外部委託業者の募集

References: IO/25/OT/70001288/LLU

“CIS Engineering Support"

（CIS エンジニアリングサポート）

IO 締め切り 2025 年 4 月 27 (日)

○はじめに

本事前情報通知（PIN）は、作業契約の入札授与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。

本文書の目的は作業範囲と入札プロセスに関する技術的な内容の基本的な要約を提供することです。

○背景

ITER は平和利用の核融合発電の科学的および技術的な実現可能性の実証を目的とした、国際共同研究開発プロジェクトです。ITER 機構の 7 つのメンバーは、;欧州連合（EURATOM が代表）、日本、中華人民共和国、インド、大韓民国、ロシア連邦、および米国です。

ITER の敷地はフランス南東部のブーシュデュローヌ地区にあり、ITER 本社（HQ）もあるフランス CEA サン・ポール・レ・デュランス に近いところに位置しています。詳細については、ITER のウェブサイト http://www.iter.org を参照して下さい。

○作業範囲

技術仕様書の付属書 1 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、以下の概略日程に示された期日までに担当調達担当官に添付の関心表明フォームで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。

  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

  PIN の発行から 10 作業日経過後、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。

〇概略日程

概略日程は以下の通りです：

マイルストーン	暫定日程
事前指示書（PIN）の発行	2025 年 4 月後半
関心表明フォームの提出	2025 年 4 月 PIN 発行の 10 暦日以内
iPROC での入札への招待の発行	2025 年 5 月末日の前
入札提出	2025 年 7 月中旬
契約評価と授与	2024 年 9 月中旬

〇契約期間と実行

ITER機構は2025年のQ3/Q4ごろ供給契約を授与する予定です。予想される契約期間は４年の固定期間に加えて、1つのオプション期間１年です。

〇経験

候補者は以下の経験と能力を持っている必要があります。

1）産業用制御システムのエンジニアリングおよび統合の経験

- 特に安全関連のアプリケーションの文脈において、複雑な産業用制御システムの設計、開発、テスト、試運転における実績のある能力。
- 制御モジュールと他のシステムとの統合に関する知識。

2）産業用オートメーションプラットフォームの専門知識

- スローコントロールアプリケーション向けの Siemens PLC-400FH ファミリーの習熟。
- 特に National Instruments LabView-FPGA v2017、c-RIO プラットフォーム、および Linux システム上の MARTe2.0 を使用した FPGA ベースのコントローラーの経験。

3) SCADA システムおよび通信プロトコルに関する知識

- WinCC OA を使用した SCADA システムの開発および統合をサポートする能力。
- OPC-UA 通信プロトコルおよび CODAC などの集中制御システムとの統合経験。

4）技術文書作成および仕様書作成能力

- ITER 規格に従った、エンジニアリング作業パッケージ、インターフェース文書、機能ブロック図、電気配線図などのエンジニアリング文書を作成する能力。
- 制御機能の仕様書作成に貢献し、システム機能分析を更新する能力。

5）オンサイトでの試運転および設置経験

- 工場および現場での受入試験を含む、電気および計装（I&C）の設置および試運転の実務経験。

〇候補

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。ITER 加盟国は欧州連合(EURATOM メンバー)、日本、中華人民共和国、インド共和国、大韓民国、ロシア連邦、アメリカ合衆国です。

法人は、単独で、またはコンソーシアムパートナーとして、同じ契約の複数の申請または入札に参加することはできません。共同事業体は、恒久的な、法的に確立されたグループ又は特定の入札手続のために非公式に構成されたグループとすることができます。

コンソーシアムのすべての構成員(すなわち、リーダーと他のすべてのメンバー)は、ITER 機構に対して連帯して責任を負います。

コンソーシアムとして許可されるために、その点で含まれる法人はコンソーシアムの各メンバーをまとめる権限をもつリーダーをもたなければなりません。このリーダーはコンソーシアムの各目メンバ

ーのために責任を負わなければなりません。

指名されたコンソーシアムのリーダーは、入札段階で、コンソーシアムのメンバーの構成を説明する予定です。その後、候補者の構成は、いかなる変更も ITER 機構に通知することなく変更してはなりません。かかる認可の証拠は、すべてのコンソーシアムメンバーの法的に授権された署名者が署名した委任状の形式で、しかるべき時期に IO に提出しなければなりません。

