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Technical Specifications (In-Cash Procurement)

Technical Specification_Flowdown and DCM Production

The purpose of this contract is to provide to the Port Plug and Diagnostics Division (PPD) flow-down of requirements from top level ITER requirements documents down to individual diagnostics systems and associated Design Compliance Matrices - using DOORS [1] as tool.

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1 Purpose

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2 Background

The ITER project is a major step in the research for nuclear energy sources for the future. It has to be a highly reliable, efficient and safe device built to produce a predefined output quantity and quality of scientific data. The bulk of the scientific data will be produced through Diagnostic systems. The Plant Breakdown Structure (PBS) identifier for largest part of the Diagnostics systems is PBS 55 (Diagnostics). A recent addition to the set of diagnostics is PBS 57 which is the In-Vessel-Viewing-System (IVVS). The diagnostics have a significant number of requirements defined in the Systems Requirement Documents [2] - SRD-55 [3] and SRD 57 [4] respectively. SRD-55 covers in a single document the requirements for all (about 50-70 depending how the port systems are counted) individual diagnostics systems at a high level. SRD-57 covers only one system [5]. The 2010 baseline for PBS 55 diagnostics is described in the Plant Description Document [6]. A major revision of the 2010 baseline has been made in 2016 which has introduced a 4 phased approach and several additions to the set of diagnostics.

For PBS 55 IO-CT is in the process to flow the top level requirements from the PR [7] – via so-called S-RPM (Safety Requirement Propagation Matrix) and T-RPM (Technical-Requirement Propagation Matrix)– as well as the Defined Requirements down to SRD-55. For PBS 57 the S-RPM and The T-RPM have been produced and approved and the Defined requirements have been drafted (expected to be approved at the start of the contract).

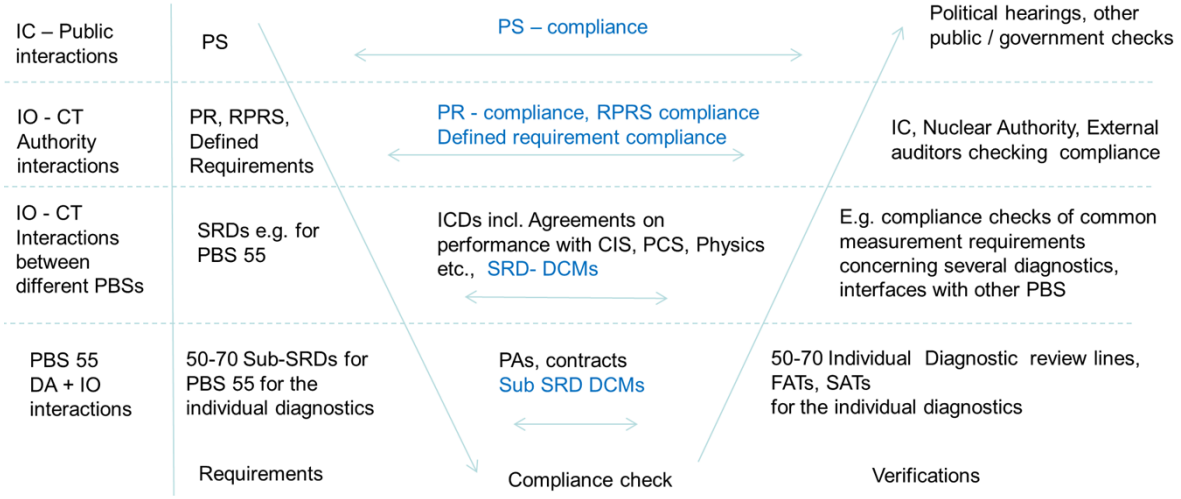

Fig. 1: Illustration of requirement flow-down for PBS 55 from Project specifications (PS) down to individual diagnostics Sub-SRDs as well as the use of Design Compliance Matrices for compliance checks at the various levels. Note that for PBS 57 the PA is signed at SRD level as there is only one system in this PBS.

Figure 1 illustrates the requirements flow-down for PBS 55 from global Project specifications down to the individual diagnostics level, which is the Sub-SRD level. For PBS 57 the equivalent flow-down stops at the system level, since there is only one diagnostic in this PBS. At each flow-down step from PS over PR and SRD to SSRD the requirements become more

specific. All up-stream requirements which are applicable to a system must be captured in the applicable requirements document for the system. The other characteristic of the requirements is that they need to be **measurable, attainable, realizable and traceable** (S.M.A.R.T. requirements).

For the control of how requirements are fulfilled and propagated Design Compliance Matrices (DCMs) [8] are used at ITER.

