

外部委託業者の募集

References: IO/26/OT/10035760/JGO

“Supply Contract ITER Disruption Mitigation System Vacuum System Components“

(ITER ディスラプション緩和システム用真空システム機器の供給契約)

IO 締め切り 20226 年 10 月 23 日(金)

○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。

この文書の目的は、作業範囲および入札プロセスに関する技術的内容の基本的な概要を提供することです。

○背景

ITER は平和利用の核融合発電の科学的小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

本調達手続きは、「ITER ディスラプション緩和システム用真空システム機器の供給契約」を締結することを目的としています。

本供給契約の対象範囲は以下のとおりです。

- ・ 316L(N)-IG材を用いた各種真空フランジの製作 (要求数量)
- ・ 316L(N)-IG材を用いた真空延長部向け各種ベローズライナーの製作 (要求数量)
- ・ 316L(N)-IG材を用いた各種インジェクター部品の製作 (要求数量)
- ・ 316L(N)-IG材を用いた真空システムサブアセンブリの製作 (要求数量)
- ・ 316L(N)-IG製チューブの供給 (要求数量および要求寸法)
- ・ 工場における品質管理体制の構築・運営
- ・ 製造、検査 (解析を含む)、清浄度管理、梱包、保管および納入に必要なすべての手順書の作成
- ・ 工程計画および関連文書の作成

詳細については、添付付属書 II の技術仕様書 GLWHUM_v1_3 をご参照ください。

○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

関心表明提出後、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。

○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
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事前指示書（PIN）の発行	2026 年 10 月 12 日
関心表明フォームの提出	2026 年 10 月 23 日
入札開始	2026 年 10 月 30 日
明確化のための質問（もしあれば）と回答	入札提出の 5 日前
入札提出	2026 年 12 月 11 日
入札評価と契約授与	2027 年 Q1
契約調印	2027 年 Q1

○契約期間と実行

ITER機構は2027年のQ1に供給契約を授与する予定です。予想される契約期間は20か月の予定です。

○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。本プロジェクトは高度な技術的複雑性を有しているため、ポンプメーカーがコンソーシアムの代表企業として参加し、ポンプの設計、製造および試験に関する社内能力を保有していることが求められます。

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「 **Supply Contract ITER Disruption Mitigation System Vacuum System Components**」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

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PRIOR INFORMATION NOTICE (PIN)

OPEN TENDER SUMMARY

IO/26/OT/10035760/JGO

for

Supply Contract ITER Disruption Mitigation System Vacuum System Components

Prior Indicative Notice annexes:

- Annex I: Expression of Interest Form
- Annex II: Technical Specification GLWHUM_v1_3

IO Contact Persons: Jingyu.Gao@iter.org, cc Serena.Profita_ext@iter.org

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 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 Supply Contract.

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

2 Background

The ITER project is an international research and development project jointly funded by its seven Members being, the European Union (represented by EURATOM), Japan, the People's Republic of China, India, the Republic of Korea, the Russian Federation and the USA. ITER is being constructed in Europe at St. Paul–Lez-Durance in southern France, which is also the location of the headquarters (HQ) of the ITER Organization (IO).

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

3 Scope of Work

The present tender process is aiming to set up a Supply Contract ITER Disruption Mitigation System Vacuum System Components.

The supply covers the following items:

- Manufacturing of the different vacuum flanges in the requested quantities from 316L(N)-IG
- Manufacturing of the different bellows liners for the vacuum extensions in the requested quantities from 316L(N)-IG
- Manufacturing of different injector parts in the requested quantities from 316L(N)-IG
- Manufacturing of the vacuum system sub-assemblies in the requested quantities from 316L(N)-IG
- Supply of the 316L(N)-IG tubes in the requested quantities and dimensions
- Organization of quality at works
- Elaboration of all procedures required for the manufacturing, inspection (including analyses), cleanliness, packaging, storage and delivery
- Time schedules and documentation

For more details, please refer to Annex II: Technical Specification GLWHUM_v1_3.

4 Procurement Process & Objective

The objective is to award one Supply 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)

The Prior Information Notice is the first stage of the Open Tender process. The IO formally invites interested Suppliers to indicate their interest in the competitive process by returning to the Procurement officer in charge the attached “Expression of Interest and PIN Acknowledgement” (Annex I) by the date indicated under the procurement timetable.

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

The Request for Proposals (RFP) will be published on our digital tool “Iproc” after the submission of Expression of Interest. This stage allows interested bidders who have indicated their interest to the Procurement Officers 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 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

One Supply Contract will be awarded on the basis of best value for money or lowest priced technically compliant method, 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)	12 October 2026
Submission of Expression of Interest form	No later than 23 October 2026
Tender launch	No later than 30 October 2026
Clarification Questions (if any) and Answers	5 days before submission deadline
Tender Submission	11 December 2026
Tender Evaluation & Contract Award	Q1 2027
Contract Signature	Q1 2027

5 Quality Assurance Requirements

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

6 Contract Duration and Execution

The ITER Organization is planning to award the Supply Contract in Q1 2027. The estimated contract duration is 20 months.

7 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, 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.