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。

既に技術仕様書 ref 番号 ITER_D_9GUSMN に記載の絶対バルブに関するフィージビリティを実施している全ての法人は本オープン入札プロセスに参加する資格はございません。

【※　詳しくは添付の英語版技術仕様書「**Service Framework Contract for CIS Engineering Support**」をご参照ください。】
ITER 公式ウェブ　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。

イーター国際核融合エネルギー機構からの外部委託
に関心ある企業及び研究機関の募集について

＜ITER 機構から参加極へのレター＞

以下に、外部委託の概要と要求事項が示されています。参加極には、提案された業務に要求される能力を有し、入札すべきと考える企業及び研究機関の連絡先の情報を ITER 機構へ伝えることが求められています。このため、本研究・業務に関心を持たれる企業及び研究機関におかれましては、応募書類の提出要領にしたがって連絡先情報をご提出下さい。

china eu india japan korea russia usa
Route de Vinon-sur-Verdon - CS 90 046 - 13067 St Paul Lez Durance Cedex - France

PRIOR INFORMATION NOTICE (PIN)

IO/25/OT/70001288/LLU

Service Framework Contract for

CIS Engineering Support

Abstract.

The purpose of this summary is to provide prior notification of the IO's intention to launch a competitive Open Tender process in the coming weeks. This summary 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 an Open Tender Procurement Process 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.

The Domestic Agencies are invited to publish this information in advance of the forth-coming tender giving companies, institutions or other entities that are capable of providing these services the prior notice of the tender details.

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 the Package

Please refer to Annex 1 of Technical Specification

4 Procurement Objective & Process

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

The Procurement Procedure selected for this tender is called the **Open Tender** procedure.

The Open Tender procedure is comprised of the following four main steps:

- Step 1- Prior Information Notice (PIN) - publication on IO web procurement page

  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 calendar days**, by returning to the Procurement officer:
  - Name of candidate company
  - Country of registration
  - Point of contact name, email, title, and phone number.

  Interested tenderers are kindly requested to return the expression of interest form (Annex II) by e-mail by the date indicated in the procurement time table below.

  Special attention:

  Interested candidate companies are kindly requested to promptly register in the IO Ariba e-procurement tool called "IPROC", if not so done yet. The process on how to do is described at the following link: https://www.iter.org/fr/proc/overview.

  When registering in Ariba (IPROC), 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. **Therefore, the person identified in the Expression of Interest must be registered in IPROC.**

- Step 2 - Invitation to Tender

  After the full registration of interested candidate companies, the Request for Proposals (RFP) will be published in "IPROC". 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 or lowest price technically compliant offer as described in the published RFP..

5 Procurement Timetable

The tentative timetable is as follows:

Milestone	Date
Publication of the Prior Information Notice (PIN)	2nd half of April 2024
Submission of expression of interest form	Within 10 calendar days of publication of PIN
Tender Launching	Before end of May 2024
Tender Submission	Mid of July 2024
Tender Evaluation & Contract Award	Mid of September 2024

6 Experience Requirements

The candidates shall have the following experiences and competences:

1) **Experience in Engineering and Integration of Industrial Control Systems**
   - Proven ability to design, develop, test, and commission complex industrial control systems, particularly in the context of safety-related applications.
   - Familiarity with integration of control modules with other systems.
2) **Expertise in Industrial Automation Platforms**
   - Proficiency with Siemens PLC-400FH family for slow control applications.
   - Experience with FPGA-based controllers, especially using National Instruments LabView-FPGA v2017, c-RIO platform, and MARTe2.0 on Linux systems.
3) **Knowledge of SCADA Systems and Communication Protocols**
   - Capability to support development and integration of SCADA systems using WinCC OA.
   - Experience with OPC-UA communication protocol and integration with centralized control systems such as CODAC.
4) **Capability in Technical Documentation and Specification Development**
   - Competence in preparing engineering documentation such as Engineering Work Packages, interface documents, functional block diagrams and electrical wiring diagrams according to ITER standards.
   - Ability to contribute to the development of specifications for control functions and update system functional analyses.
5) **Onsite Commissioning and Installation Experience**
   - Hands-on experience with electrical and I&C installation and commissioning, including factory and site acceptance tests.

