外部委託業者の募集

References: IO/MS/24/YSA/CTS

“Cryostat Thermal Shield Repair I Remanufacture C ontract(s) "

（クライオスタット熱シールドの修理・再製作）

IO 締め切り 2024 年 7 月 17 日(水)

〇目的

ITER 機構（IO）は、クライオスタットの熱シールドの修理／再製作に関する調達手続きを発行する意向です。

本書で提供されている情報および技術的な詳細は予備的なものであり、これに関心を持ち能力を確認するために業界と共有されています。したがって、入札者への招待（ITT）中に発行される最終技術仕様書が、入札に関して考慮される唯一の文書となります。

〇背景

ITER（ラテン語で「道」の意味）は、今日世界で最も野心的なエネルギープロジェクトのひとつです。

35 か国が協力して、世界最大のトカマクを建設する取り組みであり、これは磁気融合装置で、太陽や恒星がエネルギー源としている原理に基づいて大規模かつ二酸化炭素を排出しないエネルギー源としての融合の実現可能性を証明することを目指しています。

このプロジェクトは、平和利用のための融合エネルギーの科学的および技術的実現可能性を示し、最初の電力を生産する融合発電所の設計、建設、運用に必要なデータを取得することを目的としています。また、完全規模の融合発電所に必要な加熱、制御、計測、および遠隔メンテナンスなどの重要な技術を試験します。

ITER の施設はフランスのブーシュ・デュ・ローヌ県にあり、IO の本部および建設現場が含まれています。施設の建設は進行中です。詳細な情報は IO のウェブサイト（http://www.iter.org）で入手できます。

熱シールドシステムは、トカマクの熱的放射と伝導によって転送される熱負荷を最小限に抑え、4.5K で動作する冷却超伝導部品への影響を軽減する役割を果たします。このシステム設計は、これら 2 つの熱伝達メカニズムを数桁以上にわたって減少させるように最適化されており、ITER のクライオジェニクスプラントが適切な能力で超伝導磁石の温度を 4.5K に保つことを可能にしています。

熱シールドは、光学的に不透明な障壁を提供することで冷却部品を暖かい部品から保護します。その結果、トーラス形状のシールド（VV 用）と円柱形状のシールド（クライオスタット用）が適切な開口部を持つ構造になっています。

製造および組み立ての容易さのために、熱シールドは 6 つの主要なサブアセンブリに配置されています：

1. 上部クライオスタット熱シールド（上部 CTS）
2. 下部クライオスタット熱シールド（下部 CTS）*
3. サポート熱シールド（STS）**

4. 水平熱シールド（水平 TS）
   a. 真空容器熱シールド（VVTS）***
   b. 水平クライオスタット熱シールド（ECTS）
5. 熱シールドマニホールド（TSM）***
6. 熱シールド計器類（TS 計器類）***

注：* この調達の対象は LCTS 床パネルのみ
**この調達範囲に含まれるのは STS の除去パネルのみです。
***この調達範囲には含まれません。

これらのサブアセンブリおよびそれらのトカマク内の位置、主要な全体寸法、およびこの調達範囲に属する部品についての概要については、図 1 と図 2 を参照してください。

図 1 ITER 熱シールド
図 2 熱シールドの主要部品
（詳細は英文技術仕様書を参照ください）

すべての熱シールドは、シルバーでコーティングされたステンレス鋼板から成り、溶接によって熱的および機械的に接続されたシームレスなステンレス鋼冷却管を含んでいます。
クライオスタット熱シールドは、さまざまな形状の数百のパネルで構成されています。この調達範囲には合計 297 枚のパネルが含まれています。
すべてのクライオスタット熱シールドパネルは IO の倉庫（ポール・サン・ルイ・デュ・ローヌと IO の施工現場にあります）で製造され、保管されています。
2022 年には、TF 側冷却管に製造上の欠陥による応力腐食割れ（SCC）が見つかりました。これが漏れの防止と部品の完全性に影響を与えています。SCC は外部から見てさまざまなパネルに見られます。IO は状況の回復と管の故障のリスクを除去するために、すべての冷却管を交換することを決定しました。
一部のパネルには、納品後に銀コーティング層と埋め込まれたスタッドボルトの小さな腐食が見られました。
銀コーティングの過程で、スレッドの塩化物の完全な除去ができませんでした。残留している塩化物はさらなる欠陥を引き起こす可能性があります。IO はすべてのパネル表面の銀コーティングを除去し、スタッドボルトを交換することを決定しました。
修理には、パッキング、IO 倉庫と契約者のワークショップ間の輸送、各パネルの付属管の除去、パネルの表面準備（新しい管の取り付けおよび／または管の供給が必要な場合は)、管の受け入れテスト、新しい管の曲げおよび取り付け、管の漏れテスト、銀コーティングと塩素の除去、スタッドボルトの交換、修理前後の計測調査、IO による引き渡し前のすべての作業が含まれます。
パネルの品質、コスト、スケジュール、およびリスクを考慮して、修理の代わりに（銀コーティングなしで）すべてのパネルを再製作する可能性があります。製品リストは修理の作業範囲と同じですが、技術的要件は異なります。詳細な要件については、IO の製造図面が提供されています。

〇経験

契約者は、以下に詳述された作業および作業に対する適切な経験を有していなければなりません。

- 熱シールドに関連するコードおよび規格の遵守（ASME セクション VA/III/X、ASME 831.3、ANSI/ASNT-CP-189、PED/ESP など）および核コンポーネントの製造の資格。
- 大型ステンレス製装置およびステンレスパイプスプールの製造とテスト、それには高度な切断、成形、3D 曲げ、溶接（軌道溶接を含む）、および NDE（エンドスコープ、RT、PT、圧力試験、ヘリウム漏れ試験、冷震試験など）の技術が含まれます。
- CNC 機械プログラミング用の 3D 加工および 3D 測量。
- 複雑な構成を持つ大型機械装置の 3D 寸法測定。
- 高真空装置およびパイプの製造と取り付け。
- 大型ステンレス鋼部品の表面処理、精密な機械装置と 3D 寸法構成による研磨技術。

調達の事前資格段階（PQ）では、候補者は上記の作業範囲を成功裏に実施する能力を示す必要があります。

候補者は、本文書で説明されているような類似の組立作業の契約での実績を有していなければなりません。

入札段階では、候補者は物理的なサンプリングを通じて、要件に従って作業を行う能力を示す必要がある場合があります。

〇作業範囲

この作業範囲には 2 つの技術的オプションが考慮されています。

IO は、市場調査の結果（予算と時間の見積もり）を考慮して、今後の入札において 1 つのオプション（または複数のオプションの組み合わせ）を評価および選択します。

オプション 1: IO 倉庫に保管されているパネルを修理する。

オプション 2: 修理する代わりに、新しい銀コーティングのない CTS パネルの原材料を調達し製造する。

図 3 は CTS の修理作業の手順を示しています。

作業範囲の詳細および技術要件は、以下の付録に記載されています：

- 付録 1: CTS 修理／再製作作業範囲
- 付録 2: CTS 製造図面
- 付録 3: CTS 製造品目表（BOM）

〇予想される契約および主要な作業期間

契約は 2025 年第 3 四半期までに締結される予定です。調達、製造、CTS パネルの納品は、契約授与日から 3 年以内に完了することが求められます。以下は、主要な CTS パネルの予定納品日です（表 1 を参照）：

