process, within **10 working days**, by returning to the Procurement officer in charge the following information by the date indicated under paragraph 5 below:

- Name of candidate company
- Country of registration
- Point of contact name, email, title, and phone number.

Special attention:

Interested candidate companies are kindly requested to register in the IO Ariba e-procurement tool called “I-PROC”, if not already done so. The process on how to register is described in the following link: <https://www.iter.org/fr/proc/overview>.

When registering in Ariba (I-PROC), suppliers are kindly requested to register at least one contact person. This contact person will be receiving the notification of publication of the Request for Proposal and will then be able to forward the tender documents to colleagues if deemed necessary.

➤ Step 2 - Request for Proposals

After the full registration of interested candidate companies, the Request for Proposals (RFP) will be published in “I-PROC”. This stage allows interested candidate companies who have indicated their interest to the Procurement Officer in charge AND who have registered in IPROC to receive the notification that the RFP is published. They will then prepare and submit their proposals in accordance with the tender instructions detailed in the RFP.

Only companies registered in this tool will be invited to the tender and registered company can only submit a proposal in their name.

➤ Step 3 – Tender Evaluation Process

Tenderers proposals will be evaluated by an impartial evaluation committee of the IO. Tenderers must provide details demonstrating their technical compliance to perform the work in line with the technical scope and in accordance with the particular criteria listed in the RFP.

➤ Step 4 – Contract Award

The award will be done on the basis of best value for money as described in the published RFP.

5 Procurement Timetable

The tentative timetable is as follows:

Milestone	Date
Publication of the Prior Indicative Notice (PIN) on IO Webpage and communications with DAs	25 November 2024
Deadline for Submission of expression of interest form	05 December 2024
Request for Proposals (RFP) publishing on IPROC	16 December 2024
Tender Submission in IPROC	13 January 2025
Tender Evaluation & Contract Award	29 January 2025
Contract Signature	10 February 2025
Contract Commencement	End of February 2025

6 Contract Duration and Execution

The estimated contract duration shall be 12 months.

7 Experience

The tenderers shall demonstrate their knowledge, experience and capabilities in the implementation of providing expected supports in accordance with the IO technical requirements.

The working language of ITER is English, and a fluent professional level is required (spoken and written).

8 Candidature

Participation is open to all legal entities participating either individually or in a grouping/consortium. A legal entity is a company or organization that has legal rights and obligations and is established within an ITER Member State.

Legal entities cannot participate individually or as a consortium partner in more than one application or tender of the same contract. 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.

In order for a consortium to be acceptable, the individual legal entities included therein shall have nominated a leader with authority to bind each member of the consortium, and this leader shall be authorised to incur liabilities and receive instructions for and on behalf of each member of the consortium.

It is expected that the designated consortium leader will explain the composition of the consortium members in its offer. Following this, the Candidate's composition must not be modified without notifying the ITER Organization of any changes. Evidence of any such

authorisation shall be submitted to the IO in due course in the form of a power of attorney signed by legally authorised signatories of all the consortium members.

Any consortium member shall be registered in I-PROC.

9 Sub-contracting Rules

Sub-contracting is not allowed.

Technical Specifications (In-Cash Procurement)

2024-10 - CFE - PLC frameworks extension and Magnetics diagnostics I&C integration support

Call for Expertise - Technical specification of work to be performed related to future proofing of PLC frameworks and tools, and for Diagnostics I&C Integration with Central I&C systems. No PIC/PIA and PE/NPE involved.

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1 PURPOSE

This document provides the technical specification for the work to be performed under a Call for Expertise (CFE) for the following activities:

- The future proofing of Programmable Logic Controllers (PLC) framework and tools, i.e. the Unified Control Library (UCL) and Code Generation Tool (CGT), covering design improvements for scalability and expandability, additional library support, integration of EPICS components and functional testing
- The preparation of ITER magnetics diagnostics plant controller (PBS 55.A0) integration with central I&C systems, i.e. Control, Data Access and Communications (CODAC) system and Central Interlock System (CIS), covering automated procedures, configuration workflows and data archiving.

