外部委託業者の募集

References: IO/MS/24/ARC/YWU

“Specialty Valve (ARC:　Automatic Recirculation Valve)"

（特殊バルブ（ARC: 自動再循環バルブ））

IO 締め切り 2024 年 11 月 6 日(日

〇前文

この技術仕様書は、技術要件の一部を構成する「サービスおよび供給のための一般管理仕様」（GM3S）－ 参照文献[1] と併せて読む必要があります。もし矛盾が生じた場合、技術仕様書の内容が参照文献[1] の内容に優先します。

〇目的

この技術仕様書の目的は、ITER プロジェクトおよびトカマク冷却水システム（TCWS）に必要な特殊バルブ（圧力調整弁、ARC、視管、ノズルチェックバルブ）の調達契約を確立するための制限付き入札プロセスを定めることです。

〇調達対象の範囲

このセクションでは、参照文献[1] に定義された契約実施要件に加え、具体的な作業範囲を定義します。

契約者は、ITER組織と締結する契約条件に基づいて、バルブおよびアクチュエーターをITER組織に供給する必要があります。

表1は、TCWSに必要なバルブおよびアクチュエーターの予備的な材料リストを示しています。これらは変更される可能性があることに注意してください。

供給範囲には、バルブおよびアクチュエーターの製造、試験、資格確認、清掃、梱包、およびフランスのITERサイトへの配送が含まれます。

表1 - 予備的な材料リスト（変更の可能性あり）

（詳細は英文技術仕様書を参照ください）

IOからのサブコントラクター受け入れフォーム（SAF）を提供する必要があります。このフォームには、前述の文書リストが含まれており、付録6にテンプレートがあります。SAFおよび関連文書は、統一された文書としてIOに提出されなければなりません。SAFに含まれる情報は、サブコントラクターが設立された国の公用語で提出する必要があります。その言語が英語でない場合、契約者が英語の公式翻訳を提供しなければなりません。この公式翻訳は、IOとの合意がない限り、認証されている必要があります。

IOの事前の書面による同意なしに、下請け作業またはサービスの開始や下請け業者の変更は許可されません。

契約者は、特にPICまたはPIAコンポーネント、PEまたはNPEコンポーネント、QC1コンポーネントなど、重要な活動を含む下請け業者を特定する必要があります。契約者は、これらを契約管理計画またはQA計画に記述する必要があります。

重要な活動を含む下請け業者に対しては、専用のQA計画を提供する必要があります。契約者は、関連セクションにおいてIOへの報告で下請け活動を報告しなければなりません。

〇タイムテーブル

契約の期間は、契約の授与日からのバルブ納入スケジュールに応じて、2年または3年となります。

制限付き入札の開始：初期Q2
提案の受領締切：Q2中旬
評価の終了、契約の授与および契約署名：Q2末
IOは、契約に特定の入力技術データを修正するための契約変更通知を契約者に評価のために発行することがあります。この契約変更通知は契約者によって評価され、影響について正式に合意が得られた後、IOは契約変更通知の実行を指示します。使用するフォームは付録18に記載されています。

〇サプライヤーの経験

サプライヤーは、原子力産業界で使用される表1に示されたバルブの製造および供給において実績があることを示さなければなりません。また、安全機能を果たすために必要なバルブの経験も求められます。

サプライヤーは、ASME B16.34、ASME B31.3-2010カテゴリM流体に準拠して材料を製造する実績を持ち、ESPおよびESPNのフランス規制に従うことができる必要があります。

バルブアクチュエーターは、機械指令2006/42/ECおよびEMC指令2004/108/ECに準拠して設計されなければなりません。サプライヤーは、核コンポーネントの製造に必要な品質保証システムおよびサプライチェーン管理システムを構築できなければならず、2012年2月7日のフランスの命令に従って、基本的な核施設の一般的な規則を遵守しなければなりません。

以下詳細は英文技術仕様書を参照ください

【※　詳しくは添付の英語版技術仕様書「**Technical Specification for Specialty Valve(Lot 2)**」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。

Route de Vinon-sur-Verdon - CS 90 046 - 13067 St Paul Lez Durance Cedex - France

To: Potential respondants

Date: 25 October 2024
Subject: Market Survey
Letter Reference: IO/MS/24/ARC/YWU

Dear Madam/Sir,

The ITER Organization (IO) is launching a Market Survey in view of a possible future procurement competition for supply of Lot 2 **Specialty Valve (ARC: Automatic Recirculation Valve)**. In the scope of work, it will be included the manufacturing, testing, qualification, cleaning, packaging and delivery of valves and actuators (if any) to the ITER site, France.

In this regard, we would like to request information from you in order to help us better assess the market's availability to:

- *Demonstrate its capability to satisfy the requirements set forth in the technical specifications attached to this market survey,*

or/and

- *identify possible blocking points in terms of production capability, productivity, and propose ways for possible optimization/cost reduction.*

The technical specifications ref YWDX46_v1_4 attached to this Market Survey are a purely informational document, not binding for any party, for you to have more complete data to answer the questions.

We will highly appreciate if you could answer to the questions in the attachment and return it to the Procurement Officer in charge by email by **6 November 2024** yao.wu@iter.org in cc to jingyu.gao@iter.org.

None of the answers that you will provide, nor part of them, will ever be considered binding with the possible future competition nor will be shared with any possible competitors.

The IO may invite you to follow up remote meetings after receiving your responses to this Request for Information.

Yours faithfully,

Mr. Andrew Brown
Group Leader of Procurement Operational Delivery Group

Contact: Yao Wu Procurement Division, Tel 33 4 42 17 61 25 e-mail: yao.wu@iter.org

IDM UID
YWDX46

VERSION CREATED ON / VERSION / STATUS
02 Apr 2024 / 1.4 / Approved

EXTERNAL REFERENCE / VERSION

Technical Specifications (In-Cash Procurement)

Technical Specification for Specialty Valve(Lot 2)

This Technical Specification for as below

1. Lot 2 Valve Procurement for New Tendering: Specialty Valve: 1)Pressure Regulator Valve 2) ARC Valve 3) Nozzle Check Valve 4)Sight Glass 5) 3-Way Ball Valve

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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

The purpose of this Technical Specification for Restricted Tender bidding process to establish a Contract for the procurement of Specialty Valves (Pressure Regulator Valve, ARC, Sight Glass and Nozzle Check Valve) which required for the ITER Project / Tokamak Cooling Water System (TCWS).

3 Acronyms & Definitions

3.1 Acronyms

For a complete list of the ITER acronyms see Ref [17]. The acronyms listed below shall have the following meanings where used:

Abbreviation	Description
MTO	Material Take Off
CRO	Contract Responsible Officer
GM3S	General Management Specification for Service and Supply
IO	ITER Organization
PRO	Procurement Responsible Officer
ALARA	As Low As Reasonably Achievable
ANB	Agreed Notified Body
ANSI	American National Standards Institute
ASME	American Society of Mechanical Engineers
ASN	Autorite de Surete Nucleaire (French nuclear safety authority)
ASTM	American Society for Testing and Materials
CFSI	Counterfeit Fraudulent Suspect Item
CCN	Contractual Change Notice
CMA	Construction Management as Agent
CRO	IO Contract Responsible Officer
CRN	Contractor Release Note
DA	Domestic Agency e.g. China/EU/India/Korea/Russia/ USA
DN	Diameter Nominal
DOE	Department of Energy
DR	Deviation Request
DRR	Delivery Readiness Review
EN	European Standard
ESP	Equipements Sous Pression

ESPN	Equipements Sous Pression Nucléaires
EPMN	Evaluation Particular Material Nuclear
EPRO	Environment Protection Responsible Officer
ERP	Environmental Respect Plan
FAT	Factory Acceptance Test
FR	Functional Reference
GLC	Global Logistics Contractor
GM3S	General Management Specification for Service and Supply
GTD	Generic Document Title
IAEA	International Atomic Energy Agency
I&C	Instrumentation Atomic Energy Agency
ILM RO	Integrated Logistics & Materials Responsible Officer
IO	ITER Organization
ISO	International Organization for Standardization
ITP	Inspection & Test Plan
KOM	Kick-Off Meeting
LSP	Logistics Service Provider
LTI	Lost Time Injury
MIP	Manufacturing and Inspection Plan
MOM	Minutes Of Meeting
MQP	Manufacturing Quality Plan
MRR	Manufacturing Readiness Review
MSS	Manufacturers Standardization Society
MTO	Material Take Off
NB	Notified Body
NCR	Non Conformity Report
NDE	Non-destructive Examination
NS	Nuclear Safety Division
OHS RO	Occupational Health & Safety Responsible Officer
PBS	Plant Breakdown Structure
PE/NPE RO	Pressure Equipment/Nuclear Pressure Equipment Responsible Officer
PIA	Protection Important Activity
PIC	Protection Important Component
PNI	Part Number of ITER
PPE	Personal Protective Equipment
PRO	Procurement Responsible Officer
PQR	Procedure Qualification Record
SDR	Supplier Deviation Request
SIC	Safety Importance Class
SO	Supply Order

TCWS	Tokamak Cooling Water System
QA	Quality Assurance
QADP	Quality Assurance Data Package
QARO	Quality Assurance Responsible Officer
QAP	Quality Assurance Program
QC	Quality Control
RFI	Request For Information
RBSE	Radiation, Beryllium, Safety, Environment
SAF	Site Acceptance Form
SAT	Site Acceptance Test
SLP	Service Logistic Provider
SQD	Safety & Quality Department
SRO	Safety Responsible Officer
TDF	Technical Document Family
USDA	United States Domestic Agency
USIPO	United States Integrated Project Office (also referred to as US ITER)
WPAR	Welding Procedure Approval Record
WPQ	Welding Procedure Qualification
WPQR	Welding Procedure Qualification Record
WPS	Welding Procedure Specification

3.2 Definitions

Areas Under Operation: Means IO premises at the ITER Site that is not Construction Site as defined in Appendix 19 of this document.

After Receipt of Order (ARO): as used in this technical specification, is the time period where the Supplier receives an SO from the IO for the procurement of materials, components, or equipment.

Agreed Notified Body (ANB): Is the body agreed by the nuclear regulatory authority in France to ensure compliance with the ESPN.

As Low as Reasonably Achievable (ALARA): means making every reasonable effort to maintain exposures to ionizing radiation as far below the dose limits as practical, consistent with the purpose for which the licensed activity is undertaken, taking into account the state of technology, the economics of improvements in relation to state of technology, the economics of improvements in relation to benefits to the public health and safety, and other societal and socioeconomic considerations, and in relation to utilization of nuclear energy and licensed materials in the public interest.

Award of Contract (AOC): Contractual process after which the Contractor is awarded the Contract.

Contract: An all-inclusive term used to cover all legal obligations between the IO and the Contractor for the performance of part or whole work defined in the present document. These obligations are enforceable immediately at its date of entry into force, including any amendment(s). Refer to contract conditions for more details.

Contractor: the economic operator who have signed the Contract in which this document is referenced, as defined in the Special Conditions of the said Contract.

Contractor's Premises: Any location, apart from the Site, where the Contractor or Subcontractors carry out any work defined in the present document.

Construction Site: Means IO construction site as defined in Appendix 19 of this document (shaded area)

Delivery Location: Location specified by the IO where the supplies will have to be delivered by the Supplier.

Documentation: The procedures, test reports, certifications, manuals, instructions, and other data specified to be delivered by the Supplier.

Equipments Sous Pression (ESP): Articles L557 and R557 of French Environmental Code.

Equipements Sous Pression Nucléaires (ESPN): French Order dated 30 December 2015 concerning nuclear pressure equipment. The ESPN follows a pressure classification and conformity assessment procedure that is in many cases based on ESP/PED assessment modules. It is the responsibility of IO to comply with all requirements of this Order unless otherwise specified in this document.

Global Logistics Contractor: Primary IO LSP who operates the logistics for the IO at ITER Site and Off-Site.

INCOTERM: Rules defining the obligations of relevant parties and transfer of risk.

INCOTERM Named Place: A location specified for the collection/delivery location of the goods.

ITER- Organization (IO): As used in this specification, is the owner and operator of the ITER research facility.

ITER Site: ITER construction site located at the following address: ITER WORKSITE -RD 952-Entrée Nord - CS 80 001 -13066 Saint Paul les Durance Cedex.

Logistics Service Provider (LSP): operator contracted by any party who provides logistics services, such as but not limited to: transportation, storage, custom clearance services…

Manufacturer: as it pertains to the ESPN, is the legal entity which assumes responsibility for the design, manufacture and inspection of a product to be marketed under its name as an item of pressure equipment, nuclear pressure equipment, or a nuclear pressure assembly.

Mandatory Template: model of document provided by IO that the Contractor shall use in order to submit the said document and which cannot be modified without the prior agreement of the IO.

Notified Body (NB): Technical organization approved in an EU state, either for approval and monitoring of the manufacturer's quality assurance system or for direct product inspection.

Nuclear Regulatory Authorities/ Nuclear Regulator: referred to in this Specification are mainly MSNR (Office of the Ministries in charge of nuclear safety and radioprotection), ASN Autorité de Sûreté Nucléaire, French Nuclear regulator) and its technical support IRSN (Institute of nuclear safety and radioprotection).

Off Site: Anywhere that is not ITER Site.

Plant Breakdown Structure (PBS): The PBS is the hierarchical breakdown of the ITER Plant into distinct ITER elements. The PBS identifies the links between parent/child elements, so that there is only one rooting between a parent element and one of its child element (and vice versa).

Pressure Accessory: A device with an operational function and having an identifiable pressure-bearing housing – i.e. the device has a function additional to that of containing pressure. (e.g., valves, pressure regulators, gauges, etc.)

Product: Any type of deliverable, goods and services resulting from the Technical Specification..

Protection Important Component (PIC): component important for protecting the interests of public security (including nuclear safety, radioprotection and prevention and fight against malevolent acts and civil security actions in the case of an accident), health and sanitation, the protection of nature and of the environment, i.e. any structure, equipment, system (programmed or not), material, component or software that is present in the basic nuclear installation or that is under the responsibility of the nuclear operator and that implements a function required for the demonstration mentioned under the second paragraph of Article L. 593-1 of the Environmental Code or that ensures that this function is implemented per articles 1.3 and 2.5.1 of Order 7th February 2012.

Quality Assurance Program: A controlled system of planned and systematic actions required to provide adequate confidence that an item designed and constructed are in accordance with Code requirements.

Quality Assurance Manual: A written document that describes a Quality Assurance Program.

Safety Importance Class (SIC): a classification scheme for structures, systems, and components of ITER that perform a safety function and contribute towards meeting the General Safety Objectives at IO during incident/ accident situations.

Subcontractor: shall mean an economic operator who is under contract to a Contractor providing supplies, services or works to the IO, being understood that the subcontractor shall perform, under responsibility of the Contractor, with independence and free from any subordination, a specific part of the obligations of the Contract.

Supplier: shall mean a legally registered entity, that can provide standard/catalog goods or material, or standard services to a Contractor, or a subcontractor, that will enable the performance of the scope of work to be provided by the Contractor or subcontractor.

Supply Order: Instrument produced by the IO to request supplies from the Supplier. Refer to contract conditions for more details.

Service Contract: shall mean any Contract that involves performing and providing value through an action, referred to as a service, rather than providing tangible goods.

Supply Contract: shall mean any Contract for the delivery of a defined set of products, goods or items.

Site or ITER Site or IO Site: covers the Construction site and Areas under Operation. By extension, any place where IO staff is operating on a regular basis is to be considered ITER Site, if specified as such by IO.

Third Party: Is someone who may be indirectly involved but is not a principal party with a vested interest in carrying out the requirements of this Specification.

Typical Template: model document provided by IO for information that the Contractor may use in order to submit this type of document.

Work Contract: shall mean a Contract for building, construction, fabrication, completion, erection, installation, fitting out, improvement, modification, repair, maintenance, renovation, alteration or commissioning of any immovable property.

United States Domestic Agency **(USDA)**: Is the agency, which includes the US DOE and USIPO, that is responsible for the control and management of all activities covered under the arrangement for the procurement of the piping system for the TCWS.

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 (General Applicable Documents)	IDM Doc ID	Version
1	General Management Specification for Service and Supply (GM3S)	82MXQK	1.4
2	ASN Guide #8 Conformity Assessment of Nuclear Pressure Equipment - Version of 2012-09-04 - EN	DU9A7L	1.0
3	ASN Guide #19 - Application of the French Order dated 12/12/2005 on Nuclear Pressure Equipment - Version of 21-02-2013 – EN	FXQ9NZ	1.1
4	AVEVA E3D CAD Manual	8QZS2R	2.2
5	Contractor Safety Management Procedure	Q2GBJF	1.4
6	Chemical Safety Management Tool – User Manual	W6EREY	1.0
7	Directive 2014/68/UE of the European Parliament and Council dated 15 May 2014 on the harmonization of the laws of the member states relating to the market availability of pressure equipment_PED	RZ6PAK	1.0
8	Environmental Requirements	97WRFP	2.2
9	Export Control Procedure	JE3N8C	3.0
10	French Order dated 30 December 2015 on Nuclear Pressure Equipment (ESPN), modified b order dated 03 September 2018 – EN	SMP384	2.2
11	ITER Information Technology (IT) Acceptable Use Principles	27ZPBE	2.8
12	ITER Site Access Procedure	S3893D	3.1
13	ITER Site Permit to Work Overarching Procedure	3E8289	5.0
14	List of Deliverables Form	73MVYS	2.0
15	Order dated 7 February 2012 relating to the general technical regulations applicable to INB – EN	7M2YKF	1.7

Ref	Title (General Applicable Documents)	IDM Doc ID	Version
16	Overall supervision plan of external interveners chain for Protection Important Components, Structures and Systems and Protection Important Activities	4EUQFL	7.4
17	ITER Abbreviations	2MU6W5	1.18
18	ITER Quality Assurance Program (QAP)	22K4QX	8.5
19	Design Seismic Floor Response Spectra in the Tokamak Complex	SVBRJZ	1.1
20	Procedure for the Import and Export of Goods	LF4QST	2.0
21	Procedure related to Information Protection Levels	44GRMV	3.2
22	Requirements for Producing a Quality Plan	22MFMW	4.0
23	Radioprotection guide for ESPN application	2LTQ96	2.3
24	Requirements for Producing an Inspection Plan	22MDZD	3.7
25	Safety requirement Roombook	KF63PB	2.11
26	Annex 2 – Detailed List of PIAs	Q8B5C4	1.4
27	Provisions for Implementation of the Generic Safety Requirements by the External Interveners	SBSTBM	2.2
28	IBED prelim strategy and time estimate for in-service inspection & maintenance	SZWWMC	2.0
29	List of ITER-INB Protections Important Activities	PSTTZL	2.2
30	General Requirements for Centralized Procurement	LACWXL	1.7
31	Defined Requirements for PBS26	M369M3	2.1
32	Load Specifications (LS)	222QGL	6.2
33	Load Specification for Tokamak Cooling Water System	SZE5MR	2.6
34	Propagation of the Defined Requirements for Protection Important Components Through the Change of External Contractors Procedure	BG2GYB	3.3
35	TCWS System Hazard Analyses a. TCWS IBED PHTS piping equipment Hazards & Risks Analysis b. TCWS VV PHTS piping equipment Hazards & Risks Analysis c. TCWS DYS piping equipment Hazards & Risks Analysis d. TCWS DRS piping equipment Hazards & Risks Analysis	 VHFWQW TZUS6B VHKDP5 VHG2EU	 3.0 3.4 2.1 2.1
36	Technical Specification for Coatings for Equipment	R45ME7	1.1
37	Technical Specification for piping and fittings procurement	N55B8R	1.14
38	Directive 2004/108/EC of the European Parliament and of the Council of 15 December 2004 on the Approximation of the Laws of the Member States Relating to Electromagnetic Compatibility and Repealing Directive 89/336/EEC	Not Applicable	N/A
39	Directive 2006/42/EC of the European Parliament and of the Council of 17 May 2006 on Machinery, and Amending Directive 95/16/EC	Not Applicable	N/A