CTS パネル	期待される納期
STS除去パネル	2026年第2四半期

ECTSポートシュラウドおよび下部パート	2026年第4四半期
UCTSシリンダー	2027年第2四半期
ECTSシリンダー	2027年第4四半期
ECTS上部パート	2027年第4四半期
LCTSフロア	2028年第1四半期
UCTSリッド	2028年第1四半期
UCTSシュラウド	2028年第2四半期

【※　詳しくは添付の英語版技術仕様書「**Technical Summary for Cryostat Thermal Shield Repair I Remanufacture C ontract(s)**」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。

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

To: Potential Suppliers

Ref: IO/MS/24/YSA/CTS

Subject: Letter of Invitation for the Market Survey on "Cryostat Thermal Shield Repair / Remanufacture"

Dear Madam/Sir,

The ITER Organization (IO) launches a Market Survey and requests information from companies having the interest, knowledge, and capacity related to **the Cryostat Thermal Shield (CTS) Repair / Remanufacture scope of works.** With this letter, we invite all potential companies, institutions, or entities from ITER Member States to participate to this Market Survey.

china
eu
india
japan
korea
russia
usa

The main purposes of this Market Survey are to incorporate the recent market situation into the procurement conditions as well as into the technical specifications and to prepare the budget baseline for the contract(s).

Please note that this is not a Call for Nomination request, and all information including cost estimation to be collected are considered only as referential and non-binding basis. Therefore, we would greatly appreciate your feedback, which will help the IO to better understand the real situation of the industry.

You will find enclosed:

Annex I: Technical Summary

- Appendix 1: CTS Repair /Remanufacture Scope of Work
- Appendix 2: CTS Manufacturing Drawings
- Appendix 3: CTS Manufacturing Bill of Materials (BOM)

Annex II: Request for Information (RFI) Questionnaire

Annex III: Pricing Sheets

- Form 1: Pricing Sheet for Repair
- Form 2: Pricing Sheet for Remanufacture

Please return a completed questionnaire and cost estimation using the forms of Annex II and III, **no later than 17 July 2024**, to the following email address yuki.suyama@iter.org with CC to antoine.calmes@iter.org .

Thanks in advance for your participation and co-operation.

Yours faithfully,

William De Cat
Section Leader
Construction, Assembly and Logistics Section

IDM UID
9SYGNT
VERSION CREATED ON / VERSION / STATUS
13 Jun 2024 / 1.1 / Approved
EXTERNAL REFERENCE / VERSION

Technical and Financial Quotation Documents

IO/MS/24/YSA/CTS Annex I Technical Summary

This is Annex I Technical Summary for Cryostat Thermal Shield Repair / Remanufacture Contract(s) market survey / Request for Information. Ref. IO/MS/24/YSA/CTS.

Annex I - Technical Summary for Cryostat Thermal Shield Repair / Remanufacture Contract(s)

Ref. IO/MS/24/YSA/CTS

1. Purpose

The ITER Organization (IO) intends to issue a procurement procedure for the Cryostat Thermal Shield Repair / Remanufacture.

The information and technical details provided in the present document are preliminary and shared with the Industry to check their interest and capabilities for this procurement. Therefore the final technical specifications that will be issued during the Invitation to Tenderers (ITT) will be the only documents to be considered for biding.

2. Background

ITER ("The Way" in Latin) is one of the most ambitious energy projects in the world today. 35 nations are collaborating to build the world's largest tokamak, a magnetic fusion device that has been designed to prove the feasibility of fusion as a large-scale and carbon-free source of energy based on the same principle that powers our Sun and stars.

The project aims to demonstrate the scientific and technological feasibility of fusion power for peaceful purposes and to gain necessary data for the design, construction and operation of the first electricity-producing fusion plant. It will also test a number of key technologies, including the heating, control, diagnostic and remote maintenance that will be needed for a full-scale fusion power station.

The ITER site is in the Bouches du Rhône district of France. It includes the Headquarters of the IO and a construction worksite. The construction of the facility is on-going. Further information is available on the IO website: http://www.iter.org.

The Thermal Shield system minimizes heat loads transferred by thermal radiation and conduction from the hot tokamak components to the cool superconducting components that operate at 4.5K. The system design is optimized to reduce (by over two orders of magnitude) these two mechanisms of heat transfer, hence allowing the ITER cryogenics plant to maintain the superconducting magnet temperatures at 4.5K within reasonable capacity.

The Thermal Shield provides shielding to the cold components by providing an optically opaque barrier between them and the hot components. The result is a torus shaped shield (for the VV) and a cylindrical shaped shield (for the cryostat) with the appropriate openings for associated penetrations.

For ease of manufacturing and assembly the Thermal Shield is arranged in 6 primary sub-assemblies:

1. Upper Cryostat Thermal Shield (Upper CTS)
2. Lower Cryostat Thermal Shield (Lower CTS)*
3. Support Thermal Shield (STS)**
4. Equatorial Thermal Shield (Equatorial TS)
    a. vacuum vessel thermal shield (VVTS)***
    b. Equatorial Cryostat Thermal Shield (ECTS)
5. Thermal shield manifold (TSM)***
6. Thermal shield instrumentation (TS instrumentation)***

Note: * Only LCTS Floor Panels are in this procurement scope

** Only STS Removal Panels are in this procurement scope

***Not in this procurement scope

Refer to Figure 1 and Figure 2 for the overview of these sub-assemblies and their locations in the tokamak, main overall dimensions, and components which belong to this procurement scope.