3 Scope

The scope of the present contract comprises planning of the project, development of the work plan and schedule, update of SRDs, production and review of Sub-SRDs and DCMs within DOORS, project monitoring and conflict resolution, if any, and transition plan if further requirements management is needed.

The final goal is to establish the following:

- Update of the SRD 55 to include PCR 738 and other PCRs as occurring during the period of the contract;
- Production or update of 50-70 Sub-System Requirement Documents (SSRDs) for PBS 55;
- Production or update of 50-70 Design Compliance Matrices for PBS 55;
- Review of up to 50-70 SSRDs from DAs – including 11 with requirements extracted from Handbooks for PBS 55;
- Review of relevant requirements from Handbooks from the DOORS database.
- Update of SRD 57 to include S-RPM and T-RPM, Defined Requirements, PCR 738 and other PCRs as occurring during the period of the contract;
- Production of DCM for SRD 57
- Production of a transitional plan for continuation of requirement management for PBS 55 and 57.

The work is needed as foundation for all further stages of the lifecycle of the concerned diagnostics systems.

4 Definitions

For the general list of ITER abbreviations see [4]

DOORS:	acronym for the database in which SRD requirements are kept
IO-CT:	**I**TER **O**rganization **C**entral **T**eam
IO-DA:	**I**TER **O**rganization **D**omestic **A**gency
IVVS:	In-Vessel-Viewing-System
PBS:	**P**lant **B**reakdown **S**tructure
PCR:	Project Change Request
PD:	Plant Description
PPD:	**P**ort **P**lug and **D**iagnostic
RO:	Responsible Officer
RPrS:	“Rapport Preliminaire Surete” translated: Preliminary Safety Report
SRD:	**S**ystems **R**equirement Document
SSRD:	Sub-SRD

Supplier: In this document the word Supplier is a short form for the service provider who has successfully bid for this contract and his acting agent(s)

5 References

[1] https://reports.iter.org/Reports/Pages/Report.aspx?ItemPath=/Data Exchange/DOORS Database
[2] ITER_D_25DSU2 - Procedure for the Preparation, Review and Approval of SRDs
[3] SRD-55 (Diagnostics) from DOORS (28B39L)
[4] SRD-57 IVVS from DOORS (29NC9X v4.1)
[5] DDD for IVVS (P7MTX3 v1.6)
[6] PD Ch-08 Diagnostics (2WBD7N v2.2)
[7] ITER_D_27ZRW8 - Project Requirements (PR)
[8] ITER_D_473LQM - Design Compliance Matrix Procedure
[9] ITER Abbreviations (2MU6W5 v1.15)
[10] Diagnostics_Systems_list_and_Design_plan (R7ELHH v2.1)
[11] ITER Procurement Quality Requirements (ITER_D_22MFG4)
[12] Procurement Requirements for Producing a Quality Plan (ITER_D_22MFMW)
[13] Quality Assurance for ITER Safety Codes (ITER_D_258LKL)
[14] PRELIMINARY ANALYSIS OF THE IMPACT OF THE INB ORDER - 7TH FEBRUARY 2012 (AW6JSB v1.0)

6 Estimated duration

The maximum duration for this work is 12 months.

7 Work description: Diagnostics requirement flow down and DCM production

The envisaged requirement management and flow down project shall create system specific customised requirement documents corresponding to each sub-system level, which provide more specific, organized and focused requirements. The creation of requirement documents at the level of individual diagnostics, so-called Sub-SRDs (for PBS55) and SRD (for PBS 57), is essential to track and follow their specific requirement in an effective manner. Since the development of the systems is already well engaged this project needs to be carried out as soon as possible. The relevant Design Compliance Matrixes are to be derived from the SRDs (for PBS 55 and PBS 57) and the SSRDs for PBS 55. An important feature is the traceability of the requirements through the DOORS database. The work is to be performed in DOORS.

System specific input for the work for PBS 55 is the recently updated System Requirement Document (SRD 55v5) and more detailed existing sub-system requirements as defined in the various applicable documents as listed (or referenced within these listed documents) in the list of PPD projects [10] and also in handbooks or interface documents from and with other PBSs (see the list of applicable documents in the Procurement Annexes B listed in [10]).

System specific inputs for the work for PBS 57 are the existing SRD 57, the respective S-RPM, T-RPM and also the respective Defined Requirements, when they become available, and more detailed existing requirements as defined in various applicable documents.

Consequences of PCRs that are pending or occur during the duration of the contract shall be included in the SRD as needed.