2 BACKGROUND

Each of the 55+ ITER diagnostic Instrumentation and Control (I&C) systems are developed by the IO-CT and the Domestic Agencies (DA) according to their responsibilities for the supply of the various diagnostics.

The diagnostics I&C systems are integrated with central I&C systems to form part of the ITER integrated control system and take part in the integrated and automated operation of ITER from the Main Control Room (MCR).

2.1 Update of the Code Generation Tool

The ITER Code Generation Tool (CGT) [RD4] has been developed to support the use of a standardized uniform component library (UCL) [RD5] in order to perform validation actions, self-consistency checks to generate PLC code and other critical project resources. The CGT thus facilitates troubleshooting and maintenance activities, as well as enhancing the projects quality with the benefit of managing ever improving consistency with documentation.

The existing CGT now requires updates to support:

1. An additional electrical system code library, including new generated resources such as code and HMI resources.
2. Additional EPICS record support, including record-level verification and validation checks.
3. Functional tests that use the existing PLC development infrastructure [RD6], to improve the quality assurance and confidence in the generated code.

2.2 Integration Support for Magnetics Diagnostics

The magnetics diagnostic plant system [RD7] is critical to the successful operation of ITER plasma pulses, produces large volumes of sensor data that is used to calculate critical plasma parameters in real time. In addition to being used for real-time plasma diagnostic and control, the data must also be archived.

The magnetics diagnostics component will soon be integrated into the ITER operational infrastructure. This integration process will require the development, qualification and integration of:

1. Plant I&C configuration workflows and interfaces, incl. support for interfacing to OPC UA servers.
2. SUP automation, using the Sequencer infrastructure.
3. Data archiving adapters.

3 SCOPE

The Call for Expertise (CFE) aims at securing access to additional relevant technical competences to contribute to the development of identified plant system software components.

Unless specified otherwise in this document, the principles laid out in [RD8] are applicable to this technical specification.

The services are compatible with, and preferably performed, offsite with the exception of deployment and verification of magnetics diagnostics software which require onsite presence.

4 DEFINITIONS

CODAC	Control, Data Access and Communications
CVVF	Configuration Verification and Validation Framework
EPICS	Experimental Physics and Industrial Control System
SRS	System Requirements Specification
SDS	System Design Specification
SMS	System Manufacturing Specification
STR	System Test Report
STP	System Test Plan
SUP	Supervision and Automation component

5 REFERENCES

- [RD1] SEQA-45 - Software Engineering and Quality Assurance for CODAC ([2NRS2K](#))
- [RD2] [ITER_D_BHUMA6 - Supervision and Automation - Software Requirements Specification](#)
- [RD3] [ITER_D_28NSQS - Supervision and Automation - Configuration - Software Architecture and Design Description](#)
- [RD4] Code Generation Tool Design ([5JDH9E v2.0](#))
- [RD5] [Unified Control Library \(iter.org\)](#)
- [RD6] TIA Portal Tools (<https://git.iter.org/scm/coa/tia-portal-tools.git>)
- [RD7] 55.A0 Design Description Document ([2K9Y6N v1.1](#))
- [RD8] [ITER_D_82MXQK - General Management Specification for Service and Supply](#)

6 ESTIMATED DURATION

The contract duration is 12 months.

7 WORK DESCRIPTION

The work is partitioned into two task areas as follows:

- To extend the Code Generation Tool to:
 - Improve data storage handling.
 - Support the “electrical” library component.
 - Integrate EPICS records, including verification support.
 - Support functional tests using the TIA Portal resources.
- To support the integration of the magnetics diagnostics component, as follows:
 - Examine, update and develop configuration interfaces support SUP automated configuration operations.
 - Examine, update and develop sequencer components to support SUP automated sequences.