Legal entities cannot participate individually or as a consortium partner in more than one application or tender of the same contract. A consortium may be a permanent, legally established grouping, or a grouping which has been constituted informally for a specific tender procedure. All members of a consortium (i.e. the leader and all other members) are jointly and severally liable to the ITER Organization.

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

It is expected that the designated consortium leader will explain the composition of the consortium members in its offer. Following this, the Candidate's composition must not be modified without notifying the ITER Organization of any changes. Evidence of any such authorisation shall be submitted to the IO in due course in the form of a power of attorney signed by legally authorised signatories of all the consortium members.

Any consortium member shall be registered in IPROC.

8 Sub-contracting Rules

All sub-contractors who will be taken on by the Contractor shall be declared with the tender submission in IPROC. 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.

All declared sub-contractors must be established within an ITER Member State in order to participate.

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). Rules on sub-contracting are indicated in the RFP itself.

ANNEX I

EXPRESSION OF INTEREST & PIN ACKNOWLEDGEMENT

To be returned by e-mail to: Jingyu.Gao@iter.org, cc Serena.Profita_ext@iter.org

Tender reference: **IO/26/OT/10035760/JGO**
Description: **Supply Contract ITER Disruption Mitigation System Vacuum System Components**
Procurement Officer: **Jingyu Gao**

Company Name:

Country of Origin:

- ☐ WE ACKNOWLEDGE HAVING READ THE PIN NOTICE FOR THE ABOVE MENTIONED TENDER
- ☐ WE INTEND TO SUBMIT A TENDER
- ☐ WE ARE ALREADY REGISTERED IN IPROC
- ☐ WE INTEND TO REGISTER IN IPROC

Please list the users of ARIBA/IPROC that you wish to add as response team for this tender:

Name	E-mail
...	...

.....

Signature:

COMPANY STAMP

Name:

Position:

Tel:

E-mail.....

Date:

Specifications (In-Cash Procurement)

Technical Specification for the supply of the DMS vacuum system

This technical specification details the supply of Vacuum flanges Bellows liners TIV parts Vacuum pipes and pumping domes for EQ UP ISS and PCSS Pipes for Cryogenic components and port cell installation All components shall be made from 316L(N)-IG

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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 technical specification covers the manufacturing and supply of the vacuum system components for the ITER DMS. This includes the manufacturing of 316L(N)-IG austenitic steel flanges which will be partly used for the subsequent vacuum system manufacturing, partly for use in other DMS system, as well as the manufacturing of various injector parts. Furthermore, supply of various sizes of tubes made from 316L(N)-IG shall also be covered by this contract.

The 316L(N)-IG steel specified here is grade 316L(N) steel with narrower alloying element ranges and controlled impurities. The closest analogy is X2CrNiMo17-12-2 with controlled nitrogen content austenitic stainless steel described in the RCC-MR Code, Edition 2007.

The supply covers the following items:

- Manufacturing of the different vacuum flanges in the requested quantities from 316L(N)-IG
- Manufacturing of the different bellows liners for the vacuum extensions in the requested quantities from 316L(N)-IG
- Manufacturing of different injector parts in the requested quantities from 316L(N)-IG
- Manufacturing of the vacuum system sub-assemblies in the requested quantities from 316L(N)-IG
- Supply of the 316L(N)-IG tubes in the requested quantities and dimensions
- Organization of quality at works
- Elaboration of all procedures required for the manufacturing, inspection (including analyses), cleanliness, packaging, storage and delivery
- Time schedules and documentation

3 Acronyms & Definitions

3.1 Acronyms

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

Abbreviation	Description
CRO	Contract Responsible Officer
DMS	Disruption Mitigation System
GM3S	General Management Specification for Service and Supply
IO	ITER Organization
PRO	Procurement Responsible Officer
PT	Penetrant Test
RT	Radiographic Test
UT	Ultrasonic test

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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. 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	V
1	General Management Specification Service Supply (GM3S)	82MXQK	1.4
2	Manufacturing drawings of vacuum flanges	DA78Z8	
3	Manufacturing drawings of bellows liners	FY3MEM	
4	Manufacturing drawings of Injector parts	FDCAQ2	
5	Manufacturing drawings of vacuum system	DA766K	
6	Procedure for management of Nonconformities	22F53X	10.3
7	Procedure for the management of Deviation Requests	2LZJHB	9.1
8	MQP L3 Working Instruction for Manufacturing Readiness Review	44SZYP	5.1
9	Working Instruction Delivery Readiness Review (DRR)	X3NEGB	3.0
10	ITER Vacuum Handbook	2EZ9UM	2.5
11	Quality Requirements for IO Performers	22MFG4	6.4

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.	V
CS1	Metallic products: Type of inspection documents	NF-EN 10204	2004
CS2	Steels - Micrographic determination of the apparent grain size	NF-EN ISO 643	2013
CS3	Hot rolled round steel bars for general purposes — Dimensions and tolerances on shape and dimensions	NF-EN 10060	2003
CS4	Standard test methods for determining the inclusion content of steel	ASTM E45-13	2018
CS5	Standard Test Methods for Permeability of Feebly Magnetic Materials.	ASTM A342-14	2021
CS6	ASME Boiler and Pressure Vessel Code Section V – Non-destructive examinations	ASME V	2025
CS7	Process piping	ASME B36.19	2024
CS8	Buttwelding Fittings Standard	ASME B16.9	2024

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In case of change of edition year or issuing standard, which supersede above mentioned, the use of new Standards is allowed only in case of demonstration of equivalency with prior written Client's approval.

The use of EN but non-NF Standards is also allowed demonstrating equivalence with the corresponding NF version of the Standard.

Other equivalent national or international standards and codes proposed by the supplier may be acceptable with prior written Client's approval, provided conformity assessment to all criteria is satisfied.

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5 Scope of Work

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

5.1 Manufacturing of vacuum flanges

5.1.1 Description

Flanges that need to be manufactured:

- 120x Half nipple KF16 L30 (DF3ZMS_v3)
- 16x Half nipple KF25 L30 (GAMQEA_v1)
- 580x Half nipple KF40 L20 (DF44YD_v4)
- 140x Half nipple KF40 L40 (DJB5TJ_v4)
- 70x Half nipple KF50 L30 (DJKJ6H_v3)
- 110x Half nipple QCF63 L30 (DLKBZ4_v3)
- 40x Half nipple CF63 L40 (FXJFFG_v3)
- 70x ISO tapered flange NW80 (GQ3FFZ_v1)

Raw material for the flanges shall be procured by the contractor.

Table 1: Classifications

	Safety class	Quality class	Seismic class	Vacuum class	PED/ESPN class	Tritium class	RH class
Half nipple KF16 L30	PIC/SIC2	QC-2	SC1 (S)	VQC-3A	NA	TC 1A	NA
Half nipple KF25 L30	Non-SIC	QC-3	NA	VQC-3A	NA	NA	NA
Half nipple KF40 L20	PIC/SIC2	QC-2	SC1 (S)	VQC-3A	NA	TC 1A	NA
Half nipple KF40 L40	PIC/SIC2	QC-2	SC1 (S)	VQC-3A	NA	TC 1A	NA
Half nipple KF50 L30	Non-SIC	QC-3	SC1 (S)	VQC-3A	NA	TC 1A	NA
Half nipple QCF63 L30	Non-SIC	QC-3	SC1 (S)	VQC-3A	NA	TC 1A	NA
Half nipple CF63 L40	Non-SIC	QC-3	SC1 (S)	VQC-3A	NA	TC 1A	NA
ISO tapered flange NW80	Non-SIC	QC-3	NA	VQC-3A	NA	NA	NA

5.1.2 Design requirements

[DMS.VAC.001] The flanges shall be manufactured according to the provided manufacturing drawings.

5.1.3 Material, welding and fabrication requirements

[DMS.VAC.002] The material from which the flanges are machined shall be 316L(N)-IG.

[DMS.VAC.003] Material certificate EN 10204 Type 3.1 shall be supplied for all rounds, from which the flanges are made.

SUPPLY

- [DMS.VAC.004] Contents of
- Co < 0.05 wt%
 - Nb < 0.01 wt%
 - Ta < 0.01 wt%

Shall be demonstrated by certification or by test.

- [DMS.VAC.005] Lubricants used during manufacturing shall be chosen in agreement with the vacuum handbook [10].
- [DMS.VAC.006] The flanges shall be cleaned after manufacturing to be free of grease, oils and other contaminants.
- [DMS.VAC.007] Surfaces shall be free of discoloration.
- [DMS.VAC.008] The fabrication method shall be chosen by the supplier.

5.1.4 Marking

- [DMS.VAC.009] An ITER part number (PNI) will be marked on each item. The Contractor shall receive from the IO the catalogued Part Numbers of ITER (PNI) for the scope of supply, prior to the packaging.

Each flange shall be legibly identified with following information:

- Manufacturer name or symbol.
- Round number or unique identification number related to material history.
- Grade of material.
- Heat number.
- PNI number.

5.1.5 Packing, preservation & shipping

- [DMS.VAC.010] The sealing surfaces of the flanges must be protected against contamination, scratches and dust.
- [DMS.VAC.011] The welding interfaces of the flanges must be protected against contamination, deformation and scratches.

5.1.6 Delivery Time

- [DMS.VAC.012] The following quantities shall be shipped to IO:

16x Half nipple KF25 L30
 230x Half nipple KF40 L20
 35x Half nipple KF50 L30
 60x Half nipple QCF63 L30
 70x ISO tapered flange NW80

- [DMS.VAC.013] The maximum expected duration from the contract signature to the supply of the scope of work is **6** months.

The rest of the flanges shall be used for manufacturing the vacuum system components, described in section 5.4.

SUPPLY

5.2 Manufacturing of bellows liners**5.2.1 Description**

Liners that need to be manufactured:

- 70x Bellows end piece (FXJJ4Q_v1)
- 35x Bellows outer tube (FXJLWM_v2)
- 35x Bellows inner tube (FXJJ6R_v2)

Raw material for the liners shall be procured by the contractor.

Table 2: Classifications

	Safety class	Quality class	Seismic class	Vacuum class	PED/ESPN class	Tritium class	RH class
Bellows end piece	PIC/SIC1	QC-1	SC-1 (SF)	VQC-1A	NA	TC 1A	NA
Bellows outer tube	PIC/SIC1	QC-1	SC-1 (SF)	VQC-1A	NA	TC 1A	NA
Bellows inner tube	PIC/SIC1	QC-1	SC-1 (SF)	VQC-1A	NA	TC 1A	NA

5.2.2 Design requirements

[DMS.VAC.014] The liners shall be manufactured according to the provided manufacturing drawings.