Ref	Title (General Applicable Documents)	IDM Doc ID	Version
40	EDH Guide A: Electrical Installations for SSEN Client Systems	2EB9VT	2.7
41	EDH Part 4: Electromagnetic Compatibility (EMC)	4B523E	3.0
42	Chemical composition and impurity requirements for materials	REYV5V	2.3
43	Plant Control Design Handbook	27LH2V	7.1
44	Manufacturing Readiness Review	44SZYP	5.0
45	Delivery Readiness Review	X3NEGB	2.0
46	Procedure for Labelling on Physical Items	VYJ7U2	1.4
47	CAD Manual 07 – CAD Fact Sheet	249WUL	7.0
48	IDM Manual	22223J	8.29
49	Instruction for Computational Fluid Dynamic Analysis	VUEEDB	2.0
50	Instruction for Seismic Analysis	VT29D6	2.0
51	Instruction for Structural Analysis	35BVV3	4.0
52	Instruction for the Storage of Analysis Models	U34WF3	2.0
53	IO/In-Cash Contractor Documentation Exchange and Storage Working Instruction	G8UMB3	5.0
54	IO QA Deviation Request Template	2LRNQP	4.0
55	ITER Integrated safety, Environment and Security Management System (ISMS) Manual	4HCWJU	4.0
56	ITER Procurement Quality Requirements	22MFG4	5.1
57	ITER Project Management Plan (PMP)	2NCR3F	6.0
58	Overall Surveillance Plan of the Chain of External Actors for Protection Important Components, Structures and Systems and Protection Important Activities	4EUQFL	7.4
59	Procedure for Analysis and Calculations	22MAL7	6.6
60	Procedure for ITER CAD Data Exchanges	2NCULZ	4.2
61	Procedure for the CAD management plan	2DWU2M	2.2
62	Procedure for the management of Deviation Request	2LZJHB	8.1
63	Procedure for the Management of Diagrams and Drawings in pdf Format Using the SMDD Application	KFMK2B	2.2
64	Procedure for the Usage of the ITER CAD Manual	2F6FTX	1.1
65	Requirements for Producing a Contractors Release Note	22F52F	5.0
66	Safety Important Functions and Components Classification Criteria and Methodology	347SF3	1.8
67	Software Qualification Policy	KTU8HH	2.0
68	Specification for CAD data Production in ITER direct contracts	P7Q3J7	2.0
69	Template for Structural Analysis Reports	VQVTQW	1.0
70	ITER Numbering System for Components and Parts	28QDBS	5.0

Ref	Title (General Applicable Documents)	IDM Doc ID	Version
71	NCR Database – Introduction & How To for Supplier and Contractors	SY6RQ5	2.5
72	Accident Analysis Report (AAR) Volume I - Event Identification and Selection	2DPVGT	1.4
73	Accident Analysis Report (AAR) Volume II – Figures	2EBGU5	4.7
74	Accident Analysis Report (AAR) Volume II – Reference Event Analysis	2DJFX3	4.10
75	Accident Analysis Report (AAR) Volume III – Figures	2EL9ML	4.6
76	ITER Policy on Safety, Security and Environment Protection Management	43UJN7	3.1
77	List of Protection Important Components (PIC list) (EN)	JDS5K7	1.2
78	Preliminary Safety Report (RPrS)	3ZR2NC	3.0
79	Procedure for management of Nonconformities	22F53X	9.1
80	Project Requirement (PR)	27ZRW8	6.3
81	14SRD-26-PH, -CV, -DR, -DY, -SA (TCWS) from DOORS	2823A2	6.4
82	Surveillance Plan for PBS 26 – Cooling Water System	CAJTAL	3.1
83	TCWS System Description Document (SDD)	94WLDK	6.1
84	Equipment Qualification Program	XB5ABP	1.2
Ref	**Title (Technical Applicable Documents)**	**IDM Doc ID**	**Version**
85	Allowable values and limits in service level C and D for ITER mechanical components	3G3SYJ	3.1
86	Fluid Radioactivity Concentration for the ITER Tokamak Cooling Water System	26GLXV	2.4
87	Quality Classification Determination	24VQES	5.2
88	Standard Specification – Technical Specification for TCWS Fabrication Cleaning Requirement	33YCQ3	1.0
89	TCWS Procurement Valve List	XGZQ5U	8.0
90	Collection of Input Data to Support Qualification Program in Charge of TCWS Valves Supplier	YST3YH	2.3
91	Collection of Input Data to Support ESPN Regulatory File for TCWS Valves	YV8EKC	1.4
92	Guidelines For the Stress Analysis of TCWS Piping System	LYBRAM	2.0
93	Tokamak Complex – Floor Response Spectra 2016 – Esteyco	TFN4DN	1.3
94	VV PHTS System Process Loading Conditions	YJH3BY	4.1
95	Technical Specification for TCWS Valves and Actuators	UKJGPL	2.7
96	Equipment Specification for piping materials used in the design of process piping systems	SJE6S7	2.14
97	TCWS VV PHTS System Process Loading Conditions	YJH3BY	4.1
98	TCWS DYS System Process Loading Conditions	YVY8NB	1.6

Ref	Title (General Applicable Documents)	IDM Doc ID	Version
99	TCWS IBED PHTS System Process Loading Conditions	YQCUY5	2.1
100	ITER Vacuum Handbook	2EZ9UM	2.5
101	ITER Appendix 3 Materials	27Y4QC	1.20
102	ITER Appendix 4 Accepted Fluids	2ELN8N	1.14
103	ITER Appendix 8 Flanges	2DJYQA	2.7
104	ITER Valves Lot 2- Allowable loads for valves with flanged connection	9MPRH3	1.4
105	TCWS PHNB Loading Specification	YDNX56	2.1
106	TCWS CVBD Loading Condition	8PZBTB	0.0

4.2 Applicable Codes and Standards

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

Ref	Title (Applicable Codes and Standards)	Remarks
107	ANSI/FCI 70-2-2013, “Control Valve Seat Leakage”	
108	ANSI/ISA 75.01.01-2012, “Industrial Process Control Valves – Part 2-1: Flow Capacity – Sizing Equations for Fluid Flow Under Installed Conditions”	
109	ASME B1.13-2005, “Metric Screw Threads: M Profile”	
110	ASME B16.5-2013, “Pipe Flanges and Flanged Fittings: NPS ½ through NPS 24 Metric/Inch Standard”	
111	EN1591-1_2014 “Design Rules for Flanged Joints with Gasket”	
112	ASME B16.10-2017 Edition “Face-to-Face and End-to-End Dimensions of Valves”	
113	ASME B16.25- 2017 Edition, “Butt-welding Ends”	
114	ASME B16.34- 2017 Edition, “Valves – Flanged, Threaded and Welding End”	
115	ASME B31.3- 2018 Edition “Process Piping”	
116	EN13555_2014 “Sealing Gasket Design Factors and Test Methods for Round Flange Connections	
117	ASME B&PV Code Section II, “Materials – Part A: Ferrous Material Specifications”, 2017 Edition	
118	ASME B&PV Code Section VIII Division I, “Rules for Construction of Pressure Vessels” , 2017 Edition	
119	ASME NQA-1-2017 Edition, “Quality Assurance Requirements for Nuclear Facility Applications”	
120	ASME PTC-19.1, “Test Uncertainty”	
121	ASME QME-1-2017 Edition, “Qualification of Active Mechanical Equipment Used in Nuclear Power Plants”	

Ref	Title (Applicable Codes and Standards)	Remarks
122	ASTM A182M-09a “Standard Specification for Forged or Rolled Alloy and Stainless Steel Pipe Flanges, Forged Fittings, and Valves and Parts for High-Temperature Service”	
123	ASTM A262-14 “Standard Practices for Detecting Susceptibility to Intergranular Attack in Austenitic Stainless Steels”	
124	ASTM A312M-09 “Specification for Seamless and Welded Austenitic Stainless Steel Pipes”	
125	ASTM A342M-14 “Standard Test Methods for Permeability of Feebly Magnetic Materials”	
126	ASTM A351M-2006, “Standard Specification for Castings, Austenitic, for Pressure-Containing Parts”	
127	ASTM A479M-08 “Specification for Stainless Steel Bars and Shapes for Use in Boilers and Other Pressure Vessels”	
128	ASTM ANS/ISO 17025-2005, “General Requirements for the Competence of Testing and Calibration Laboratories”	
129	IEEE 323-04, “Standard for Qualifying Class 1E Equipment for Nuclear Power Generating Stations”	
130	IEEE 344-13, “IEEE Standards for Seismic Qualification of Equipment for Nuclear Power Generating Stations”	
131	IEEE 382-07, “IEEE Standard Qualification of Safety-Related Actuators for Nuclear Power Generating Stations”	
132	IEEE 383-04, “IEEE Standard for Qualifying Class 1E Electrical Cables and Field Splices for Nuclear Power Generating Stations”	
133	ISO 15848-1:2006, “Industrial Valves – Measurement, Test, and Qualification Procedures for Fugitive Emissions – Part 1: Classification System and Qualification Procedures for Type Testing of Valves”	
134	MSS SP-55-2011, “Quality Standard for Steel Castings for Valves, Flanges, Fittings, and Other Piping Components – Visual Method for Evaluation of Surface Irregularities”	
135	MSS SP-101-1989, “Part-Turn Valve Actuator Attachment – Flange and Driving Component Dimensions and Performance Characteristics”	
136	MSS SP-102-1989, “Multi-Turn Valve Actuator Attachment – Flange and Driving Component Dimensions and Performance Characteristics”	
137	NF EN 10204:2005, “Metallic Products – Types of Inspection Documents”	

Ref	Title (Applicable Codes and Standards)	Remarks
138	NF EN ISO 148-1:2011, “Metallic materials – Charpy pendulum impact test”	
139	SSPC-SP-1, “Solvent Cleaning”	
140	SSPC-SP-2, “Hand Tool Cleaning”	
141	SSPC-SP-5, “White Metal Blast Cleaning”	
142	SSPC-SP-10, “Near-White Blast Cleaning”	
143	EN 12266-1:2012, “Industrial Valves – Testing of Metallic Valves – Part 1: Pressure Tests, Test Procedures and Acceptance Criteria – Mandatory Requirements”	
144	ASTM A193M, Standard Specification for Alloy-Steel and Stainless Steel Bolting for High Temperature or High Pressure Service and Other Special Purpose Applications	
145	ASTM A194M, Standard Specification for Carbon and Alloy Steel Nuts for Bolts for High Pressure or High Temperature Service, or Both	
146	ASME B16.20, Metallic Gaskets for Pipe Flanges	
147	EN1515-4: Selection of Bolting of Equipment suitable to the Pressure Equipment Directive 97/23/EC. As an equivalent/alternative to that of ASTM.	

5 Scope of Work

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

The Contractor will be required to supply valves and actuators to the ITER Organization under the conditions of the Contract to be signed with the ITER Organization.

Table 1 represents the preliminary bill of materials of valves and actuators required for the TCWS. Please note that they are subject to change.

The scope of supply includes manufacturing, testing, qualification, cleaning, packaging and delivery of valves and actuators to the ITER site, France.

Table 1 – Preliminary Bill of Materials (subject to change)

Systems	Item & Type	Grade/ Material	Pressure Class (Pressure Class is to be confirmed by the supplier based on the design conditions)	Size (DN)
TCWS	Pressure Regulator Valve	304L & 316L (or equivalent grades CF3/CF3M)	150, 300, 600, 900, 2500	DN 25, 60,65, ½”Swagelok, 3/8”Swagelok
	ARC Valve	304L & 316L (or equivalent grades CF3/CF3M)	300, 600	DN40, 50, 65, 80, 150
	Sight Glass	304L & 316L (or equivalent grades CF3/CF3M)	150,300,600,900	DN 25,50,65,80
	Nozzle Check Valve	304L & 316L (or equivalent grades CF3/CF3M)	300, 600	DN100,250,400
	3-Way Ball Valve	304L & 316L (or equivalent grades CF3/CF3M)	150	DN150

*Note that the above valve types include valves will be required to perform safety functions.

5.1 Scope of Supply

5.1.1 Description

The total number of valves will be as below, it is an order of magnitude estimate of the number of valves, at the current design stage, this estimate is provided for information only, to help tenderers assess their ability to self-perform and determine the percentage of work which they will need to subcontract/partner up with other suppliers.

Item & Type	Quantity	Remarks
Pressure Regulator Valve	31	DN25(15+1Spare EA)/ DN50 (7EA)/DN65(2EA)/ ½" Swagelok (3EA), 3/8" Swagelok (3 EA)
ARC Valve	11	DN40(1EA)/DN50(1EA)/DN65(3EA)/DN80(3EA)/DN150(3EA)
Sight Glass	16	DN25(4EA)/DN50(9EA)/DN65(2EA)/DN80(1EA)
Nozzle Check Valve	6	DN100(1EA)/DN250(3EA)/DN450(2EA)
3-Way Manual Ball Valve	1	DN150(1EA)
Total	65	

*Subcontracting limits: sub-contracting is allowed up to one level of subcontracting only, except otherwise provided in the Special Conditions. The Contractor shall not subcontract more than 30% of the total Contract Price or of the Maximum Amount of the Contract, except otherwise formally provided in the Special Conditions.

The Contractor shall not subcontract any part of the Contract without prior written authorisation from the IO. To that respect, the Contractor shall provide the IO a Subcontractor Acceptance Form (including the list of documents mentioned in the said document, see template in Appendix 6). The SAF and the associated documents shall be submitted to the IO as a unique document. The information included in the SAF shall be submitted in the official language of the country where the subcontractor is established. Where the language of such documents is not English, an official translation in English shall be provided by the Contractor. Such official translation shall be certified unless otherwise agreed with the IO.

No commencement of subcontracted works or services and change of the subcontractor are allowed before IO prior written consent.

The Contractor shall identify all their subcontractors, with special focus on any subcontractor which scope involve critical activities, such as PIC or PIA components, PE or NPE components, QC1 components or any scope that the Contractor identifies as key in their supply chain.

The Contractor shall describe in their Contract Management Plan or QA Plan the above.

For subcontractors whose scope involves critical activities, a dedicated QA plan shall be provided. The Contractor shall report subcontracting activities in their reporting to IO in the relevant section.

5.1.1.1 Timetable

The duration of the contract will be 2 or 3 years, depends on valve delivery schedule from the date of the award of the contract.

*Launch of the Restricted Tender to the pre-qualified companies – Early Q2

*Deadline to receive offers – Mid of Q2

* End of evaluation, award of the Contract with Signature of the Contract – End of Q2

*The IO may issue for assessment to the Contractor a Contractual Change Notice, typically to modify a specific input technical data to the Contract. This Contractual Change Notice must be assessed by the Contractor, and upon formal agreement on the impact, the IO shall instruct the Contractual Change Notice for execution. The form to be used is as per Appendix 18.

5.1.1.2 Experience of Supplier

The Supplier shall have demonstrable experience in the manufacturing and supply of above stipulated Table 1 valves used in the nuclear industry, as well as valves that are required to perform safety functions.

The Supplier shall have demonstrable experience in manufacturing such materials conformingly to ASME B16.34, ASME B31.3-2010 Category M fluid, and is able to comply with ESP and ESPN French regulation.

The valve actuators shall be designed to conform with the Machinery Directive 2006/42/EC and EMC Directive 2004/108/EC. The Supplier shall be able to set-up Quality Assurance System and Supply Chain Management System required for manufacturing of nuclear components and shall comply with the French Oder of 7th February 2012 establishing the general rules for basic nuclear installations.

5.1.2 Design requirements

Whenever the scope is for the supply of a system, part or piece of equipment that is to be designed by Contractor or is for a service that covers for the design of a system, part of piece of equipment, or more generally the scope requires analysis and calculation tasks, the Contractor shall apply the below unless specified otherwise in the Technical Specification.

The Contractor shall apply [Ref. 59], procedures for Analyses and Calculations as well as all lower level Instructions, Templates and Checklists made applicable by the Procedure and summarized in the below table.

Technical Checker and Reviewer are defined in the relevant document as listed in above and below table.

Analysis Type	Instructions	Report Template	Reviewer Checklist	Technical Checker Checklist	Independent Peer Reviewer Checklist
Structural	35BVV3	VQVTQW	RYATXV	TK33SU	VQVFEN
Seismic	VT29D6	VAET99	Q6FH53	V5ZWSB	V5Z65L
Nuclear	R7XRXB	n/a	VP6G35	RSJ9CS	T8K5CG
Electromagnetic	TSZ9KQ	6NVTVK	PRAT8Q	SYCCLR	VNYHRB
Computational Fluid Dynamics	VUEEDB	TL7H73	VJJSZ3	VJJVFJ	VJJUDV
Contamination	XQVZKS	n/a	V96NYH	X7RR2N	X8CS4Z

This specification defines the material, design, fabrication, inspection, examination, testing, certification, packaging, and shipping requirements for Specialty valves of ESPN equipment

(Level N2 and N3) and non-ESPN equipment used in the TCWS. The valves are pressure accessories in accordance with ESP/PED [Ref. 7] and the supplier shall check the requirements which are specified in Appendix 1 and verify the PED category of the valves.

Safety important components (SIC) is indicated in the Appendix 1, Under Order 7 February 2012 [Ref. 15], these SIC components are classified as protection important components (PIC) and require control and guaranty of the quality of the PICs during the design and manufacturing phase to ensure its safety functions can be maintained in all postulated situations. This is accomplished through the guidelines provided for in the Management of Propagation of Nuclear Safety Requirements in the Supplier Chain [Ref. 34]

The Supplier shall design, fabricate, assemble, test and deliver the Specialty valves described in the Valve Datasheets (Appendix 1) including the required accessories, spare parts, special tools, and documentation to the IO.

Each valve's safety important class is stipulated in Valve List, datasheet (Appendix 1)

5.1.2.1 Functions and Boundaries

The valve's primary function is to provide positive shutoff or to control flow of the process fluid. The process fluid will be as described in the Valve Datasheet (see Appendix 1)

Boundaries of jurisdiction shall be the valve ends where the valve's pressure boundary connects to the adjoining piping. The valves are pressure accessories in accordance with ESP/PED [Ref. 7]

5.1.2.2 Design Conditions

The valve body of the Specialty valves shall be designed to ASME B16.34[Ref.114] and to the additional requirements specified in this Specification to comply with the Essential Safety Requirements (ESR) (N2 or N3 depending on the valves) of ESPN [Ref. 9]. *Each valve purchased in accordance with this Specification is described in, and its detailed design data, including special technical requirements, are provided in the Valve datasheet of Appendix 1.

*ESP/ESPN regulation, manufacturer would have, in addition to B16.34, to use another design code in order to meet the requirement. Choice of the code is at the discretion to the manufacturer that ASME Sec. VIII Div. 2 or ASME Sec. III and RCC-M as well as RCC-MRx. The full respect of ESP/ESPN and the coverage of any gap between the ESP/ESPN and the selected code is responsibility of the manufacturer.

The material of the valve shall be compatible with the TCWS piping, which is ASTM A312M [Ref. 1.4.110] grade TP304L stainless steel and the intended process fluid as described in the Valve Datasheets (see Appendix 1).

The specialty valve shall be designed to close and remain closed against the maximum expected differential pressure applied across the valve seat. Internal trim shall be able to withstand the full differential pressure. Maximum differential pressure is listed on the Valve Datasheets.

In the case of Pressure Reducing Valve (PRV), outlet side of the PRV (part located after the internal trim) shall be designed to withstand the same design condition (pressure/temperature) as the inlet side of the valve.

The body, bonnet or cover, body joint bolting, and body-bonnet or cover bolting shall be constructed of materials as listed in the respective ASTM specifications referred to in ASME B16.34 Table 1 [Ref.114] Identical materials in accordance with the ASME Boiler and Pressure Vessel Code, Section II [Ref. 117] may also be used for these parts.

Specialty valves' counter flange and associated gasket as well as bolting calculation shall be supplied by valve supplier. Counter flanges shall be of SA 182 304L material and compatible with the pressure class defined in the Appendix 1. Higher pressure class may be required to meet the leakage class requirement in some cases. Confirmation of pressure class of flange required to meet the technical requirements is in the scope of the supplier.

Specialty valves shall be suitable for re-packing while under pressure in the fully open position. Valve stem design shall also allow for tightness at intermediate obturator position when the valves in intended for flow control.

Especially, upon the Sight-Glass, Supplier shall be informed about following sentences.

- Sight Glass shall meet design pressure/temperature requirements provided in the valve datasheet, including hydrotest requirements.

- Sight Glass material shall be compatible with the expected irradiation to which the valve will be subjected

- Sight Glass shall be able to withstand system pressure test to which they are connected without any special precaution such as glass removal or other similar activity

- As far as possible, rotating part should be avoided except if it can be demonstrated that in no case those part could become loose material generating foreign body migration in TCWS sub-system.

* If sight glass is a component of piping, it shall be under the IO module H. Same requirement in according to section 5.1.9 page 35. If not, sight glass is equipment like pressure accessory, so conformity assessment shall be conducted by contractor or manufacturer.

5.1.2.3 Engineering Analysis

Final valve/actuator datasheets provided for procurement may not exactly match the products available from the supplier. Therefore, in all cases, the supplier shall provide engineering analysis documenting how the supplied valves meet or exceed the requirements supplied in the datasheets. Alternatively, the supplier may provide engineering recommendations as to available alternates, including engineering analysis justifying their use in the intended application.

Also engineering analysis such as valve design report, seismic analysis report, fatigue analysis report, valve stem torque, flange stress calculations, cavitation analysis, FEM analysis will be in the scope of the supplier. The above is to state some common reports, IO can request additional analysis or details to be provided to justify compliance with the technical specification and code requirements. These analyses can include, but are not limited to fatigue/stress analyses due to thermal stratification/cycles, dynamic behaviour, etc. These analyses can be stand-alone requests, or they may impact the downstream sizing/design characteristics of the procured valves.

All engineering analysis which are needed for the implementation of the requirements set-out in this Technical Specification shall be included in the valve price.

Valves shall be qualified to the requirements of this specification and valve datasheet (Appendix 1). Specific requirements for each valve will be provided in the final valve datasheets. Bounding qualification profiles may be provided to simplify the qualification process.

5.1.2.4 Installation and Design Criteria

The valves will be installed inside the Tokamak Building and the exact valve installation location is specified in the valve datasheet (Appendix 1).

The valves shall satisfy the requirements of the PED and ESPN regulation, whichever is applicable.

5.1.2.5 Valve Coefficient (Cv)

Specialty valve size and characteristics shall be selected such that the required Cv is no greater than approximately 90% of the valve's rated (100% open) Cv for the operating conditions listed in the Valve Datasheets. At the minimum flow conditions, the valve seat and plug shall not be susceptible to damage (wire draw, etc.).

Cv vs. position graph for the valve and trim selected shall be submitted with the proposal. Prior test results may be used for the valves selected if they exist and shall be submitted to IO for review prior to acceptance. Cavitation characteristics shall also be submitted with the proposal.

5.1.2.6 Design/Construction Details

The valve shall be designed for an operational life of 24 years. The supplier shall review this requirement and advise IO of any concerns with respect to valve design offered by the supplier. Packing and preservations requirements shall be provided and shall be sufficient to ensure long term storage of the valve. Up to 5 years of warehouse storage and 5 years on-site preservation can be expected for these valves before being put into actual service. This shall be accounted for in the packing during valve supply and in the preservation instructions.

Valve components of the same type and size shall be mutually interchangeable.

5.1.2.6.1 Environmental Conditions

All specialty valves shall be designed to operate within the required environmental conditions (radiation, magnetic field, seismic, fire, pressure, temperature, and humidity), as defined in the Load Specification [Ref. 32] and the Safety Requirement Roombook [Ref. 25] and Input data for qualification [Ref. 90]. The required environmental conditions for each valve are provided for in Appendix 1 of this Specification. In accordance with TCWS mechanical design guideline, valves shall be able to withstand an acceleration of 4.5g (in every direction) without any need to support the actuator.

Maximal temperature during accident scenario (category III and IV) can reach up to 130°C and 0.2 MPa (room condition) and valves and it's accessories shall be designed to withstand these conditions.

In order to cope with the fire event, it is expected that the supplier provides the maximal temperature for the valve and it's accessories as function of the requirement (integrity, operability or tightness) in order to allow IO to design the corresponding fire insulation. For this purpose, a weak link analysis calculation which is expected to be provided.

5.1.2.6.2 Lock and Tag Function

The capability to provide locking of the valve in intermediate positions shall be provided for three way ball valve and pressure regulating valves.

5.1.2.6.3 Valve Dimensions

End-to-end dimensions and face-to-face dimensions for buttwelding-end valves and for flanged-end valves shall be in accordance with ASME B16.10 [Ref. 112]. Each valve shall be examined to ensure it meets the dimensional requirements of this section.

5.1.2.6.4 Valve Body

The internals of the valve body shall be designed to limit the deposition of possible radioactive materials inside the valve body. This may be accomplished in the design of the internals by eliminating:

- Sharp angles
- Strong reductions
- Spaces likely to trap the deposits of corrosion products
- Zones of retention
- Socket welds
- Materials which do not have an optimum surface quality

For valves that require a certain installation orientation, an arrow shall be provided on the external surface of the valve body depicting the required flow direction through the valve.

5.1.2.6.5 Bonnet or Cover Plate

Valves having threaded bonnet joints (other than union joints) shall not be used. Bonnet or cover plate closures shall be: flanged, secured by at least four bolts with gasketing conforming to EN 1591-1 [Ref. 111] for sealing gasket design factors and test methods for round flange connection, especially leak rate $L_{0.01}$ (specific leak rate ≤ 0.01 mg $s^{-1}m^{-1}$) or proprietary, attached by bolts, lugs, or other substantial means, and having a gasket design that increases gasket compression as fluid pressure increases; or secured with a full penetration weld made in accordance with EN 13555 [Ref. 116] or secured by a straight thread sufficient for mechanical strength, a metal-to-metal seat, and a seal weld made in accordance with EN 13555 [Ref. 116], all acting in series. The leak rate for bonnet should meet L0.001 criteria as per EN13555.

5.1.2.6.6 Valve Sheet, Plugs, or Disc

Hard faced valves seats, plugs, or discs shall be designed to allow relapsing and be capable of being replaced in the field with the valve “in-line”. The material for the valve seat, plug, or disc shall be free of Cobalt. The valve plug and seat shall be of a metallic design.

Valves with double seated designs that can trap fluid subjected to heating and expansion shall provide a means of pressure relief to avoid excessive pressure build up between the seats. Hot fluid could also be trapped and lead to sub-atmospheric pressure when it cools down. The valve shall maintain its sealing capacity during this condition. The valve will be exposed to the radiation conditions as specified in the Valve Datasheet (see Appendix 1) and shall be able to withstand the exposure. Hard faced valve seats shall be free of Cobalt.

Seats of specialty valves NPS 2 and above shall be renewable. Welded seats are not accepted.

5.1.2.6.7 Valve Stem

The valve shall be specially designed to prevent stem leakage to the environment. Valves shall be designed so that the stem seal retaining fasteners (e.g., packing, gland fasteners) alone do not retain the stem. Specifically, the design shall be such that the stem shall not be capable of removal from the valve, while the valve is under pressure, by the removal of the stem seal retainer (e.g., gland) alone.

The supplier shall be capable of providing valves where the leak tightness of the valve stem seal shall be able to conform up to the requirements of class “BH” from table 1 of ISO 15848-1 [Ref.133]. Live loading systems shall be used when possible. Specific leak rate requirements will be specified on the individual valve datasheets.

5.1.2.6.8 Manual Operator

Hand-wheels shall be of spoke design, preferably with not more than six spokes. Webbed or disc hand-wheels shall not be used. Valves of sizes DN400 and above shall be provided with gear operation. Clockwise operation of the hand-wheel shall give closing movement of the valve, unless stated otherwise. The manual force required to operate the manual operator shall meet the requirements of NF EN 12570 Section 5.1. The valve supplier shall provide justification for the friction factor used in sizing of the manual valve actuator.

5.1.2.6.9 Threaded Fasteners

Threaded fasteners shall have M series threads conforming to ASME B1.13M [Ref. 109]. All threaded pressure retaining fasteners shall be provided with corrosion resistant positive locking devices. Frictional locking devices are not acceptable. All nuts and bolts shall have hexagonal heads unless otherwise specified. The minimum strength of the material used for the nuts and bolts shall meet the requirements of ASME B16.34 Section 6.4 [Ref. 114]. And calculation to demonstrate thread suitability for the selected torque shall be part of the design report. Fasteners as per EN1515-4 are also acceptable.

5.1.2.6.10 Auxiliary Connections

Auxiliary connections, e.g., for bypass connections, shall be designed, fabricated, and examined to warrant at least the same pressure-temperature ratings as the valve and shall be installed prior to the test of the valve to which they are attached.

Welded auxiliary connections shall be butt welded directly to the wall of the valve, socket welding shall not be used. If the size of the connection requires reinforcement, then a boss shall be added satisfying the requirements of Para 6.3.5 [Ref. 116].

5.1.2.6.11 Valve Lifting Attachments

Heavy components of valves shall be provided with a method of handling, such as lugs or eye-bolts.

5.1.2.6.12 Position Indication (Pressure Reducing Valve)

For pressure reducing valve, tapping for local pressure gauge should be provided upstream and downstream of the valve to allow valve adjustment on site. Threaded connections shall be made with swagelock two-ferrule mechanical grip fitting or alternate with ITER IO approval. Pressure gauges for the PRV are in the scope of the supplier.

5.1.2.6.13 Valve Body Joints

Valve body joints, other than bonnet or cover plate joints, shall conform to Para M307.2(c)(2) [Ref. 116]. Flow direction arrows shall be cast on the valve body, or otherwise permanently attached to the exterior of the valve.

5.1.2.6.14 End Connections

Valve ends shall have ends that are of the same material and schedule as that of the pipe to which the valve will connect. Socket welded and threaded connections are not permitted for the end connections of the valves. Especially, contractor should consider that for valves that are smaller than DN65 size, the length of cylindrical shape in the body, from the pipe end, prepared as ASME B16.25, should be at least 5mm. The gap from the weld location to any valve accessory above should be minimum of 75mm to allow for weld to be made on site between pipe and the valve. If this is not possible, the vendor can provide for extension of the valve weld ends sufficiently away from the obstructing accessories.

5.1.2.6.14.1Buttweld Ends

The details for the welding end preparation for valves shall be in accordance with ASME B16.25 [Ref. 113] with the tolerances for the inside and outside diameter conforming to ASME B16.34 Para 6.2.1 [Ref. 114].

5.1.2.6.14.2 Flanged Ends

Flanged ends shall be prepared with flange facing, nut-bearing surfaces, outside diameter, thickness, and drilling in accordance with ASME B16.5 [Ref. 110] and EN 13555-1 [Ref. 116] requirements for the leak tightness L0.01.

All flanged valves shall have flanges compatible with the pressure-temperature rating of the valves and the required valve load cases. Flanges furnished with tapped holes shall provide full effective thread engagement, not including chamfered threads, for a length equal to the nominal diameter of the bolt thread.

In case of process fitting for pressure gauge, threaded connection shall be made with swagelock two-ferrule mechanical grip design fitting or and ITER IO approved.

5.1.2.6.14.3 Appurtenances for Flanged Valves

Valves that are listed as being supplied with flanged ends per Appendix 1 shall be provided with two counter-flanges, and adequate bolts, nuts, washers, and gaskets as described below, However, Valve supplier perform the mechanical calculation of the flange including the piping interface loads for the normal operation and exceptional situations proved in [Ref. 104]:

Counter-flanges: Counter flanges shall be supplied with each flanged valve. The counter flanges shall match the valve's class and shall be procured/fabricated to ASME B16.5 [Ref. 110] and EN 1591-1 [Ref. 111] for design rules for flanged joints with gasket and EN 13555 [Ref.116] for sealing gasket design factors and test methods for round flange connection, especially leak rate $L_{0.01}$ (specific leak rate ≤ 0.01 mg $s^{-1}m^{-1}$) Technical and material requirements of the counter flanges are provided in [Ref.37]

Bolts: The bolts shall conform to ASTM A193M [Ref. 144],A193 B8 or ASTM A453 gr. 660B or EN1515-4 [Ref.146] requirements. The material selection shall be based on the system requirements to achieve leak tightness.

Nuts: Nuts for the flanged connections shall be supplied with each flanged valve. The nuts shall conform to ASTM A194M [Ref.145] or ASTM A453 gr. 660B or EN1515-4 [Ref.146] requirements. The material selection shall be based on the system requirements to achieve leak tightness.

Washers: Washers (Belleville or equivalent: in order to minimize periodic re-torquing of bolts during operation) shall be supplied with each flanged valve. The washers shall be of SS304 material.

Gaskets: Gaskets shall be supplied with each flanged valve. The gaskets shall conform to ASME B16.20 [Ref.146] requirements and be suitable for the specified conditions. Especially to ensure the desired leak tightness of L0.01 which shall be confirmed to EN13555. In case of bonnet the leak requirement is L0.001.

The items provided shall be adequate for the valve's class with which they are supplied.

5.1.3 Operating requirements

1. TCWS system being the primary cooling system, they are affected by the pulse nature of the plasma, in addition, periodic heating operation (such as baking) are necessary from operation point of view. As a result, TCWS shall be designed taking into account that most of TCWS valves are prone to temperature fluctuation (up to 60°C) for a high number of cycles (up to 200°C) for a small number of cycles (up to 50 cycles). Also for certain valves, design temperature can be as high as 400°C. Detail of loading will be provided in the valve datasheet and combination with the Process Loading Condition. [Ref.94], [Ref. 97], [Ref.98], [Ref.99], [Ref 105] and [Ref. 106]. Especially, Supplier shall carefully review the [Ref.91] and [Ref.92] as well as the reference to the System Process Loading Condition. [Ref.94], [Ref. 97], [Ref.98], [Ref.99], [Ref 105] and [Ref. 106].

2. Operating and design conditions to be satisfied, for each valve application, are given on the Valve Data Sheets that will be included in the supply order (valve datasheets in Appendix 1 are for tender purposes only). The design of each valve/actuator shall satisfy the requirements of this specification as a minimum. The Supplier is expected to supplement these with the Supplier's own design and quality requirements.
3. The valves shall be designed for safe, proper and continuous operation over the design life, at their design conditions as specified in this specification and the Valve Data Sheets. They shall also be designed to minimize fatigue, thermal transient effects, corrosion, deterioration, vibration, and other operational problems.
4. The valves shall be designed to permit satisfactory operation at the pressure conditions, accelerations, temperatures, flow rate, differential pressures, system fluid, and imposed loads as specified in the body of this specification and the Valve datasheet and Process Loading Condition.
5. All valves shall be designed such that they may be applied in accordance with any of the pressure and temperature combinations as defined by ASME B16.34[Ref. 114] for the primary pressure rating of the valve as well as the additional design code if applicable.

Choice of the code is at the discretion of the manufacturer which is the full respect of the coverage of any gap information between additional code is responsibility of the manufacturer.

6. Valves and materials furnished by the Supplier shall be suitable for installation and service at the specified site conditions found in the Valve datasheet.
7. The valves shall be capable to open and close against the maximum inlet pressure and the maximum differential pressure shown on the Valve datasheet, as applicable.
8. The valve shall be designed to close against the design pressure of the valve times 1.1. Once closed, the valve shall be capable to bear the maximum specified differential pressure defined in the valve datasheet i.e. the closing member and valve integrity shall be guaranteed. The valve shall not leave it's closed position under the maximum specified delta pressure specified in the valve datasheet (Appendix 1).

5.1.3.1 Miscellaneous Requirements

1. The scope of this specification shall include technical field support and consultation services during installation, initial operation of all equipment furnished, performance testing, and training of ITER-IO operating and maintenance personnel.

2. Proper clearances shall be provided between all moving parts to assure satisfactory performance during all modes of operations within the specified temperature range.

3. All equipment shall be qualified to ensure that they will operate satisfactorily in their electromagnetic environment. Electromagnetic field strength is listed on the Valve Data Sheet and input data for qualification [Ref. 90].

4. The valve shall be designed for an operational life of 24 years. The supplier shall review this requirement and advise IO of any concerns with respect to valve design offered by the supplier. Packing and preservations requirements shall be provided and shall be sufficient to ensure long term storage of the valve. Up to 5 years of warehouse storage and 5 years on-site preservation can be expected for these valves before being put into actual service. This shall be accounted for in the packing during valve supply and in the preservation instructions. If this is a requirement, it shall be stated on the valve data sheet. The Supplier shall review this requirement and advise the IO of any extra requirements or modifications which shall be made to the valves.

5. Valves shall be designed to contain or limit pressure above normal working pressure that may build up in trapped cavities due to thermal expansion or evaporation of liquid. This shall be completed by self relieving seats.

6. Upon the water tests medium, it shall be clean, inhibited, fresh water, Stainless steel valves shall be tested using inhibited fresh water having a maximum chloride content of 15 ppm. This is also applies to valves fabricated with some parts made of stainless steel. The temperature of the test must be a minimum of +5°C. In case of non-impact tested body materials, the minimum temperature of the test medium shall be +5°C. After testing with water, all valves shall be thoroughly dried to prevent possible corrosion from the water.

5.1.4 Interface requirements

The control interface for the control valves shall meet the requirements for and be compatible with the ITER plant system instrumentation and control (I&C), as described in Appendix 1.

5.1.5 Mechanical Requirements

5.1.5.1 Material Specifications

5.1.5.1.1 Chemical Composition

To ensure the TCWS meets the radioprotection guidelines as stipulated in the Radioprotection Guide for ESPN Application [Ref. 23], strict requirements are placed on the chemical composition of Cobalt, Niobium, and Tantalum in the materials for the valves [Ref. 42]. Strict requirements are placed on the composition of Boron to prevent adverse effects to weldability.

The chemical composition of the materials for the valves are limited as follows:

Chemical Composition (%)			**Description**
Co, max	**Ta, max**	**Nb, max**	
0.20	0.05	0.10	

- Boron (B)
  - 0.0018 wt.%, max

*There are controlled concentrations of Boron only for the material procurement of parts to be welded or hard-faced. Weld ability is enhanced when needed.

5.1.5.1.2 Prohibited Materials

Mercury shall not be used in any manner, including construction of the valve, which can result in exposure of valve parts to the metal or its vapor. The use of lead or other low melting point metals in contact with the working fluid is prohibited. The use of nitride surfaces exposed to the working fluid is prohibited. Care shall be taken to prevent contamination of valve material by red lead-graphite-mineral oil, molybdenum disulphide lubricants, halides, sulphur, copper, zinc and phosphorus. Teflon and similar elastomers may not be used. The use of Halogen products are prohibited. The use of materials containing asbestos or PCBs shall be prohibited. The use of Stellite and Antimony is forbidden.

5.1.5.1.3 Testing Requirements

All materials used in the construction of the valve shall be subject to mill tests for chemical and physical properties as required by the ASME/ASTM material standard listed in ASME B16.34 Table 1, Material Group 2.3 [Ref. 114] or an identical material in accordance with ASME BPVC, Section II [Ref. 117]. Certificates (test reports) showing that required tests have been carried out at the source should be submitted. Type 3.1 certificate of EN 10204 [Ref. 137] shall be provided for material used in the valve.