Through the project period, the Supplier together with the project manager assigned from PBS-55 shall follow up the work stream of SSRD creation. The project managers should communicate with SSRD creators frequently to support them if they are facing any difficulties with their interface, and further support them to solve any conflicts with their interfaces, in order to create SSRDs in a limited project period. However, due to the ITER project nature, some of the SSRD creation may be differed to a later stage if the project owner see the need to re-allocate resources to other priorities than SSRD creation work. Such decisions shall be reported in Monthly steering meeting report.

The Supplier is expected to provide the DOORS support and the general requirement management support as well as the managerial support needed for the work described in the following.

7.1 Team and work-plan creation

The project team shall be formed from ROs of the PBS-55 and PBS-57 staff, and the Supplier shall initially evaluate the capabilities and resources of PBS-55 and PBS-57 within the given time frame to plan the project strategy. Upon starting project planning, the Supplier shall assess the existing SRD-55 and SRD-57 and the SSRDs which have been drafted, to plan the statement of work and work stream considering given project formation.

7.2 SRD 55

For the beginning of the contract it is assumed that SRD-55 has recently been updated to version 5 (inclusion of Project Requirements through S-RPM, T-RPM and Defined Requirements), and that this SRD is available as DOORS module. Furthermore it is assumed that no change of the content has been made with regards to measurement requirements nor with regards to which diagnostic contributes to which measurement. Such updates are foreseen now as part of this contract and shall be done as needed, normally after the corresponding SSRD for the subsystem has been approved. They require Deviation Requests and/or PCRs. The writing of the Deviation Requests or PCRs is not part of the contract, but the inclusion of the consequences into the SRD is. Typically for PBS55 there are about 10-20 PCRs per year to deal with. Not all have impact on SRDs. It is assumed that 5 PCRs will have an impact.

One PCR which is already approved (PCR 738), but not fully implemented yet, requests that the four phases of the project shall be reflected in the SRDs and that some additional diagnostics are incorporated into the existing suite of diagnostics from the 2010 baseline. The implementation of this should be one of the early deliverables. It involves creation of matrices of which diagnostic is available when and indications how well the required measurements are covered in the different phases. The methods and tools for this exist from the previous one-phase approach. A data-base RO and the systems ROs from PBS 55 will support the creation of the matrices.

Another – foreseen, but not yet launched - PCR concerns the update of the measurement requirements for the erosion, re-deposition, dust and tritium measurements. For this PCR the measurement requirements in the SRD need to be updated according to already existing tables due to previous activities inside PBS 55. The necessary decisions on what to implement will have to be taken by the ROs.

7.3 DCM for SRD 55

In the past DCMs were created not for PBS 55 as a whole but for individual diagnostics systems using applicability statements as low-pass filter and compliance statements to indicate the actual state of compliance of the individual diagnostic. Here we want to create for the first time a DCM for the whole of PBS 55. The main emphasis is on the system wide measurement requirements and other system wide requirement allocations like shut down dose rate, worker dose etc. This DCM shall bring together the sum of the SSRDs contributions to these system wide requirements. The aim is to allow monitoring how well the individual diagnostics contributing to one requirement cover the system wide requirement. A first version of this top-level DCM shall be made when a minimum number of SSRDs (approximately 10-20) are available, which should be the case at the beginning of the contract. Further updates are foreseen as further SSRDs become available and as PCRs are processed.

7.4 SSRDs for PBS 55

7.4.1 Level 1 SSRDs

Level 1 SSRDs (low pass filtered from SRD 55v5 in DOORS via applicability judgement by the ROs but not containing more details) are to be created containing only that part of the content of the parent SRD which is applicable to the specific diagnostic system.

It is assumed that at the beginning of the contract a certain number (at least 10) of level 1 Sub-SRDs will have been produced already. For those systems for which level 1 Sub-SRDs do not yet exist, they will have to be created: about 40-60 are expected to be created depending on the way diagnostics are grouped.

Once a SSRD has been created based on the requirements selected, the requirements will be edited inside the SSRD to ensure they are specific to the sub-system.

A link set will be created within the DOORS database to show traceability to the parent requirement located in SRD 55.

The software management tool that will be used is the DOORS in which all SRDs are written.

The ROs are needed to make the decision on the flow-down of the requirements from SRD 55v5.

7.4.2 Level 2 SSRDs

A certain number (of the order of 5) of so called level 2 SSRDs which contain also more system specific details coming from PAs, DDDs, memos etc. are assumed to exist as well. The other SSRDs (45-65 in total depending on how many systems can be combined in one SSRD) will have to be brought up to at least the level 2.

Specifically for I&C requirements, currently a strategy for how to capture the requirements has not been defined. The Supplier will need to provide support to IO staff on a strategy of how this can be implemented in the most efficient way. Where requirements do not exist, requirements will have to be written to ensure suitable detail can be flowed down into the level 2 SSRDs.

In some cases requirements (assumed 5 cases) may need to be written from scratch based on the technical information available (e.g for some of the new diagnostics systems/subsystems that are introduced through PCRs).

This work relies on support by the ROs of the systems.

7.4.3 Level 3 SSRDs

Some SSRDs (up to 11) (so called level 3 SSRDS) will have been supplied or will be supplied by F4E including requirements extracted from various handbooks.

The concerned diagnostics are the following: Feedthroughs, Ports, Plasma Position Reflectometer, Wide Angle Viewing System, Core Plasma Thomson Scattering, Collective Thomson Scattering, Electrical services in Divertor Components, Bolometers, Radial Neutron Camera, Pressure Gauges and Charge Exchange Recombination System. Such SSRDs will have to be reviewed to ensure the content is correct and consistent with the approach used by IO.

A number of technical handbooks are available within the DOORS database, approximately 12 handbooks. The most important handbooks are: Electrical Design Handbook, Plant Control Design Handbook, Tritium Handbook, Vacuum Handbook, Seismic Nuclear Safety Approach, Load Specification, Radiation Hardness manual, Remote Handling Code of Practice.

These will have to be reviewed with the ROs for applicability for the respective systems and the SSRs need to be amended as needed – also for conditional requirements in case there are potential new requirements through future design changes (e.g. water cooling). For the moment it is not foreseen to extent this work to other SSRDs than those for the 11 F4E diagnostic systems.

7.4.4 Update of SSRDs for PCRs and other requirement sources

Furthermore the SSRDs need to be updated to account for the PCR 738 (4 phased approach) induced changes to the SRD 55 in a flow-down fashion. The ROs have to make the decisions of how the implementation shall be made.

The same is true for requirement changes from other PCRs.

These updates shall be included into the SSRDs regardless of the particular level at which they are – with the decision on the applicability to be made by the ROs.

It is assumed that requirements in interface documents and load-specs are not extracted to the SSRDs but that these documents are referenced in the SSRDs as containing applicable further requirements.

7.5 DCMs for SSRDs for PBS 55

Sub-SRD DCMs need to be created – in DOORS - on the basis of the SSRDs. It shall be indicated which requirements apply to a DA and which ones apply to IO. The decisions have to be made by the ROs.

The SSRD DCMs shall be produced closely after the production (and approval – for the highest level SSRDs to be produced for the concerned systems) of the SSRDs.

7.6 SRD 57

Contrary to PBS 55 where the project requirements have been included already, For SRD-57 the update to include the relevant project requirements has still to be made by including all

requirements from S-RPM and T-RPM and Defined Requirements. The required decisions have to be made by the RO.

Requirement changes from pending PCRs (in particular PCR 738) and new PCRs (e.g. it is expected that a calibration feature for PBS 55 diagnostics may have to be incorporated into the in-vessel viewing system) shall be incorporated into the SRD 57.

For I&C requirements, currently a strategy for how to capture the requirements has not been defined. The Supplier will need to provide support to IO staff on a strategy of how this can be implemented in the most efficient way. Where requirements do not exist, requirements will have to be written to ensure suitable detail can be flowed down into the SRD.

7.7 DCM for SRD 57

On the basis of the updated version(s) of SRD 57 a DCM needs to be created and if needed updated. It shall be indicated which requirements apply to a DA and which ones apply to IO. The decisions have to be made by the RO.

The DCM shall be produced and updated closely after the approval of the updated version(s) of the SRD.

7.8 Transitional plan

3 months before the end of the contract period, a transitional plan shall be drawn up – if needed - for how the requirement management has to continue after the end of the contract.

7.9 Summary report

At the end of the contract a summary report shall be delivered.

8 Responsibilities

8.1 Contractor's Responsibilities

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

• Strictly implement the IO procedures, instructions and use templates;

• Provide experienced and trained resources to perform the tasks;

• Contractor's personnel shall possess the qualifications, professional competence and experience to carry out services in accordance with IO rules and procedures;

• Contractor's personnel shall be bound by the rules and regulations governing the IO ethics, safety and security IO rules.

8.2 IO's Responsibilities

The IO shall:

• Nominate the Responsible Officer to manage the Contract;

• Organise a monthly meeting(s) on work performed;

• Provide offices at IO premises.