Examine, update and develop data archiving components to interface to CODAC data archiving infrastructure.

The development process for both features is similar:

- Review of the current proposed design (together with the developed ITA prototypes – that have supported and validate the idea);
- Proposal of a detailed design (using UML);
- Implementation of the actual design, leveraging the already existent C++ common framework that exists in IO-CT;
- Continuous testing and validation of the development; and
- Production of user-documentation.

These activities are expected to be executed following an *agile* approach, with weekly technical meetings involving all the key actors (namely, one dedicated developer by IO-CT and IO-CT representatives), with additional support from the CODAC SUP TRO and development team, when necessary.

The development work will be broken down into chunks of activities that allow for a fast release cycle (e.g. 3 weeks' time). The components will go through static analyses, be unit-tested and assessed against relevant software quality assurance metrics through Continuous Integration (CI), and (as soon as technically feasible) the releases will be validated in the scope of the magnetics plant controller I&C development.

7.1 Activity Breakdown

Title	Outputs/Features	Date
1.1 CGT Design update 1	Improved storage performance design	22/12/24
2.1 MagDiag, Design 1	Configuration interfaces design	15/01/25
1.2 CGT Implementation 1	Updates for design, phase 1	16/02/25
1.3 CGT Design 2	Electrical library support design	02/03/25
2.2 MagDiag, Implementation 1	Configuration interfaces impl.	26/03/25
2.3 MagDiag, Design 2	Sequencer stakeholder consultation	09/04/25
1.4 CGT Implementation 2	Updates for design, phase 2	27/04/25
1.5 CGT Design 3	EPICS record support design	18/05/25
2.4 MagDiag, Implementation 2	Sequencer component implementation	18/06/25
2.5 MagDiag, Design 3	Archiving stakeholder consultation	02/07/25
1.6 CGT Implementation 3	Updates for design, phase 3	13/07/25
1.7 CGT Design 4	Integrated testing design	03/08/25
2.6 MagDiag, Implementation 2	Archiving component implementation	10/09/25
1.8 CGT Implementation 3	Updates for design, phase 4	28/09/25
2.7 MagDiag, Implementation 3	Finalised implementation	05/11/25
1.9 CGT Implementation 4	Finalised implementation	09/11/25

7.2 List of Deliverables and Due Dates

Deliverable	Description	Type (TDFC)	Due date
D1	<ul style="list-style-type: none"> Updated I&C software Verification report Consolidated activity report 	Software V&V Report Report	T0 + 4 months

D2	<ul style="list-style-type: none"> • Updated I&C software • Verification report • Consolidated activity report 	Software V&V Report Report	T0 + 8 months
D3	<ul style="list-style-type: none"> • Updated I&C software • Verification report • Consolidated activity report 	Software V&V Report Report	T0 + 12 months

8 RESPONSIBILITIES

IO will nominate a Technical Responsible Officer for this contract.

The contractor will provide specialist resources on a long-term permanent basis for the duration and at the location as required under this scope of work. The contractor undertakes that:

- The personnel will possess the qualifications, professional competence and experience to carry out such services in accordance with best practice within the industry;
- The personnel will be bound by the rules and regulations governing ITER safety and security when present at ITER premises;
- The required safety clearance deliverables will be provided and maintained accurate during period of execution of the services.

8.1 Experience and Specific Skills

Education:

- Master degree or equivalent in Physics, Control Engineering or Computer Science.

Professional experience:

- At least 10 years' experience working as Control Software Engineer in designing, installing, commissioning or operation of large-scale scientific control systems;
- Familiarity with fusion machines, plasma physics and tokamak diagnostics is considered most advantageous.