5.1.5.1.3.1 Impact and Tensile Testing

Mechanical properties shall be obtained from test specimens that represent the final heat-treated condition of the material required by the material specification.

All austenitic steel materials (including weld metal) of pressure boundary items shall be tested in accordance with the requirements of PED/ESPN [Ref. 7 and Ref. 10].

Use of ISO standards for tensile and impact testing is mandatory.

5.1.5.1.3.2 Hardness Test

Shore hardness test of the rubber parts used in the valve, shall be carried out and certificate of compliance for the rubber components shall be submitted.

5.1.5.1.3.3 Shell Leak Test

Shell leak test shall be conducted on each valve in accordance with the requirements of ASME B16.34 Section 7.1 [Ref. 114]. Testing shall be performed prior to any painting or coating of the valves. Stem leak tests shall be in accordance with the requirements of ISO 15848-1 [Ref. 133].

For valves identified as PED last barrier in the valve datasheet, internals do participate to the pressure retaining function and as such, shall be tested according to the Shell Leak Test requirements of ASME B16.34.

5.1.5.1.3.4 Valve Closure Test

Each valve shall be given a closure test in accordance with the requirements of ASME B16.34 Section 7.2 [Ref. 114]. Certain Specialty valves (as indicated on the valve datasheets) are required to isolate under accident conditions (e.g., full flow and full dp) and must be tested under such conditions.

The closure tightness requirements shall conform to the requirements specified in the Valve Datasheet(s). When a requirement for the closing/opening time is included in the Valve Datasheets, this time shall also be measured during this test.

5.1.6 Software For Flange, Gasket and Bolt & Nut

IO would like to recommend supplier to use specific calculate flanged connections based on EN 1591-1, using gasket characteristics according to EN13555, according to which both main force connections and secondary force connections can be taken into account. The calculation method of ASME BPVC Sec. VIII is also available in ad independent module.

To evaluate the results, the flange and bolt loading, the gasket contact pressure, the bolt elongation, the flange face gradient and adherence to the sealing requirements are shown for each loading state. The results of the calculation can be printed in a report, saved and copied into other windows applications.

5.1.7 Welding, Fabrication and NDE Requirements

5.1.7.1 Welding

Weld fabrication and heat treatment of welds shall be performed in accordance with ASME B16.34 Para 2.1.6(b) [Ref. 114]. Welding WPQR and WPQ shall be approved by an agreed RTPO.

For the valves, welding of any components which contribute to the pressure resistance of the valve and components which are directly attached to them will be performed according to the requirements of General Requirements for Centralized Procurement [Ref. 30].

For the valves, whose ESPN category is N2, welding details are connected to pipe shall be guaranteed 100% volumetric examination.

5.1.7.2 Surface Preparation Requirements

Selection, qualification, and application of coating materials shall be in accordance with applicable sections of the Steel Structures Painting Council (SSPC) specifications. Surface preparation activities shall be in accordance with the following standards or recommended practices, as applicable:

SSPC-SP-1 [Ref. 139], SSPC-SP-2 [Ref. 140], SSPC-SP-5 [Ref. 141], and SSPC-SP-10 [Ref. 142]

Other coating, testing, and inspection activities shall be in accordance with the following standards or recommended practices, as applicable.

All coating systems must be applied in accordance with the Supplier’s recommendations. The blast-cleaned surfaces shall be coated with the base coat within 4 hours after blasting and before rusting occurs. All surface preparation and painting work shall be subject to the approval of IO. Colour selection shall be subject to the approval of IO prior to application of the topcoat.

Stainless steel surfaces shall not be coated but shall be clean metal and free of weld spatter, oil, dirt, and grease.

5.1.7.3 Coating Material

For the requirements of the coatings for valves, refer to Technical Specification for Coatings for Equipment [Ref. 36].

The Supplier shall submit his coatings procedure, detailing surface preparation and coatings application to IO for review and approval.

5.1.7.3.1 Required Documentation

The Vendor shall supply ITER-IO with metal tags on each piece of equipment, indicating the following information: coating manufacturer used, brand name of primer and finish coat, and color.

5.1.7.4 Nameplate

The valve shall be permanently identified with a stainless steel tag meeting the information requirements of [Ref. 7], Appendix 1. Additionally, the following information will also be included. The information shall be stamped of chemical, mechanical, or electrical etched:

- Purchaser's Supply Order and Part Item Numbers
- ITER PNI Number
- Drawing Number
- NoBo Number
- Test Date
- Datasheet IDM Number (ASME B16.34 Nameplate)
- Supplier's Name and Address
- Supplier's Serial Number
- Supplier's Model Identification
- Year of Manufacture
- Service Description
- Valve type
- Applicable data such as pressure, temperature, size, material, etc.

The stainless steel tag shall be firmly attached to the main body of the valve or attached with a corrosion resistant stainless steel wire.

5.1.7.5 "CE" Marking and Declaration of Conformity

"CE" marking is not required for valves in the scope of ESPN Order [Ref. 10]. Nevertheless, valves in the scope of ESPN Order [Ref. 10] and put on the market with "CE" marking could keep the "CE" marking.

A declaration of conformity shall be drawn up and signed certifying that the valves comply with the Essential Safety Requirements of the ESPN Order (dated 30/12/2015) [Ref. 10].

When required by the regulation the certificate of conformity(CoC) form the ANB in charge of the conformity assessment of the items shall be transmitted to IO before deliver.

In case for the equipment not being manufactured under the IO module H/H1, it would be considerable for CoC shall be submitted to IO after transportation which will be done under contractor's responsibility.

5.1.7.6 Non-Destructive Examination

Non-destructive examinations shall be performed on the cast, forged, rolled, wrought, or fabricated material after heat treatment required by the material specification either prior to or after the finish machining if it is indicated in materials procurement specifications. Surfaces shall be clean and free of surface conditions that may mask unacceptable indications. The NDT operator shall be qualified by an agreed, recognized third party organization (RTPO).

Especially in case of casting material for valve, it shall be employed RT or UT to avoid undetected defect.

5.1.7.6.1 Radiography (RT)

5.1.7.6.1.1 Castings

The radiographic procedures and acceptance standards to be used shall be in accordance with *ASME B16.34 Para 8.3.1.1 and Mandatory Appendix I [Ref. 114].

*In ASME B16.34, only speciality valve will be employed RT.

5.1.7.6.1.2 Forgings, Bars, Plates, and Tubular Products

Forgings, bars, plates, and tubular products are radiographically examined in accordance with the procedure and standards in ASME B16.34 Mandatory Appendix I and Para 8.3.2.1 [Ref. 114].

5.1.7.6.2 Ultrasonic Examination (UT)

5.1.7.6.2.1 Castings

For castings, ultrasonic examination is performed in accordance with ASME B16.34 Para 8.3.1.3 [Ref. 114].

5.1.7.6.2.2 Forgings, Bars, Plates, and Tubular Products

For forgings, bars, plates, and tubular products, ultrasonic examination shall be performed in accordance with ASME B16.34 Mandatory Appendix IV and Para 8.3.2.1 [Ref. 114]. If during the examination, ultrasonic indications are not interpretable due to, for example, grain size, the material shall be radiographed using the procedure requirements of Para 8.3.1.1 [Ref. 114].

5.1.7.6.3 Weld Examination

All fabrication welds of bodies and bonnets consisting of an assembly of welded segments of castings, forgings, and bars, tubular products, or plates, or combinations thereof, shall receive non-destructive examination in accordance with ASME B16.34 Para 2.1.6(c) [Ref. 114]. Welding shall meet the requirements of General Requirements for Centralized Procurement [Ref. 30].

5.1.7.6.4 Visual Examination (VT)

The rubber parts used in the valve shall be visually inspected for any nicks, gouges, cuts, or any discontinuities that may compromise the physical integrity or function of the part. A complete visual inspection of the pressure boundary parts on all valves is required before final assembly and on accessible pressure boundary parts without disassembly after hydrostatic testing. The purpose of the visual inspection is to verify all surfaces are free of cracks, hot tears, arc strikes, prod marks and/or other detrimental discontinuities. All finished welds shall be subject to visual examination. The visual inspections shall be compatible with the code requirements [Ref. 115].

5.1.7.6.5 Wall Thickness Measurements

Wall thickness measurement requirements are supplementary to Code requirements. The Supplier shall submit its procedure and drawings for wall thickness measurements, with the critical dimensions to be measured specified, to ITER-IO for approval. Wall thickness measurements shall be performed after machining operations have been completed. As a minimum, the wall thickness shall be measured at 4 points, 90 degrees apart on each nozzle and on the neck of the valve. Flange thickness of the bonnet and the thickness of the nozzle flanges in the case of flanged-end valves shall be measured at 4 points, 90 degrees apart. The Supplier

shall take several measurements in a general area, giving special attention to suspect locations and shall record the location of the measurements on the drawings.

In case of surface roughness check inspection, reference guide of IDM document is [Ref. 23] and To limit the risk of corrosion and activation of the corrosion products, the manufacturer will have to bring a particular care to the roughness (target value of Ra is 6.3µm), so in regard to roughness, inside surface in contact with fluid shall ensure a surface roughness ≤ 6.3 µm.

5.1.7.7 In-Service Inspection Requirements

Valves shall be designed to permit inspection, satisfying the requirements provided in ESPN Annex 5 Para 3.4 [Ref.10] and the guidelines in ASN Guide No. 8 Appendix 3 Section "Maintenance – In-Service Inspection" [Ref. 2]. The minimum periodicity for preventative maintenance shall be 10 years [Ref. 28]. The minimum periodicity for in-service inspection shall not be less than 2 years.
*For the in-service inspection of PE, reference document is Arrêté du 20 novembre 2017 relatif au suivi en service des équipements sous pression et des récipients à pression simples – EN (W2C32X v.1.2)

5.1.8 Analysis and Qualifications

5.1.8.1 Seismic Qualification

The Supplier is responsible for assuring the identified valve(s) in the Valve Datasheets operated under the seismic conditions specified herein. The valves shall maintain integrity and/or functionality depending on the specified seismic conditions in the valve datasheets up to SL-2. All valves shall maintain their pressure boundary integrity during and after a seismic event and for some valves, internal leak tightness or operability is to be ensured as per requirements in the Valve Datasheet.

The valve(s) shall be made to withstand an equivalent simultaneous seismic static loading, as described in the Load Specification for Tokamak Cooling Water System [Ref. 33]. The load shall be applied at the center of gravity of each component or part. Appendages shall be considered as separate pieces of equipment, mounted in place, for analysis and design. The allowable working stress range of materials involved will not be increased for the required seismic loadings. The methodology for seismic qualification of valves can be obtained from ASME QME-1 Non-mandatory Appendix QR-A [Ref. 121]. The Supplier shall prepare and submit a Seismic Qualification Report.

For SL-1, all valves shall maintain their operability under an acceleration of 1.6g. For SL-2, all valves shall maintain their integrity under an acceleration of 4.5g. In addition, for some valve, operability or tightness is requested under SL-2 condition. The list of those valves will be indicated in the valve datasheet.

5.1.8.2 Weak Link Analysis

A weak link analysis shall be performed on the valve and its various components to determine the maximum loads to which they can be subjected. The analysis will review each component in the valve to determine the maximum load the weakest component can safely sustain. The backseat shall be included in weak link analysis. All weak link analyses shall use the same

coefficient of friction (CoF). Weak link evaluation shall distinguish between torque and thrust limitations.

5.1.8.3 Valve Functional Qualification

All valves listed as active on the Valve Datasheets of Appendix 1 shall be functionally qualified in accordance with Section QV of ASME QME-1 [Ref. 121], including mandatory appendix QV-1 and Section QV-G, while being subjected to mechanical operating and mechanical loads (i.e., connected pipe loads, etc.), design pressure as specified in the Valve Datasheets, and the seismic accelerations specified in Section 5.1.2.6.1 of this specification. Functional testing shall include all mounted appurtenances. The specialty valve are QME-1 QV Category B valve assemblies.

Dynamic testing methodologies shall conform to the method described for the line mounted actuators in IEEE 344 [Ref. 130] and IEEE 382 [Ref. 130] qualification testing may be combined. Dynamic testing is typically expected for valves ensuring operability function after seismic event 5classified as SC1-SF in the valve datasheet. The Supplier shall submit a report documenting the results of the qualification test to the IO.

5.1.8.4 Environmental Qualification [Ref. 91]

An environmental qualification of the non-metallic components of valves shall be performed at the bounding environmental conditions, as specified in the Valve Datasheets, to evaluate the function of the valve component whose failure could prevent the valve from performing the intended function. The qualification shall meet the requirements of ASME QME-1 Non-mandatory Appendix QR-B [Ref. 121]. The material environment capabilities shall be identified, including references to the verification documentation.

5.1.9 Quality Assurance & Control Provisions

The Contractor shall have an ISO 9001 certified quality system or alternatively a QA program approved by QARO. In addition, the quality management system shall comply with the IO quality requirements as per [Ref. 56]

For the Protection Important Components of the nuclear facility, the Supplier or any of its Subcontractors shall implement a specific management system for work on protection important components, on the basis of activities defined and executed by the Supplier and its Subcontractor. This system could be included in the Quality Assurance (QA) Plan.

Subcontractors not performing critical quality activities may be exempted from the requirement to produce Quality Plans and MIPs at the discretion of the IO Quality Assurance Responsible Officer. This decision will be dependent on the level of detail about sub-contracted work in the Supplier’s Quality Plan. In such cases, the work can be included in the Supplier’s MIP and managed in accordance with the Supplier’s management system. The list of critical quality activities will be provided by the Supplier for acceptance by IO prior to award of each contract.

The Quality Classification of the scope of work is a key drive to identify the applicable requirement for the implementation of the Contract. Those requirements are identified in [Ref. 87] also Quality Class is stipulated in valve list(datasheet) in Appendix 1.

If the Contract involves PIC or PIA as defined below, the Contractor shall comply with the all requirements expressed in “Provisions for implementation of the generic safety requirements by the external actors/interveners” [Ref. 27]. The Contractor shall explain in its quality system or in a dedicated quality plan the measures taken to ensure compliance with these requirements. The Contractor shall ensure the propagation of these requirements to all its subcontractors and/or suppliers involved in PIC or PIA.

A Protection Important Component (“PIC”), as per INB Order Article 1.3, is defined as “component which is important for protecting the interests mentioned under Article L. 593-1 of the Environmental Code (nuclear security – i.e. nuclear safety, radiation protection, 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. structure, equipment, system (programmed or not), material, component or software that is present in the Basic Nuclear Installation (INB) or that is under the responsibility of the nuclear operator and that implements a function required for the demonstration mentioned under the second paragraph of Article L. 593-7 of the Environmental Code (Safety demonstration) or that ensures that this function is implemented.

As per articles 1.3 of the INB Order, A Protection Important Activities (PIA) is defined as an “Activity important for protecting the interests mentioned under Article L. 593-1 of the Environmental Code (public safety, health and sanitation, the protection of nature and of the environment), i.e. activity that falls under the technical or organizational provisions mentioned under the second paragraph of Article L. 593-7 of the Environmental Code or that is liable to affect them;” The Contractor shall put in place a technical control, as defined in Article 2.5.3 of the INB Order, for each PIA. Parties carrying out technical monitoring for a PIA are distinctly separate from the parties who performs the activities. PIAs and their technical control shall be performed according to procedures (demonstration of compliance a priori) and be properly recorded (demonstration of compliance a posteriori). The performers of PIAs and of their technical control shall have necessary skill and qualification as per INB order 2.5.5.

Non-conformity, any item, or work that does not fulfil its specified requirements shall be identified and segregated as being nonconforming. Eash nonconforming item or work shall be prominently tagged, or uniquely identified and, when practical, segregated to prevent its use. Contractor shall comply with [Ref. 79].

The non-conformity report shall be issued by the Contractor Representative, specifying the requirement and evaluated by the QARO and the IO Responsible Officer.

Non-conformities shall be recorded and documented in a systematic manner and relevant treatment for their resolution, including evidence of implemented corrective actions, shall be traceable and allow progress reviews using the IO Non-Conformity Database system (NCR Database). Upon request, access and training will be organised by QARO to enable Contractor Representative to use the NCR database.

For any reason agreed by the parties, if use of NCR database is not recommended, then Contractor representative will have to issue a non-conformity report using the NCR template is available in Appendix 11 and submit their document using the IDM documentation management system.

Contractor shall ensure that NCR are manage in a timely manner and report list of NCR and their status in their Progress Report.

No delivery is allowed with open NCR, unless otherwise agreed by IO in dully recorded.

PE/NPE

Pressure Equipment (PE) are equipment in the scope of the Pressure Equipment Directive 2014/68/UE, Nuclear Pressure Equipment (NPE) are equipment in the scope of the French Order dated 30 December 2015 (also called ESPN Order) and classified as an assembly of Pressure Equipment/Nuclear Pressure Equipment in accordance with Articles L. 557-1 and following, Article R.577-1-1 and following of the French Environmental Code (referring to Directive 2014/68/UE concerning Pressure Equipment) and with amended French Order 30 December 2015 concerning Nuclear Pressure Equipment. They are called ESP/ESPN items. The ESP/ESPN items shall be designed and manufactured in conformity with specific requirements of this Order concerning Pressure Equipment/Nuclear Pressure Equipment and the relevant French laws and regulations.

During the manufacture of PE/NPE, depending on the classification of the equipment an official body (contracted by the manufacture of the PE/NPE) has to be involved in the conformity assessment, called: Notified Body(NB) for PE and Agreed Notified Body (ANB) for NPE.

IO being manufacturer

When the IO acts as manufacturer of PE/NPE, the Contractor and all Subcontractors and Suppliers (whatever level) performing design, manufacturing and/or test activities shall develop procedures describing the activities in compliance with regulatory and IO requirements and submit them to IO for approval and NB/ANB for acceptance (when requested by the regulations), prior to starting the implementation.

All along the manufacturing process, the Contractor shall supply all the necessary documentation, allowing the IO as manufacturer to sign the regulatory declaration of conformity at the end of the manufacturing process.

*Counter Flange

: If the counter flange is applied the IO module H, it shall be applied requirement as least, - implementation plan for design & manufacture of PE/NPE with [Ref. VE2DSP v.4.8]

In this case, the counter flange is a raw material so it shall be provided to IO with the EN 10204 material certificate type 3.1 or 3.2 as per IO’s HRA and NPMA requirements.

As IO is manufacturer, IO needs to provide HRA of piping (including the counter flange) with HRA for pipes [Ref. 47DYCW], NPMA for pipes [Ref. 45W24V] and NPMA for counter flange[Ref. 8NSN4F]

Contractor being manufacturer

PE/NPE not manufactured by IO must be delivered with their regulatory Declaration of Conformity and Instruction Notice (or Operation Manual) written in English according to the requirement of the Contract and in French according to the requirements of the regulations.

*Conter Flange

If Contractor is manufacturer, NPMA shall be provided by contractor or supplier and IO needs to approve before purchasing the material.

5.1.9.1 Quality Assurance Program (QAP)

This section states the minimum provisions to be included in the Supplier's quality program as applicable to the Product. The Supplier's QAP shall be applied to the entire Product under this Specification and is subject to approval by IO in accordance with the ITER QAP [Ref.18]. The ITER QAP [Ref.18] is based on IAEA Safety Standard GS-R-3 and on conventional QA principles and integrates the requirements of the French Order dated, 7th February 2012 on the quality of design, construction and operation in a Basic Nuclear Installation. For this purpose, the Supplier shall ensure that their subcontractors carrying out the Specification are in compliance with the QA requirements under the relevant QA classifications.