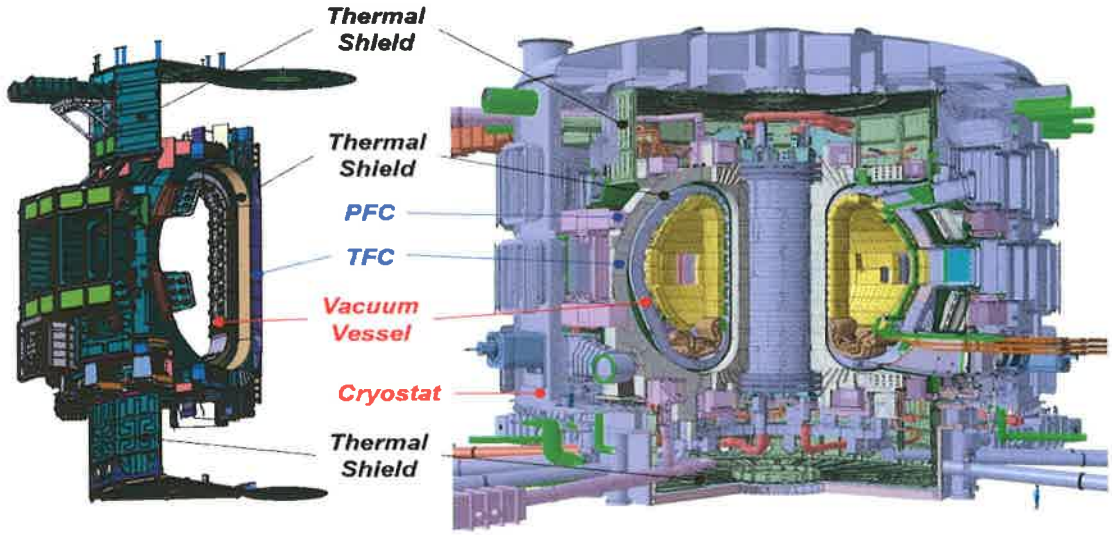

Figure 1 ITER Thermal Shield

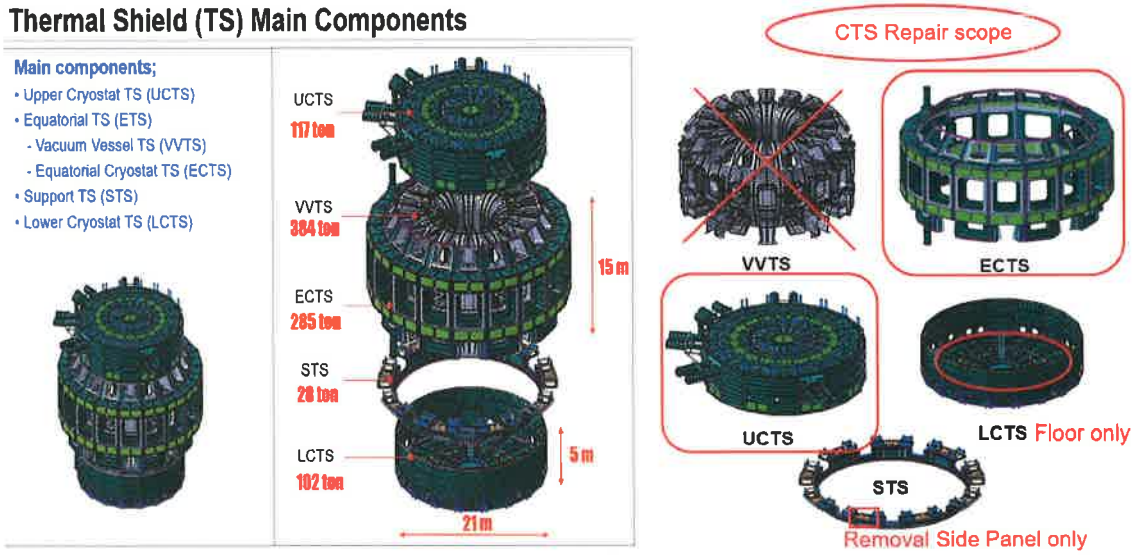

Figure 2 Thermal Shield Main Components

All thermal shields are made of stainless steel plates, silver coated; with seamless stainless steel coolant tubes thermally and mechanically connected by welding.

Cryostat Thermal Shields are composed of hundreds panels with different shapes. A total of 297 panels belongs to this scope.

All Cryostat Thermal Shield Panels were manufactured and are stored in IO warehouses (Located in Port Saint-Louis-du-Rhône and IO worksite).

In 2022, the TF side cooling tubes were found to contain Stress Corrosion Cracking (SCC) due to a manufacturing defect. This is affecting the leak tightness and integrity of the components. The SCC is on various panels visible from the outside. IO has decided to replace the entirety of the cooling pipes to recover the situation and remove the risks of pipe failures.

Small amount of local corrosions on the silver coating layer and at the embedded stud bolts were found for some panels after delivery.

During the silver coating process, the perfect cleaning of chloride at the thread was not possible. The remaining chloride may cause further defect. IO has decided to remove all silver coating on panels surface and replace the stud bolts.

Repair entails the packing, transportation between IO warehouse and Contractor's workshop, the removal of attached pipes on each panel, the surface preparation of panels for the installation of new pipes and/or supply of pipes (where relevant), pipe acceptance testing, bending and attachment of new pipes, leak testing of pipes, Silver coating and chlorine removal, studs replacement, metrology surveys (before and after repair) prior to take-over by IO.

Considering the quality, cost, schedule, and risks for panel repair, we may remanufacture (without silver coating) all the panels instead of repair. The BoM is the same as repair scope of work but technical requirement are different. IO manufacturing drawings are provided for detail requirements.

3. Experience

The Contractor shall have adequate experience for the work and activities as detailed below.

- Compliance with codes and standards applicable for Thermal Shield (ASME Section V/VIII/IX, ASME B31.3, ANSI/ASNT-CP-189, PED/ESP…) and qualification for manufacturing nuclear components.
- Manufacture and testing of large stainless steel equipment and stainless pipe spools including advanced cutting, forming, 3D bending, welding (include orbital welding), and NDE (Endoscope, RT, PT, Pressure test, Helium leak test, Cold shock test…) techniques.
- 3D machining with 3D survey for CNC machine programming.
- 3D dimensional survey on large mechanical equipment with complicated configuration.
- High vacuum equipment and pipe manufacturing and installation.
- Large stainless steel component surface treatment with precise mechanical equipment and polishing techniques with 3D dimensional configurations.

During procurement pre-qualification (PQ) phase, the Candidates will need to demonstrate that they have the capabilities to successfully perform the entire scope of work mentioned above. The Candidates shall have proven experience in contracts for similar assembly works to that described in this document.

During the Tender phase, the Candidates may be required to demonstrate through physical sampling that they are capable of carrying out some works to the requirements specified by the IO.

4. Scope of work

2 technical options are contemplated for this scope of work.

IO will assess and select one option (or combined options) for the forthcoming tender(s) considering Market Survey results (budgetary and time estimates).

Option – 1: Repair the panels which currently stored in IO warehouses.

Option – 2: Procure raw material and manufacture new CTS panels without silver coating instead of repair all the existing CTS panels.

Figure 3 is the sequence of work for CTS repair.