5.2.3 Material, welding and fabrication requirements

[DMS.VAC.015] The material from which the liners are machined shall be 316L(N)-IG.

[DMS.VAC.016] The base material shall be made from cross-forged material which is Electro-Slag Remelted (ESR) or Vacuum Arc Remelted (VAR).

[DMS.VAC.017] Material certificate EN 10204 Type 3.1 shall be supplied for all rounds, from which the liners are made.

[DMS.VAC.018] Contents of

- Co < 0.05 wt%
- Nb < 0.01 wt%
- Ta < 0.01 wt%

Shall be demonstrated by certification or by test.

[DMS.VAC.019] Lubricants used during manufacturing shall be chosen in agreement with the vacuum requirements.

[DMS.VAC.020] The liners shall be cleaned after manufacturing to be free of grease, oils and other contaminants.

[DMS.VAC.021] Surfaces shall be free of discoloration.

[DMS.VAC.022] The fabrication method shall be chosen by the supplier.

5.2.4 Marking

[DMS.VAC.023] An ITER part number (PNI) will be marked on each item. The Contractor shall receive from the IO the catalogued Part Numbers of ITER (PNI) for the scope of supply, prior to the packaging.

Each liner shall be legibly identified with following information:

SUPPLY

- Manufacturer name or symbol.
- Round number or unique identification number related to material history.
- Grade of material.
- Heat number.
- PNI number.

5.2.5 *Packing, preservation & shipping*

[DMS.VAC.024] The welding interfaces of the liners must be protected against contamination, deformation and scratches.

5.2.6 *Delivery Time*

[DMS.VAC.025] The maximum expected duration from the contract signature to the supply of the scope of work is **6** months.

SUPPLY

5.3 Manufacturing of Injector components**5.3.1 Description**

Assemblies that need to be manufactured:

- 12x TIV assembly EQL (Variant 1) (FNC9TF_v3)
 - o 1x Reducer (Variant 1)
 - o 1x Spacer
 - o 1x Half Nipple KF40 L20
 - o 1x Inlay
- 4x TIV assembly EQL (Variant 2) (FNC9TF_v3)
 - o 1x Reducer (Variant 2)
 - o 1x Spacer
 - o 1x Half Nipple KF40 L20
 - o 1x Inlay
- 12x TIV assembly EQR (GFVYXR_v2)
 - o 1x Reducer
 - o 1x Spacer
 - o 1x Half Nipple KF40 L20
 - o 1x Inlay
- 30x Injector bellows (FNBE29_v4)
 - o 1x Injector bellows left flange
 - o 1x Injector bellows right flange
- 28x CF40->KF40 adapter (FNBQ9E_v3)
- 54x Stage AB flange (FNAY2R_v5)
 - o 1x CF200 AB flange
 - o 1x Half Nipple KF40 L40
- 27x Stage A extension (GVCH32_v2)

Raw material for the parts shall be procured by the contractor. Half nipples shall be taken from the lot produced under 5.1. Gate valves will be free-issued by IO.

Table 3: Classifications

	Safety class	Quality class	Seismic class	Vacuum class	PED/ESPN class	Tritium class	RH class
TIV assemblies	PIC/SIC1	QC-1	SC-1 (SF)	VQC-1A	NA	TC 1A	NA
Injector bellows	PIC/SIC2	QC-2	SC1 (S)	VQC-1A	NA	TC 1A	NA
CF40>KF40 adapter	PIC/SIC2	QC-2	SC1 (S)	VQC-1A	NA	TC 1A	NA
Stage AB flange	PIC/SIC2	QC-2	SC1 (S)	VQC-1A	NA	TC 1A	NA
Stage A extension	PIC/SIC2	QC-2	SC1 (S)	VQC-1A	NA	TC 1A	NA

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5.3.2 *Operating requirements*

[DMS.VAC.026] The vacuum components operate in a pressure range between 10^{-6} mbar and 1 bara. A Helium leak test shall be performed by the supplier on all welded sub-components.

5.3.3 *Design requirements*

[DMS.VAC.027] The parts shall be manufactured according to the provided manufacturing drawings.

5.3.4 *Material, welding and fabrication requirements*

[DMS.VAC.028] The material from which the parts are machined shall be 316L(N)-IG.

[DMS.VAC.029] The base material shall be made from cross-forged material which is Electro-Slag Remelted (ESR) or Vacuum Arc Remelted (VAR).

[DMS.VAC.030] Material certificate EN 10204 Type 3.1 shall be supplied for all rounds, from which the parts are made.

[DMS.VAC.031] Contents of

- Co < 0.05 wt%
- Nb < 0.01 wt%
- Ta < 0.01 wt%

Shall be demonstrated by certification or by test.

[DMS.VAC.032] Lubricants used during manufacturing shall be chosen in agreement with the vacuum requirements.

[DMS.VAC.033] The parts shall be cleaned after manufacturing to be free of grease, oils and other contaminants.