Technical Competencies and demonstrated experience in:

- Using, designing, implementing and verifying control system distributed automation software frameworks and applications;
- Executing integration and commissioning of heterogeneous I&C systems, including identifying and resolving issues;
- Using Linux, virtualization environments, real-time operating systems and application frameworks;
- Using C++, Matlab and python programming languages and environments;
- Applying high-integrity software quality assurance processes;
- Following agile software development processes;

- Delivering high quality technical reports and documentation in English;
- Using EPICS7 Channel Access and pvAccess communication protocols and EPICS7 ecosystem tools is considered most advantageous;
- Familiarity with the ITER integrated control system architecture, tools and techniques is considered most advantageous given the tight schedule.

Behavioural competencies:

- Ability to create and sustain a mutually supportive team work environment;
- Ability to create clean and maintainable code;
- Ability to analyse multiple and diverse sources of information to understand problems accurately before moving to proposals.

9 ACCEPTANCE CRITERIA

The following criteria shall be the basis of the acceptance of the successful accomplishment of the Work.

9.1 Delivery date criteria

On-time delivery of deliverables according to the milestone dates defined in Section 7. Quarterly reports are defined and used as a vehicle to track acceptance of detailed activity deliverables for payment purposes.

9.2 Report and Document Review criteria

Refer to section 6.2 of [RD8].

9.3 Software delivery criteria

Software source code shall be delivered in the ITER Organizations software repository (GIT) by the Contractor for acceptance. The IO Technical Responsible Officer for this contract is the Approver of the delivered software source code.

The acceptance is based on CI reports, source code and quality peer reviews performed with each GIT pull requests, and when technically achievable, release verification reports pertaining to the magnetics plant controller I&C development project.

10 SPECIFIC REQUIREMENTS AND CONDITIONS

The services are compatible with hybrid onsite and offsite activities, with the exception of deployment and re-qualification after software change which require onsite presence.

11 WORK MONITORING / MEETING SCHEDULE

The work will be managed by means of weekly planning and progress meeting and/or formal and informal exchange of documents which provide detailed information. Planning meetings will be organized by the ITER Organization to plan the upcoming activities, review the progress of the work, discuss, and resolve the technical problems.

The main purpose of the weekly meetings is to allow the ITER Organization and the contractor to:

1. Allow early detection and correction of issues that may cause delays;
2. Review the completed and planned activities and assess the progress made;
3. Permit fast and consensual resolution of unexpected problems;
4. Clarify doubts and prevent misinterpretations of the specifications.

On a quarterly basis, the contractor shall submit to ITER Organization an activity report with references to software deliveries and documentation produced during that period.

On request and by agreement, additional special subject meetings will be organized.

12 QUALITY ASSURANCE (QA) REQUIREMENTS

Considering the collaborative nature of the contributions, together with members of the ITER Control System team, and the objective for the produced software to be used on the production-level ITER control system, the Quality Assurance requirements described in the CODAC Software Engineering and Quality Assurance document [RD1] for Software Integrity Level 1 (SWIL-1) components shall apply to all deliverables.

13 SAFETY REQUIREMENTS

See section 5 of [RD8].

The work covered by this technical specification does not include PIC/PIA.

Expression of Interest

To be returned by e-mail to: alessia.donato@iter.org copy lijun.liu@iter.org before 05
December 2024

ITER Organization / ITER Headquarters
Procurement & Contracts Division
Route de Vinon-sur-Verdon
CS 90 046
13067 St. Paul Lez Durance Cedex
France

TENDER No. **IO/24/CFE/10030272/ADO**

TENDER Title: **PLC frameworks extension and Magnetics diagnostics I&C
integration support**

Officer in charge: **Alessia Donato – Procurement & Contracts Division,
ITER HQ Building 81/139**

☐ We acknowledge receipt of all tender documents for the above mentioned tender.
(In event of missing documents, contact the ITER Officer in charge)

☐ We intend to submit a tender

Contact Person for this solicitation Process:

Name: Tel:

Position: E-mail address:

Signatory Name:

Company Stamp

Title:

Signature:

Date: