外部委託業者の募集

References: IO/24/OT/70001077/EBT

“Nuclear Analysis framework contract"

（核解析枠組み契約）

IO 締め切り 2024 年 2 月 26 日(月)

〇はじめに

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。

国内機関は本情報を入札に先立って、以下のサービスを提供できる企業、研究機関その他の法人に入札プロセスの詳細について周知をお願いします。

〇背景

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 の敷地は南フランスにあり、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。

〇作業範囲

本入札プロセスは環境保護調整サービス契約を締結することを目的にしています。

詳細は添付資料Ⅱの技術仕様書ref 9MJ8ZK version 1.1.を参照してください。

〇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
  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	2024 年 2 月 12 日
関心表明フォームの提出	2024 年 2 月 26 日
入札への招待（ITT）の IPROC での発行	2024 年 3 月 1 日
入札提出	2024 年 4 月 12 日
入札評価	2024 年 4 月
契約授与通知	2024 年 5 月 E
契約調印	2024 年 6 月初旬
最初のタスクオーダー開始	2024 年 6 月 E

〇契約期間と実行

予想される契約期間は2024年の6月から2028年までの固定期間4年を予定しています。
ITERでの使用言語は英語です。詳細な要件は技術仕様書おw参照ください。

〇経験

入札者は、I0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示す必要があります。詳細な技術的評価の基準はＩＰＲＯＣのRFPの元、後日通知される予定です。

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。

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。

【※　詳しくは添付の英語版技術仕様書「**Nuclear Analysis framework contract**」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 INDICATIVE NOTICE (PIN)

OPEN TENDER SUMMARY

IO/24/OT/70001077/EBT

for

Nuclear Analysis framework contract

Abstract

The purpose of this summary is to provide prior notification of the IO intention to launch a competitive Open Tender process in the coming weeks. This summary provides some basic information about the ITER Organization, the technical scope for this tender, and details of the tender process for the provision of nuclear analysis services.

1 Introduction

This Prior Indicative Notice (PIN) is the first step of an Open Tender Procurement Process leading to the award and execution of a Framework Service Contract. The purpose of this document is to provide a basic summary of the foreseen scope of the contract 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 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 Work

The present tender process is aiming to set up a Framework Contract for nuclear analysis services. Please find the attached Technical Specifications ref. 9MJ8ZK version 1.1.

4 Procurement Process & Objective

The objective is to award a Framework 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 Indicative Notice (PIN):**

  The Prior Indicative Notice is the first stage of the Open Tender process. The IO formally invites the Domestic Agencies to publish information about the forth-coming tender in order to alert companies, institutions or other entities about the tender opportunity in advance.

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

  Special attention:
  Interested tenderers are kindly requested to register in the IO Ariba e-procurement tool called "IPROC". You can find all links to proceed along with instruction going to: https://www.iter.org/fr/proc/overview.

  When registering in Ariba (IPROC), suppliers are kindly requested to nominate 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 - Invitation to Tender (ITT) :**

  Following the PIN and the interests shown by the tenderers, the Request for Proposals (RFP) will be published on our digital tool "IPROC". This stage allows interested bidders 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.

- **Step 3 – Tender Evaluation Process :**

  Tenderers' proposals will be evaluated by an impartial, professionally competent technical evaluation committee of the ITER Organization. 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 :**

  A Framework service contract will be awarded on the basis of best value for money according to the evaluation criteria and methodology described in the RFP.

Procurement Timetable

The tentative timetable is as follows:

Milestone	Date
Publication of the Prior Indicative Notice (PIN)	12th February 2024
Submission of expression of interest form	26th February 2024
Invitation to Tender (ITT) launched in IPROC	01st March 2024
Tender Submission	12th April 2024
Tender Evaluation	April 2024
Award Notice	End May 2024
Contract Signature	Beg June 2024
First Task Order commencement	End June 2024

5 Quality Assurance Requirements

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

6 Contract Duration and Execution

The duration of the Framework Contract will be a firm period of 4 years from June 2024 to June 2028.

The working language of ITER is English, and the detailed requirements for language are specified in the attached Technical Specifications.

7 Experience

The tenderer shall demonstrate their technical and industrial experience related to the scope of work as detailed in the technical specifications. The detailed technical evaluation criteria will be informed to tenderers at later stage under RFP at IPROC.

8 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 lead will explain the composition of the consortium members in a covering letter at the tendering stage. 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 IPROC.

9 Sub-contracting Rules

The Contractor shall not subcontract any part of the Services under this Framework Contract and any Task Orders.

IDM UID
9MJ8ZK

VERSION CREATED ON / VERSION / STATUS
12 Dec 2023 / 1.1 / Approved

EXTERNAL REFERENCE / VERSION

Technical Specifications (In-Cash Procurement)

Nuclear Analysis Framework Contract

This document is to define the objective of a new framework contract to perform a number of well-controlled nuclear analyses for ITER to support fulfilling some part of terms of reference of Radiation, Safety & Environment Group (RSE)

PDF generated on 10 Jan 2024
DISCLAIMER : UNCONTROLLED WHEN PRINTED – PLEASE CHECK THE STATUS OF THE DOCUMENT IN IDM

Table of Contents

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

Purpose of this document is to define the objective of a new framework contract to perform several well-controlled nuclear analyses for ITER to support fulfilling some part of terms of reference of Radiation, Safety & Environment Group (RSE) [2].

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
RSE	Radiation Safety and Environment group
SDDR	ShutDown Dose Rates

For a complete list of ITER abbreviations see: ITER_D_2MU6W5 – ITER Abbreviations.

3.2 Definitions

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

CDT-1 – Common Design Team 1 working on design development of shielding of PCR1154

RADWASTE- Radiation Waste.

4 Applicable Documents & Codes and standards

4.1 Applicable Documents

This 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, this is the responsibility of the contractor to seek clarification from IO.

SERVICE

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	IDM Doc ID	Version
1	General Management Specification for Service and Supply (GM3S)	82MXQK	1.4
2	Quality Assurance for ITER Safety Codes Procedure	258LKL	3.1
3	Decree No. 2012-1248 dated 9 November 2012 authorizing IO to create a basic nuclear facility called “ITER"	CZK7M5	1.1
4	Provisions for Implementation of the Generic Safety Requirements by the External Interveners	SBSTBM	2.2
5	ITER Policy on Safety, Security and Environment Protection Management	43UJN7	3.1
6	SRO Surveillance Plan for NIU - Annex 2: Detailed list of PIAs	T6XFXM	1.0
7	Instructions for verification of input for radiation transport calculations	TP4LL9	1.5
8	Instructions for Nuclear Analyses	R7XRXB	5.3
9	Methodology for Determination of Safety Factor for Nuclear Analysis	TSZAB3	2.0
10	Propagation of the defined requirements for protection important components through the chain of external contractors	BG2GYB	3.3
11	List of ITER-INB Protections Important Activities	PSTTZL	2.2

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

The detailed quality assurance requirements are given in section !! with a list of reference documents.

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].

SERVICE

Background and Objectives

To ensure ITER commitment and compliance with article 14 of the ITER agreement, specifically the following "The ITER Organization shall observe applicable national laws and regulations of the Host State in the fields of public and occupational health and safety, nuclear safety, radiation protection, licensing, nuclear substances, environmental protection, and protection from acts of malevolence]" and to meet the requirement as per the order dated 7 February 2012 relating to the general technical regulations applicable to INB – EN (7M2YKF), several well-controlled and qualified nuclear analysis are to be performed.

This part of the document identifies and elaborates such analysis to update radiation maps for the period of 2024-2028.

This list is expected to partially meet the part of terms of reference of the RSE group [2], which is radiation safety scope. A transverse function TF02 "Radiation Safety", design plan [3], dealing with the ITER safety function "Limitation of the exposure": Workers' radiation protection and public's radiation protection is in place to carefully monitor at ITER levels those requirements and provide necessary justifications. A Nuclear Analysis roadmap for 2024-2028 is being prepared to illustrate the objective and plans to move forward.

The radiation safety requirements are the following:

- Respect the radiation zoning presented in RPrS and updated in Safety roombook for the 3 modes (Labour code focusing on workers) – if needed, based on radiation maps provided, radiation zoning may be updated with proper justifications.
- Respect the radiation requirements for unregulated area and at the fence of the INB site (Public & environment code)
- Respect the specific PR requirements PR355, PR1782 who have more stringent requirements for Yellow zone (<100µSv/h) and green zone (<10µSv/h) to enhance ALARA principle in mode 1 (Labour code focusing on workers)
- Respect the 2.5mSv/year in average for the worker (RPrS objectives)
- Collective dose <500 men.mSv/year in average and implement an ALARA approach (RPrS objectives)

The production of the nuclear analysis (at ITER level, at area level or for specific PBS) will have the objective to present the radiation conditions in order to meet those requirements.

In addition, nuclear analysis are providing :

- the radiation conditions to be considered for the qualification of equipment. Following nuclear responses are provided (Neutrons flux, 1 MeV equivalent neutrons fluence, dose to silicon, dose to polymers).
- The activation data for waste assessment with specific cooling time but with a coherent set of input used for radiation maps
- Nuclear heating response to confirm the nuclear load
- Damage (DPA), production of gas…

In the frame of this FWC, in coherence with INB order, it will be asked also to support IO regarding the identification of the uncertainties and the safety margins to be used to provide the data above.

SERVICE

Currently the status is the following:

Radiation maps:

Mode	TF analysis	Baseline	Comments
0	ITER_D_RJLLFY	YES: PCR-755 (TWZA2X) in 2016	Discrepancies with [8] were identified in TP9T64. Therefore PIM-466 was launched with the aim to mitigate them. PIM-466 was converted in PCR-1154. RSE is not using this data for verification but ITER_D_7N5BRQ (see below).
	ITER_D_7N5BRQ	Not baseline, only additional shielding were baselined through PCR-1154 (2020) and following PCR daughters	PCR-1154 is the result of PIM-466. ITER_D_3QBAPQ radiation maps mode 0 was sent to ASN (ITER_D_3TPMBK) in 2021. Following ASN/IRSN instruction, IO proposed new radiation criteria who are those presented in ITER_D_7N5BRQ*. Radiation maps delivered in 2020, data used for verification of the radiation zoning
	ITER_D_3FM52L		Used to provide radiation conditions for equipment/electronics qualification program (use of RADAT tool) through A Deviation Request Process vs baseline
1	ITER_D_V35THE	YES: mPCR-384	Quite old data. Currently replaced by F4E and NIE scoping studies who are more up to date (see below). RSE is not using this data for verification but NIE documents.
	F4E_D_2QERK5	NO	In Bioshield mode 1 – scoping studies from 2021 (specific safety factors were considered – still under discussion)
	NIE: ITER_D_68VR7F	NO	13 representatives areas of the Tokamak complex (2020-22) – No safety factors used
2	ITER_D_F8UEXR, ITER_D_67CN24, ITER_D_HPX254	YES: PCR-755 (TWZA2X) 2016	Radiation maps delivered in 2015. RSE is not using this data for verification.
	ITER_D_67Q2VG	Not baseline, only additional shielding were baselined	Radiation maps delivered in 2022, data used for verification through a

		through PCR-1154 (2020) and following PCR daughters	Deviation Request Process vs baseline

Radiation maps mode 0 (ITER_D_7N5BRQ) and mode 2 (ITER_D_67Q2VG) are using similar input (Building models from 2019).

ALARA/ORE:

ALARA / ORE	Baseline	Comments
ITER_D_6ECUV5, ITER_D_6976LV, ITER_D_5U5ZK4	No	Scoping studies performed in 2020-22 on 13 representative TK areas. Status 12/2022

The latest version of the analysis results with radiation maps is available at ITER_D_7N5BRQ - Radiation conditions (RM2020) in/out of TC using ambitious thresholds for radiological zones for workers and ITER_D_3FM52L for equipment/electronics.

Updating radiation maps including updating following sources and models.

- Building and systems :
  - ITER_D_3FEA8J - Tokamak Complex MCNP Model Report
  - ITER_D_2SA24Q - Auxiliary Buildings Report - MCNP models
  - ITER_D_2SGT5W - NB Cell & HV Deck - MCNP model
  - ITER_D_2RLM3G - E-lite 360º MCNP model - Model Report
- Sources :
  - ITER_D_2YBFY3 - Plasma Radiation Source for Radiation Maps
  - ITER_D_YNWTFW - Water source modelling for ITER Radiation Maps

To update the source, the procedure of generation of auxiliary source also proposed to be updated.

The plasma source is built through a 360 degree ITER tokamak model called E-lite model. The Elite model is an accurate representation, with conservative approaches adopted to encounter the limit of knowledge. The details of the E-lite model are available at ITER_D_2RLM3G - E-lite 360º MCNP model - Model Report. The sources considered in the radiation maps calculations include :

- Pre-DT plasma neutrons : DD neutrons and subsequent photons
- Photo-neutrons from runaways Electrons
- DT neutrons from the plasma and the prompt gamma generated through (n,p) reactions
- ERID & calorimeter source
- The radioactive water sources (^{16}N, ^{17}N, ^{19}O).
- Activated corrosion Products
- Radioactive decay of activated components
- Activated dust (notably on filters, or in vessel/RH equipment)

Apart from the above, the proposed contract should also cover some of the important activities of CDT-1, especially design calculations of L4 shielding and Top lid. See the tracking table of CDT-1 on PCR1154 design plan 87VJQK.

The proposed contract should also cover refining one of the important source term called Activated Corrosion Products (ACP). This includes evaluating and performing parametric/sensitivity studies on the ACPs contributions to the ORE and extrapolate a “rule of thumbs”. Using the developed ACP sources, that will be provided by IO, we need to consider possible ORE “hot-spots” resulting from radiation calculations and the need to re-fine the 3D models to avoid/reduce errors due to the geometry simplification (e.g. HXs, systems with a larger number of pipes). Finally, a proper estimation of safety factor for ACP sources should be obtained through sensitivity studies.

Similarly, the dust sources will be assessed and properly considered in the different radiation maps concerned.

Stakeholders

We can identify external and internal stakeholders.

External are ASN and IRSN, radiation maps are used to demonstrate the respect of radiation safety regulation and requirements. Therefore, radiation maps are delivered in coherence with the need of the project to answer some technical prescriptions (Hold point) or according to safety milestones defined with ASN to get an authorization.

Internal are other entities within the project, such as:

- ENG :
    - ENG is in charge to provide the input (geometry, materials) through a process with a good traceability of the data used
    - Through TF02, radiation maps are used to provide indicators regarding the safety function “Limitation of exposure” at ITER level andto cross check the coherency between local nuclear analysis used to demonstrate radiation safety requirements in PBS design review (CDR, PDR, FDR), to support transverse entities (CDT-1, PWG) or to answer to NCR, DR or RFI
    - Radiation maps are used to provide radiation conditions for the PBS qualification program
- SCOD :
    - To provide data that used with Inspection/maintenance plans provided by PBS and validated by SCOD in order to assess the Occupational Radiation Exposure
    - To provide data to be able to prepare General rules of operation

Needs within IO and regulator.

ASN needs

- Current radiation maps mode 0/2 were used to answer to the Assembly Hold Point regarding B2 slab. Since those radiation maps, RSE is following carefully the evolutions of the project (gate reviews of PBS or PCR-1154 items, PWG progress…). A NCR was opened regarding TCWS source that should lead to a new radiation maps mode 0 where it will be verified the impact on radiation safety requirements.
- Radiation maps for mode 1 will be needed to demonstrate the radiation zoning and to be used to assess the ORE and individual dose target per year. At this stage, we have NIE scoping studies and some assessment provided to specific areas (Port cell in FDR). This will have to be updated and provided to ASN/IRSN and next RPrS update.
- The next update (radiation maps delivered) of the radiation maps is foreseen for the next safety milestone to get authorization to start the Tokamak and for RPrS update. The anticipated time line is :
    - T0: Next safety milestone – authorization to start
    - RPrS update : T0-2 years

- Radiation maps update: T0-3 years
- If **T0 is in 2033 (to be scaled, at present for indicative purpose)**

ASN needs
Closure of TCWS NCR / RC1 : Radiation maps update in 2024
Radiation maps mode 0, 1 and 2 to be provided 2030 for the RPrS update (TK complex and HCC) but also waste assessment

IO needs:

- Current radiation maps are used for qualification program
- Within the frame of Project rebaselining the project will need : In general the system and equipment designer's needs are Total integrated dose (AFP+DT1+Accident), Equivalent Neutron fluence, worst case TNF. Along with SDDR for maintenance scenario assessment, translates to the following:
  - DT1 radiation maps :
    - Mode 0: assume to be similar to the current radiation map mode 0, but to be updated according to building maturity (B14, end of HIT cycle, PCR-1154 items with higher maturity , updated status regarding penetrations) and the PBS maturity and DT1 machine configuration
    - Mode 2: According to DT1, response of in vessel systems will be significantly lower, thus could lead to local shielding optimization
    - Mode 1: According to DT1 configuration, radiations will be significantly lower, thus project will need to know the current situation
  - AFP radiation maps :
    - Mode 0: it should be provided the radiation maps for DD phase of AFP. In addition Runaways Electrons phenomena shall be properly captured with AFP configuration
    - Mode 1: it is expected to provide SDDR within the VV. It is expected low SDDR outside the VV (Port cell) after a certain cooling time, it is still under discussion the need to have such detailed radiation maps or only a local analysis (Port cell)

Project needs
Radiation maps mode 0 (DT1) to be provided in 2026 (6 years after current mode 0)
Radiation maps mode 0 (AFP) to be provided in 2024-25 (no radiation maps exist in DD)
Radiation maps mode 1 to be provided in 2028 (6 years after NIE assessment)
Radiation maps mode 2 to be provided in 2026 (4 years after current mode 2)

5.1 Scope of work #1

To meet the above objectives, Contractor shall provide neutronics analysis support to the ITER Nuclear Shielding Co-ordinator at the Contractor's premises, or on the ITER site with the location and type of support being detailed in the specific Task Order. The Contractor will assist

the ITER Nuclear Shielding Co-ordinator with the planning, preparation, documentation, management and execution of the activity as defined in the applicable Task Order.

5.1.1 Description

The scope of the specific support will include, but will not necessarily be limited to:

- Creation of computer models
    - Simplification of CAD models (various formats including CATIA, step etc.)
    - Conversion of CAD models to input to transport codes (various formats including e.g. MCNP, Attila)
    - Incorporation of models in to ITER reference models or combining of models. A specific effort will have be made to update/create a new ITER reference model architecture enabling to facilitate the ease of the ITER MCNP reference model with capability to extract/isolate representative areas easily.
    - Specification of materials
    - Variance reduction optimisation (e.g. weight windows)
    - Tally specification
    - Documentation of models
- Radiation transport calculations
    - Estimates of neutron flux with energy resolution when required
    - Estimates of gamma flux with energy resolution when required
    - Assessment of shut-down dose rates during mode 1
    - Assessment of uncertainties/safety margins and quality or results
    - Production of mesh tally results
    - Documentation of results
- Preparation of proposals on shielding design for:
    - Support in the analysis of the Hot Cell Complex
    - Dose reduction methods following ALARA approach during mode 1 (maintenance)
- Support in responses to ASN
    - to help reducing mode-1 dose during maintenance,
    - to help review the RPrS & rad chapters, confirming the radiological zoning
    - to help answer future ASN questions on radiation maps, etc.
- Determination of nuclear responses
    - Nuclear heating
    - Damage
    - Gas production
    - Material dose estimates
    - Biological dose estimates
- Activation calculations
    - Specification of materials including impurities
    - Activation and inventory calculations
    - Pathway analyses
    - Mapping of isotopic content
    - Evaluation of doses from activated material in tokamak buildings and Hot cell complex

- Definition of Sources
    - Production of neutron source models for
        - Deuterium (DD) and deuterium/tritium (DT) plasmas
        - Runaways Electrons
        - Activated water
    - Production of gamma source models for activated components
    - Production of gamma source models for ACP
    - Production of gamma source models for dust (Dust in Filters)
- Full reporting of analyses
    - Provision of input and output results
    - Provision of reports on all work undertaken

- The contractor is expected to have access to the following computer resources
    - ITER approved radiation transport codes (D1S-UNED, MCNP)
    - ITER validated activation code (FISPACT, ACAB, ORIGEN…)
    - CAD to MCNP conversion programs
    - CAD software
    - Provision of appropriate computer platforms for computations within the time-scales of the tasks orders.

- Supervision and planning
    - Provision of oversight and coordination for nuclear analysis activities performed by the Contractor
    - Provision of information on task durations, resources etc. to develop analysis schedules
    - Provision of various reports to record progress against the project plan, identifying issues and recommending solutions

5.1.2 Service Duration

The maximum expected duration for this activity is 48 months.

6 Location for Scope of Work Execution

Contractor shall provide neutronics analysis support to the ITER Nuclear Shielding Co-ordinator at the Contractor's premises, or on the ITER site with the location and type of support being detailed in the specific Task Order.

7 IO Documents

The work will require many inputs including various configurations and other information depending upon the specific task orders. The list of such documents will be provided in the technical specifications of related task orders at time to time.

8 List of deliverables and due dates

The Supplier shall provide IO with the documents and data required in the application of this technical specification, the GM3S Ref [1] and any other requirement derived from the application of the contract.

The detailed list of deliverables and the schedules will be specified in the technical specifications of individual task orders.

Supplier is requested to prepare their document schedule based on the list provided as above, and using the template available in the GM3S Ref [1] appendix II (click here to download).

9 Quality Assurance requirements

The Quality class under this contract is expected to include all quality classes, [Ref 1] GM3S section 7 applies in line with the defined Quality Class.

The specific quality requirements are detailed below.

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

The general requirements are detailed in the following ITER document: ITER_D_22MFG4 - ITER Procurement Quality Requirements.

Neutronic analyses have to be performed following the ITER QA requirements for analyses and calculations: ITER_D_22MAL7 - Analyses and Calculations and ITER_D_R7XRXB - Instructions for Nuclear Analyses.

Prior to commencement of the task, a Quality Plan (see ITER_D_22MFMW - Requirements for Producing a Quality Plan) must be submitted for IO approval giving evidence of the above and describing the organisation for this task; 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.

Deviations and Non-conformities will follow the procedure detailed in the IO document: ITER_D_22F53X - Requirements for DA / Supplier / Subcontractors Deviations & Nonconformities.

Prior to delivery of any manufactured items to the IO Site, a Release Note must be signed: ITER_D_22F52F - Requirements for Producing a Contractors Release Note.

Documentation developed as the result of this task shall be retained by the performer of the task or the DA organization 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 Quality Assurance for ITER Safety Codes (ITER_D_258LKL-Quality Assurance for ITER Safety Codes Procedure).

10 Safety requirements

The scope under this contract covers for PIC and/or PIA and/or PE/NPE components, [Ref 1] GM3S section 5.3 applies.

10.1 Nuclear class Safety

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 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.
In order to successfully perform the tasks in these Technical Specifications, the Contractor shall:

- **Strictly implement the IO procedures, instructions and use templates;**
- **Strictly implement the requirements specified in** ITER_D_SBSTBM - Provisions for Implementation of the Generic Safety Requirements by the External Interveners**;**
- **Implement a technical control for each PIA defined in** ITER_D_WQKUHQ – Surveillance Plan for the Design, Integration and Construction of TAPB and HCC - Annex 2 List of PIA**;**
- **Provide experienced and trained resources to perform the tasks;**
- **Contractor's personnel shall possess the qualifications, professional competence and experience to carry out services 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.**

Specific surveillance (similar to audit) will be performed by IO to verify that the above requirements as well as those in chapter 15.1 are respected by the contractor. Contractor will be informed by IO in the Task order.

11 Specific General Management requirements

Requirement for [Ref 1] GM3S section 6 applies in full requirement

11.1 Contract Gates

The contract gates are defined in [Ref 1] section 6.1.5, the specific gates will be specified in the individual technical specifications.

11.2 Work Monitoring

The mechanism for the work monitoring if required will be specified in the specific technical specifications of individual task orders.

11.3 Meeting Schedule

The meeting schedule will be specified in the technical specifications of future task orders.

11.4 CAD design requirements

If this contract requires for CAD activities, those will be specified in the individual task orders, then [Ref 1] GM3S section 6.2.2.2 applies"

11.5 Profiles and skills

The Contractor's team shall cover all disciplines that may reasonably be required to carry out the scope of work.

As guidance, the following personnel profiles are expected to be required for work at the contractor's site and at the ITER site:

- Analyst
- CAD Operative
- Project Manager
- Person(s) for technical checking and reviewing the work.

The following minimum required professional competencies are necessary to fulfil the scope of work for each of the profiles listed above:

- proven experience in the nuclear physics or engineering and nuclear analysis
- Demonstrated experience of nuclear issues/sources related to fusion experiments
- ability to use CAD packages and to convert it for MCNP
- Demonstrated experience to use massive MCNP model (>1, 000, 000 surfaces), large number of penetrations (>4000) and high power computation capabilities
- Demonstrated experience with MCNP/D1S
- Demonstrated experience with activation codes (e.g. FISPACT,ACAB etc)
- knowledge of INB order 2012 and PIA requirements
- knowledge of Quality Assurance systems ISO 9001 and their practical application,
- fluent in English both written and oral,
- ability to communicate effectively and to write clear and concise reports in English,
- proficient in the use of Microsoft Office suite of software,
- good interpersonal, communication and organizational skills,
- ability to read engineering drawings

11.6 Anticipated level of requirements

The anticipated level of support corresponding to each of the profiles is given below as guidance. The numbers quoted correspond to the estimated workforce needed to support nuclear analysis tasks. However, this level of support will not necessarily be achieved during the life of the contract.

- 2024-2025 1.89 man-years
- 2025-2026 1.89 man-years
- 2026-2027 1.89 man-years
- 2027-2028 1.89 man-years

11.7 Responsibilities

Access and regulation:

Contractor will be responsible for all work visas and other required documentation and their respective costs associated with working at the ITER site.

IT equipment and licences:

Where the task order includes the supply of IT equipment, the contractor shall have and maintain the necessary IT equipment and licenced software tools required. All deliverables shall be supplied in a format acceptable to IO.

Where licensing or Export Control issues exist, the Contractor will be responsible for supplying the code and licenced users and abiding to all the relevant legal obligations and any costs associated with them.

The IO uses Microsoft Office Suite for general purpose document preparation, Catia/Enovia V5 for design work and Primavera for Scheduling. AutoCAD software is also available (used primarily for integrating third party Installations into the ITER CATIA models).

11.8 Acceptance Criteria

Documents must be prepared according to applicable IO policies and procedures. The tasks will be considered complete and acceptable once the tasks have been performed in accordance with this specification and submitted to, reviewed by and accepted by the IO. The IO will review the deliverables and provide comments to the Contractor within 2 weeks from when the deliverables are submitted to IO. Revision iterations will follow as necessary.

11.9 Licensing requirements

In application of the ITER agreement, article 14, ITER follows the French Regulation for Nuclear safety. Because of its inventory in nuclear materials, ITER has been classified in France as a nuclear facility “Installation Nucléaire de Base” and in particular numbered as INB no.174 per the French Decree [**3]** and the associated decision from the ASN (French Safety Authority) [4]. ITER Organization (IO) is the nuclear operator of this INB and understood like that in the framework of this contract.
As required by the INB Order, and notably its article 2.2.1, the nuclear operator (IO) must notify the external interveners of the necessary provisions for application of the INB order.
The supplier must comply with the all requirements expressed in “Provisions for implementation of the generic safety requirements by the external interveners” **[4]**.
The contractor must be aware of **[6]** and must be also known, understood and applied by all staff of the contractor and cascaded down in the managerial lines of the contractor and all of their sub-contractors (when applicable).

11.10 Protection important activities

As per articles 1.3 and 2.5.2 of the Order of 7 February 2012:

“Activity important for protecting the interests mentioned under Article L. 593-1 of the Environmental Code (nuclear security – i.e. nuclear safety, radiation protection, the prevention and fight against malicious acts, and also civil security actions in the event of an accident –, public health and sanitation or protection of nature and the environment), i.e. activity that falls under the technical or organizational provisions mentioned under the second paragraph of Article L. 593-1 of the Environmental Code or that is liable to affect them;”

SERVICE

In practice, and according to **[6]**, the calculations to be carried out in the scope of this contract are a PIA. The defined requirements associated to this PIA are also included in **[6]** and defined below:

Defined Requirement	Provisions to be implemented in this contract
The input data shall be: o Up to date o Validated o Consistent with safety demonstration For undefined input data: o Clearly identified and referenced assumptions o Sensitivity study to assess the impact of the range of assumptions or use of non-arguable conservative assumptions o Formally validated baseline or conservative input data in the document in support of the safety analysis	o Input data to be provided by IO to ensure that the input is formally validated baseline or conservative input data in the document in support of the safety analysis. o The contractor shall apply the instructions for verification of input for radiation transport calculations **[7]** as per section 7. o The contractor shall apply the instructions for nuclear analysis **[8]** as per section 7. The contractor shall clearly define and identify the assumptions taken
The calculation model used shall always be equally or more conservative than the Configuration Management Model (CMM).	Input data to be provided by IO to ensure that the input is formally validated baseline or conservative input data in the document in support of the safety analysis
The method and code shall be qualified according to **[2]**.	The contractor shall apply the instructions for nuclear analysis **[8]** as per section 7.
The method and code shall be used within its qualification domain	The contractor shall apply the instructions for nuclear analysis **[8]** as per section 7 and the requirements stated in this specification.
The uncertainties associated with the methods shall be estimated, or additional margins shall be added and substantiated, through sensitivity studies.	The contractor shall apply the instructions for nuclear analysis **[8]** as per section 7 where the estimation of uncertainties is part of the output data and acceptance criteria.
The parameters (including input data) that have strong impact on the results shall be identified.	As part of this contract, the contractor shall identify the parameters (including input data) that have strong impact on the results and provide it in the final report.
All input data, methods codes and their validity domain and uncertainties shall be included in the report.	The contractor shall apply the instructions for nuclear analysis **[8]** as per section 7 and the requirements stated in this specification.
Intermediate and final results shall be expressed in international units.	Intermediate and final results shall be expressed in international units.
A sensitivity studies shall be performed for covering uncertainties or additional safety factor in the results and the results shall be integrated in the report.	The contractor shall apply the instructions for nuclear analysis **[8]** as per section 7 where the estimation of uncertainties is part of the output data and acceptance criteria.

SERVICE

The acceptance criteria shall be included in the report; all margins and safety factor shall be expressed in safety limits.	All margins and assumed safety factors shall be given in the final report.

As required by the INB Order **[2]**, and notably its article 2.2.1, the nuclear operator (IO) must notify the external interveners of the necessary provisions for application of the INB order.

1) The supplier must comply with the all requirements expressed in "Provisions for implementation of the generic safety requirements by the external interveners" **[4]**.
2) For each requirement, the external intervener must explain in its quality system the dispositions taken to implement the requirements stipulated in this document.
3) **All external interveners must be informed that ITER is a nuclear facility (an "INB", for Installation nucléaire de base, "Basic nuclear installation" in French regulation) identified in France by the number "INB no. 174".** In application of the ITER agreement, article 14, ITER follows the French Regulation for Nuclear safety. Because of its inventory in nuclear materials, ITER has been classified in France as a nuclear facility "Installation Nucléaire de Base" and in particular numbered as INB no.174 per the French Decree No. 2012-1248 dated 9 November 2012 authorizing IO to create a basic nuclear facility called "ITER" (ITER_D_CZK7M5) and the associated ASN Decision 2013-DC-0379 dated 12 November 2013 establishing the prescriptions applicable to ITER Organization for the design and construction of the licensed nuclear facility INB No. 174 called ITER (ITER_D_MU6PP3). ITER Organization (IO) is the nuclear operator of this INB.
4) In every contract involving PIA and PIC, disregarding the level in the supply chain of the contracting parties, it must be clearly stated that defined requirements on PIC and PIA have to be fulfilled. For PIC and their defined requirement, the procedure **[10]** applies. For PIA and their defined requirement, the document **11]** applies.
5) The external intervener must explain in its quality system:
   - What are the dispositions taken to implement the requirement as per point number 4 above.;
   - What are the verifications made to check the appropriate propagation of the defined requirement;
   - What are the records used to document this verification.
6) The ITER Policy on Safety Security and Environment Protection Management (ITER_D_43UJN7) must be circulated, known, understood and applied by all staff of the external intervener and cascaded down in the managerial lines of the external intervener and of contractors and sub-contractors.
7) The external intervener must be aware of the ITER dispositions for application of the INB Order, which are implemented:
   - Through the IO Integrated Management system "MQP" for the organizational and managerial matters;
   - Through the configuration management system for the technical matters.

   The list of IO applicable documents for the contracts is provided in a specific annex of each contract.
   a. On this basis, the external intervener must implement its own quality assurance program (QAP) and must demonstrate that it is compliant with the IO quality management requirements, in particular for the application of INB order.
   b. The external intervener's QAP is submitted for approval to IO before initiating any activity related to this contract.
   c. For each step of this contract, external intervener must provide the corresponding

Quality Plans.

8) The external intervener must grant access rights to the IO and French nuclear regulatory authorities representatives to its facilities and records **and those of its suppliers and subcontractors** for the purposes of surveillance of defined requirements during the design, construction/manufacturing, commission, assembly, maintenance and surveillance of a PIC. This surveillance also includes the examination of all PIA and the follow-up and verification of all corrective actions which are to be implemented.
9) The external intervener must establish a supervision plan for its own external interveners.
10) The external interveners must establish and/or must request to its contractors to establish their manufacturing inspection plans (MIP) following IO procedure Requirements for Producing a Manufacturing and Inspection Plan (ITER_D_22MDZD).
    - Activities classified as PIA's must be clearly identified in the corresponding MIP templates and in agreement with IO PIA definitions after IO review and acceptance.
    - The type of the intervention points on the PIA's are marked up after acceptance by IO and are properly tracked after the execution of the required technical controls.
11) For each PIA performed by the external intervener or one of its sub-contractor (disregarding the level in the supply chain), the external intervener must ensure that:
    - The PIA is performed in accordance with procedure and using means for meeting *a priori* the related defined requirement.
    - The PIA is traced to check *a posteriori* whether the defined requirement were met.
12) For each PIA performed by the external intervener, the external intervener must performs also a technical control to ensure that:
    - The PIA is carried out in compliance with the appropriate defined requirements.
    - The appropriate corrective and preventive actions have been defined and implemented.
13) The external intervener must put in place an organization to guaranty that the persons carrying out the technical control for PIA's are distinct from the individuals who have accomplished the activities.
14) For each PIA performed by a sub-contractor of the external intervener (disregarding the level in the supply chain), the external intervener must ensure that the subcontractor make analogous provisions.
15) The external intervener must ensure that the PIA and their technical controls are carried out by persons with the appropriate competences and qualifications. For that purpose, the external intervener must notably apply the procedure [6]. The external intervener must ensure that its sub-contractors (disregarding the level in the supply chain) make analogous provisions. The external intervener must explain in its quality system the dispositions taken to implement this requirement.
16) The external intervener must ensure that each PIA and the related technical controls:
    - Are documented to demonstrate a priori that they comply with the defined requirements,
    - Are traced to check a posteriori that they comply with the defined requirements,

    This applies to every PIA and technical controls performed by the first external contractor in the contractual chain or any one of its sub-contractor (disregarding the level in the supply chain).
17) The external intervener must keep updated records of the results of implemented PIA and their technical control, the related action of verification and the assessment when

requested by IO and must provide them to IO per the specific IO procedures for documentation management.

The external intervener records must be easily accessible and legible by IO, protected, kept under appropriate conditions and archived for an appropriate and justified period of time.

18) The external intervener must implement the same criteria in its Quality Assurance System for categorization and remedial actions. In particular the detection of NC must be immediately communicated to IO and registered in the record system of the external intervener and of IO (per section 5.9 “Records”).
19) The external intervener must implement a management system in accordance with the requirement defined under (18) above, allowing in a short delay (less than one month):
    - The opening and categorization of a NC;
    - The performance of root cause analysis of the NC;
    - The establishment of the remedial, preventive (PA) and corrective actions (CA);
    - The follow-up of the evolution of the NC, PA and CA;
    - The proper close-out of the NC.
20) The external intervener must be in charge of the management of its NCR, including the tentative deadlines for the closure of the NC. If the deadline for NC management cannot be respected, the external intervener must communicate to IO the cause for this delay (managerial, technical, human reasons) and searches for solutions, in agreement with the importance of the discrepancy.
21) Before releasing any control milestones such as hold points or notification points in the MIP’s, or any milestones indicated in the contract as release notes, each external intervener must check that:
    - All NC’s have been resolved;
    - Objective evidences of remedial actions performance are available;
    - All NC’s are properly close-out.
22) Each external intervener must:
    - Raise preventive and correctives actions when required, and scheduled them within an implementation program, following IO procedures.
    - Tracked their evolution until they are closed-out.
23) Each external intervener must require its contractors to apply the above management of NC’s, PS’s and CA’s.
24) The external intervener, aware of this classification, must provide skilled personnel able to immediately alert IO in case of possible significant event, as soon as detected.
25) In addition to individually managing each one of its discrepancy, the external intervener must periodically reviews the discrepancies in order to assess the cumulated effect of as-yet-uncorrected discrepancies and to identify and analyse the recurrence propensity for similar types of discrepancies. If need be, any preventives and correctives actions must be identified and scheduled within an implementation program.
26) The external intervener must systematically collect, analyse and communicate to IO the information that is likely to help IO improving the PIA activities.
27) On a monthly basis, the external intervener must provide follow-up status of nonconformities, correctives actions and preventive actions scheduling, resolutions and efficiency of such activities.
28) Any safety demonstration must be in compliance with the Authorization basis.
29) For detailed design or construction studies and calculation related to complementary safety demonstration, the external intervener must provide results based on a solid safety demonstration as per article 3.8 of the INB order and the instructions provided by IO for its application.

SERVICE

30) For any deviation, the external intervener must raise a deviation request under the IO procedure conditions.
31) The external intervener must require its contractors to raise a deviation request as soon as detected.
32) The external intervener and its contractors must provide together the deviation request evidences of compliance with the authorization basis. The external intervener must check that the provided evidences are based on a solid safety demonstration as per article 3.8 of the INB order and the instructions provided by IO for its application.

SERVICE

ANNEX I

EXPRESSION OF INTEREST & PIN ACKNOWLEDGEMENT

To be returned by e-mail to: emilie.blanchet@iter.org copy kristel.jeanmart@iter.org

TENDER No.	**IO/24/OT/70001077EBT**
DESIGNATION of SERVICES:	**Nuclear Analysis framework contract**
OFFICER IN CHARGE:	**Emilie Blanchet – Procurement & Contracts Division ITER Organization**

☐ WE ACKNOWLEDGE HAVING READ THE PIN NOTICE FOR THE ABOVE MENTIONED TENDER

☐ WE INTEND TO SUBMIT A TENDER

☐ WE WILL NOT TENDER FOR THE FOLLOWING REASONS:

……

Signature: COMPANY STAMP

Name: .....

Position: .....

Tel: .....

E-mail.....

Date: .....