The detail scope of work and technical requirement is described in the Appendixes:

- Appendix 1: CTS Repair /Remanufacture Scope of Work
- Appendix 2: CTS Manufacturing Drawings
- Appendix 3: CTS Manufacturing Bill of Materials (BOM)

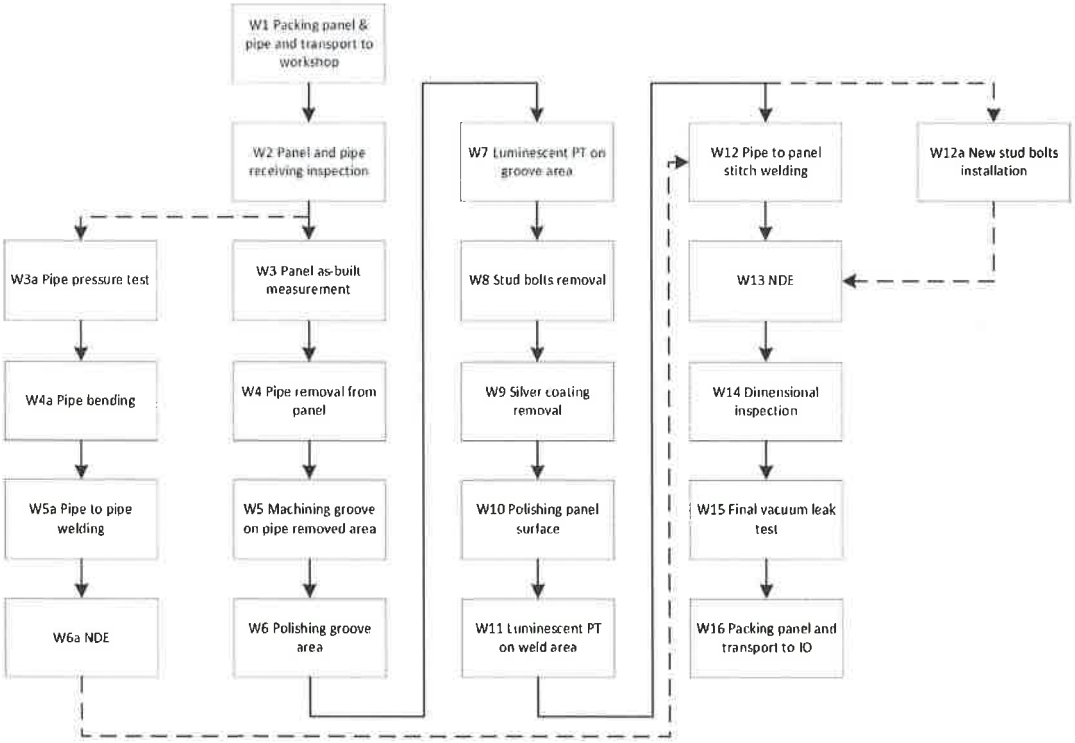

Figure 3 CTS Repair Sequence of Work

5. Expected contract(s) and main activities durations

The contract(s) is/are expected to be signed by Q3 2025. The procurement, manufacturing, delivery of the CTS panels in the scope of this Technical Summary (as per description of the section 4) shall be completed no later than 3 years from the date of contract award and according to the following preliminary delivery of the main CTS panels in Table 1:

CTS Panels	Expected Delivery
STS Removal Panel	Q2 2026
ECTS Port Shroud and Lower Part	Q4 2026
UCTS Cylinder	Q2 2027
ECTS Cylinder	Q4 2027
ECTS Upper Part	Q4 2027
LCTS Floor	Q1 2028
UCTS Lid	Q1 2028
UCTS Shroud	Q2 2028

Table 1 Main component delivery schedule

Component	VAR	Tag Number	Description	QTY	UOM
LCTS Floor Center			Center_Frame_A01	1	pc
LCTS Floor Center		2404LF-TSH-2000	Center_Panel_A02	1	pc
LCTS Floor Center			Center_Frame_B01	1	pc
LCTS Floor Center		2404LF-TSH-2001	Center_Panel_B02	1	pc
LCTS Floor Panel	A	2404LF-TSH-0101	Floor_Panel_IB_#01	1	pc
LCTS Floor Panel	B	2404LF-TSH-0201	Floor_Panel_IB_#02	1	pc
LCTS Floor Panel	C	2404LF-TSH-0301	Floor_Panel_IB_#03	1	pc
LCTS Floor Panel	D	2404LF-TSH-0401	Floor_Panel_IB_#04	1	pc
LCTS Floor Panel	EA	2404LF-TSH-0501	Floor_Panel_IB_#05	1	pc
LCTS Floor Panel	GA	2404LF-TSH-0601	Floor_Panel_IB_#06	1	pc
LCTS Floor Panel	C	2404LF-TSH-0701	Floor_Panel_IB_#07	1	pc

LCTS Floor Panel	D	2404LF-TSH-0801	Floor_Panel_IB_#08	1	pc
LCTS Floor Panel	EB	2404LF-TSH-0901	Floor_Panel_IB_#09	1	pc
LCTS Floor Panel	GA	2404LF-TSH-1001	Floor_Panel_IB_#10	1	pc
LCTS Floor Panel	C	2404LF-TSH-1101	Floor_Panel_IB_#11	1	pc
LCTS Floor Panel	GA	2404LF-TSH-1201	Floor_Panel_IB_#12	1	pc
LCTS Floor Panel	C	2404LF-TSH-1301	Floor_Panel_IB_#13	1	pc
LCTS Floor Panel	GA	2404LF-TSH-1401	Floor_Panel_IB_#14	1	pc
LCTS Floor Panel	A	2404LF-TSH-1501	Floor_Panel_IB_#15	1	pc
LCTS Floor Panel	D	2404LF-TSH-1601	Floor_Panel_IB_#16	1	pc
LCTS Floor Panel	F	2404LF-TSH-1701	Floor_Panel_IB_#17	1	pc
LCTS Floor Panel	GB	2404LF-TSH-1801	Floor_Panel_IB_#18	1	pc
LCTS Floor Panel	A	2404LF-TSH-0102	Floor_Panel_OB_#01 LHS	1	pc
LCTS Floor Panel	B	2404LF-TSH-0202	Floor_Panel_OB_#02 LHS	1	pc

LCTS Floor Panel	C	2404LF-TSH-0302	Floor_Panel_OB_#03 LHS	1	pc
LCTS Floor Panel	D	2404LF-TSH-0402	Floor_Panel_OB_#04 LHS	1	pc
LCTS Floor Panel	EA	2404LF-TSH-0502	Floor_Panel_OB_#05 LHS	1	pc
LCTS Floor Panel	GA	2404LF-TSH-0602	Floor_Panel_OB_#06 LHS	1	pc
LCTS Floor Panel	C	2404LF-TSH-0702	Floor_Panel_OB_#07 LHS	1	pc
LCTS Floor Panel	D	2404LF-TSH-0802	Floor_Panel_OB_#08 LHS	1	pc
LCTS Floor Panel	EB	2404LF-TSH-0902	Floor_Panel_OB_#09 LHS	1	pc
LCTS Floor Panel	GA	2404LF-TSH-1002	Floor_Panel_OB_#10 LHS	1	pc
LCTS Floor Panel	C	2404LF-TSH-1102	Floor_Panel_OB_#11 LHS	1	pc
LCTS Floor Panel	GA	2404LF-TSH-1202	Floor_Panel_OB_#12 LHS	1	pc
LCTS Floor Panel	C	2404LF-TSH-1302	Floor_Panel_OB_#13 LHS	1	pc
LCTS Floor Panel	GA	2404LF-TSH-1402	Floor_Panel_OB_#14 LHS	1	pc

LCTS Floor Panel	A	2404LF-TSH-1502	Floor_Panel_OB_#15 LHS	1	pc
LCTS Floor Panel	D	2404LF-TSH-1602	Floor_Panel_OB_#16 LHS	1	pc
LCTS Floor Panel	F	2404LF-TSH-1702	Floor_Panel_OB_#17 LHS	1	pc
LCTS Floor Panel	GB	2404LF-TSH-1802	Floor_Panel_OB_#18 LHS	1	pc
LCTS Floor Panel	A	2404LF-TSH-0100	Floor_Panel_OB_#01 RHS	1	pc
LCTS Floor Panel	B	2404LF-TSH-0200	Floor_Panel_OB_#02 RHS	1	pc
LCTS Floor Panel	C	2404LF-TSH-0300	Floor_Panel_OB_#03 RHS	1	pc
LCTS Floor Panel	D	2404LF-TSH-0400	Floor_Panel_OB_#04 RHS	1	pc
LCTS Floor Panel	EA	2404LF-TSH-0500	Floor_Panel_OB_#05 RHS	1	pc
LCTS Floor Panel	GA	2404LF-TSH-0600	Floor_Panel_OB_#06 RHS	1	pc
LCTS Floor Panel	C	2404LF-TSH-0700	Floor_Panel_OB_#07 RHS	1	pc
LCTS Floor Panel	D	2404LF-TSH-0800	Floor_Panel_OB_#08 RHS	1	pc
LCTS Floor Panel	EB	2404LF-TSH-0900	Floor_Panel_OB_#09 RHS	1	pc

LCTS Floor Panel	GA	2404LF-TSH-1000	Floor_Panel_OB_#10 RHS	1	pc
LCTS Floor Panel	C	2404LF-TSH-1100	Floor_Panel_OB_#11 RHS	1	pc
LCTS Floor Panel	GA	2404LF-TSH-1200	Floor_Panel_OB_#12 RHS	1	pc
LCTS Floor Panel	C	2404LF-TSH-1300	Floor_Panel_OB_#13 RHS	1	pc
LCTS Floor Panel	GA	2404LF-TSH-1400	Floor_Panel_OB_#14 RHS	1	pc
LCTS Floor Panel	A	2404LF-TSH-1500	Floor_Panel_OB_#15 RHS	1	pc
LCTS Floor Panel	D	2404LF-TSH-1600	Floor_Panel_OB_#16 RHS	1	pc
LCTS Floor Panel	F	2404LF-TSH-1700	Floor_Panel_OB_#17 RHS	1	pc
LCTS Floor Panel	GB	2404LF-TSH-1800	Floor_Panel_OB_#18 RHS	1	pc
Total				58	

Total surface machining

Total surface polishing

Appendix 3 CTS Man

GBS BUI-FLR-ROM	Quality Class	Safety Class	PIC	Material	Length (mm)	Width (mm)
11-B2-PIT	QC-1	NSR	No	304LN		
11-B2-PIT	QC-1	NSR	No	304LN	4240	2115
11-B2-PIT	QC-1	NSR	No	304LN		
11-B2-PIT	QC-1	NSR	No	304LN	4240	2115
11-B2-PIT	QC-1	NSR	No	304LN	2950	1764
11-B2-PIT	QC-1	NSR	No	304LN	2950	1764
11-B2-PIT	QC-1	NSR	No	304LN	2950	1764
11-B2-PIT	QC-1	NSR	No	304LN	2950	1764
11-B2-PIT	QC-1	NSR	No	304LN	2950	1764
11-B2-PIT	QC-1	NSR	No	304LN	2950	1764
11-B2-PIT	QC-1	NSR	No	304LN	2950	1764

11-B2-PIT	QC-1	NSR	No	304LN	2950	1764
11-B2-PIT	QC-1	NSR	No	304LN	2950	1764
11-B2-PIT	QC-1	NSR	No	304LN	2950	1764
11-B2-PIT	QC-1	NSR	No	304LN	2950	1764
11-B2-PIT	QC-1	NSR	No	304LN	2950	1764
11-B2-PIT	QC-1	NSR	No	304LN	2950	1764
11-B2-PIT	QC-1	NSR	No	304LN	2950	1764
11-B2-PIT	QC-1	NSR	No	304LN	2950	1764
11-B2-PIT	QC-1	NSR	No	304LN	2950	1764
11-B2-PIT	QC-1	NSR	No	304LN	2950	1764
11-B2-PIT	QC-1	NSR	No	304LN	2950	1764
11-B2-PIT	QC-1	NSR	No	304LN	2983	1458
11-B2-PIT	QC-1	NSR	No	304LN	2983	1458

11-B2-PIT	QC-1	NSR	No	304LN	2983	1458
11-B2-PIT	QC-1	NSR	No	304LN	2983	1458
11-B2-PIT	QC-1	NSR	No	304LN	2983	1458
11-B2-PIT	QC-1	NSR	No	304LN	2983	1458
11-B2-PIT	QC-1	NSR	No	304LN	2983	1458
11-B2-PIT	QC-1	NSR	No	304LN	2983	1458
11-B2-PIT	QC-1	NSR	No	304LN	2983	1458
11-B2-PIT	QC-1	NSR	No	304LN	2983	1458
11-B2-PIT	QC-1	NSR	No	304LN	2983	1458
11-B2-PIT	QC-1	NSR	No	304LN	2983	1458
11-B2-PIT	QC-1	NSR	No	304LN	2983	1458
11-B2-PIT	QC-1	NSR	No	304LN	2983	1458

11-B2-PIT	QC-1	NSR	No	304LN	2983	1458
11-B2-PIT	QC-1	NSR	No	304LN	2983	1458
11-B2-PIT	QC-1	NSR	No	304LN	2983	1458
11-B2-PIT	QC-1	NSR	No	304LN	2983	1458
11-B2-PIT	QC-1	NSR	No	304LN	2983	1458
11-B2-PIT	QC-1	NSR	No	304LN	2983	1458
11-B2-PIT	QC-1	NSR	No	304LN	2983	1458
11-B2-PIT	QC-1	NSR	No	304LN	2983	1458
11-B2-PIT	QC-1	NSR	No	304LN	2983	1458
11-B2-PIT	QC-1	NSR	No	304LN	2983	1458
11-B2-PIT	QC-1	NSR	No	304LN	2983	1458
11-B2-PIT	QC-1	NSR	No	304LN	2983	1458
11-B2-PIT	QC-1	NSR	No	304LN	2983	1458

11-B2-PIT	QC-1	NSR	No	304LN	2983	1458
11-B2-PIT	QC-1	NSR	No	304LN	2983	1458
11-B2-PIT	QC-1	NSR	No	304LN	2983	1458
11-B2-PIT	QC-1	NSR	No	304LN	2983	1458
11-B2-PIT	QC-1	NSR	No	304LN	2983	1458
11-B2-PIT	QC-1	NSR	No	304LN	2983	1458
11-B2-PIT	QC-1	NSR	No	304LN	2983	1458
11-B2-PIT	QC-1	NSR	No	304LN	2983	1458
11-B2-PIT	QC-1	NSR	No	304LN	2983	1458

ufacturing Bill of Material (BOM)

Height (mm)	Weight (kg)	Tube Length (m)	Bends (nos)	Surface (m2)	M16 Stu
					Type A
200		16	8	7	34
200		16	8	7	34
200		19	40	4	
200		19	40	4	
200		19	40	4	30
200		19	40	4	
200		19	40	4	
200		19	40	4	
200		19	40	4	
200		19	40	4	30

200		19	40	4	
200		19	40	4	
200		19	40	4	
200		19	40	4	30
200		19	40	4	
200		19	40	4	30
200		19	40	4	
200		19	40	4	
200		19	40	4	
200		19	40	4	
200		19	40	4	
200		19	40	4	
200		19	40	4	
200		17	19	4	
200		17	19	4	

200		17	19	4	30
200		17	19	4	
200		17	19	4	
200		17	19	4	
200		17	19	4	30
200		17	19	4	
200		17	19	4	
200		17	19	4	
200		17	19	4	30
200		17	19	4	
200		17	19	4	30
200		17	19	4	

200		17	19	4	
200		17	19	4	
200		17	19	4	
200		17	19	4	
200		17	19	4	
200		17	19	4	
200		17	19	4	30
200		17	19	4	
200		17	19	4	
200		17	19	4	
200		17	19	4	30
200		17	19	4	
200		17	19	4	

200		17	19	4	
200		17	19	4	30
200		17	19	4	
200		17	19	4	30
200		17	19	4	
200		17	19	4	
200		17	19	4	
200		17	19	4	
200		17	19	4	
		986	1420	212	428

49.3

412.17

ds (Nos) Type B	Manufacturing Drawing	As-built drawing
	014305 - LCTS_FLOOR_CENTRAL_PARTS	2704LF-M503-FLR-000 - LCTS_FLOOR_AS_BUILT_DRAWING
	014305 - LCTS_FLOOR_CENTRAL_PARTS	2704LF-M503-FLR-000 - LCTS_FLOOR_AS_BUILT_DRAWING
	014305 - LCTS_FLOOR_CENTRAL_PARTS	2704LF-M503-FLR-000 - LCTS_FLOOR_AS_BUILT_DRAWING
	014305 - LCTS_FLOOR_CENTRAL_PARTS	2704LF-M503-FLR-000 - LCTS_FLOOR_AS_BUILT_DRAWING
	014350 - LCTS_FLOOR_VAR_A	2704LF-M503-FLR-000 - LCTS_FLOOR_AS_BUILT_DRAWING
	014370 - LCTS_FLOOR_VAR_B	2704LF-M503-FLR-000 - LCTS_FLOOR_AS_BUILT_DRAWING
	014373 - LCTS_FLOOR_VAR_C	2704LF-M503-FLR-000 - LCTS_FLOOR_AS_BUILT_DRAWING
	014374 - LCTS_FLOOR_VAR_D	2704LF-M503-FLR-000 - LCTS_FLOOR_AS_BUILT_DRAWING
	014376 - LCTS_FLOOR_VAR_EA	2704LF-M503-FLR-000 - LCTS_FLOOR_AS_BUILT_DRAWING
	014395 - LCTS_FLOOR_VAR_GA	2704LF-M503-FLR-000 - LCTS_FLOOR_AS_BUILT_DRAWING
	014373 - LCTS_FLOOR_VAR_C	2704LF-M503-FLR-000 - LCTS_FLOOR_AS_BUILT_DRAWING

	014374 - LCTS_FLOOR_VAR_D	2704LF-M503-FLR-000 - LCTS_FLOOR_AS_BUILT_DRAWING
	014394 - LCTS_FLOOR_VAR_EB	2704LF-M503-FLR-000 - LCTS_FLOOR_AS_BUILT_DRAWING
	014395 - LCTS_FLOOR_VAR_GA	2704LF-M503-FLR-000 - LCTS_FLOOR_AS_BUILT_DRAWING
	014373 - LCTS_FLOOR_VAR_C	2704LF-M503-FLR-000 - LCTS_FLOOR_AS_BUILT_DRAWING
	014395 - LCTS_FLOOR_VAR_GA	2704LF-M503-FLR-000 - LCTS_FLOOR_AS_BUILT_DRAWING
	014373 - LCTS_FLOOR_VAR_C	2704LF-M503-FLR-000 - LCTS_FLOOR_AS_BUILT_DRAWING
	014395 - LCTS_FLOOR_VAR_GA	2704LF-M503-FLR-000 - LCTS_FLOOR_AS_BUILT_DRAWING
	014350 - LCTS_FLOOR_VAR_A	2704LF-M503-FLR-000 - LCTS_FLOOR_AS_BUILT_DRAWING
	014374 - LCTS_FLOOR_VAR_D	2704LF-M503-FLR-000 - LCTS_FLOOR_AS_BUILT_DRAWING
	014380 - LCTS_FLOOR_VAR_F	2704LF-M503-FLR-000 - LCTS_FLOOR_AS_BUILT_DRAWING
	014382 - LCTS_FLOOR_VAR_GB	2704LF-M503-FLR-000 - LCTS_FLOOR_AS_BUILT_DRAWING
	014350 - LCTS_FLOOR_VAR_A	2704LF-M503-FLR-000 - LCTS_FLOOR_AS_BUILT_DRAWING
	014370 - LCTS_FLOOR_VAR_B	2704LF-M503-FLR-000 - LCTS_FLOOR_AS_BUILT_DRAWING