[DMS.VAC.034] Surfaces shall be free of discoloration.

[DMS.VAC.035] The fabrication method shall be chosen by the supplier. The welding procedure shall be qualified for the application (WPS, PQR).

[DMS.VAC.036] All welds shall be carried out by a qualified welder (WPQ as per ASME Sec. IX or equivalent).

5.3.5 *Quality Control Provisions*

[DMS.VAC.037] All welds shall be numbered for later PT testing.

[DMS.VAC.038] Visual inspection and dimensional inspection shall be carried out for each complete weld assembly according to the dimensions on the drawings.

5.3.6 *Non-destructive testing*

[DMS.VAC.039] All welds shall be subject to PT testing. PT shall be performed as per CS6 reference, PT personnel shall be qualified as per SNT-TC-1A. Acceptance criteria as per CS6 apply.

[DMS.VAC.040] All welds shall be subject to volumetric inspection, either UT or RT. The selected procedure shall be performed as per CS6 reference, personnel shall be qualified. Acceptance criteria as per CS6 apply.

5.3.7 *Marking*

[DMS.VAC.041] An ITER part number (PNI) will be marked on each item. The Contractor shall receive from the IO the catalogued Part Numbers of ITER (PNI) for the scope of supply, prior to the packaging.

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Each part shall be legibly identified with following information:

- Manufacturer name or symbol.
- Round number or unique identification number related to material history.
- Grade of material.
- Heat number.
- PNI number.

5.3.8 *Packing, preservation & shipping*

[DMS.VAC.042] The welding interfaces of the parts must be protected against contamination, deformation and scratches.

5.3.9 *Delivery Time*

[DMS.VAC.043] Delivery shall be organized in batches.

Batch 1 (delivery no later than **6** months after contract signature):

- 2x TIV assembly EQL (Variant 2)
- 5x Injector bellows
- 2x CF40->KF40 adapter
- 2x Stage AB flange
- 2x Stage A extsion

Batch 2 (delivery no later than **12** months after contract signature):

- 6x TIV assembly EQL (Variant 1)
- 6x Injector bellows
- 6x CF40->KF40 adapter
- 6x Stage AB flange
- 6x Stage A extension

Batch 3 (delivery no later than **16** months after contract signature):

- 1x TIV assembly EQL (Variant 2)
- 1x Injector bellows
- 1x CF40->KF40 adapter
- 1x Stage AB flange
- 1x Stage A extension

Batch 4 (delivery no later than **20** months after contract signature):

- 6x TIV assembly EQL (Variant 1)
- 12x TIV assembly EQR
- 1x TIV assembly EQL (Variant 2)
- 19x Injector bellows
- 19x CF40->KF40 adapter
- 19x Stage AB flange
- 19x Stage A extension

SUPPLY

5.4 Manufacturing and delivery of the DMS vacuum components**5.4.1 Description**

For the purpose of evacuating the ITER DMS, each bank is equipped with two pumping systems, one for tritiated gas and one for non-activated gas and cryo-vacuum. The flanges produced under the scope in 5.1, that haven't been shipped to IO, shall be used for this manufacturing. Pipes and fittings shall be procured by the manufacturer.

Parts that need to be manufactured:

- 2x ISS EQL vacuum pipes (GFYJAN_v2)
 - o 6x Stage B pumping pipe EQL
 - o 6x Stage B pumping jumper EQL
 - o 1x Cryostat pumping pipe EQL
 - o 1x Injector pumping manifold EQL
 - o 1x ISS pumping jumper EQL
- 2x ISS EQR vacuum pipes (GFYM4R_v2)
 - o 6x Stage B pumping pipe EQR
 - o 6x Stage B pumping jumper EQR
 - o 1x Cryostat pumping pipe EQR
 - o 1x Injector pumping manifold EQR
 - o 1x ISS pumping jumper EQR
- 4x ISS UP vacuum pipes (GJ4HDG_v2)
 - o 1x Stage B pumping pipe UP
 - o 1x Stage B pumping jumper UP
 - o 1x Stage A pumping manifold UP
 - o 1x Cryostat pumping pipe UP
 - o 1x Cryostat pumping jumper UP
 - o 1x ISS pumping jumper UP
- 8x Active pumping dome (DLPLYA_v3)
 - o 1x Active dome cap
 - o 4x Dome latch
 - o 1x Dome stabilizing ring
 - o 1x Dome tube
- 8x Non-active pumping dome (DLPXVH_v2)
 - o 1x Non-active dome cap
 - o 4x Dome latch
 - o 1x Dome stabilizing ring
 - o 1x Dome tube
- 2x PCSS EQL vacuum pipes (GFW8F7_v1)
 - o 1x DTL pumping pipe EQL
 - o 1x Gas board pumping manifold EQL
 - o 1x ISS pumping pipe EQL
 - o 1x Non-active diagnostic pipe EQL
 - o 1x Non-active manifold jumper EQ
 - o 1x Non-active manifold EQL
 - o 1x Non-active SVS pumping pipe1 EQL
 - o 1x Non-active SVS pumping pipe2 EQ
 - o 1x SVS active pumping pipe EQL
 - o 1x Type2 pumping pipe EQL
 - o 1x Type2 pumping jumper EQL