9 List of Deliverables and Due Dates

9.1 Project Charter, Statement of Work and detailed Work schedule

The first deliverable will be a document that describes the actual work-scope (updated - if needed - against the assumed work-scope as described in section 7) and how to achieve it. While the charter contains the overall project formation, the Statement of Work describes the approach in more detail. This Charter and Statement of Work shall be presented at the first monthly steering meeting. After the evaluation of the team members' resources, a detailed work schedule with corresponding owners resourcing plan shall be prepared.

Target date for Charter, Statement of work and first detailed work-schedule: T_0+ 1 month

The work schedule shall be updated at every end of the month. Target dates: T_0+ 2 months, …, T_0+ 12 months.

9.1.1 Updates of SRD 55 and production and updates of DCM for SRD 55

Main deliverables for SRD 55 updates from section 7.2 and predicted target dates:

- Inclusion of PCR 738 into SRD 55 (target date: T_0+ 2 months)
- Inclusion of Dust, Erosion, Re-deposition, Tritium requirements PCR into SRD 55 (still to be launched) outcome (T_0+ 6 months)
- Provision for inclusion of 3 other PCRs and deviation requests into SRD 55 (target date: T_0+ 12 months)
- Update of requirements and contributing diagnostics in SRD 55 as arriving from SSRD work (target date: T_0+ 12 months)

Main deliverables for production and updates of DCM for SRD 55 from section 7.3 and predicted target dates:

- Creation of first version of DCM for PBS 55 on the basis of SRD55v5 (target date T_0+ 1 month)
- Update of DCM for PBS 55 after inclusion of PCR 738 (target date T_0+ 2 months)
- Update of DCM for PBS 55 after inclusion of dust erosion re-deposition tritium requirements (target date T_0+ 6 months)
- Update of DCM including other PCRs if needed (Target date: T_0+ 12 months)

9.1.2 Production of Level 1 SSRDs and associated DCMs

Main deliverables for Level 1 SSRDs from section 7.3 and predicted target dates:

- Creation 40-60 level 1 SSRDs on the basis of SRD55v5 (target date T_0+ 4 month)

Main deliverables for level 1 DCMs from section 7.5 and predicted target dates:

- Creation 50-70 level 1 DCMs (target date T_0+ 4 month)

Main deliverables for Level 1 SSRDs and DCMs from section 7.4.4:

- Update of 50-70 level 1 DCMs (target date T_0+ 12 month)

9.1.3 Production of Level 2 SSRDs and associated DCMs

Main deliverables for level 2 SSRDs from section 7.4.2 and predicted target dates:

- Creation 50 level 2 SSRDs from existing docs (target date T_0+ 11 months)
- Development of IC requirements for 50 SSRDs (target date T_0+ 11 months)
- Creation of 5 level 2 SSRDS from scratch for PBS 55 (target date T_0+ 11 months)

Main deliverables for level 2 DCMs from section 7.5 and predicted target dates:

- Creation 50 level 2 DCMs for PBS 55(target date T_0+ 11 month)

The production of these level 2 SSRDs and DCMs are considered as major step towards what is needed to fulfil the diagnostic requirement management mission in general.

9.1.4 Production of Level 3 SSRDs and associated DCMs

Main deliverables for level 3 SSRDs from section 7.4.3 and predicted target dates:

- Review and update of 11 level 3 SSRDs including relevant requirements from 12 handbooks (target date T_0+ 11 months)

Main deliverables for level 3 DCMs from section 7.5 and predicted target dates:

- Creation 11 level 3 DCMs (target date T_0+ 11 month)

The production of these level 3 SSRDs and DCMs are considered as major step towards what is needed to fulfil the diagnostic requirement management mission with regards to F4E diagnostics in particular.

9.1.5 Update of SRD and production of DCM for PBS 57 In-Vessel Viewing System

Extract of main deliverables for SRD 57 from section 7.6 and predicted target dates:

- Inclusion of S-RPM, T-RPM and Defined Requirements and PCR 738 into SRD 57 (target date: T_0+ 3 months)
- Inclusion of PCR on calibration feature – if PCR approved (target date: T_0+ 6 months)
- Development and Inclusion of IC requirements (target date: T_0+ 11 months)

Extract of main deliverables for DCM from section 7.7 and predicted target dates::

- Creation of DCM 57 including S-RPM, T-RPM and Defined Requirements and PCR 738 (target date: T_0+ 3 months)
- Update of DCM for inclusion of PCR on calibration feature (target date: T_0+ 6 months)
- Update of DCM for inclusion of IC requirements (target date: T_0+ 11 months)

9.2 Transition Plan and Execution Summary

Extract of main deliverable from section 7.8 and predicted target dates:

- Transition plan (target date: T_0+ 9 months)

Extract of main deliverable from section 7.9 and predicted target dates::

- Execution Summary (target date: T_0+ 12 months)

9.3 Monthly Steering Meeting Report

At the end of each month, a brief summary of the progress of the project has to be submitted.