7 Quality Assurance Requirements

Prior to commencement of any work under this Contract, a "Quality Plan" shall be produced by the Contractor and submitted to the IO for approval, describing how they will implement the ITER Procurement Quality Requirements.

8 Contract Duration and Execution

The ITER Organization will award the Contract in Q3/Q4 2025. The estimated contract duration is with an initial firm period of 4 (four) years and an optional extension of 1 (one) year.

9 Candidature

Participation is open to all legal entities participating either individually or in a grouping/consortium. A legal entity is an individual, 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 a covering letter at the tendering stage (the Invitation to Tender). 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.

10 Sub-contracting Rules

All sub-contractors who will be taken on by the Contractor shall be declared with the tender submission. Each sub-contractor will be required to complete and sign forms including technical and administrative information which shall be submitted to the IO by the tenderer as part of its tender.

The IO reserves the right to approve (or disapprove) any sub-contractor which was not notified in the tender and request a copy of the sub-contracting agreement between the tenderer and its subcontractor(s).Sub-contracting is allowed but is limited to 30% of the total Contract value. Rules on subcontracting in details will be indicated in the RFP itself.

IDM UID
CAHQPF

VERSION CREATED ON / VERSION / STATUS
09 Apr 2025 / 1.0 / Approved

EXTERNAL REFERENCE / VERSION

Technical Specifications (In-Cash Procurement)

CIS Engineering Support Services Framework

This document defines the technical requirements for the provision of technical and engineering services to support the design, integration, installation and commissioning of the ITER Central Interlock System.

The support services will be ordered under a framework service contract by means of task orders and shall be performed at IO site and at the Contractor premises.

SERVICE

Table of Contents

SERVICE

1 Preamble

This Technical Specification is to be read in combination with the General Management Specification for Service and Supply (GM3S) – [Ref 1] that constitutes a full part of the technical requirements.

In case of conflict, the content of the Technical Specification supersedes the content of Ref [1].

2 Purpose

This document defines the technical requirements for the provision of technical and engineering services to support the design, integration, installation and commissioning of the ITER Central Interlock System.

The support services will be ordered under a framework service contract by means of task orders and shall be performed at IO site and at the Contractor premises.

3 Acronyms & Definitions

3.1 Acronyms

The following acronyms are the main one relevant to this document.

Abbreviation	Description
CRO	Contract Responsible Officer
GM3S	General Management Specification for Service and Supply
IO	ITER Organization
PRO	Procurement Responsible Officer
CIS	Central Interlock System
CODAC	Control, Data Access and Communication
COTS	Commercial Off The Self
FPGA	Field Programmable Gate Array
ICS	Interlock Control System
IDM	ITER Document Management
CPSS	Coil Power Supply System
KOM	Kick-Off Meeting
MCTB	Magnet Cold Test Bench
QA	Quality Assurance
RD	Reference Documents
FAT	Factory Acceptance Tests
PIS	Plant Interlock System
SAT	Site Acceptance Tests
SDN	ITER Synchronous Data Network
SVN	ITER CODAC SubVersioN
V&V	Verification & Validation

3.2 Definitions

This section is covered in section 2.1 of the GM3S. Please note definition of Contractor, although defined in Ref [1] 2.1 is duplicated here as the term is largely used within this document.

Contractor: shall mean an economic operator who have signed the Contract in which this document is referenced.

4 Applicable Documents & Codes and standards

4.1 Applicable Documents

It is the responsibility of the Contractor to identify and request for any documents that would not have been transmitted by IO, including the below list of reference documents.

This Technical Specification takes precedence over the referenced documents. In case of conflicting information, it is the responsibility of the Contractor to seek clarification from IO.

Upon notification of any revision of the applicable document transmitted officially to the Contractor, the Contractor shall advise within 4 weeks of any impact on the execution of the contract. Without any response after this period, no impact will be considered.

Ref	Title	Doc Ref.	Version
1	General Management Specification for Service and Supply (GM3S)	ITER_D_82MXQK	1.4
2	Plant Control Design Handbook	ITER_D_27LH2V	7.1
3	ITER Procurement Quality Requirements.	ITER_D_22MFG4	5.1
4	Procurement Requirements for Producing a Quality Plan.	ITER_D_22MFMW	4.0

4.2 Applicable Codes and Standards

This is the responsibility of the Contractor to procure the relevant Codes and Standards applicable to that scope of work.

Ref	Title	Doc Ref.	Version
CS1	Functional safety of electrical/electronic/programmable electronic safety related systems – Part 1 to 7.	IEC 61508	2010
CS2	Functional safety - Safety instrumented systems for the process industry sector - Part 1 to 3.	IEC 61511	2016

4.3 Reference Documents

Ref	Title	IDM Doc ID	Version
[RD1]	Central Interlock System (PBS-46) - Design Description Document (DDD)	ITER_D_QCH3GJ	2.5
[RD2]	Guidelines for the Design of the Plant Interlock System (PIS)	ITER_D_3PZ2D2	5.0
[RD3]	Guidelines for PIS configuration and integration.	ITER_D_7LELG4	4.0
[RD4]	TO4 documentation : PFCS F-PIC functions, Overrides, Simulation template and SPI data publishing	ITER_D_N6D3NM	1.0
[RD5]	CIS-CG (PROTOTYPE) technical requirements	ITER_D_8M9P9A	1.2
[RD6]	PIS PLC templates	ITER_D_SDTX28	2.0

SERVICE

[RD7]	SDG-45 – Software Development Guideline	ITER_D_YDKRGN	
[RD8]	Introduction to ITER official Schematic tools	ITER_D_4H3FEP	2.2
[RD9]	How to use the SMDD Application	ITER_D_JKT5KN	4.7
[RD10]	CAD Manual 08-02 Diagrams - SXP Design Methods	ITER_D_CARVFK	1.2
[RD11]	PBS 45-46-48 - CAD Design Handbook for CODAC, CIS and CSS	ITER_D_8Q9Z8J	1.1

5 Scope of Work

This section defines the specific scope of work for the service, in addition to the contract execution requirement as defined in Ref [1].

5.1 Background

The ITER Interlock Control System (ICS) is responsible for executing the protection functions, which are the automated interlocks capable of detecting failures and initiating corrective actions. These are divided into local protection functions and central protection functions. The Plant Interlock Systems (PIS) handle failures at the local system level, ensuring that hazards are contained before they escalate. The Central Interlock System (CIS), procured in-fund by IO (PBS.46), provides higher-level coordination, ensuring that failures affecting multiple systems are properly mitigated. The CIS will implement the control logic in charge of the execution of the central interlock functions, which aims at the coordination and supervision of the locally distributed PIS. The different PIS, on the contrary, oversee the local protection functions with direct sensors and actuators on the process. In addition, the Advanced Protection System (APS) is designed to predict and prevent hazardous scenarios by analyzing real-time data and further coordinating via CIS the execution of the required mitigation actions.

For the management and execution of the protection functions, an architecture composed of slow (PLC), fast (FPGA based embedded controllers) and hardwired (custom designed for highest reliability) technologies, following the IEC-61508 standard, has been designed. The slow architecture Programmable Logic Controllers are based on Siemens 400FH family (redundant, failsafe) programmed with the native safety libraries. The fast architecture controllers consist of a combination of a host and a FPGA connected via PCI Express. The operating system on the host is a Linux real-time kernel later than v3.5. The FPGAs are embedded in a COTS product (National Instruments cRIO - NI9159), based on Xilinx Virtex-5. The host-side application of the fast architecture interfaces the SCADA and central data-logging systems through OPC UA, while the PLC uses the native S7 communications. Finally, the CIS SCADA is developed with Siemens WinCC-OA software, currently under version 3.19. This service is used for monitoring the overall status, data logging, detailed analysis of interlock events and manually operate the overrides as required during commissioning and operation.

CIS group also provides support for the development integration and commissioning of the PIS, in the way of prototyping PIS design and its interfaces, software template management, development of the so called mini-CIS for participation in FAT, SAT of the different PIS.

Finally, the CIS Test Platform was built as a replica of the CIS, including a PIS Emulator, to serve as a validation platform for all functions of the CIS, including both system functions and protection functions. Currently used mainly as a development platform, it will turn into a testing and pre-deployment environment as soon as the final development stage requires so.

In the current status the CIS has undergone approximately 50% of installation and will soon start the main commissioning activities. However, as the definition of the investment protection functions continues under progress, updates to the software and to the hardware interfaces will

be required on the installed systems over the coming years. In addition, it will be required to support the obsolescence management activities for the technologies in place; and to the management of the CIS infrastructure used for development and testing.

The engineering services to be provided under this contract are distributed into independent sub-tasks:

5.2 Topic#1: Installation, commissioning and interface documentation.

5.2.1 Description

This task involves the support to produce installation and operational related documentation, including the following:

- Support the design and management of the activities related to electrical and functional diagrams, involving new designs as well as updating existing ones.
- Support in the review, update, and modification of all interfacing documentation (ICD/IS/IDS), between PBS46 and other systems.
- Follow up hardware modifications required for both CIS and CIS test environment. Support in the design, hardware procurement, follow up of works and put in service of the modifications.
- Support to the production of EWP documentation preparation such as termination reports, electrical diagrams, technical specifications.

The contractor will participate in the management of CIS hardware, using IO existing tools to maintain CIS components registered as well as tracking of activities using Jira system, including the following activities:

- Update CLM database currently in use by CIS, for hardware management, keeping track of used components, spares, loans, and follow-up of delivery material to/from IO central warehouse and to external collaborators via loans.
- Update and maintain the Jira ticketing system CIS page to allow follow-up of registered incidences.
- Update CIS electrical and wiring diagrams using the standard IO recommended tools (See 11.4).

The Contractor will participate in the development and update of the different mini-CIS and will also participate in presence at the commissioning activities when required, whether they occur onsite (cryogenic system, RPC system, CPSS, MCTB) or offsite. The activities include the provision of the corresponding test procedures, test report and identification and follow-up of deviations.

Whenever the participation of the offsite team to these commissioning or FAT activities may be required, the fixed dates for these commissioning activities will be provided to the Contractor in due time. The Contractor shall commit to assign the necessary resources on the proposed dates.

5.2.2 Service Duration

The duration of this service will extend throughout the complete duration of the framework service contract.

SERVICE

5.2.3 Required Competencies

The work involves technical expertise in computer science, database management and software development to advance the development of the ICS. It involves as well understanding and practical use of ITER procedures and IEC 61511 to support the Interlock control System lifecycle

- Experience in the design, construction and operation of instrumented safety systems for large heterogeneous facilities.
- Experience in hardware and software design and integration of safety industrial control systems, under the IEC-61508 and IEC-61511 standards.
- Experience in functional analysis, reliability assessment and functional specification of I&C functional safety related functions.
- Extensive practical experience in installation, commissioning, acceptance testing and functionality validation of I&C functional safety systems.
- Review and production of I&C cabling diagrams for I&C systems according to French standard NFC-15-100.
- Practical experience in physical integration of I&C systems and creation of electrical diagrams by using configuration management model tools (e.g. SEE Electrical)
- Expertise in computer science, database management and software development
- Experience in documentation management systems
- Good interpersonal communication skills.
- Ability to facilitate dialogue with a wide variety of contributors and stakeholders to identify process requirements.
- Technical document generation.
- System requirements management.
- Technical risk analysis.
- Electrical certification to allow work in electrical rooms.
- Understanding of Large Scientific Projects like ITER Project will be an asset.
- English at proficient level

5.3 Topic #2: CIS systems infrastructure management for development and testing

5.3.1 Description

The contractor shall provide comprehensive technical expertise and support services to assist the IO-TRO and the CIS team in the development, configuration, and integration of software and IT systems associated with both Test Platform and the systems on-site under commissioning. The work includes the preparation of testing procedures and documentation, support in the configuration and testing of network and operating systems, software deployment, and the integration of Human-Machine Interfaces (HMIs). The contractor will also assist in the implementation of configuration management practices for both software and hardware components.