The QA classification scheme shall be used:

- To identify items requiring less stringent quality requirements with consequential cost saving,
- To establish a basis on which a stepwise hierarchy of quality requirements can be developed.

The assignment and definition of QA classification shall follow Section 2.3 of the ITER QAP [Ref.18].

A project-specific Quality Plan that meets the requirements of the IO procedure for a project-specific Quality Plan [Ref.22], shall be submitted for IO review and approval. Similar information must be provided for control of quality activities for all levels of subcontractors supplying material or services when inspection or certification is required.

5.1.9.2 Traceability

The Supplier shall have traceability procedures in place that shall guarantee traceability between materials delivered and the EN10204 [Ref.137] certificate at every stage of manufacturing. Procedures shall be submitted to and approved by IO prior to the start of manufacturing operations. The traceability requirements also apply for welding consumables.

Traceability shall be maintained by procedural methods that cover receipt, identification, storage, transfer to production, temporary storage, and use in production. The correct inspection documents shall be made available at the final inspection (see guideline 7/4).

Note: Welding consumables are defined by trade name, designation and relevant EN classification standard.

Inspection documents of welding consumables should give test results, for technical characteristics according to designation and classification standard, such as:

- Chemical composition of welding filler metal or all-weld metal as appropriate
- Tensile properties of all-weld metal: tensile and yield strength, elongation
- Impact properties of all-weld metal at temperature according to designation.

And other test results as required by the applicable standard/code and this Specification.

* The chemical composition of the welding materials are limited as follows:

Chemical Composition (%)			Description
Co, max	Ta, max	Nb, max	
0.20	0.05	0.10	

The Supplier shall establish and maintain procedures for identifying the material by suitable means from receipt through production up to the finished product.

Where traceability is a requirement or necessary for the adequate control of the work, the plan should define its scope and extent, including:

- How affected items are identified
- How contractual and regulatory traceability requirements (see section 3.1.5 – Annex I of PED [Ref.7] are identified and incorporated into working documents
- What records relating to such traceability are to be generated and how and by whom they are to be controlled.

5.1.9.3 Responsibilities

The Supplier shall be fully responsible for quality with respect to all services, materials, manufacturing, and testing, etc. They shall be responsible for imposing all technical and quality requirements, as applicable, to all the fabricator's sub-suppliers furnishing hardware or services in accordance with all applicable Specifications.

The technical and quality requirements of all applicable specifications shall be passed down to all levels of subcontractors. These include, but are not limited to, requirements for handling, packaging, shipping, storage, inspections, and testing. Supplier shall identify to its Subcontractors all applicable QA requirements imposed by the supply order and this Specification, and shall ensure Subcontractor's compliance thereto and shall include the requirements in procurement documents. The Supplier shall conduct internal audits of its own facilities and external audits of its sub-suppliers.

QA and QC activities by IO shall not relieve the Supplier and their sub-suppliers from responsibility to perform all inspections and tests required by the contract and governing codes and standards.

Any deviation to the specification requirements or IO accepted documents shall be submitted to the IO for review and acceptance, in writing, prior to proceeding. The Contractor may raise a Deviation Request (DR) to ask for the authorization to depart from a contractual requirement. Deviation Requests shall be approved by IO before implementation of the related activity(ies) (e.g. manufacture of the item). DR shall be manged using IDM IT system from initial submission to closure. The DR template is available in Appendix 10.

5.1.9.4 Role of Agreed Notified Body (ANB)

The manufacturer and the ANB contracted by the supplier shall be allowed to perform inspection in the facilities of the valve/actuator fabricator. No proprietary processes or information shall inhibit the ANB/manufacturer from performing its functions. This applies to all levels of subcontractors.

5.1.9.5 Propagation of Safety Requirements

TCWS components are classified as safety important components (SICs) because they: (a) confine activated corrosion products (ACPs) and tritium, (b) provide over-pressure protection or limit pressure under abnormal conditions, (c) TCWS subsystem VV PHTS provides decay heat removal of in-vessel components, and (d) minimize radiological exposure (by using low concentrations of Co, Ta, and Nb).

The IO shall inform the Supplier that the valves and/or actuators being procured are considered protection important components (PIC). Under Order 7 February 2012 [Ref. 15], the PICs require control and guaranty of the quality of the PICs during the design, manufacturing and transportation phase to ensure its safety functions can be maintained in all postulated situations. This is accomplished through the guidelines provided for in the Management of Propagation of Nuclear Safety Requirements in the Supplier Chain [Ref. 22].

In the contracts passed down to the subcontractors, it is clearly stated that in addition to technical requirements, defined requirements on PIC, IO shall ensure the surveillance of the Protection Important Activities (PIA). The contractor shall ensure the technical control. The subcontractor must possess a quality system in agreement with the importance of the valves and/or actuators being delivered and in particular for the follow-up of the PIA corresponding to the PIC to be provided under the contract. The contractor shall provide documented information on how to perform the technical control (each protection-important activity undergoes technical monitoring), to ensure that the activity is carried out in compliance with the requirements defined for the activity and, if necessary, for the protection-important components concerned and that the appropriate corrective and preventive actions have been defined and implemented. This system shall be included in the MIP or Quality Plan.

A non-exhaustive list of PIAs for the design, manufacture and transportation of the components are provided in “Annex 2 – Detailed list of PIAs” [Ref. 26]. The list of PIA for ITER are described in “List of ITER-INB Protections Important Activities” [Ref. 29]. Additionally, the generic safety requirements to be implemented in order to satisfy the requirements of the INB Order [Ref. 15] are identified in “Provisions for implementation of the generic safety requirements by the external interveners” [Ref. 16].

This applies to all levels of subcontractors. Additionally, the supplier shall inform the IO of all subcontractors at all levels involved in the supply.

5.1.9.6 Equipment Qualification

Measuring and Test Equipment shall be calibrated, and calibration maintained according to a calibration program based on a recognized standard. The measuring and test equipment shall have a current Certificate of Calibration traceable to a national recognized testing laboratory. Certificates of Calibration must be submitted to IO. The laboratory shall be certified in accordance with ASTM ANS/ISO 17025 [Ref. 128].

5.1.9.7 Technical Qualification

5.1.9.7.1 General

1. It is clear that qualification program and strategy are in the full scope of the valve supplier which is based on input data provided by IO in [Ref.90]
2. The primary objective of qualification is to demonstrate with reasonable assurance that the valves/actuators for which a qualified life or condition has been established can perform their function without experiencing failures before, during, and after applicable seismic events. Valves/actuators, with their interfaces, must meet or exceed the requirements of this specification (e.g., radiation, magnetic field, seismic, fire, pressure, temperature, and humidity).

3. Previous qualification by the manufacturer for a valve type should be submitted in lieu of new qualification testing provided that the qualification documents provided show that the requirements of this specification are met or exceeded by the existing qualification.
4. The service conditions of the valves/actuators are specified in the Valve Data Sheets included as Appendix 1 to this specification and Equipment Qualification Program [Ref. 84].

5.1.9.7.2 Qualification Program

1. A qualification program shall be submitted to the IO, for review and acceptance, which provides the procedures, method of analysis, and test setup for all qualification testing.
2. The following elements shall be determined from the qualification program:
    a. What tests are to be performed on which equipment and for what purpose.
    b. What analyses are to be conducted on which equipment and for what purpose.
    c. The sequence in which the program is to be conducted.
    d. The acceptance criteria to be employed.
3. The following major points must be addressed in the Qualification Program:
    a. Purpose
    b. Scope
    c. Equipment Description
    d. Function
    e. Qualified life objective or design life
    f. References
    g. Service Conditions
    h. Aging technique with justification
    i. Margins
    j. Qualification Test Program
    k. Acceptance Criteria
    l. Quality Assurance
    m. Qualification Test Report, and documentation to be maintained
4. The qualification program must also include a technical justification for the adequacy of the test specimens selected to model the full range of equipment configurations to be qualified; this may be accomplished by a reference to a separate document.
5. The qualification program shall include provisions for test inspections at pre-determined points of the test sequence.
6. The qualification program(s) shall be submitted to the IO, for review and acceptance, before any qualification activities are undertaken.
7. Any of the qualification reports prepared as part of this program shall be available for review by the IO and shall be included in the final report. The final report shall be prepared and submitted to the IO for review and acceptance. It shall provide evidence of

the qualification of the valve/actuator and shall cite any precautions, restrictions, or limitations which must be accounted for by the IO in order to maintain the qualified status of the valve/actuator.

5.1.9.7.3 Qualification Test Procedures

These procedures, coupled with the qualification program, shall form a complete picture of the program to be conducted and activities to be performed. The procedures shall be prepared by the Supplier, are an integral part of the overall program, and shall provide for the following:

1. Complete identification of all equipment to be qualified (tested and/or analysed), including type, make, model, manufacturer, number of test specimens, etc.
2. Complete test setup requirements, including:
    a. Mounting arrangements, including test specimen orientation
    b. Interface simulation of the test items to the actual field installation
    c. Connection requirements
    d. Power applied to the test items
    e. Monitoring and recording instrumentation
    f. Required test specimen settings or adjustments
    g. Acceptable ambient environmental parameters for the test
3. Identify the equipment parameters to be monitored and recorded, and the method of connecting the monitoring and recording equipment.
4. Identify the environmental parameters, including margin, to be monitored and recorded, and the methods to be employed.
5. Identify any assumptions used and provide suitable justification for their use.
6. Identify the parameters to be simulated during the test and identify the range, duration, etc., of the test parameters and the method of monitoring and recording.
7. Identify the requirements that the test or analysis is intended to verify.
8. Identify the acceptance criteria that will be utilized to evaluate the results.
9. Indicate the number and identification of test samples to be included in each test.
10. Provide test equipment performance requirements.
11. Identify the sequence in which the test is to be conducted.
12. Identify the method of processing and disposition of failures and anomalies that may occur during testing.
13. Provide step-by-step procedures for conducting the tests.
14. Identify the Class 1E and non-Class 1E boundaries, and isolation devices for hardware.

The qualification test procedures shall be submitted to the IO, for review and acceptance, before any qualification activities are undertaken.

5.1.9.7.4 Qualification Test Reports

Qualification reports shall be prepared by the Supplier. Qualification documentation shall be in accordance with Section 7.2 of IEEE 323 [Ref. 129]. Each report shall provide the following:

1. Contain the related qualification program and test procedure(s) which serve as its basis.
2. Contain all data required by the qualification effort.
3. Contain all analytical methods and models utilized for qualification service and environment.
4. Specify qualification service and environment.
5. Show classification table of components with/without age-related failure degradation mechanisms.
6. Contain justification of aging methods.

7. Contain the acceptance criteria and evidence that report applies to the items tested.
8. Demonstrate successful performance in terms of the acceptance criteria.
9. Report and analyse all anomalies that occurred to provide demonstrable proof that the anomaly does not invalidate the qualification results.
10. Provide historical data or other justification for replacement intervals.
11. Correlation of program information with instruction book/operations manual for maintenance, surveillance, replacement intervals, etc.
12. Contain appropriate Supplier signature(s) and date(s) indicating review and approval of the report, in accordance with approved/accepted QA program.

Any of the qualification reports prepared as part of this program shall be available for review by the IO, and shall be included in the final test report.

Qualification Synthesis Report including *two documents shall be prepared and submitted to the IO, for review and acceptance, that provides evidence of the qualification of the subject equipment and shall cite any precautions, restrictions, or limitations which must be accounted for by the IO in order to maintain the qualified status of the subject equipment.

*Reference File: The document that indicate the drawings used for the qualified equipment.

* Qualification Preservation Sheet: Indicating all the maintenance and the conditions to maintain the qualification.

5.1.9.8 Manufacturing Inspection Plan (MIP)

For manufacturing scope of work, a MIP is required for scope under Quality Class 1, Quality Class 2 and Quality Class 3. Manufacturing is here to be understood at large and also cover for service scope with the exception of software development that are covered by under [Ref. 67]

Typical Manufacturing Inspection Plan is available in Appendix 8.

MIP shall list all operations that are critical from a quality point of view. As such, QARO and CRO reserve the rights to request for MIP revision if any activity becomes critical and is not listed in MIP.

A MIP shall be prepared by the Supplier that meets the requirements of ITER MIP [Ref. 24]. The MIP is a listing of the chronological sequence of manufacturing operations affecting quality encompassing the whole scope of the subcontract and ranging from verification of materials, manufacture, inspection and test to delivery. For PIC elements, the MIP also clearly identifies the PIA. It will be used to monitor quality control and acceptance tests. It is permissible for the Supplier to submit multiple MIPs that are more succinct and manageable to the particular operation, if desired. Prior to Manufacturing operations, the MIP shall be generated in accordance with the procedure provided in Section 4 of ITER MIP [Ref. 24] and available to the IO. This requirement is to be passed down to all levels within the procurement chain.

The level of detail in a MIP shall be sufficient to prevent the inadvertent by-passing of critical operations and to enable adequate planning, monitoring and verification of critical operations. This document shall be submitted to the IO for review.

Several control points shall identified in each MIP:

HP (Hold Point) identifies an operation that must be formally sign-off by an IO or third party representative mandated by the IO before the work continues beyond this point. The work must not continue until the release delivered by IO or/and the Third Party. Where physical witnessing is required for a HP, this must be clearly indicated in the inspection plan for the associated task. IO or Third Party many add a Hold Point to a specific activity at any time during implementation of the work by the Contractor.

NP (Notification Point) identifies an operation/task that must be notified to the IO or a Third Party. IO or Third Party are invited to attend to the operation/task but if they don't attend at the notified time, the work can be proceeded by the Contractor.

RP (Registration Point) identifies an activity where the IO or Third Party not invited to attend but they need to be informed immediately of the results by the Contractor. The information is delivered by the relevant record signed-off by the Contractor. The work can continue when the record has been delivered to IO.

W (Witness): identifies an operation that must be witnessed.

S1 (Surveillance 1): identifies an operation that requires 100% inspection.

S2 (Surveillance 2): identifies an operation that requires random inspection or spot checks.

R (Review): identifies a document that must be reviewed by the IO or Third Party.

For Hold Points, Notification Points and Witness Points the Contractor shall notify the inspection body representative at least 12 calendar days prior to the implementation of the activity for any operation. Upon mutual agreement between the different stakeholders, the notification period may be reduced.

The IO may add hold, witness, or notification points to the MIP and identify tests or inspections that must be witnessed by the IO representative. The Supplier shall indicate intervention points that must be witnessed by the IO representative with a "W" code at the appropriate locations in the MIP. The MIP template is provided in [Ref. 24].

The IO approved MIP is a prerequisite to the Supplier proceeding with the work contained. It is permissible for the IO to indicate partial approval to authorize operations that would be constrained due to issues with subsequent operations.

5.1.9.9 Audits

Supplier shall inform its Subcontractors that IO is a nuclear facility identified in France by the number INB-174. Certain items that are subject to this Specification are classified as PIC to which the French Order dated 7th February 2012 applies and are subject to IO and regulatory body inspections. PIA shall be identified for PIC in order to comply with the requirements of the safety function [Ref. 16].

The USDA, IO, ANB, and French regulator (for PIC) reserve the right to conduct announced or unannounced inspections and audits, at the Supplier's facilities to verify conformance of the work being performed to the requirements of the supply order and this Specification. The ANB shall have free access to perform any inspections there that it deems necessary to check compliance of the requirements stemming from the risk analysis or as applicable that the Supplier properly meets the obligations of the approved quality system [Ref. 2]. Both Supplier and its

Subcontractors are subject to such inspections and audits. No proprietary processes or information shall inhibit USDA, IO, ANB, or other official party from performing its audit or inspection function. The USDA, IO, ANB, and French regulator exercise of, or failure to exercise, this right to inspect or witness shall not relieve the Supplier of its obligation to comply with the terms and conditions of the supply order.

IO reserves the right to verify the validity of the Certificate of Compliance during the performance of audits of the Supplier or by independent inspection or test of the item(s).

If and when required, audits, inspections (further to the one defined in the MIP) and surveillance visits of Contractor's activities or its sub-contractors may be organized by either IO, regulatory bodies or the French Nuclear Authority without prior warning.

The Contractor shall grant access rights to IO, and regulatory body representatives to their offices, facilities and records.

The Contractor shall flow this requirement down to their subcontractors to allow IO, regulatory bodies and the French Nuclear Authority to also perform the above actions in their premises.

5.1.9.10 Access to Contractor's Premises

The Supplier shall grant access rights to the IO, USDA, ANB/NB, and French regulator (for PIC) to its facilities, records, proprietary processes and/or information and those of its Subcontractors for the purposes of surveillance of defined requirements during the construction/manufacturing of a PIC. This surveillance shall also include the examination of all protective-important actions and the follow-up and verification of all corrective actions which are to be implemented.

The IO, USDA, and Host regulatory body representatives shall have authority to refuse release for shipment if the requirements of this Specification have not been fulfilled. Copies of required inspections and certified test reports shall be available for review. Final acceptance of material or components shall be performed on the ITER site.

5.1.9.11 Quality Records

Records shall be maintained to show objective evidence of quality. No quality records shall be destroyed or otherwise disposed of prior to completion of the work, and IO shall have an opportunity to acquire possession of such records prior to their disposal. Records shall be maintained for access and retrievability by the IO at its discretion.

5.1.9.11.1 Document Retention Requirements

Documentation records listed in section 6.1, shall be maintained in accordance with the Supplier's QA program to show objective evidence of quality. No quality records shall be destroyed or otherwise disposed of prior to completion of the Product. After completion and delivery of the Product to IO, the Supplier shall keep the technical documentation and the EU declaration of conformity for 10 years after pressure equipment or assemblies have been placed on the market. The IO shall have an opportunity to acquire possession of such records prior to disposal. Documents shall be annotated with the IO supply order number or other numbering system traceable to it for identification.

Lifetime records are records meeting the requirements of ASME NQA-1 Part 1, Requirement 12, section 401 [Ref. 119]. These records are required to be maintained for the life of the valves and/or actuators while installed in the plant or stored for future use. The documentation will be made available for any relevant national authorities for inspection purposes.

Radiographic record keeping, when applicable, the Contractor is required to deliver the radiographic record primarily in digital format that allows the same accurate interpretation as a Physical radiographic record and answer to traceability requirements to ensure re-interpretation as defined in applicable Code and Standard.

If for technical reason digital recording is not possible, the Contractor will have to arrange delivery of the original documents to IO site (including the preservation during the transportation).

The date of delivery of those records and any other relevant conditions will have to be approved by the CRO and mutually agreed at the KOM in compliance with the Contract.

It is of the utmost importance that for PIC/PIA components, QC1 and/or PE/NPE, radiographic records are dully identified and transmitted.

If Pressure Equipment Directive (Directive 2014/68/EU dated 15/05/2014) is applicable for scope of contract, the Contractor has to keep related documents for 10 years after releasing their pressure equipment on the market.

5.1.9.11.2 Test Sample Retention Requirements

The test coupons and specimens used for acceptance per lot shall be kept by the Supplier for a period of at least 36 months starting from the date of acceptance of the components.

5.1.9.11.3 Supply Chain Management

5.1.9.11.3.1System

The Supplier shall possess an effective supply chain management system covering, but not limited to, supply orders management, inventory and data management, flow management, storage management, manufacturing documentation management, and shipment management.

5.1.9.11.3.2 IO Procurement

Supply Orders (SO) will be issued by the IO to the Supplier as and when required to meet pre-assembly and/or construction milestones for material types indicated in this specification. Manufacturing lead times for each item to be supplied shall be provided and shall be no more than 6 months from placement of order to delivery. Expediting will be performed on all supply orders to ensure contractual delivery dates are met. A Supplier Portal will be available for upload of information and documentation related to the contract. Documentation required shall include, but not be limited to; test certificates, conformity certificates, packing lists, etc.