9.4 Table of Deliverables and Due Dates

The following table makes the assumption that relevant handbooks are available in DOORS and that the ITER ROs are available as needed. If these assumptions are not met other combinations of deliverables can be agreed.

Deliverables according to assumed status and priorities of ITER project* and assuming availability of ROs for work to be done under supervision**

Deliverable #	Sub item #	Deliverable Description	Max. Delay after T0 (months)
D1	1	**Monthly report #1**	$T_0 + 1$
	2	Project charter	
	3	Statement of Work	
	4	1st detailed Work schedule	
	5	Creation of first version of DCM for PBS 55 on the basis of SRD55v5	
	6	Review and update of #1 level 3 SSRD including relevant requirements from 12 handbooks	
	7	Creation of #1 level 3 DCM for PBS 55	
D2	1	**Monthly report #2**	$T_0 + 2$
	2	Inclusion of PCR 738 into SRD 55	
	3	Update of DCM for PBS 55 after inclusion of PCR 738	
	4	Creation level 1 SSRDs #1-#20 on the basis of SRD55v5	
	5	Creation level 1 DCMs #1-#20 for PBS 55	
	6	Review and update of #2 level 3 SSRD including relevant requirements from 12 handbooks	
	7	Creation of #2 level 3 DCM for PBS 55	
	8	Update of workschedule #1	
D3	1	**Monthly report #3**	$T_0 + 3$
	2	Creation level 1 SSRDs #21-#40 on the basis of SRD55v5	
	3	Creation level 1 DCMs #21-#40 for PBS 55	
	4	Creation level 2 SSRDs #1-#5 from existing docs for PBS 55	
	5	Development and inclusion in SSRDs of IC requirements for level 2 SSRDs #1-#5	
	6	Creation of level 2 DCMs #1-#5 for PBS 55	
	7	Review and update of #3 level 3 SSRD including relevant requirements from 12 handbooks	
	8	Creation of #3 level 3 DCM for PBS 55	
	9	Inclusion of S-RPM, T-RPM and Defined Requirements and PCR 738 into SRD 57	
	10	Creation of DCM 57 including S-RPM, T-RPM and Defined Requirements and PCR 738	
	11	Creation level 2 SSRDs #6-#10 from existing docs for PBS 55	

	12	Development and inclusion in SSRDs of IC requirements for level 2 SSRDs #6-#10	
	13	Creation of level 2 DCMs #6-#10 for PBS 55	
	14	Update of workschedule #2	
D4	1	**Monthly report #4**	T_0 + 4
	2	Creation of remaining level 1 SSRDs #41-#... on the basis of SRD55v5	
	3	Creation of remaining level 1 DCMs #41- #... For PBS 55	
	4	Creation level 2 SSRDs #11-#15 from existing docs for PBS 55	
	5	Development and inclusion in SSRDs of IC requirements for level 2 SSRDs #11-#15	
	6	Creation of level 2 DCMs #11-#15 for PBS 55	
	7	Review and update of #4 level 3 SSRD including relevant requirements from 12 handbooks	
	8	Creation of #4 level 3 DCM for PBS 55	
	9	Update of workschedule #3	
D5	1	**Monthly report #5**	T_0 + 5
	2	Inclusion of Dust, Erosion, Re-deposition, Tritium requirements PCR into SRD 55	
	3	Update of DCM for PBS 55 after inclusion of dust erosion re-deposition tritium requirements	
	4	Creation level 2 SSRDs #16-#20 from existing docs for PBS 55	
	5	Development and inclusion in SSRDs of IC requirements for level 2 SSRDs #16-#20	
	6	Creation of level 2 DCMs #16-#20 for PBS 55	
	7	Creation from scratch #1 of a level 2 SSRD for PBS 55	
	8	Review and update of #5 level 3 SSRD including relevant requirements from 12 handbooks	
	9	Creation of #5 level 3 DCM for PBS 55	
	10	Update of workschedule #4	
D6	1	**Monthly report #6**	T_0 + 6
	2	Inclusion of (yet to define) PCRor deviation request #1 into SRD 55	
	3	Creation level 2 SSRDs #21-#25 from existing docs for PBS 55	
	4	Development and inclusion in SSRDs of IC requirements for level 2 SSRDs #21-#25	
	5	Creation of level 2 DCMs #21-#25 for PBS 55	
	6	Review and update of #6 level 3 SSRD including relevant requirements from 12 handbooks	
	7	Creation of #6 level 3 DCM for PBS 55	