Furthermore, the contractor will be responsible for maintaining and enhancing the CIS Test Platform, maintaining and upgrading server and network infrastructure as required, contributing to the design and development of supervisory control software using the WinCC-OA/smartnodes++ framework, and ensuring seamless integration between CODAC technologies and the CIS. This includes establishing connectivity with the ITER Database, creating RPM packages managing the repositories, organising Git/SVN services. Services will primarily be delivered remotely, with limited onsite presence, and will involve regular collaboration with the CIS team and participation in technical meetings to ensure alignment and progress tracking.

SERVICE

5.3.2 Service Duration

The duration of this service will extend throughout the complete duration of the framework service contract.

5.3.3 Required Competencies

The work involves technical expertise in computer science, database management and software development

- Proven experience in network configuration, testing, and troubleshooting in industrial or research environments.
- Solid knowledge of Linux-based operating systems (preferably Red Hat Enterprise) and software deployment practices.
- Familiarity with Human-Machine Interface (HMI) systems and their integration in control environments, in particular with WinCC-OA.
- Experience with configuration management processes for software and hardware.
- System administration skills, including remote server management, user access control, and platform maintenance.
- Hands-on experience with CODAC technologies, including ITER DB integration, RPM package creation, and Ansible-based build systems.
- Strong collaboration and communication skills for participation in technical meetings and coordination with international teams.
- Python development and software QA,
- Good interpersonal communication skills,
- Technical document generation,
- English at proficient level, both in written and orally.

5.4 Topic #3: Development support for testing and integration of the ICS Fast Architecture prototypes

5.4.1 Description

The CIS-FA logic-solver design is based on a 1oo2D (Diagnostic) pattern, aiming to achieve over 90% safe-failure fraction (SFF). The overall architecture consists of two NI9159 units that communicate the result of their self-test diagnostics between each-other to make a coordinated failure response.

Currently, the main lines of activity are the following:

- The CIS Critical Gateway prototype is an FA central controller which is responsible for responding to avoidance events (considered as low-criticality, software-interlock events) and executing the CIS, pulse-stop logic. A prototype is under development which requires its integration into the CIS test platform and with other control subsystems such as the PCS or the operations SUPervisor.
- Upgrade of the CIS test platform, with the fast PIS emulator adapted to cRIO technology.
- Plant Interlock Systems currently engaged under prototyping developments (such as magnets quench detection system of disruption mitigation system), or refurbishing existing designs such as the CPSS F-PIC
- Plant Interlock systems requiring a miniCIS to be developed in support to the FAT and system commissioning activities, such as magnetics diagnostics.

SERVICE

In order to support the above activities, the contractor will develop logic blocks under LabVIEW and integrate them into the existing FPGA design, prepare and execute test plans in the laboratory, participate in the validation of HMIs, and following technical specifications given will design the application specific logic solvers.

Additionally, the contractor will be required to review, produce or contribute to technical documents such as minutes of meetings, user manuals, design descriptions documents, configuration management, etc.

5.4.2 Service Duration

The duration of this service will extend throughout the complete duration of the framework service contract.

5.4.3 Required Competencies

The work involves technical expertise in FPGA development, particularly under the NI LabView v2014 or v2017 and the cRIO controller (NI9159 model). Additionally, expertise in computer science, Linux kernel software development to advance the development of the ICS, as well as understanding and practical use of ITER procedures. Understanding of IEC 61508-3 to support the Interlock control System lifecycle would be helpful. Specifically:

- Experience in hardware and software design and integration of safety industrial control systems, under the IEC-61508 and IEC-61511 standards.
- Experience in functional analysis, reliability assessment and functional specification of I&C functional safety related functions.
- Expertise in computer science, Linux kernel software development.
- Experience in documentation management systems.
- Experience in development of hardware and software prototypes under National Instruments cRIO platform and LabView.
- Experience FPGAs and LabVIEW-FPGA v2017.
- Experience with PCIe Specifications.
- Experience with Linux PCI driver architecture.
- C/C++ development and software QA.
- Good interpersonal communication skills.
- Technical document generation.
- English at proficient level, both in written and orally.