5.1.9.11.3.3 Supplier Procurement

The Supplier shall monitor internal supply orders to ensure material specifications and delivery dates are met.

5.1.9.11.3.4 Identification

All materials and packages shall be clearly marked and labelled in accordance with IO standards set out in section 6.1 the Framework Agreement, and/or SO.

The supply chain management organization, disposals, tools, and procedures shall be described in the Quality Plan.

5.1.9.11.3.5 Counterfeit, Fraudulent, and Suspect Items (CFSI)

The Supplier has to have a special focus on CFSI. The supplier shall have a process in place to identify CFSI and develop this in their Contract Management Plan or QA Plan.

Upon IO information about CFSI warning, Contractor shall also be able to check if their subcontractor(s) and/or supplier(s) might be impacted in their supply chain.

5.1.9.12 Project Management

The Supplier shall designate a Project Manager, within 5 working days after award of contract (AOC), who will be responsible for the overall design, manufacture, factory testing, installation, performance testing, schedule, cost control and resolution of disputes and discrepancies. The Supplier shall also identify specific individuals responsible for each aspect of the Work. The Supplier's proposal shall provide an outline of the management structure and resumes of the team members for the project.

5.1.9.12.1 Project Schedule

The Supplier shall provide a schedule, in Primavera P.6 format (Alternative Software is possible to use, e.g. MS Project), within 10 working days after receipt of each Supply Order. It shall identify the submittals to and approvals from IO of the Supplier's and Subcontractors' specifications, drawings, procedures, and other types of documents as appropriate.

As a minimum the schedule shall include task descriptions with start and finish dates for each task. Separate detailed task breakdowns shall be provided for design, procurement, fabrication, and factory testing phases and end with a Scheduled Jobsite Delivery Date.

The schedule shall be in a Critical Path Method style with logic ties that identify each activity and is capable of tracking percentage complete for verification of progress. The schedule must be compatible with the overall master project schedule developed by IO and is subject to IO's approval.

The schedule shall be made available in both hard copy and electronic form, in Primavera or MS Project. The schedule shall include all work activities identified within the Specification. The schedule shall include milestones for design, fabrication, shop testing, and delivery of TCWS equipment to allow for IO to monitor the progress of the Work and to schedule its interface activities with the Supplier. The schedule shall include all documents and deliverables listed in the Specification.

The project schedule must be provided to IO for approval prior to implementation of any Work. The Supplier shall consider potential schedule conflicts due to previous or pending commitments to supply services or material to other customers. Anticipated deviations from the schedule must be identified to IO as soon as possible to evaluate the impact of changes on the master project schedule.

5.1.9.12.2 Project Meeting

5.1.9.12.2.1 Project Kick-Off Meeting

The Supplier shall participate in a Project Kick-off Meeting. The Project Kick-off Meeting shall be scheduled at a mutually agreeable time as soon as practical after AOC, but not before the Draft Schedule and Draft Quality Plan are submitted by the Project Manager to the IO representative.

The Kick-off Meeting will include the Supplier's Project Manager and other principal participants as requested by the IO. The primary purpose for the Project Kick-off Meeting is to confirm that the meeting participants understand the terms and conditions of the subcontract, technical specification and drawings. The following topics will be discussed:

a. Scope and content of the Quality Plan, Manufacturing and Inspection Plan, and Assembly Procedures.
b. Expectations for satisfying quality standards, documentation requirements, delivery arrangements, acceptance criteria, and payment schedules.

The Supplier shall prepare written draft Project Kick-off Meeting Minutes that document the agreements and commitments resulting from the Project Kick-off Meeting discussions.

5.1.9.12.2.2 Periodic Project or progress Meetings

The Supplier is responsible for documenting meeting discussions and preparing written minutes for each of these meetings within two working days.

A progress review meeting is to be held on a monthly basis between the Contractor representative and CRO with the appropriate support of relevant stakeholders. The planning of those meetings is to be agreed during the KOM and dates booked accordingly. The Contractor to ensure the timely submission of the Progress Report minimum one (1) week prior to the meeting.

5.1.9.12.2.3 Project Status Reports

The Supplier shall submit monthly written and electronic progress reports to the IO Representative that reflect the status of the engineering, fabrication and delivery phases of the Work. These reports shall discuss the following:

- Completion of all scheduled activities
- Actual and projected delays of all activities
- Inclusion of any additional schedule activities
- Proposed changes in project management or key project personnel
- Status of key existing engineering, procurement or manufacturing issues that may impact quality, performance, or delivery
- Anticipated or approved deviations from the Specification
- Other issues pertinent to project schedule or milestone completions
- Open items

5.1.9.12.3 Communication Protocol

5.1.9.12.3.1 Scope Change

The IO reserves the right to underrun/overrun the quantities under any line item of the material for any size/type valve and/or actuator. The basis of the contract is a unit price contract and final quantities will be specified in future supply order.

5.1.9.12.3.2 Engineering/Design Review

The Supplier shall make available to IO, at its premises and upon 10 days' notice, confidential and proprietary drawings, documents and other data ("Design Data") and technical assistance sufficient to allow IO to conduct a design review of the equipment to be supplied under the Supply Order. This Design Review may have a duration of up to 10 consecutive work days.

In carrying out this Design Review, IO shall be entitled to engage consultants to give assistance provided that these consultants shall have first entered into a Non Disclosure Agreement directly with the Supplier. It is acknowledged by IO that the Design Data shall remain vested at all times with the Supplier, and shall only be used by IO for the purposes of the Supply Order. The Design Data shall be treated as confidential by IO and shall not be disclosed by IO to third parties or copied without the express written consent of the Supplier (such consent shall be deemed to have been given for disclosures of Design Data to consultants who have entered into a non disclosure agreement as aforesaid).

All matters related to engineering/design will be discussed directly between IO's and Supplier's engineering representatives. Any correspondence of an engineering/design nature shall be exchanged between the same engineering representatives. Copies of such correspondence will be sent to the Project Coordinator. Personnel from both the Supplier and IO who receive engineering/design information, including design change requests, shall forward such information to the IO Project Manager or his designee.

Engineering Representatives from both the Supplier and IO shall determine the method and frequency of meetings and conference calls related to engineering/design matters. IO's Project Manager and Engineering Representative shall attend Project Management meetings to represent engineering/design matters.

The Supplier shall send all drawings and other documents of an engineering/design nature directly to IO's Project Manager or the Engineering Representative. The Supplier shall include in the transmittal letter the information indicated below in the Drawing Transmittal List.

5.1.9.12.3.3 Document Transmittal Techniques

The Parties agree to utilize, to the maximum extent possible, electronic mail (Email) via the Internet for correspondence. Since electronic mail transmittals (and FAXed transmittals) are discoverable, Project management personnel from both Parties shall minimize the amount of physical documents transmitted and should stress to their respective personnel the need to: (1) utilize such methodology for Project related matters only; (2) not transmit confidential or proprietary information; and, (3) maintain professionalism with respect to such communication. Transmittal of drawings or large documents will utilize the most effective methods (e.g., DHL) considering the urgency associated with the transmittal.

Electronic submittal of non-drawing documents shall be provided in the current version of the Adobe Acrobat (*.pdf) file format. Documents that require formal approval by the Supplier shall be submitted in a hard copy form with all necessary (approval) signatures. Electronic copies of such documents may be submitted for review purposes only, or if specifically requested by IO.

5.1.9.12.3.4 Action Item List

IO shall create and maintain a list of open action items assigned to the Supplier or IO. The list shall identify the action to be taken, category (critical or non-critical), responsible Party or individual, and the date the required action is to be completed. Due dates should be met in order to maintain project schedules and proper work sequence. If any Supplier or IO individual believes that there are necessary actions which are not reflected on the list, the individual should contact the appropriate project coordinator with a request to add the action. It is not the intent of the Action List to document all requirements in the Supply Order. The bases for making entries on the Action List are: (1) actions which are not identified specifically enough in the Supply Order

to convey the action plan; (2) actions which need to be tracked to ensure timely response; and (3) actions which need to be sequenced with other work. The lack of entries on the Action List does not relieve either the Supplier or IO from fulfilling their obligations under the Supply Order.

5.1.9.12.3.5 Document Transmittal List

The Supplier shall maintain a Document Transmittal List which documents the transmittal of drawings, procedures, and any other document which the Supplier is required to send to IO pursuant to the Supply Order. The Document Transmittal List shall document: (1) the total population of drawings or documents to be submitted, categorized by component; (2) type of document being transmitted; (3) specific identification; (4) actions required by IO pursuant to the Supply Order; (5) the due date for such IO action; (6) consequences if the due date is not met; and, (7) indication if planned subsequent revisions are forthcoming. Current copy shall be included with the monthly project status report, as a separate file.

5.1.9.12.3.6 Periodic Conference Call

The Supplier Representative and the IO Representative shall hold conference calls, at a time to be mutually agreed upon, to discuss the progress and status of the Work. Such discussions shall include, but not be limited to, Work schedule, status of action items, resolution of technical problems, and contractual or commercial issues. The Supplier shall prepare and send draft minutes of the conference calls to the IO representative within 2 days of the meeting.

5.1.9.12.3.7 Manufacturing Facilities and MRR

The IO reserves the right to visit and inspect the manufacturing facilities prior to the signature of the contract with the successful tenderer.

The Supplier shall follow up Manufacturing Readiness Review (MRR) is the last review before manufacturing and if successful it gives the start the manufacturing of the valves. [Ref. 44].

The manufacturing readiness review is key to ensure that all requirements are met prior to start the manufacturing. If the scope of supply only covers for off the shelves items, this gate does not apply.

5.1.10 Documentation

All documentation shall conform to the following requirements and the list given in Section 6. is only a minimal list of project relevant documents but that it is supplier’s full responsibility to generate all necessary documents to fulfil the need of the contract and provide all justification/evidence that delivered product meet requirement and also supplier shall issue the deliverable list(VPIS; Vendor Print Index Schedule) within 4 weeks after contract, which is specified all supplier’s document list with issuing schedule:

5.1.10.1 General Requirements

- Drawings and/or other documents shall be submitted indicating all information required for interfacing with the design for the balance of plant, including but not limited to design codes, dimensions, maintenance access requirements, materials of construction, finishes, connections, weights, centre of gravity, mounting requirements, imposed loads, allowable loads, capacities, limits and precautions.
- Supplier’s (or Supplier’s subcontractor’s) drawings and/or other documentation shall be submitted indicating operating and performance data, installation instructions, lubrication requirements, preventative maintenance requirements, performance and condition monitoring requirements, power and instrumentation requirements.
- The documents produced by the Supplier may be bi-lingual. The primary language is English and the secondary language is that of the Supplier. The English text shall take

precedence over any other languages in the document. The English text shall have exactly the same technical meaning as the Supplier text. When bi-lingual text is used it shall apply to all texts on the drawing.

- All documents shall be clean and legible white prints with uniform background density suitable for electronic scanning and subsequent reproduction from an electronic format. The original documents shall meet the requirements of ISO 6428. In addition, all documents shall be submitted in PDF files and native format, or another electronic format if mutually agreed upon. Hard copies may be submitted in addition to electronic transmission. Hard copies shall be submitted rolled, but shall not be folded.
- The quality of reproductions shall be of such clarity as to produce a third generation copy which will meet the legibility requirements stated above.
- Insofar as practical, documentation shall be typed and arranged in a neat and professional manner. Handwritten documents shall conform to the legibility requirements and quality requirements of this section. Any pen and ink changes necessary after printing will be performed by drawing a single strike through line, preserving the original information, with neat ink text initialled and dated. Material certificates with opaque correction fluids on it will not be accepted.
- Documents not meeting the quality requirements specified herein will be returned to the Supplier without IO review for correction and resubmission. Rejected documents will not be a basis for approving schedule extensions or cost increases.
- All documents shall utilize IO's Valve Item Number and Supplier's part number for valve and component identification.
- All or part of the Supplier's documents, sketches, or instructions (or Supplier's subcontractor's) may be copied or reproduced as necessary by IO for project use. This shall include documents that are labelled "Copyright".
- The Supplier is responsible for the document requirements. This includes documents from subcontractors. This responsibility may not be delegated or passed on to any other subcontractor.
- Supplier's as-built record drawings shall be updated to reflect changes made during shop fabrication. All as-built drawings (both physical copies and in native format) shall be provided prior to shipment of the equipment.
- All documents must be noted as checked for completeness and accuracy and shall be signed off or initialled as "Approved" or "Certified" prior to submittal for IO's review. Non-compliant documents shall be returned to the Supplier.
- Revisions to documents shall be circled or noted otherwise so that such revisions may be easily identified, and a written description of the revision shall be included in a revision column.
- Documents submitted by the Supplier shall be of the actual component part the Supplier is furnishing. No documents will be accepted that state "Similar To", "Same As-Except", "Typical", "Opposite Hand", or other such short cuts.
- On any document submitted by the Supplier that contains more than one device, or one device with multiple listings, or lists optional devices, then the Supplier must specifically identify such device or option that is being furnished.
- The Supplier shall provide all the documentation required to clean, start-up, test, operate, and maintain all Supplier supplied valves and accessories.
- Acceptance by IO of any of Supplier's documents neither certifies nor warrants Supplier's conformance to any of its obligations under the Supply Order.
- Shall the Supplier, upon receipt of documents as commented by the IO, for whatever reason, no incorporate each and every of IO's comments as so marked by IO on the

Supplier's documents, the Supplier shall so advice the IO in writing the reason for not incorporating these comments.

- The Supplier shall make no revisions to IO reviewed and accepted documents other than those authorized by the IO. Any and all revisions to Supplier's documents other than those marked on Supplier's documents by the IO shall require authorization by the IO prior to further revision by the Supplier. The intent is to provide the IO with timely notification of drawing revisions that may affect interconnecting systems. If the Supplier document is revised after acceptance by the IO, it shall be resubmitted for additional review and acceptance.
- The IO shall return a copy of all documents reviewed and each shall be dispositioned as follows:
    - Approved – Work may proceed; no further submittals or changes are needed from the Supplier.
    - Approved with Comments – Work may proceed; comments provided for Supplier's consideration only. Resubmittal required.
    - Reviewed with Comments – Work may proceed; subject to incorporation and compliance with comments. Resubmittal is required.
    - Receipt Acknowledged – This disposition is used for information-type submittals.
    - Disapproved – Disapproved work may not proceed, revisions and resubmittal of the affected document is required.

      Note: Release for material procurement and fabrication shall be in writing and not dependent on document status.
- The following project information shall be shown on all documents and document transmittals submitted by the Supplier:
    - Project Name
    - IO's Supply Order Number
    - Supplier's Supply Order Number or Shop Order Number
    - IO's Valve Item Number
- Supplier shall provide a complete list of all document and instruction manuals that will be provided for each Supply Order and the proposed submittal schedule with the proposal. Final drawing submittal schedule, as mutually agreed to by the Supplier and IO, will be incorporated into the supply order.
- Supplier shall review and approve under its QA program drawings and/or documents submitted by Supplier's subcontractors prior to submitting these documents to the IO for review. Specific cases in which parallel review by the IO and Supplier would be advantageous to the project schedule will be considered on a case basis.
- Documentation shall be submitted as specified in Section 6. to this specification. The content of the documents shall include the information specified in the applicable sub-sections to this specification. The time frame for document submittal is indicated in Section 6. of this specification.
- Prior to Release for Manufacture, the documentation listed in Column A of Section 6 to this specification shall be submitted to the IO for review and acceptance. No material orders or fabrication shall begin until released by the IO.

5.1.10.2 Weld Documentation Requirements

The following welding documentation shall be retained in the Supplier's shop and available for IO review.

- Administrative procedures for the control of the welding program, which includes qualification of Welding Procedure Specifications, qualification and assignment of welders, filler metal control, performance of post-weld heat treatment (PWHT), control of welding work, specification of workmanship requirements, and other information related to the administrative control of welding.
- Records of Welder Performance Qualification and updates/renewal of qualification for the welders who will be assigned to the work.
- Forms which are to document the production welding activities.
- Drawing(s) depicting examination surface configuration and the surface finish for pressure retaining and integrally attached welds and adjacent base material subject to volumetric examination shall be provided by the Supplier.

Welding and NDE documentation listed above shall comply with requirements of Annex I – section 3.1.2 and 3.1.3 of the PED [Ref. 7]

5.1.10.3 ESPN/PED Instruction Manuals

- Supplier is requested to not confused between supplier's general Operating and Maintenance Manual and this ESPN/PED Instruction Manual.
- Three copies of preliminary instruction manuals shall be submitted to the IO for review and acceptance in accordance with the Document Submittal Schedule, Section 6. to this specification.
- Five copies and 1 CD of final instruction manuals shall be submitted to the IO for record in accordance with the Document Submittal Schedule, Section 6. to this specification.
- It shall be the Supplier's responsibility to include the requirements for instruction manuals listed in Section 5.1.10.4 to this specification as part of the Supply Order. The Supplier shall collect and assemble this information as part of the instruction manuals.
- Before manuals are assembled, a finalized index and summarized listing of inclusions shall be sent to the IO for review and acceptance.
- Supplements shall be submitted as required throughout the warranty period. Supplement version may be a complete new manual, or supplement inserts with instructions for insertion into the manuals.
- According to French Environmental Code, the instruction manual (regulatory document) of valves in the scope of PED or ESPN Order shall be supplied in French Language.

5.1.10.4 Specific Instruction Manual Requirements

As a minimum, instruction manuals shall contain the following information:

1. Index and tabs
2. Reference to stand-alone document that contains the information concerning shipment, loading/unloading, hauling, storage, unpacking, and installation of all Supplier furnished equipment. This stand-alone document shall also be provided with the equipment at the time of equipment delivery.
3. Instructions for start-up, operation, inspection, and maintenance of all Supplier furnished equipment, including preventive maintenance schedule. This should include the following:
    a. Descriptions of valve assemblies.
    b. Installation and start-up checklist.
    c. Trouble shooting tables of charts for all component types including diagnosis and remedy.

d. Recommended start-up and shutdown procedures.
e. All service bulletins, letters, etc., that may enhance performance and/or maintenance.
f. Requirements for initial checkout, pre-commissioning and commissioning of all equipment and components furnished by the Supplier and Supplier's subcontractors. Special requirements for such items as cleanliness, chemistry, and initial operating limits shall be identified.
g. Operating recommendations, operational adjustments, and theory of operation for all Supplier furnished equipment including operating limits and precautions.
h. Recommended performance and condition monitoring and recommended plant log format.