	8	Inclusion of PCR on calibration feature for PBS 55 into SRD 57 – if PCR approved	
	9	Update of DCM 57 for inclusion of PCR on calibration feature - if PCR approved	
	10	Update of workschedule #5	
D7	1	**Monthly report #7**	$T_0 + 7$
	2	Creation level 2 SSRDs #26-#30 from existing docs for PBS 55	
	3	Development and inclusion in SSRDs of IC requirements for level 2 SSRDs #26-#30	
	4	Creation of level 2 DCMs #26-#30 for PBS 55	
	5	Review and update of #7 level 3 SSRD including relevant requirements from 12 handbooks	
	6	Creation of #7 level 3 DCM for PBS 55	
	7	Update of workschedule #6	
D8	1	**Monthly report #8**	$T_0 + 8$
	2	Creation level 2 SSRDs #31-#35 from existing docs for PBS 55	
	3	Development and inclusion in SSRDs of IC requirements for level 2 SSRDs #31-#35	
	4	Creation of level 2 DCMs #31-#35 for PBS 55	
	5	Creation from scratch #2 of a level 2 SSRD for PBS 55	
	6	Review and update of #8 level 3 SSRD including relevant requirements from 12 handbooks	
	7	Creation of #8 level 3 DCM for PBS 55	
	8	Update of workschedule #7	
D9	1	**Monthly report #9**	$T_0 + 9$
	2	Inclusion of (yet to define) PCR or deviation request #2 into SRD 55	
	3	Update of PBS 55 DCM including PCR or deviation request #2	
	4	Creation level 2 SSRDs #36-#40 from existing docs for PBS 55	
	5	Development and inclusion in SSRDs of IC requirements for level 2 SSRDs #36-#40	
	6	Creation of level 2 DCMs #36-#40 for PBS 55	
	7	Creation from scratch #3 of a level 2 SSRD for PBS 55	
	8	Review and update of #9 level 3 SSRD including relevant requirements from 12 handbooks	
	9	Creation of #9 level 3 DCM for PBS 55	
	10	Transition plan	
	11	Update of workschedule #8	
D10	1	**Monthly report #10**	$T_0 + 10$

	2	Creation level 2 SSRDs #41-#45 from existing docs for PBS 55	
	3	Development and inclusion in SSRDs of IC requirements for level 2 SSRDs #41-#45	
	4	Creation of level 2 DCMs #41-#45 for PBS 55	
	5	Creation from scratch #4 of a level 2 SSRD for PBS 55	
	6	Review and update of #10 level 3 SSRD including relevant requirements from 12 handbooks	
	7	Creation of #10 level 3 DCM for PBS 55	
	8	Update of workschedule #9	
D11	1	**Monthly report #11**	T_0 + 11
	2	Creation level 2 SSRDs #46-#50 from existing docs for PBS 55	
	3	Development and inclusion in SSRDs of IC requirements for level 2 SSRDs #46-#50	
	4	Creation of level 2 DCMs #46-#50 for PBS 55	
	5	Creation from scratch #5of a level 2 SSRD for PBS 55	
	6	Review and update of #10 level 3 SSRD including relevant requirements from 12 handbooks	
	7	Creation of #11 level 3 DCM for PBS 55	
	8	Development and Inclusion of IC requirements for PBS 57	
	9	Update of DCM for PBS 57 for inclusion of IC requirements	
	10	Update of workschedule #10	
D12	1	**Execution summary**	T_0 + 12
	2	Inclusion of (yet to define) PCR or deviation request #3 into SRD 55	
	3	Update of requirements and contributing diagnostics in SRD 55 as arriving from SSRD work	
	4	Update of all DCMs to reflect latest SSRDs	

*Re-prioritisation of the tasks depending on ITER Project needs within the current scope may be needed and will be discussed and agreed between the IO-RO and the Contractor.

**If ROs are not sufficiently available to keep up the pace of the production, the scope needs to be adjusted in agreement with IO.

10 Acceptance Criteria

Acceptance of the deliverables shall be examined at each due period of monthly steering meeting. These will be in the form of monthly progress reports as indicated in section 8.4. They shall be reviewed by the RO of the contract or his delegate for acceptance.