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- o 1x SVS active branch EQ
- o 1x Non active SVS jumper EQL
- o 1x Type2 pumping outlet EQL
- 2x PCSS EQR vacuum pipes (GFWB4K_v2)
 - o 1x DTL pumping pipe EQR
 - o 1x Gas board pumping manifold EQR
 - o 1x ISS pumping pipe EQR
 - o 1x Non-active diagnostic pipe EQR
 - o 1x Non-active manifold jumper EQ
 - o 1x Non-active manifold pipe EQR
 - o 1x Non-active SVS pumping pipe1 EQR
 - o 1x Non-active SVS pumping pipe2 EQ
 - o 1x SVS active pumping pipe EQR
 - o 1x Type2 pumping pipe EQR
 - o 1x SVS active branch EQ
 - o 1x Type2 pumping outlet EQR
- 4x PCSS UP vacuum pipes (GG5ERD_v2)
 - o 1x DTL pumping pipe UP
 - o 1x Gas board pumping manifold UP
 - o 1x ISS pumping pipe UP
 - o 1x Non-active manifold jumper UP
 - o 1x Non-active manifold UP
 - o 1x Non-active SVS pumping pipe1 UP
 - o 1x Non-active SVS pumping pipe2 UP
 - o 1x SVS active pumping pipe UP
 - o 1x Type2 pumping pipe1 UP
 - o 1x Type2 pumping pipe2 UP
 - o 1x SVS active branch UP
- 8x RGA (GF8HGP_v2)
 - o 1x RGA vacuum tube
 - o 1x Mu metal tube
 - o 1x Magnetic shielding
 - o 1x Mu metal Orifice
 - o 10x CF40 RGA flange
 - o 10x KF40 RGA flange

Table 4: Classifications

	Safety class	Quality class	Seismic class	Vacuum class	PED/ESPN class	Tritium class	RH class
Stage B pump. pipe	Non-SIC	QC-2	SC-1 (SF)	VQC-1A	NA	TC 1A	NA
Other Pipes	Non-SIC	QC-3	SC-1 (SF)	VQC-3A	NA	TC 1A	NA
Pumping domes	Non-SIC	QC-3	SC-1 (SF)	VQC-3A	NA	TC 1A	NA
RGA	Non-SIC	QC-3	SC-1 (SF)	VQC-3A	NA	TC 1A	NA

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5.4.2 *Operating requirements*

[DMS.VAC.044] The vacuum components operate in a pressure range between 10^{-6} mbar and 1 bara. A Helium leak test shall be performed by the supplier on all welded sub-components.

5.4.3 *Design requirements*

[DMS.VAC.045] The parts shall be manufactured according to the provided manufacturing drawings.

5.4.4 *Material, welding and fabrication requirements*

[DMS.VAC.046] Flanges from section 5.1 shall be used for this scope. Parts that need to be machine in addition, as well as the pipes shall be 316L(N)-IG.

[DMS.VAC.047] The base material for pipes and fittings shall be made from cross-forged material which is Electro-Slag Remelted (ESR) or Vacuum Arc Remelted (VAR).

[DMS.VAC.048] Material certificate EN 10204 Type 3.1 shall be supplied for all rounds, from which the parts are made.

[DMS.VAC.049] Contents of

- Co < 0.05 wt%
- Nb < 0.01 wt%
- Ta < 0.01 wt%

Shall be demonstrated by certification or by test.

[DMS.VAC.050] Lubricants used during manufacturing shall be chosen in agreement with the vacuum requirements.

[DMS.VAC.051] The finished products shall be cleaned after manufacturing and welding to be free of grease, oils and other contaminants.

[DMS.VAC.052] Surfaces shall be free of discoloration.

[DMS.VAC.053] The fabrication method shall be chosen by the supplier. The welding procedure shall be qualified for the application (WPS, PQR).

[DMS.VAC.054] All welds shall be carried out by a qualified welder (WPQ as per ASME Sec. IX or equivalent).

5.4.5 *Quality Control Provisions*

[DMS.VAC.055] All welds shall be numbered for later PT testing.

[DMS.VAC.056] Visual inspection and dimensional inspection shall be carried out for each complete weld assembly according to the dimensions on the drawings.

5.4.6 *Non-destructive testing*

[DMS.VAC.057] 10% of welds shall be subject to PT testing. PT shall be performed as per CS6 reference, PT personnel shall be qualified as per SNT-TC-1A. Acceptance criteria as per CS6 apply.

[DMS.VAC.058] 10% of welds shall be subject to volumetric inspection, either UT or RT. The selected procedure shall be performed as per CS6 reference, personnel shall be qualified. Acceptance criteria as per CS6 apply.

[DMS.VAC.059] 100% of welds on the VQC-1A pipes shall be subject to volumetric inspection, either UT or RT. The selected procedure shall be performed as per CS6 reference, personnel shall be qualified. Acceptance criteria as per CS6 apply.

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5.4.7 *Marking*

[DMS.VAC.060] An ITER part number (PNI) will be marked on each item. The Contractor shall receive from the IO the catalogued Part Numbers of ITER (PNI) for the scope of supply, prior to the packaging.

Each part shall be legibly identified with following information:

- Manufacturer name or symbol.
- Round number or unique identification number related to material history.
- Grade of material.
- Heat number.
- PNI number.