4. Maintenance information:
    a. Maintenance data shall contain all data needed to keep the supplied equipment in good repair and to maintain the equipment so that it performs within specification parameters. It shall include the following:
        i. Settings, adjustments, and calibration data including tolerances and the basis for each tolerance tabulated for all instruments associated with equipment startup, operation, shutdown, and alarms.
        ii. Torque requirements, equipment operating clearances, and adjustments required for proper equipment operation, including rotational checks.
        iii. Test equipment with required accuracies and special tools needed to maintain the equipment.
        iv. Environmental qualification maintenance interval with maximum allowable time between repair/replacement. Environmental qualification maintenance intervals should not be shorter than eighteen (18) to twenty-four (24) months.
        v. Maintenance instructions shall include detailed in-process acceptance checks and post-maintenance testing instructions.
        vi. Maintenance information should include strategies for replacement versus repair and obsolescence issues.
    b. Periodic testing shall contain step-by-step instructions including precautions, warnings, and acceptable test values necessary to verify that the equipment is operating within specifications. A schedule of recommended mechanical, electrical, and instrumentation and control performance tests shall be supplied.
    c. Preventive maintenance shall contain a comprehensive, systematic, step-by-step maintenance program. This program shall provide a complete description of the requirements, acceptance limits with action to be taken when limits are exceeded, and tasks to be accomplished. Also included are precautions and warnings for maintaining the operational capability of the equipment within specifications. If any item is required to maintain equipment qualification requirements, it shall be clearly stated in a caution statement.
    d. The time intervals of recommended mechanical, electrical, and instrumentation and control tasks shall be supplied and shall include the following:
        i. Visual inspections
        ii. Examinations
        iii. Replacements
        iv. Measurements
        v. Calibrations
        vi. Overhauls
        vii. Maintenance activities require prior to, during, and following an extended shutdown (e.g., equipment layup)

e. Basis for each task consisting of the following information:
    i. Preventive Maintenance (PM) Basis
    ii. Task Number and Task Name or Title
    iii. Task Objective. A concise statement of the objective of the task (such as disassemble, clean, inspect, etc.) to accomplish a specific goal.
    iv. Task Content. A summary of the job steps and any reference to a more detailed task procedure provided.
    v. Principal failure locations and causes. List of the most likely failures or wear-out modes and their typical causes that the task discovers or corrects.
    vi. Progression of the degradation in time. The expected failure or wear-out timing of each of the above listed failure modes based on the design and environmental conditions for the machine.
    vii. Support for the task interval and relation to other tasks. Provide a link between the expected failure or wear-out timing and the time interval recommended in Paragraph 4.d of above. Cite any other tasks that are performed more frequently which enable this task to be performed less frequently.

f. Corrective maintenance shall contain step-by-step instructions including precautions and warnings, required to adjust and align the equipment. Also, shall include removal, repair, reinstallation, and alignment of repairable or replaceable parts, modules, subassemblies, and assemblies normally expected to require service over the life of the equipment. If any instruction affects the equipment qualification requirements, it shall be clearly stated in a caution statement. The instructions shall include the following:
    i. Actions to be accomplished in a specified order, including torque requirements for all threaded fasteners.
    ii. Tools.
    iii. Parts.
    iv. Materials.
    v. Test equipment and setup instructions.
    vi. Preliminary control settings.
    vii. Supporting illustrations.
    viii. Testing requirements following corrective maintenance to ensure operability.

g. Supplier should supply recommendations for predictive maintenance applied technologies, including sensor location and selection, recommended data acquisition and evaluation techniques, and recommended condition-based maintenance activities.

5. Long and short term storage and handling procedures and requirements in accordance with the requirements of the equipment technical specification.
6. Supplier’s data for all devices, instruments, and accessories.
7. Address of the Supplier-authorized service facility nearest to the jobsite.
8. Component and parts list with ordering information showing part numbers for all components furnished by the Supplier and Supplier’s subcontractors. (to be supplied electronically via the IO-supplied template)
9. Recommended spare parts list for all equipment and components furnished by the Supplier and Supplier’s subcontractors in accordance with the requirements of the equipment technical specification. (to be supplied electronically via the IO-supplied template)
10. Listing of all special tools furnished including stock numbers and identification of equipment to which the tools apply.

11. Certified test data and reports, hydrotest certificates, performance curves, correction curves, and Code certificates.
12. Drawings including the following:
    a. Valve assembly outline drawings
    b. Valve assembly cross-section drawings
13. Compilation of preventive maintenance charts for all equipment furnished by the Supplier and Supplier's subcontractors.
14. Preventive maintenance and overhaul recommendations, including frequency and schedules for all equipment and components furnished by the Supplier and Supplier's subcontractors.

General Notes on the composition of the Instruction Manuals:

- Information furnished shall be complete for all Supplier furnished equipment. Material that does not contribute to the understanding of the design, handling, storage, installation, operation, and maintenance of the equipment provided shall be excluded.
- Use shall be made of drawings, diagrams (including wiring diagrams), pictures, or actual photographs when they add to the understanding and clarity of the text.
- Precautions and warnings relative to the safety of life and equipment shall be included where applicable.
- It is recognized that there are commercial-type handbooks for many items of equipment. This type of information may be utilized under the following conditions:
    - Where published material is available in a form that contains essential information required, such material may be utilized in whole or in part if properly integrated and indexed into the overall Instruction Manual. For example, the Supplier may utilize instructions for subassemblies or component parts that are furnished by manufacturers who supply instruction handbooks on their subassemblies.
    - Where the subassembly or component part item is of such nature that local repair normally is not employed, and the item is usually returned to the factory as a unit for overhaul, reference shall be made to such fact in the Instruction Manual.
    - If the publication of the subassembly or component part manufacturer does not contain a complete care, operation, maintenance, and parts breakdown meeting these requirements, it shall be the responsibility of the Supplier to include such information in the Instruction Manual or to arrange with the subassembly manufacturer to provide a publication that will meet these requirements.
- The instruction manuals shall be assembled as follows:
    - Combine all individual manuals and submit a composite manual. Loose documentation is not acceptable.
    - All printed material, such as standard booklets, shall be original documents and not copies of such material. Any printed material provided shall be clear and of high quality suitable for use in instruction manuals by operations and maintenance personnel. Supplier prepared text shall be in electronic format with text search capability.
    - The various sections of the instruction manuals shall be separated with dividing tabs with section numbers which correspond with the numbered index. The dividing tabs shall have mylar reinforced tabs and binder holes.

- Any drawing which are provided as part of the manual that cannot be inserted as a single page shall be folded and placed in a plastic print holder with the opening at the top.
- Manuals shall contain a specific section where reduced drawings covering general equipment arrangement, parts and parts list, sub-vendor component and parts drawing, machinery layouts, certified drawings, and other drawings providing pertinent information may readily be identified. A drawing index shall be provided.

5.1.10.5 Deliverables Required Prior to Manufacturer

Prior to manufacture, the Supplier shall submit to IO the following documents:

- Procedures for packing and transportation.
- Process procedure for manufacturing
- Quality plan
- Manufacturing and Inspection Plan (MIP)
- Records certifying the qualification of NDE/Inspection personnel and welders
- Testing procedures
- Welding Procedure Specifications (WPSs) and Procedure Qualification Record (PQR), if applicable
- Qualification dossier

5.1.10.6 Documents Prior to Shipment

5.1.10.6.1 Quality Assurance Data Package (QADP)

Prior to final acceptance and issuance of a Inspection Release Note (IRN), a Quality Assurance Data Package (QADP) shall be submitted by the Supplier to IO for review and approval for each Valve Item Number. The QADP shall be submitted in both hard copy format, as stipulated below, and in electronic format, preferably as a pdf.

- The records shall be contained in a three ring binder with all documents contained on single sided paper. Drawings shall be ANSI B size drawings. Large drawings may be supplied provided they are placed in individual sleeves. The sleeves and drawings shall be arranged to allow the individual drawing title or drawing number to be identified without fully opening the document.
- The QADP shall have a table of contents listing all sections and attachments. Each section of the QADP shall have an individual section tab.
- The QADP shall be organized in the following manner:
  - Section 1 – ASME B&PV Code Section VIII Manufacturer Data Report, Manufacturer Certificate of Conformance, Approved Notified Body Certificate of Conformance, Contractor's Release Note and Certificate of Compliance.
  - Section 2 – As-built drawings showing actual wall thickness and calculations of required minimum wall thickness of all pressure boundary components.
  - Section 3 – Risk Analysis, Seismic Analysis Report, Environmental Qualification Report, Functional Qualification Report and Period of Calculated Pressure Integrity.
  - Section 4 - Fabrication Documents, including but not limited to:
    - Completed Manufacturing and Inspection Plan (MIP)
    - Bill of Material

- CMTRs per EN and ASME
- Fabrication Drawings
- Euronorm Inspection Certificate
- Weld Repair and Temporary Attachment Maps
- NDE Examination Reports
- Dimensional Inspection Reports
- Certified Capacity and Set Pressure, Leakage, and Hydrostatic Test Report
- Certificate of Cleanliness
- Supplier Deviation Requests (SDRs)
- Heat Treatment and PWHT Records with Furnace Charts
- Nameplate Facsimile or Rubbing
- Nonconformance Reports
- Drawing showing nameplate location and RT Station Marker Origins

5.1.10.7 Certified Material Test Reports (CMTR) and Inspection or Qualification Reports

The test reports shall include certification that all requirements of this Specification have been met. The tests required by this Specification shall be presented in the appropriate EN 10204 [Ref. 137] certificate and also the Certificate of Compliance.

5.1.10.8 Storage and Handling Procedure

1. The supplier shall provide recommended storage and handling procedures for both long term (one year and longer) and short term (less than one year) storage for all supplier-furnished equipment and spare parts.

2. At time of shipment, each type of equipment or assembly shall be accompanied by three copies of long and short term storage, lifting and handling, and maintenance instructions.

3. Storage requirements shall contain recommended storage conditions for the supplied equipment and spare parts. These recommendations shall address storage of incoming equipment, as well as storage during operation and during long idle periods after the equipment has been installed or in operation. If there are any equipment qualification program storage requirements, they shall be clearly stated in a caution statement. The recommendations shall include the following:

    a. Part number as listed on the parts list.

    b. Figure and index number, if applicable.

    c. Special protective environments (e.g., inert gas atmosphere, specific moisture content levels, temperature levels, etc.).

    d. Special equipment (e.g., containers, desiccants, shock absorbers, etc.) associated with the equipment storage.

    e. Shelf life remaining upon shipment from the supplier.

    f. Periodic inspections required.

g. Preventive maintenance required (e.g., lubrication, energization, shaft rotation, etc.).

4. All furnished equipment shall be prepared and secured for shipment and long term storage to preclude any damage during transit and so that handling, unloading, and inspection may be facilitated upon delivery.

5. As a minimum, storage of equipment shall comply with the requirements of Subpart 2.2 of ASME NQA-1 [Ref. 119].

5.1.10.9 Inspection Certificate Type 3.1 or 3.2

The Supplier shall provide the Inspection Certificate type 3.1 or 3.2 in accordance with EN 10204 [Ref. 137]. The certificate shall include a statement of compliance with the Order, with indication of results of specific tests.

Inspection Certificate type 3.1 and an inspection report shall be provided by a Supplier that has undergone a specific assessment for metallic raw material of valves and/or actuators and has an appropriate quality assurance system, certified by a Competent Body established within the European Community (EU) in accordance to PED [Ref. 7]. The field of validity of the certification specifies production of the valves and/or actuators indicating the relevant material types. The specific assessment of the quality system shall properly cover all relevant processes and material properties referred to in the specifications for metallic raw material of the valves and/or actuators. For welded items, the relevant processes covered shall also include the manufacturing process of the welded items (in particular welding and NDT).

Inspection Certificate type 3.2 must be provided by a Supplier that does not have a quality assurance system as described above. The certificate can be provided by the Supplier provided there is justification from the ANB or NB following material testing.

5.1.10.10 Certificate of Compliance

The Certificate of Compliance shall be submitted along with product delivery. The above test reports shall show that the valves and/or actuators satisfy the intent of this specification and shall be submitted with a Certificate of Compliance. The Certificate of Compliance shall attest to the completeness, accuracy and compliance with this specification.

The Certificate of Compliance shall satisfy the following criteria:

a) Identify the Contract and/or supply order number and a description of the items as ordered, provided and certified in satisfaction of the Contract and/or supply order and all applicable agreed upon changes.

b) Identify the specific procurement requirements met by the purchased material such as codes, standards, and other specifications.

c) Identify any procurement requirements that have not been met.

d) A person cited in the Supplier's quality assurance program as responsible for certification shall attest to the certificate by signature, title, and date of signing.

IO reserves the right to verify the validity of the Certificate of Compliance during the performance of audits of the Supplier or by independent inspection or test of the item(s).

5.1.10.11 Coding & Marking

If coding is applicable, the Contractor shall receive from the IO the catalogued Part Numbers of ITER (PNI) for the scope of supply. If the ITER component name has been pre-assigned by IO during manufacturing, the Functional Reference (FR) has to be also identified on the component.

The Contractor shall manage a material take-off list completed with their serial number / heat number/ batch number or any relevant contractual identification.

In case where the Contractor is in charge of the design of the equipment, the Contractor shall liaise with CRO to determine the applicable IO Part Numbers.

All components supplied by the Contractor shall be physically labelled (Marking) with the minimum contents of the "product label" as specified in below table:

Label	By whom	When	Lifecycle	Mandatory contents	Additional information may be specified in Tech. Spec., etc.	Note
Product (individual Items)	Contractor	After production	Permanent	1) Title of Product, 2) Manufacture Part Number, MN, 3) PNI, 4) SN, 5) Safety Classification, e.g. PIC/SIC, ESPN, 6) Quality Class.	1) Other Ref. Num., 2) Dimensions, 3) Weight, 4) Manufacturer, 5) Production Date (MM/YYYY), 6) CE marking, as required [4].	PNI to be provided by IO.
Shipping (Package)	Contractor	After packaging	Temp.	1) Title of crate, 2) Purchase Order, PO, Contract Number, PA code, etc., 3) Shipping/Crate Num., 4) Manufacturer Ref. Num., 5) MN, 6) PNI, 7) SN, 8) Safety Classification, e.g. PIC/SIC, ESPN, 9) From (CON-M) / To, 10) Net / gross weight, 11) Responsibility, 12) Packing Date (MM/YYYY).	1) Dimensions, 2) Other Ref. Num., 3) Quantity in the crate	For PNI as mentioned above. Accompanying signs, e.g. sign of handling precaution during transportation.

5.1.11 Spare Parts

1. The Supplier shall recommend parts which should be stocked as spare parts for both commissioning operation and nuclear operation of the valve. The recommendation for spare parts stock levels should take into consideration lead time for delivery of replacement parts after order, design life of part, wear-out rate of part or similar pieces of equipment, and operating conditions to which the equipment will be subjected. The priced spare parts list shall be recommended in the tender documents. For each supply order, the Supplier shall submit this priced spare parts list to the IO for review in accordance with the document submittal schedule, Section 6. of this specification. IO will issue a separate supply order for spare parts after a review of the Supplier's parts list.

2. Delivery of the spare parts selected by IO will be specified at the time of order. The Supplier shall clearly identify all spare parts as such by securely attaching a tag showing the following information to each part:

    a. IO Valve Item Number and Supplier's Part Number

    b. Part Name and Part Description

    c. Drawing Reference and Part Item Number

3. Recommended spare parts list shall include:

    a. All equipment and components furnished by the Supplier and it's subcontractor(s), plus identification of appropriate spare and replacement parts, modules, subassemblies, and assemblies. A parts location illustration shall be included if applicable.

    b. Each item shall include the following:

        i. Part number as listed on the parts list

        ii. Figure and index number if applicable

        iii. Recommended quantity to be stocked

        iv. Storage requirements

        v. Shelf life

    c. Supplier shall provide information regarding alternate suppliers of subcomponents when they are available.

    d. Provide information for special needs and long-lead time items if different from standard or easily obtained components.

    e. The Contractor shall complete their recommended spare part list using template as per Appendix 15.

5.1.11.1 Special Tooling

The Supplier shall provide all special tools required for the handling, maintenance, and repair of the valves. If the same tool(s) can be used for a series of similar valves, then 3 to 4 tools per every 50 valves shall be supplied.

5.1.12 Packing, preservation & shipping

5.1.12.1 Cleanness Requirements

1. The interior surfaces of the valves and actuators shall meet the requirements for ASME NQA-1 [Ref. 119] Class “B” cleanness.

2. The exterior surfaces of the valves and actuators shall meet the requirements for ASME NQA-1 [Ref. 119] Class “C” cleanness prior to packaging.

3. Procedures for cleaning, cleanness control, inspections, tests to verify cleanness, and rectification of unacceptable cleanness shall be submitted to IO for review and acceptance.

4. Any expendable materials that come in contact with the valves/actuators shall minimize the impact on operating chemistry and shall not cause degradation (e.g., by cross-contamination with carbon steel). Use of expendable material shall be controlled by written procedure.

    - Before the start of fabrication, when such materials are used, a listing of proposed materials and products to be used on the valves/actuators for the expendable products covered by this specification, along with a Certified Product Report for each product, shall be submitted to the IO and ANB for approval. This list shall include grinding wheels, adhesives, dye penetrant materials (i.e., those materials used in the performance of penetrant examination, including penetrant agent, penetrant remover, emulsifier, developer, and specified unique post-cleaning agents), rust preventatives, tapes, temperature indicating sticks, paint sticks or inks, ultrasonic testing couplants, weld purge dams, welding/cutting compounds, wrapping materials including temporary insulating materials, desiccants, plugs, caps, layout dyes, machining coolants and lubricants, cleaning agents, and solvents.

5.1.12.2 Packaging Requirements

5.1.12.2.1 Logistics, General Requirements

The following generic requirements apply for the shipment of any scope of supply (item, component or piece of equipment) from the manufacturer/assembly site to the ITER Site or any other location as defined in the Contract. The Contractor shall pack and preserve those in order to prevent any damage during the handling, transportation and storage. The scope of supply shall be subject to control and inspection, as defined below.

During cleaning, particular attention shall be given to the removal of weld spatter, debris and other foreign matter, particularly from the coolant passages and sealing surfaces. Final cleaning shall ensure effective cleaning without damage to the surface finish, material properties or

metallurgical structure of the materials. The Contractor shall submit to the IO the proposed cleaning procedure for acceptance. The demonstration of meeting the above cleaning requirements represents a Hold Point (HP) when defined in the Inspection and control plan.

5.1.12.2.2 Valves

1. The packaging for valves shall meet the minimum requirements of ASME NQA-1, Level "C" [Ref. 119], for overseas shipment, and the additional requirements stated herein.

2. Packaging of the valves shall be provided to ensure adequate protection, yet still allow adequate thermal breathing, during transport and delivery, on-site storage prior to installation, and during idle period after the valves are installed and awaiting operation.

3. Packaging and shipping details, including drawings, shall be prepared by the Supplier and submitted for review and acceptance prior to shipment. And also supplier shall submit Packing List Template (Appendix12) and Delivery Report Template (Appendix13), This documentation shall include at a minimum:

    a. Description of how the valves are packaged.

    b. Packaging date.

    c. Full address of the place of delivery and the name of the person responsible to receive the package.

    d. Number and type of components and samples contained in the package.

    e. Enclosed documentation.

    f. Declaration of integrity of the package.

    g. Declaration of integrity of the components and samples.

    h. Any additional relevant information on the status of the components and samples.

4. Materials intended for use in preservation, packaging, and shipping, such as tape, wood, plastic caps, sheet, vapor corrosion inhibitor coverings or other covers which are applied directly to stainless steel and nickel-based alloys shall be compatible with the materials to which they are applied. The packaging materials shall be certified to meet the requirements of ASME NQA-1, Level "C" and the additional requirements stated herein.

5. The interior of the valve shipping package shall provide for moisture control during shipping. A maximum allowable relative humidity of 60% shall be required. The packaging method shall be stipulated in the Supplier's packaging procedure. A humidity indicator(s) shall be arranged so that it can be viewed from outside the sealed shipping package. If desiccants are used, they shall be non-corrosive and shall not liquefy under saturated conditions.

6. For valves, any open ends shall be properly cleaned and then securely fitted with plastic or wooden caps. A method of moisture control shall be provided for packaging of the valves, using silica desiccant gel firmly attached to the surface of the valve. The desiccant shall be non-corrosive and shall not liquefy under saturated conditions. The valve shall

then be enclosed in clean, heavy-duty plastic and openings tightly sealed. Small openings such as couplings, threadolets, and nipples shall be sealed by use of small light stainless steel metal or plastic inserts pressed in and retained with a seal of waterproof tape.

5.1.12.2.3 Actuators

1. The packaging for the valve actuators shall meet the minimum requirements of ASME NQA-1, Level “C” [Ref. 119], for overseas shipment.

5.1.12.2.4 General

1. All valve assemblies shall be prepared for shipment so that handling and unloading may be facilitated. At no time are valves, actuators, or accessories to be shipped in a disorderly arrangement or situation of disarray so as to promote damage or hamper inspection of the valves when received on the job site.