	014373 - LCTS_FLOOR_VAR_C	2704LF-M503-FLR-000 - LCTS_FLOOR_AS_BUILT_DRAWING
	014374 - LCTS_FLOOR_VAR_D	2704LF-M503-FLR-000 - LCTS_FLOOR_AS_BUILT_DRAWING
	014376 - LCTS_FLOOR_VAR_EA	2704LF-M503-FLR-000 - LCTS_FLOOR_AS_BUILT_DRAWING
	014395 - LCTS_FLOOR_VAR_GA	2704LF-M503-FLR-000 - LCTS_FLOOR_AS_BUILT_DRAWING
	014373 - LCTS_FLOOR_VAR_C	2704LF-M503-FLR-000 - LCTS_FLOOR_AS_BUILT_DRAWING
	014374 - LCTS_FLOOR_VAR_D	2704LF-M503-FLR-000 - LCTS_FLOOR_AS_BUILT_DRAWING
	014394 - LCTS_FLOOR_VAR_EB	2704LF-M503-FLR-000 - LCTS_FLOOR_AS_BUILT_DRAWING
	014395 - LCTS_FLOOR_VAR_GA	2704LF-M503-FLR-000 - LCTS_FLOOR_AS_BUILT_DRAWING
	014373 - LCTS_FLOOR_VAR_C	2704LF-M503-FLR-000 - LCTS_FLOOR_AS_BUILT_DRAWING
	014395 - LCTS_FLOOR_VAR_GA	2704LF-M503-FLR-000 - LCTS_FLOOR_AS_BUILT_DRAWING
	014373 - LCTS_FLOOR_VAR_C	2704LF-M503-FLR-000 - LCTS_FLOOR_AS_BUILT_DRAWING
	014395 - LCTS_FLOOR_VAR_GA	2704LF-M503-FLR-000 - LCTS_FLOOR_AS_BUILT_DRAWING

	014350 - LCTS_FLOOR_VAR_A	2704LF-M503-FLR-000 - LCTS_FLOOR_AS_BUILT_DRAWING
	014374 - LCTS_FLOOR_VAR_D	2704LF-M503-FLR-000 - LCTS_FLOOR_AS_BUILT_DRAWING
	014380 - LCTS_FLOOR_VAR_F	2704LF-M503-FLR-000 - LCTS_FLOOR_AS_BUILT_DRAWING
	014382 - LCTS_FLOOR_VAR_GB	2704LF-M503-FLR-000 - LCTS_FLOOR_AS_BUILT_DRAWING
	014350 - LCTS_FLOOR_VAR_A	2704LF-M503-FLR-000 - LCTS_FLOOR_AS_BUILT_DRAWING
	014370 - LCTS_FLOOR_VAR_B	2704LF-M503-FLR-000 - LCTS_FLOOR_AS_BUILT_DRAWING
	014373 - LCTS_FLOOR_VAR_C	2704LF-M503-FLR-000 - LCTS_FLOOR_AS_BUILT_DRAWING
	014374 - LCTS_FLOOR_VAR_D	2704LF-M503-FLR-000 - LCTS_FLOOR_AS_BUILT_DRAWING
	014376 - LCTS_FLOOR_VAR_EA	2704LF-M503-FLR-000 - LCTS_FLOOR_AS_BUILT_DRAWING
	014395 - LCTS_FLOOR_VAR_GA	2704LF-M503-FLR-000 - LCTS_FLOOR_AS_BUILT_DRAWING
	014373 - LCTS_FLOOR_VAR_C	2704LF-M503-FLR-000 - LCTS_FLOOR_AS_BUILT_DRAWING
	014374 - LCTS_FLOOR_VAR_D	2704LF-M503-FLR-000 - LCTS_FLOOR_AS_BUILT_DRAWING
	014394 - LCTS_FLOOR_VAR_EB	2704LF-M503-FLR-000 - LCTS_FLOOR_AS_BUILT_DRAWING

	014395 - LCTS_FLOOR_VAR_GA	2704LF-M503-FLR-000 - LCTS_FLOOR_AS_BUILT_DRAWING
	014373 - LCTS_FLOOR_VAR_C	2704LF-M503-FLR-000 - LCTS_FLOOR_AS_BUILT_DRAWING
	014395 - LCTS_FLOOR_VAR_GA	2704LF-M503-FLR-000 - LCTS_FLOOR_AS_BUILT_DRAWING
	014373 - LCTS_FLOOR_VAR_C	2704LF-M503-FLR-000 - LCTS_FLOOR_AS_BUILT_DRAWING
	014395 - LCTS_FLOOR_VAR_GA	2704LF-M503-FLR-000 - LCTS_FLOOR_AS_BUILT_DRAWING
	014350 - LCTS_FLOOR_VAR_A	2704LF-M503-FLR-000 - LCTS_FLOOR_AS_BUILT_DRAWING
	014374 - LCTS_FLOOR_VAR_D	2704LF-M503-FLR-000 - LCTS_FLOOR_AS_BUILT_DRAWING
	014380 - LCTS_FLOOR_VAR_F	2704LF-M503-FLR-000 - LCTS_FLOOR_AS_BUILT_DRAWING
	014382 - LCTS_FLOOR_VAR_GB	2704LF-M503-FLR-000 - LCTS_FLOOR_AS_BUILT_DRAWING

0

Storage	Remarks on Stud
Port Saint Louis	
Port Saint Louis	P12-M16x70L- STUD BOLT
Port Saint Louis	
Port Saint Louis	P12-M16x70L- STUD BOLT
Port Saint Louis	
Port Saint Louis	
Port Saint Louis	P11:M20 X20 - 30nos P17:M12X47 - 30 Nos(All Type A)
Port Saint Louis	
Port Saint Louis	
Port Saint Louis	
Port Saint Louis	

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Port Saint Louis	
Port Saint Louis	

Port Saint Louis	P11:M20 X20 - 30nos P17:M12X47 - 30 Nos(All Type A)
Port Saint Louis	
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Port Saint Louis	
Port Saint Louis	
Port Saint Louis	
Port Saint Louis	
Port Saint Louis	

Port Saint Louis	
Port Saint Louis	
Port Saint Louis	
Port Saint Louis	
Port Saint Louis	
Port Saint Louis	
Port Saint Louis	Covered in LHS
Port Saint Louis	
Port Saint Louis	
Port Saint Louis	
Port Saint Louis	Covered in LHS
Port Saint Louis	
Port Saint Louis	

Port Saint Louis	
Port Saint Louis	Covered in LHS
Port Saint Louis	
Port Saint Louis	Covered in LHS
Port Saint Louis	
Port Saint Louis	
Port Saint Louis	
Port Saint Louis	
Port Saint Louis	

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

Annex II – Request for Information (RFI) Questionnaire

Ref. IO/MS/24/YSA/CTS

Cryostat Thermal Shield repair / remanufacture works

Firms interested in participating to this market survey shall return a completed questionnaire to the following email address yuki.suyama@iter.org with copy to antoine.calmes@iter.org, no later than 17 July 2024.

Please note that this is not a Call for Nomination request. At this moment the ITER Organization (IO) is preparing a procurement strategy for this project.

Reference documents:

I. IO/MS/24/YSA/CTS Invitation Letter
II. IO/MS/24/YSA/CTS Annex I: Technical Summary
- Appendix 1: CTS Repair /Remanufacture Scope of Work
- Appendix 2: CTS Manufacturing Drawings
- Appendix 3: CTS Manufacturing Bill of Materials (BOM)

III. IO/MS/24/YSA/CTS Annex III: Pricing Sheets
- Form 1: Pricing Sheet for Repair
- Form 2: Pricing Sheet for Remanufacture

china
eu
india
japan
korea
russia
usa

1. *General information about the Company / Institute compiling the questionnaire*

Company/Institute Name: …….

Persons to be contacted:

Contact person	***Name + Title***	***Email address***	***Telephone***
Commercial Matters:			+
Technical Matters:			+

Main activities

Main activities	***Description***
1.	
2.	
3.	
…….	

Turnover

Contact person	***Turnover 2021***	***Turnover 2022***	***Turnover 2023***	***Number of employees***

All activities				
In the field of *Manufacturing design and manufacture of large mechanical equipment for Nuclear Plants or classified installations*				

2. Technical Competence and Experience

2.1 Do you have experience in the raw material procurement and manufacture of large stainless steel component (size 8m x 6m x 1m with 20mm Thickness) in compliance with ASME section V/VIII/IX and ASME B31.3 or PED/ESP for nuclear projects?

YES ☐ **NO** ☐

If YES, please provide reference projects (at minimum x2 with contract value higher than 2M€) and main scope of work. Please provide main process of procurement, manufacturing, and controls.

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2.2 Do you have experience in the large and thick stainless steel plate manufacture process include cutting, pressing, forming, bending, machining, buffing, welding and Non-destructive examination?

YES ☐ **NO** ☐

If YES, please provide references and describe the process, tooling/equipment capacity, qualification, methods and controls.

.....

.....

2.3 Do you have experience in the large stainless steel plate (8m x 6m) surface treatment process include 3D dimensional machining with 3D dimensional survey for CNC machine programming? Do you have experience with the precise polishing techniques to ensure the surface roughness Ra < 0.1 μm and mirror glass Gloss Value ≥ 70%?

YES ☐ **NO** ☐

If YES, please provide examples with machine and equipment used. Please explain what the challenges were and how you had achieved such requirements: methods, process of machining & polishing, and controls.

.....

.....

2.4 Do you have experience in accurate metrology and reverse engineering?

YES ☐ **NO** ☐

If YES, please provide reference and relevant data like high precision measurement equipment, tools, instrumentation, measurement accuracy, engineering software, and 3D dimensional inspections during manufacture process.

.....

.....

.....

2.5 Do you have experience in working on vacuum component and high cleanliness controlled environment?

YES ☐ **NO** ☐

If YES, please provide reference, your relevant clean room classifications, facilities, maintenance methods, and inspections.

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.....

.....

2.6 Do you have experience in fabrication and installation of DN8 stainless steel pipe include bending, orbit welding, stitch welding, and NDE (Endoscope, RT, PT, Pressure test, Helium leak test, and cold shock test)?

YES ☐ **NO** ☐

If YES, please provide the bending methods statement, bending equipment, maximum bending radius, welding equipment and process, qualifications, methods and controls.

.....

.....

.....

2.7 Do you have enough capacities (workshop, manpower, tooling) to repair and/or remanufacture the components as listed in BoM according to the requirement in Technical Summary?

YES ☐ **NO** ☐

If YES, please provide a description of the workshop capacities, the industrial plan, the time schedule for both repair and remanufacture. Please provide technical challenges you foresee for these scopes of work and how you intend to mitigate.

.....

.....

.....

2.8 Based on your assessment and your industrial experience, which option is the most cost and schedule efficient, repair or remanufacture?

REPAIR ☐ **REMANUFACTURE** ☐

Please provide your assessment with key parameters to consider

.....

.....

.....

3. Scope of Works

Would your Company cover the full scope of work as a single contractor for repair and/or remanufacture?

YES ☐ **NO** ☐

If NO, please specify and justify which part of the contract would be taken over by another company, and in which role: as a partner in a consortium or as a subcontractor? Please indicate the name and address of the potential company/companies if known at this time.

Please provide the information requested in the below table for repair and remanufacture separately:

Services to be performed by another company (and % of the work)	***Partner in a consortium or Subcontractor + Name and Address (optional)***	***Comments***
....		
....		
....		

4. Quality Assurance

Are you certified ISO 9001 or equivalent?

YES ☐ **NO** ☐

Please specify your certifications.

QA Certifications	*Comments*	*Validity Period*

5. Cost estimate, and Sub-contracting rate

Please provide a cost estimate according to IO/MS/24/YSA/CTS Annex III: Pricing Sheets.

Please provide a sub-contracting rate based on following formula for for repair and remanufacture separately.

$$\textit{Sub-contracting rate (\%)} = \frac{\textit{Sub-contracting cost}}{\textit{Total price – raw material cost incl. test cost}}$$

6. General Comments

Please indicate any other information that may be relevant for this market survey.

.....

.....

.....

.....

.....

.....

.....

Signature: COMPANY STAMP

Name: .....

Position: .....

Tel: .....

Date: .....

CTS Repair / Remanufacture RFI - Pricing instructions (IO/MS/24/YSA/CTS Annex III)

At the stage of Request for Information (RFI), IO expects preliminary quotation for the detailed scope of Works.

IO is requesting a quotation for only 4 typical panels not for entire repair/remanufacture scope.

The prices offered shall be in Euros “all inclusive”, including all duties and taxes except duties and taxes for which ITER is exempt (VAT).

Each Section shall be all inclusive of all prices (directs, indirects, support services, materials etc.). The following shall be included in the p

- all necessary tasks to prepare, execute, control, preserve the Works until Taking Over
- all equipment, tools, consumables, materials, support services, machines
- all materials & measures to meet cleanliness requirements
- all overheads, management cost, profit, risk, insurance, taxes, charges etc.
- all engineering design, document, as-bult drawing and survey data, qualifications
- all non-destructive examination as required in technical summary
- all packing, handling, transportation, and storage
- all raw material procurement and 3D dimensional Metrology

If any investment cost such as additional facility necessary to carry out the repair or remanufacture works, to be indicated.

Prices shall be in EUR 2024 considering a price escalation every 2 years from Commencement Date

roposed prices (not limited to):