5.4.8 *Spare Parts*

Left over flanges shall be shipped together with the finished pipe assemblies.

5.4.9 *Packing, preservation & shipping*

[DMS.VAC.061] The sealing surfaces of the flanges must be protected against contamination, scratches and dust.

[DMS.VAC.062] Open connectors shall be plugged with plastic caps to avoid internal contamination with dust. Components shall be wrapped in bubble wrap for shipping.

5.4.10 *Delivery Time*

[DMS.VAC.063] Delivery shall be organized in batches.

Batch 1 (delivery no later than **6** months after contract signature):

- 2x UP ISS vacuum pipes
- 1x UP PCSS vacuum pipes
- 1x Active pumping dome
- 1x Non-active pumping dome
- 1x RGA

Batch 2 (delivery no later than **12** months after contract signature):

- 1x EQL ISS vacuum pipes
- 1x EQL PCSS vacuum pipes
- 1x UP PCSS vacuum pipes
- 2x Active pumping dome
- 2x Non-active pumping dome
- 2x RGA

Batch 3 (delivery no later than **16** months after contract signature):

- 1x UP ISS vacuum pipes
- 1x UP PCSS vacuum pipes
- 1x Active pumping dome
- 1x Non-active pumping dome
- 1x RGA

Batch 4 (delivery no later than **20** months after contract signature):

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- 1x EQL ISS vacuum pipes
- 1x EQL PCSS vacuum pipes
- 2x EQR ISS vacuum pipes
- 2x EQR PCSS vacuum pipes
- 1x UP ISS vacuum pipes
- 1x UP PCSS vacuum pipes
- 4x Active pumping dome
- 4x Non-active pumping dome
- 4x RGA

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5.5 Supply of pipes

5.5.1 Description

Round materials to be supplied:

- 70x pipe: DN40 Sch10, L = 6000 mm
- 15x pipe: DN65 Sch10, L = 6000 mm
- 2x pipe: DN80 Sch10, L = 6000 mm
- 15x pipe: DN125 Sch5, L = 6000 mm
- 15x pipe: DN150 Sch5, L = 2500 mm

Table: Classifications

	Safety class	Quality class	Seismic class	Vacuum class	PED/ESPN class	Tritium class	RH class
DN40 Sch10	Non-PIC	QC-3	SC1 (S)	VQC-3A	NA	TC 1A	NA
DN65 Sch10	Non-PIC	QC-3	SC1 (S)	VQC-3A	NA	TC 1A	NA
DN80 Sch10	Non-PIC	QC-3	SC-2	NA	NA	NA	NA
DN125 Sch5	Non-PIC	QC-3	SC-2	NA	NA	NA	NA
DN150 Sch5	Non-PIC	QC-3	SC-2	NA	NA	NA	NA

5.5.2 Design requirements

[DMS.VAC.064] The tolerances for diameter, length, straightness, ovality shall comply with CS7.

5.5.3 Material, welding and fabrication requirements

[DMS.VAC.065] The material from which the pipes are machined shall be 316L(N)-IG.
 [DMS.VAC.066] Material certificate EN 10204 Type 3.1 shall be supplied for all rounds.
 [DMS.VAC.067] Contents of

- Co < 0.05 wt%
- Nb < 0.01 wt%
- Ta < 0.01 wt%

Shall be demonstrated by certification or by test.

[DMS.VAC.068] The relative magnetic permeability of the finished rounds shall be measured at room temperature after solution annealing. The value measured shall be lower than or equal to 1.03 (for fields of over 80000 A/m (1000 Oe) as per Test method 2 or measured with a low μ permeability indicator as per method 3 of ASTM A342-14. Specimen for testing shall be cut at least one diameter wide into the length of the round and from 0.25*d depth from the radial surface. Measurements of permeability made with other physical methods (e.g. permascopes, magnetoscopes, etc.) are accepted provided information about type and trademark of apparatus used and information about calibration.

[DMS.VAC.069] The grain size number as determined in accordance with NF-EN ISO 643:2013 shall be greater than 2. The grain size homogeneity shall be ± 1 around the true average value. The presence of a few grains of index 1 or 0 is tolerated. The amount of

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non-metallic inclusions shall meet standard ASTM E45-13. Macroinclusions are strictly forbidden and are cause of rejection.

The mechanical properties of the pipes are shown in Table 4.

Table 5: Mechanical properties

Test temperature	Tensile Strength, (Rm) min (MPa)	Yield Strength (Rp0.2%) min (MPa)	Elongation A, (5d) min (%)
Room temp.	525-700	220	45
250 °C	415	135	-

[DMS.VAC.070] The properties shall be demonstrated by certificate.

[DMS.VAC.071] Pipes shall be visually examined. Their surfaces shall be plain, uniform and free from wrinkles, buckles, blowholes, tears, cracks and inclusions. If in doubt, a liquid penetrant examination shall be performed.

Criteria:

Indications with one dimension exceeding 1 mm shall be considered as a recordable condition.