11 Specific requirements

This task will require two engineers. Engineer 1 will have a full time presents at IO, as this will be required for the day-to-day duties of the task. Engineer 2 will be required to spend 25% of the time located at IO; the remaining 75% of the time can be spent either at the suppliers office or alternatively at IO.
The starting date of the work in ITER Organization should be 2 to 3 weeks after the decision to active the contract corresponding to the date at which the company has been informed.

Deliverables shall be delivered in the following formats:

- Monthly Progress Reports - MS Word using an ITER official template;
- SSRDs - DOORS modules;
  - MS Word export from DOORS.
- DCMs - MS Excel export from DOORS.

Note. Deliverables in Excel and Word format will be uploaded to the specific IDM location before the end of the task order. DOORS modules will be stored on the DOORS database folder in a directory allocated by the IO DOORS administrator. Full access to the DOORS modules shall be granted to the IO DOORS administrator.

The supplier shall be able to demonstrate the following technical skills and experience in providing the service:

- Experience in System Engineering, I&C, Electrical Engineering, Mechanical Engineering, Nuclear Safety, RAMi Analysis; (An appreciation of complex Diagnostic systems would be advantages);
- Ability to capture, translate and write requirements;
- Understanding of how requirements flow down from project level to sub-system level;
- Experience in the field of large scientific experiments or equivalently complex high technology projects;
- Experience in Nuclear Fusion/Fission is very important;
- Experience using DOORS for requirement management; (experience using the MIR cockpit developed by F4E would be advantages);
- Ability to balance quality/risk/cost of projects;
- Ability to work in multidisciplinary, international team environment;
- Ability to demonstrate the work deliverables to Engineers, Physicists and Management;
- Knowledge of Quality Assurance systems and their practical application;

12 Work Monitoring / Meeting Schedule

The progress of the work shall be monitored monthly, and it shall be reviewed at monthly steering meeting, which is primary scheduled at the end of each month. ITER and the contractor may discuss to revise the meeting schedule in accordance with the project progress.

13 Delivery Time Breakdown

The first few weeks of the project shall be spent for initial assessment and preparation of the project charter and the statement of work.

Until the end of the 2nd month will be spent producing a DCM, and Applicability Matrix based on requirements selected from the parent document SRD 55.

3rd, 4th & 5th months shall be spent updating and producing level 1 SSRDs until the completion of 50 level 1 SSRDs and producing DCMS for each SSRD.

The 6th, 7th, 8th, 9th and 10th months will involve requirement capture of additional lower level requirements not present in the parent requirement document SRD 55; a 2nd DCM shall be produced containing the requirements that have been captured and then will undergo a review process between the supplier and ITER ROs.

The 10th and 11th months will be used producing level 2 SSRDs and individual DCMs to show all requirements captured per SSRD.

Throughout the task order duration, SSRDs received from the ITER DAs will be reviewed.

By month 12 SRD 57 for the In-Vessel Viewing System will have been updated, SSRDs released from the DAs will have been reviewed and all relevant Handbooks within the DOORS database will have been exported into MS Word format.

The project shall be complete 1 year from the project kick off.

14 Quality Assurance (QA) Requirements

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

The general requirements are detailed in [11].

Prior to commencement of the task, a Quality Plan must be submitted for IO approval giving evidence of the above and describing the organisation for this task; the skill of workers involved in the study; any anticipated sub-contractors; and giving details of who will be the independent checker of the activities (see [12]).

Documentation developed as the result of this task shall be retained by the performer of the task or the DA organization for a minimum of 5 years and then may be discarded at the direction of the IO. The use of computer software to perform a safety basis task activity such as analysis and/or modelling, etc. shall be reviewed and approved by the IO prior to its use, in accordance with [13].

15 Safety Requirements

ITER is a Nuclear Facility identified in France by the number-INB-174 (“Installation Nucléaire de Base”).

For Protection Important Components and in particular Safety Important Class components (SIC), the French Nuclear Regulation must be observed, in application of the Article 14 of the ITER Agreement.

In such case the Suppliers and Subcontractors must be informed that:

- The Order 7th February 2012 applies to all the components important for the protection (PIC) and the activities important for the protection (PIA).
- The compliance with the INB-order must be demonstrated in the chain of external contractors.
- In application of article II.2.5.4 of the Order 7th February 2012, contracted activities for supervision purposes are also subject to a supervision done by the Nuclear Operator.

For the Protection Important Components, structures and systems of the nuclear facility, and Protection Important Activities the contractor shall ensure that a specific management system is implemented for his own activities and for the activities done by any Supplier and Subcontractor following the requirements of the Order 7th February 2012 [14].