5.5 Topic #4: Development and integration of PLC based slow interlock architecture

5.5.1 Description

The services to be provided fall within the scope of supporting the development, integration, and maintenance of PLC-based interlock systems under the responsibility of PBS46, in the framework of ITER's Central Interlock System (CIS). The Contractor will contribute to the configuration, programming, and validation of PLC applications involved in investment protection and interlock functionalities for various plant systems interfacing with CIS, as well as the development if the CIS modules themselves. This includes the preparation of configuration data, development of control logic (CLD's, Control Logic Diagrams), review and update of technical documentation, and active support during commissioning and testing phases.

SERVICE

Support will also extend to maintaining existing systems, updating PLC templates, and assisting in integration activities with plant systems and other ITER sub-systems. The contractor is expected to participate in activities both remotely and onsite at the IO, particularly during key milestones such as factory and site acceptance tests, or commissioning campaigns. Work shall be performed in close collaboration with the CIS team and other PBS stakeholders, in alignment with ITER's engineering practices and documentation standards.

5.5.2 Service Duration

The duration of this service will extend throughout the complete duration of the framework service contract.

5.5.3 Required competencies

The work requires technical expertise with Siemens S7-400FH PLCs and development with the native safety libraries. In particular:

- Proven experience in Siemens PLC technologies, especially in the context of investment protection and interlock logic development.
- Competence in multiproject configuration, NetPro setup, and development of structured PLC code, aligned with safety and reliability requirements.
- Familiarity with industrial control systems used in large-scale scientific facilities or energy sector installations, ideally in nuclear or fusion environments.
- Ability to review and update engineering documentation, including signal lists, functional specifications, and configuration databases (e.g., Excel-based datasets).
- Proficiency in using version control systems such as SVN for managing PLC software and related artefacts.
- Support for design and management of the Control Logic Diagrams following internal templates under MS Visio.
- Experience supporting testing and commissioning activities, including the preparation and execution of FAT and SAT procedures, resolution of punch list items, and post-test reporting.
- Knowledge of ITER-specific tools, standards, and practices, such as PCDH, IDM, and the ITER Control System architecture (CODAC/CIS), is highly desirable.
- Strong capacity to work in a multicultural and interdisciplinary environment, with good communication skills and the ability to collaborate effectively with IO staff and external suppliers.

5.6 Resources estimation

During the execution of the framework contract, IO estimates to have an average of 3-4 engineers working in parallel to cover the different Subtasks.

5.7 Location for Scope of Work Execution

The Contractor shall perform the works partially at IO premisses and at contractor premises. The correct balance will be decided per-task but provisions for near site deployment is required.

6 Contract Duration

The framework contract duration is four (4) years firm and optional period of one (1) additional year.

7 IO Documents

No additional IO documents are required than the ones mentioned in the reference section. The same are presently available on IDM.

8 List of deliverables and due dates

The deliverables and due dates will be specified in each task order drawn under this framework contract.

9 Quality Assurance requirements

The Quality Class under this contract is QC1[3]; GM3S Section 8 applies in line with the defined Quality Class.

The supplier shall have a quality management system in accordance with ISO 9001:2015. During tendering phase, the supplier (performer) shall present a copy of their valid ISO 9001:2015 certificate (or equivalent certificate recognized by IO).

The Contractor shall produce a Quality Plan two weeks prior to T0.

10 Safety requirements

The scope under this contract does not cover PIC and/or PIA and/or PE/NPE components, and therefore GM3S [1] section 5.3 does not apply.

11 Specific General Management requirements

Requirement for [1] GM3S Section 6 applies is amended with the below specific requirements.

11.1 Specific Responsibilities

11.1.1 Contractor's Responsibilities

In order to complete the tasks defined in this Technical Specification, the Contractor shall:

- Nominate a Contract Manager to be responsible for the execution of the Contract and its follow-up including contacts, meetings and progress reports throughout the duration of the Contract.
- Strictly implement the IO procedures, instructions and use templates.
- Provide experienced, qualified and trained resources to perform the tasks.
- Ensure the resources possess the required qualifications (i.e. electrical qualification) when certain types of works are required, in accordance with IO rules and procedures.
- Contractor's personnel shall be bound by the rules and regulations governing the IO ethics, safety and security IO rules.
- Assess PBS-46 findings and assess further the feasibility of the proposed modifications, reporting any blocking issues as early as possible for IO evaluation.
- Provide the documentation as necessary to justify completion the scope defined.

SERVICE

- Provide all the software and data-configuration files that has been developed.
- Preparing minutes of progress meeting and submitting them for review on IDM.

11.1.2 IO's Responsibilities

The IO shall:

- Nominate the Responsible Officer to manage the Contract.
- Organise a monthly meeting with the Contractor Contract manager on the work performed and record the minutes.
- Provide access to IO premises and network during onsite work; IT equipment and allocated office desks will be provided for stays is longer than 6 months.

Any IT IO account creation is to be requested by IO-RO. The account duration should be limited to the required usage of the account (e.g. contract duration), and the Contractor's resources working on-site for periods longer than 6 months are expected to make use of such accounts, which also provide access to videoconference software and other sharing tools required for the daily job.

11.2 Meeting Schedule

11.2.1 Kick-off meeting (KOM)

A Kick-off meeting will be organized by the IO with the Contractor no later than 1 month after the Contract is signed. In this meeting, to be held remotely via Microsoft Teams, IO will provide the necessary information as outlined in Section 5 of this document and clarify the scope of the works if needed.

The Contractor will present a draft of the Quality Plan, to be delivered within 3 weeks of the contract signature, identifying as a minimum the work team and main stakeholders.

The Contractor is responsible for preparing the minutes of the kick-off meeting.

11.2.2 Progress meetings

The Contractor who is in charge of preparing the deliverables will be expected to attend regular progress meetings as requested, and to the formal exchange of documents transmitted by emails required. Progress meetings will be called by the ITER Organization, to review the progress of the work, the technical problems, the interfaces and the planning. This will be organized remotely via Microsoft Teams, with a periodicity of 2 weeks to 1 month depending on the technical clarifications required.

11.3 CAD design requirements

11.3.1 Schematic Tools Used by the Design Office.

This contract covers the scope of production of electrical schematics and detailed wirings, which requires to follow the tools and rules as specified by Design Office.

The document [RD8] is issued by ITER Organization Design Office and gives an overview of the ITER official schematics tools (Authoring tool) to be normally used by DAs and partners.

Each discipline utilizes its own specific authoring tool:

- See System Design: Used for CBD and SLD.
- See Electrical Expert: Used for electrical schematics or detail wiring.
- CATIA/ENOVIA: Used for 3D management.

SERVICE

These tools are essential for maintaining the consistency and integration needs of technical data within the ITER Project.

For the scope of this contract, only See Electrical Expert activities are relevant.

11.3.2 Training, certification of users.

Each user shall be trained before using the authoring tool and obtain IO certification. [RD8]

11.3.3 Publication system for all diagrams in SMDD

The document produced shall be saved in the SMDD application used to manage the diagrams and drawings. A PDF, a BOM and a native document will be requested to be saved on this location.

The process is described in [RD9].

11.3.4 CAD Manual & Handbook describing CAD methodology for CIS.

The CAD Manual applicable to the activities in the scope of this contract are covered under [RD10]. In addition, a document with slides showing how practically the PBS 46 CAD works must be organised can be found in [RD11].

The referenced documents offer an overview of the CIS and its contractor's collaboration with DO but do not provide specific quantities for the workload estimation and specific diagram references. This will be subject of the future Task Orders within the framework contract.

11.4 Information protection

The information protection level shall be "non-public", "non-classified".

ANNEX II

EXPRESSION OF INTEREST

To be returned by e-mail to: Lijun.Liu@iter.org

TENDER No.:	IO/25/OT/70001288/LLU
DESIGNATION:	Service Framework Contract for CIS Engineering Support
OFFICER IN CHARGE:	Lijun LIU – Procurement Division ITER Organization

We acknowledge having read the PIN notice for the above-mentioned tender and we would like to be invited for this process

.....

The contact person for this tender process:

Name: Title:

Email: Telephone:

Company Name:

Country of Company Registration:

Signature: COMPANY STAMP

Name: .....

Position: .....

Date: .....