The following are acceptable:

- Linear indications of 8 mm or less for pipes DN 40 or less, and of 10 mm or less for rounds more than DN 40.
- As the operating conditions of the pipes could lead to a risk of lamellar tear, the only acceptable indications are those with a cumulative length over the most densely covered meter as follows:
 - Less than 30 mm for pipes up to DN 40.
 - Less than 40 mm for pipes over DN 40.

Two separate indications are considered as one if the distance between them is less than twice the length of the smaller of the two. The length of the indication is then equal to the sum of the length of the two indications plus the distance between them.

If these criteria are not respected, no repair welds shall be authorized and the part is rejected.

However, if there are special and highly localized indications (which can be checked by shear wave ultrasonic examination) this zone can be eliminated by grinding and the plate accepted if its dimensions remain within the acceptable tolerances.

The Supplier may remove surface defects by grinding, providing that:

- The remaining thickness is within the tolerances specified by the drawing or the purchase order.
- The cavity blends smoothly with the surrounding surface.
- After removal, the surface is subject to liquid penetrant examination in accordance with RMC 4000 of RCC-MR 2007.

The following criteria shall be applied for the liquid penetrant examination. An indication greater than 1 mm shall be considered recordable conditions.

The following are unacceptable:

- Linear indications.
- Rounded indications with one dimension greater than 2 mm.

Welding repairs are not permitted.

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5.5.4 *Marking*

[DMS.VAC.072] An ITER part number (PNI) will be marked on each item. The Contractor shall receive from the IO the catalogued Part Numbers of ITER (PNI) for the scope of supply, prior to the packaging.

Each pipe shall be legibly identified with following information:

- Manufacturer name or symbol.
- Round number or unique identification number related to material history.
- Grade of material.
- Heat number.
- PNI number.

5.5.5 *Packing, preservation & shipping*

[DMS.VAC.073] Safety class and quality class shall determine the requirements for packaging, preservation and shipping.

[DMS.VAC.074] Prior to the shipments of the material, the supplier shall ensure that each pipe shall confirm the identification marking with respect to delivery reports/documents to ensure the traceability. The DRR deliverables (Contractor Release Note, Delivery Report, Packing List) shall be approved prior to the delivery, as per GM3S specification Ref [1] (section 10).

5.5.6 *Delivery Time*

[DMS.VAC.075] The maximum expected duration from the contract signature to the supply of the scope of work is **12** months.

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6 Location for Scope of Work Execution

[DMS.VAC.076] The Contractor can perform the work at their own location.

7 IO Documents

7.1 IO Documents:

Under this scope of work, IO will deliver the following documents by the stated date:

Ref	Title	Doc ID	Expected date
1	Manufacturing drawings of vacuum flanges	DA78Z8	
2	Manufacturing drawings of bellows liners	FY3MEM	
3	Manufacturing drawings of injector components	FDCAQ2	
4	Manufacturing drawings of vacuum system	DA766K	

8 List of deliverables

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. You can find here below a minimum list of documents, but not limited to, that are required within the expected timing:

Technical Design Family (TDF)	Generic Document Title (GTD)	Further Description	Expected Timing (T0+x) *
Quality plan			T0+1
Manufacturing input	Manufacturing Flow or Assembly Sequence		T0+2
	Manufacturing inspection plan		T0+2
	Manufacturing Instruction or Procedure		T0+2
	Non-destructive Examination Procedure		T0+2
	Manufacturing Process Qualification Report		T0+2
	Factory acceptance test procedure		T0+2
	Training or Qualification Record		T0+2
	Data Sheets		T0+2
Manufacturing Dossier	FAT results		T0+12
	Complete list of critical subcontractors		T0+12
	Certificates conformity		T0+12
	Cleaning report		T0+12
	Material certificates		T0+12
Delivery readiness	Contractor release note		T0+12
	Delivery report		T0+12
	Packing list		T0+12
	Storage & Preservation Requirements Form.		T0+12

(*) T0 = Commencement Date of the contract ; X in weeks.

Supplier shall prepare their document schedule based on the 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 [QC-1], [QC-2], [QC-3]. GM3S section 8 applies in line with the defined Quality Class.

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The contractor shall have ISO 9001 certified quality system or QA program approved by QARO.

10 Safety requirements

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

Components classifications can be found in section 5.

11 Specific General Management requirements

Requirement for [1] GM3S section 6 applies in full.

NCR procedure [6] and DR procedure [7] shall be applicable.

11.1 Contract Gates

A Kick-off meeting shall be held to clarify the any open points before start of the project (e.g. material required by the Supplier).

A Manufacturing Readiness Review (MRR) according to [8] shall be held at the latest 4-6 weeks after the KoM. Quality Plan and Manufacturing input shall be delivered for this MRR.

A Delivery Readiness Review (DRR) according to [9] shall be held before shipping. The Manufacturing dossier and the delivery readiness shall be prepared for this DRR.

The supplier shall organize these meetings and produce the Minutes of the Meeting.

11.2 Work Monitoring

Work monitoring is done by regular meetings via videoconference. The supplier shall organize these meetings and produce the Minutes of the Meeting.

Site visit to the supplier premises may be arranged during contract execution.

11.3 Meeting Schedule

Meeting schedule can be set at kick-off meeting.

11.4 CAD design requirements

This contract does not imply CAD activities.

11.5 Delivery location

The delivery location is ITER Organization site, Cadarache, France.