2. All valves, actuators, and accessories shall be packaged or crated to prevent deterioration, contamination, or physical damage during transit or storage. Any articles or material that may be otherwise lost shall be boxed or wired in bundles and marked for identification with the valve item number and supply order number.

3. Pressure containing casting and pressure controlling parts shall be traceable to the foundry by unique identification marking independently of the pattern owner marking. This identification mark shall be stamped or laser printed marking. Painted identification marks are not accepted.

4. The part identification mark shall identify the heat, ladle charge and the sequential number in the ladle.

5.1.13 Delivery and DRR

The purpose of the DRR is to review and validate Contractor’s documents, as developed in [Ref. 45]:

- CRN, template in Appendix 7.
- Delivery Report, template in Appendix 13
- Native-file Packing List, template in Appendix 12
- Storage & Preservation requirements, typical in Appendix 15
- Customs documents: Packing list and Pro-forma invoice, but other ad-hoc documents may be requested, as developed in [Ref. 20]
- Transportation Quality Plan (if “non-conventional” load)
- Lifting, handling, and/or Packing procedures or requirements
- and/or any other technical or logistical information that is needed so that the material can be adequately managed through transportation, reception, storage, preservation and ultimately into ITER construction and assembly.

No shipment is allowed without a successful DRR.

The transport of the valves and/or actuators shall be the responsibility of the Supplier. The selection of the transport company shall be at the contractor’s discretion and the Supplier shall be responsible for the transport to the delivery location. Further details will be provided for in the contract conditions.

Transportation arrangement shall in accordance with the Incoterm applicable per the Contract. Transportation falls in different categories depending on the largest individual packages(s) size & weight combination as per below table:

Acronym	Definition	Maximum Length (cm):	Maximum Width (cm):	Maximum Height (cm):	Maximum Weight (kg):
HEL	Highly Exceptional Load	1900	900	910	600000
CEL	Conventional Exceptional Load	1900	500	500	60000
CTL	Conventional Truck Load	1200	250	250	26000

For any critical transportation, a Transportation Quality plan shall be approved by the IO before shipment is organized. Critical Transportation includes:

- All HEL and CEL, regardless of safety & quality classification
- All PIC regardless of size, except bulk raw material (such as piping, fittings (i.e. elbows, tees), steel beams, and steel plates)
- Any additional special or sensitive components (i.e. requiring specific measures for protection and specific handling) as defined in the Technical Specification.

Delivery Readiness Review (DRR)shall be executed before each shipment planned to IO and other sites where free issued items are delivered, as applicable before IO obtains final custody. DRR mandatory documents are Contractor Release Note (CRN), Delivery Report, Packing List and Equipment Storage & Preservation Requirements. Ref. [45].

The DRR Gate is an official Hold Point (HP) and therefore must be approved as per first paragraph of this chapter prior to the start of transportation. This includes providing the Contract deliverables as per the Technical Specification and listed in above mentioned paragraph with the document names and relevant templates referenced, as per [Ref. 45]. All of these DRR deliverables shall be approved prior to pickup or collection at the Contractor's designated facility for delivery to ITER or other agreed location. After both the Release Note and Delivery Reports are approved, this signifies that the delivery may proceed as planned. The Contractor has to account for sufficient time for submission of the DRR documents (minimum 15 working days)

When the Contractor is in charge of the final delivery to ITER site, copies of the driver's passport or identify card shall be sent to logistics-planning@iter.org at least 24 hours prior to arrival to the IO site to ensure approval of Driver access.

If the items supplied are to be transported from non-EU countries to the IO site, the Contractor shall follow the requirements of [Ref. 20]. Regardless of whom is the LSP chosen by the Contractor, the GLC of IO is responsible to process the customs clearances for all shipments. The LSP chosen by the Contractor shall liaise with the IO GLC and the Contractor shall provide the necessary customs documentation to the GLC at the same time as when the export declaration is being done.

In case the Contractor requires the loan of a lifting or handling equipment owned by the IO, the Contractor shall follow the appropriate procedure and complete the relevant forms provided by the CRO. The Contractor is responsible to ensure the loan equipment is fit for purpose and used by duly qualified people.

Close-out

The close-out is the last contract gate. It is managed by the PRO in coordination with the CRO, checking that all the contractual aspects of the Contract have been fulfilled by each Party, with the exception of obligations surviving the delivery of the last milestone (such as but not limited to: warranty).

The PRO will send the close-out letter to the Contractor representative as per Appendix 5 for validation within 15 calendar days (passed this time, close-out will be considered approved by default by the Contractor).

This last gate does not call for a formal meeting unless agreed differently by the parties.

5.1.13.1.1 Delivery Location

Collection of the valves and/or actuators shall be at the designated location per Incoterms 2010. It shall be performed as Delivery at Place (DAP), with the place to be delivered as described below.

The valves and/or actuators shall be shipped to DAP 2010, ITER ORGANIZATION, St Paul les Durance, France ; supply order may have one or more delivery locations.

5.1.13.1.2 Delivery Date

The contractor shall respect the delivery dates indicated in the supply order, in accordance with the contractual lead time.

6 IO Documents

6.1 IO Documents: Document Submittal Schedule

Under this scope of work, IO will deliver the following documents by the stated date:
Nomenclature:
Column A – Before MRR; Manufacturing Readiness Review
Column B – After MRR; Manufacturing Readiness Review
Column C – Before DRR; Delivery Readiness Review
Column D – After DRR; Delivery Readiness Review
Column E – Document included in QA Data Package (QADP), QADP approval prior to IRN
ARO – After Receipt of Order
E – Electronic File (either TIFF or PDF, and native file format, for drawings, CD for instruction manuals)

Supplier Document Submittal Schedule

*****Below list is just guideline, it could be more added documents depends on valve type and quantity.

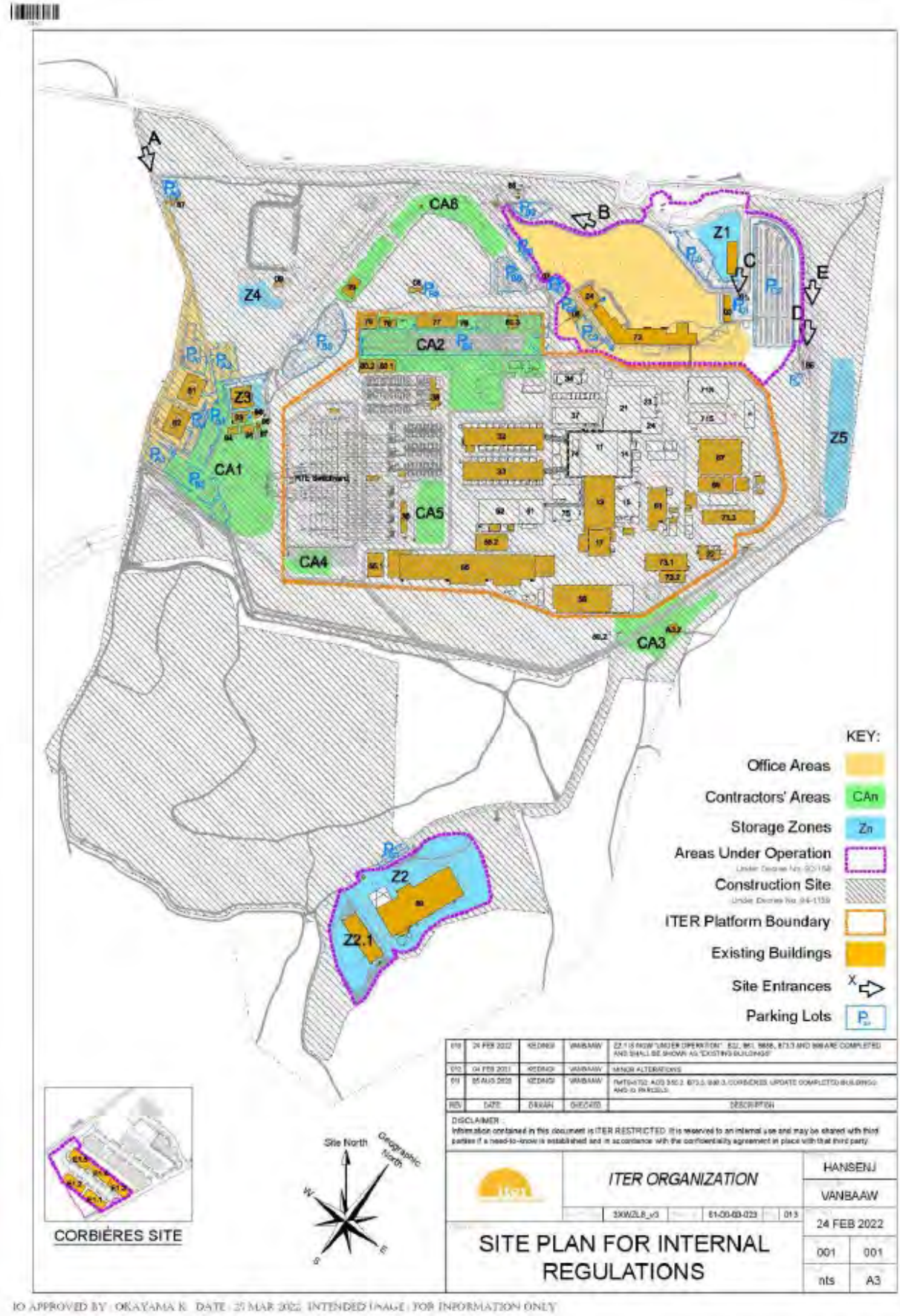
Item	Submittal Due Date	A	B	C	D	E
Project Quality Plan(Contractor, Subcontractor)	2 weeks before KOM	X				
Deliverable List (VPIS) including all relevant document list with issuing, returned and revised schedule table and ANB (ESPN) or NoBo (PED) correspondence status	4 weeks ARO	X				
Project Master Schedule	4 weeks ARO	X				
ITER Project Specific QA Plan	4 weeks ARO	X				X
Dimensional Outline Drawing of Valve and Actuator	8 weeks ARO	X				X
Cross-Section Drawings and Bill of Materials	8 weeks ARO	X				X
Product Procurement Specification for Materials	16 weeks ARO	X				X
EPMNs or (N)PMA for All Particular Materials Appraisal	16 weeks ARO	X				X
MRR Check List	12 weeks prior to MRR	X				
MRR Plan	18 weeks prior to MRR	X				
Technical Compliance Matrix	16 weeks ARO	X				
Dimensional Checking Procedure	16 weeks ARO	X				
List of DNRE	16 weeks ARO	X				
Cleaning Procedure	16 weeks ARO	X				
Manufacturing Procedure (Manufacturing Process)	16 weeks ARO	X				
Packing and Transportation Procedure with sketch (COG)	16 weeks ARO	X				
NDE Procedure (RT, UT, PT, VT)	16 weeks ARO	X				
Certificate of NDE Personnel	16 weeks ARO	X				
List of DNRE	16 weeks ARO	X				
Supplier and Sub-Supplier list	16 weeks ARO	X				
Machining Procedure	16 weeks ARO	X				
Fire Qualification Report	16 weeks ARO	X				
Weak Link Analysis Report	16 weeks ARO	X				
Design Report	16 weeks ARO	X				
Hazard & Risk Analysis Report	16 weeks ARO	X				
Inspectability Analysis Report	16 weeks ARO	X				
Justification of Retained solution	16 weeks ARO	X				
End of Manufacturing Visual Inspection	16 weeks ARO	X				
Each MPS(Material Procurement Specification)	16 weeks ARO	X				
Actuator Data	16 weeks ARO	X				X
Data for Accessories	16 weeks ARO	X				

Item	Submittal Due Date	A	B	C	D	E
Acceptable Pressure/Temperature Table, if not standard class valve	16 weeks ARO	X				
Interface Data	16 weeks ARO	X				
Quality Assurance Data Package (QADP)	16 weeks ARO			X		X
Parts List	16 weeks ARO			X		
Storage and Handling Procedures	12 weeks ARO			X		
Spare Parts List	8 weeks prior to DRR			X		X
Special Tools List	12 weeks ARO			X		X
Surface Preparation and Painting Procedures	16 weeks ARO	X				
Shop Test Procedures	16 weeks ARO	X				X
Limits and Precautions	16 weeks ARO			X		
Preventative Maintenance and Lubrication Schedule	8 weeks prior to DRR			X		
Qualification Program	12 weeks ARO	X				X
Qualification Procedure	20 weeks ARO	X				X
Seismic and Environmental Qualification Test Reports	24 weeks ARO	X				X
Functional Qualification Reports	24 weeks ARO	X				X
Analyses	24 weeks ARO	X				X
Shop Procedures	12 weeks ARO	X				
Weld Procedures and Welder Qualifications	16 weeks ARO	X				
Examination Surface Configuration and Finish	16 weeks ARO	X				
As-Built Drawings	18 weeks ARO	X				X
IRN (Inspection Release Note)	8 weeks prior to DRR					
Delivery Report Template	8 weeks prior to DRR					
Package & Packing List Template	8 weeks prior to DRR					
Equipment Storage & Preservation Requirement Form	8 weeks prior to DRR					
Packaging and Shipping Details	8 weeks prior to DRR		X			X
Instruction Manual final index and summary listing of inclusions	16 weeks ARO	X				X
Identify critical components of each valve assembly	16 weeks ARO	X				
Certified Material Test Reports	4 weeks prior to MRR	X				X
Certified Test Report(s)		X				X
Certificate of Cleanliness		X				X
Certificate of Conformance to Supply Order Requirements	8 weeks prior to DRR			X		X
Manufacturing and Inspection Plan (ESPN/ Non-ESPN)	12 weeks ARO	X				X
Pressure Boundary Thickness Measurement Procedure	16 weeks ARO	X				X
Preliminary Instruction Manuals (EPSN/PED)	24 weeks ARO	X				
Final Instruction Manuals (ESPN/PED)	28 weeks ARO	X				X
EOMR(End Of Manufacturing Report)	2 weeks after Item shipping	X				X
Pressure Boundary Thickness Measurement Procedure	16 weeks ARO	X				X

7 Appendices

1. Appendix 1: Valve List and Datasheet https://user.iter.org/?uid=9FB44G&version=v1.0
2. Appendix 2: Document Schedule GM3S-Appendix II-Document Schedule.doc
3. Appendix 3: KOM GM3S-Appendix-III_KOM_Template.doc
4. Appendix 4: Progress Report GM3S-Appendix_IV_Contractor_Progress_Report_Template.docx
5. Appendix 5: Close-out Letter GM3S-Appendix-V_Close-out Letter_Template.docx
6. Appendix 6: Subcontractor Acceptance Form GM3S-Appendix-VI_SAF.xlsx
7. Appendix 7: Contractor Release Note GM3S-Appendix-VII_Release Note Template.docx
8. Appendix 8: Inspection & Test Plan (MIP) GM3S-Appendix-VIII_Inspection_and_Test_Plan_Template.docx
9. Appendix 9: Request for Information Form GM3S-Appendix-IX_RFI_template.docx
10. Appendix 10: Deviation Request GM3S-Appendix-X_DR_Template.dotx
11. Appendix 11: Non Conformance Report GM3S-Appendix-XI-NCR_Template.dotx
12. Appendix 12: Package and Packing List GM3S-Appendix-XII Packing List Template.xlsx
13. Appendix 13: Delivery Report GM3S-Appendix-XIII_Delivery_Report_Template.docx
14. Appendix 14: Equipment Preservation Procedure GM3S-Appendix-XIV_Equipment_Preservation_Typical.docx
15. Appendix 15: Spare Part List GM3S-Appendix-XV_Spare Part_List_Template.xls
16. Appendix 16: Notification of Intervention Point GM3S-Appendix_XVI_Notification_for_intervention_points.docx
17. Appendix 17: Inspection and Test Plan (ITP) GM3S-Appendix_XVII_Inpection_and_Test_Plan_template.docx
18. Appendix 18: CCN Template GM3S-Appendix_XVIII_CCN_Template.docx

19. Appendix 19 IO Worksite and Site Map



QUESTIONNAIRE

MARKET SURVEY

Supply of Lot 2 Specialty Valve (ARC: Automatic Recirculation Valve)

We invite all potential companies, institutions or entities from ITER Member States to participate in this Market Survey by returning a completed questionnaire **no later than 6 November 2024 EOB time** , to the Procurement Officer in charge to the following email address yao.wu@iter.org in cc to jingyu.gao@iter.org.

This will help the IO in preparing a better overall package if we decide to tender this work.

The answers to the questions are not binding and are for information only.

1 General Information

Company Name:

Address:

Years in Operation:

Primary Industry Focus:

Representatives to be contacted:

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

2 Questions

2.1 Have your ever Designed and manufactured ARC: Automatic Recirculation Valves before? If Yes, please to mention a few reference projects and client name which were undertaken by your company.

YES ☐

NO ☐

Please provide a list of project/s and the technical conceptual brief of your ARC valve:

2.2 Having reviewed the attached technical specifications (ref. YWDX46_v1_4) as a reference, do you identify any blocking points for the design and manufacture? If yes, could you specify?

YES ☐

NO ☐

Please provide a list of deviations:

2.3 ***The schedule for the procurement of the ARC Valves will have to be respected imperatively. This entails:***

- ***Contract signature at the end of 2024;***
- ***Delivery lead time of ARC valve 24 months after contract signed.***
- ***DAP ITER Site (INCOTERMS)***

Do you see any blocking point in this schedule, if Yes, could you do specify your own proposal delivery lead time with an explanation as to why the IO proposed schedule is not feasible?

YES ☐

NO ☐

Please provide your own valve delivery lead time and schedule:

2.4 This question is about the raw material chemical composition limits. Do you meet below chemical composition of raw material? If No, please specify deviation of chemical composition.

- Co 0.20% Max

- Ta 0.05% Max

- Nb 0.10 Max

- In case of welding rods, Co and Boron 0.0018 wt % Max content shall be stipulated in mill certificate. (EN10204 3.1 type)

YES ☐

NO ☐

Please provide major deviations of chemical composition:

2.5 ***Do you have your own PED Certificate (Pressure Equipment Directive 2014/68/EU)? If yes, could you inform us of your type of module with description of pressure equipment items and Notified Body Name?***

YES ☐

NO ☐

Please inform PED certificate module and description of items and Notified Body name:

2.6 Do you have experience of ESPN French regulation application of your valve design and manufacturing?

YES ☐

NO ☐

Please specify your experience:

2.7 In addition to above 2.6, it shall be guaranteed that the valves are qualified to irradiation qualification as Min. 8 MGy. Could you meet this criteria?

YES ☐

NO ☐

Please specify if your answer is NO:

2.8 In addition to above 2.6, it shall be guaranteed that the valves are seismic qualified to 4.5g acceleration in every direction. Could you meet this criteria?

YES ☐

NO ☐

Please specify your limitataions if your answer is NO:

2.9 ***The valve internal leakage shall comply with Rate C of EN12266-1, the external leakage of stem, bonnet and flange (when applicable) shall comply with EN15848-1 & EN13555 Bh+L0.001+L0.01. could you meet this criteria?***

YES ☐

NO ☐

Please specify your limitations if your answer is NO:

2.10 Could you provide ARC valve + Counter Flanges set (Flanges, Gaskets and Fasteners) as well?

YES ☐

NO ☐

If NO, please to specify specific reasons:

2.11 Are you interested in applying for the Tender Process for the procurement of the Specialty Valve (ARC: Automatic Recirculation Valve)? IF yes, how much time do you need to prepare and be able to submit both technical and commercial offer?

YES ☐

NO ☐

Please provide your estimated time to submit the technical and commercial offer:

2.12 Do you wish to communicate any points of concern or would like to add anything over and above the answers previously provided?

YES ☐

NO ☐

Please provide a brief answer if deemed needed: