

Technical Specifications (In-Cash Procurement)

SRD-55 requirement flow down analysis and production

Project Management for SRD-55 requirement flow down

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1 Purpose

The ITER project is a major step in the research for nuclear energy sources for the future. It has to be 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 the Diagnostics systems is PBS 55. It has a significant number of requirements defined in the Systems Requirement Document SRD-55 [1] which covers in a single document the requirements for all different sub-systems at a high level. An overview of the diagnostics of ITER is given in the Plant Description Document [2] which describes the baseline configuration for the ITER diagnostics.

The Port Plug and Diagnostic Division (PPD) which is in charge of PBS 55 has a scope of more than 100 projects [3] most of which belong to PBS 55. With this number of projects and associated sub-systems PBS 55 has one of the largest number of sub-systems amongst all the different ITER PBSs, and now it needs to flow the top level requirement from SRD-55 [1] down into specific sub-system requirements in a way that is compatible on one hand with the top-level SRD-55 document and on the other hand with the more detailed existing sub-system requirements as defined in the various approved documents as listed (or referenced within these listed documents) in the list of PPD projects [3] and finally also in the handbooks or interface documents from other PBSs (see the list of applicable documents in the Procurement Annexes B listed in [3]).

The purpose of this contract is to initiate and manage such restructuring of requirement flow down of SRD-55 at PPD in an efficient manner.

The final goal is to establish 50 up-to-date child-SRDs (sub-system SRDs) of SRD-55 within a limited time frame of maximum 1 year in order to allow the ITER Diagnostic sub-systems to fully benefit from the improved requirement situation. The work is needed as foundation for all further stages of the lifecycle of the concerned subsystems.

2 Scope

The scope of the SRD-55 requirement flow down project comprises initiation and planning of the project, development of the work plan and schedule, supervising the production of 50 child-SRDs to variable degrees of detail depending on the available sub-system specific information and the available support by ITER ROs and the priorities of ITER, project monitoring and conflict resolution, if any, and transition plan if further child-SRD development is needed.

3 Definitions

For the general list of ITER abbreviations see [4]

DOORS: acronym for the database in which SRD requirements are kept

IO-CT: **ITER Organization Central Team**

IO-DA: **ITER Organization Domestic Agency**

PBS: **Plant Breakdown Structure**

PD: **Plant Description**

PPD: **Port Plug and Diagnostic**

RO: **Responsible Officer**

SRD: **Systems Requirement Document**

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)

4 References

- [1] [SRD-55 \(Diagnostics\) from DOORS \(28B39L v4.0\)](#)
- [2] [PD Ch-08 Diagnostics \(2WBD7N v2.2\)](#)
- [3] [Diagnostics Systems list and Design plan \(R7ELHH v2.1\)](#)
- [4] [ITER Abbreviations \(2MU6W5 v1.15\)](#)
- [5] <https://reports.iter.org/Reports/Pages/Report.aspx?ItemPath=/Data Exchange/DOORS Database>
- [6] [ITER Procurement Quality Requirements \(ITER_D_22MFG4\)](#).
- [7] [Procurement Requirements for Producing a Quality Plan \(ITER_D_22MFMW\)](#)
- [8] [Quality Assurance for ITER Safety Codes \(ITER_D_258LKL\)](#).
- [9] [PRELIMINARY ANALYSIS OF THE IMPACT OF THE INB ORDER - 7TH FEBRUARY 2012 \(AW6JSB v1.0\)](#)

5 Estimated duration

The maximum duration for this work is 12 months.

6 Work description: Project Management for SRD-55 requirement flow down

Whereas ITER is the largest nuclear fusion device with highly complicated subsystems interconnected with each other, and also as PBS-55 has one of the largest number of sub-systems within, updating and tracking requirements defined in the System Requirement Document SRD-55 [1] and the various more detailed sub-system requirement documents are very challenging and resource consuming.

The ITER SRD-55 Requirement flow down project is aiming to create system specific customised requirement documents corresponding to each sub-system level without having any loop hole from its master SRD-55, which provides more specific, organized and focused requirements to Responsible Officers (ROs). The creation of new sub-system level requirement documents, so-called child-SRDs, is essential to ROs 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.

While SRD-55 itself has been updated time by time, to reflect the latest ITER requirement from different interfaces, and the child-SRDs, once created, also needs to be updated without any time differences from its master SRD-55 updates. Therefore, the creation of child-SRD is not only one-time document creation but rather the creation of the requirement flow down structure with the help of IT to enable automated master-SRD-55 requirement update be informed to corresponding child-SRDs and its owners.

An important feature is the back-traceability of the child-SRD requirements to the parent-SRD requirements in the SRD-55 and the other sources of requirements through the DOORS database to allow checks of coherence and completeness. This feature shall be part of the work-scope through all levels of detail of the child SRD production.

The project team shall be formed from all PBS-55 staffs including IT team, and the Supplier shall initially evaluate the capabilities and resources of PBS-55 within the given time frame to plan the project management strategy, aiming to cover all PBS-55 sub-systems and producing ideally 50 level 2 SRDs within a maximum of 1 year period from the project kick-off (see deliverable table in section 8.5). Upon starting project planning, the Supplier shall assess the

existing SRD-55 and the child-SRDs which have been drafted, to check consistency with master SRD-55, and plan the statement of work and work stream considering given project formation.

Through the project period, the Supplier together with the project manager assigned from PBS-55 shall follow up the work stream of child-SRD creation. The project managers should communicate with child-SRD 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 child-SRDs in limited project period. However, due to the ITER project nature, some of the child-SRDs creation may be differed to a later stage if the project owner see the need to re-allocate resources to other priorities than child-SRD creation work. Such decisions shall be reported in Monthly steering meeting report.

While most of the child-SRDs of sub-systems shall be created within given period, others may take several more months. The Supplier is also requested to prepare the transition plan for the project manager assigned from PBS-55, and the plan should be presented and executed at the very last month of the project to make sure the remaining work be carried out smoothly.

7 Responsibilities

7.1 Supplier's Responsibilities

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

- Strictly implement the IO procedures, instructions and use templates;
- Provide experienced and trained resources to perform the tasks;
- Supplier's personnel shall possess the qualifications, professional competence and experience to carry out services in accordance with IO rules and procedures;
- Supplier's personnel shall be bound by the rules and regulations governing the IO ethics, safety and security IO rules.

7.2 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.

8 List of Deliverables and Due dates

8.1 Project Charter and Statement of Work

The first deliverable will be the document that describes an approach to create the child-SRDs from master SRD-55. While the charter contains the overall project formation, Statement of Work described more detailed approach of the child-SRD creation itself. This Charter and Statement of Work shall be presented at the first monthly steering meeting.

8.2 Detailed Work Schedule

After the evaluation of the team members' resources, a detailed work schedule for each child-SRDs with corresponding owners resourcing plan shall be prepared. The detailed work schedule shall be updated frequently for the purpose of project control, at least official Updated Detailed Work Schedule shall be presented at every end of the month.

The detailed work-schedule contains for child SRD three steps as illustrated in figure 1 under the assumption that a suitable parent SRD is available (SRD-55 v 5.0, which is presently in preparation).

8.2.1 *Production of level 1 child SRDs*

The first step (Step 1 in Figure 1) would be the creation of child SRDs on the basis of the applicability matrix information provided in the Design-Compliance Matrices available for Diagnostics for which the CDR is completed. This is expected to create many (approximately 50 within the contract and ultimately 70 perhaps) child SRDs in an efficient and transparent way which contain only that part of the content of the parent SRD which is applicable to the specific diagnostic system. The format that is to be used is the DOORS format [5] in which all SRDs are written,

8.2.2 *Production of level 2 child SRDs*

In the next step (Step 2a in Figure 1) the other system specific existing requirements as listed in existing documentation like DDDs, load-specs, flow-down memos of measurement requirements shall be included leading to level 2 SRDs. The production of these level 2 child SRDs are considered as major step towards what is needed to fulfil the diagnostic requirement management mission.

8.2.3 *Production of level 3 child SRDs*

In a third and final step (step 2b) the level 2 child SRDs should be further expanded to the third and final level including also requirement information from handbooks, again filtered through individual applicability matrixes. This step depends on the availability of the handbooks in DOORS [5] form. If they are available in this form this step is relatively straightforward and comparable in complexity with Step 1 assuming that the ROs fill out the applicability matrix in due course. The most important handbooks are the vacuum handbook, the electrical handbook, the plant control handbook and the Remote handling guidelines.

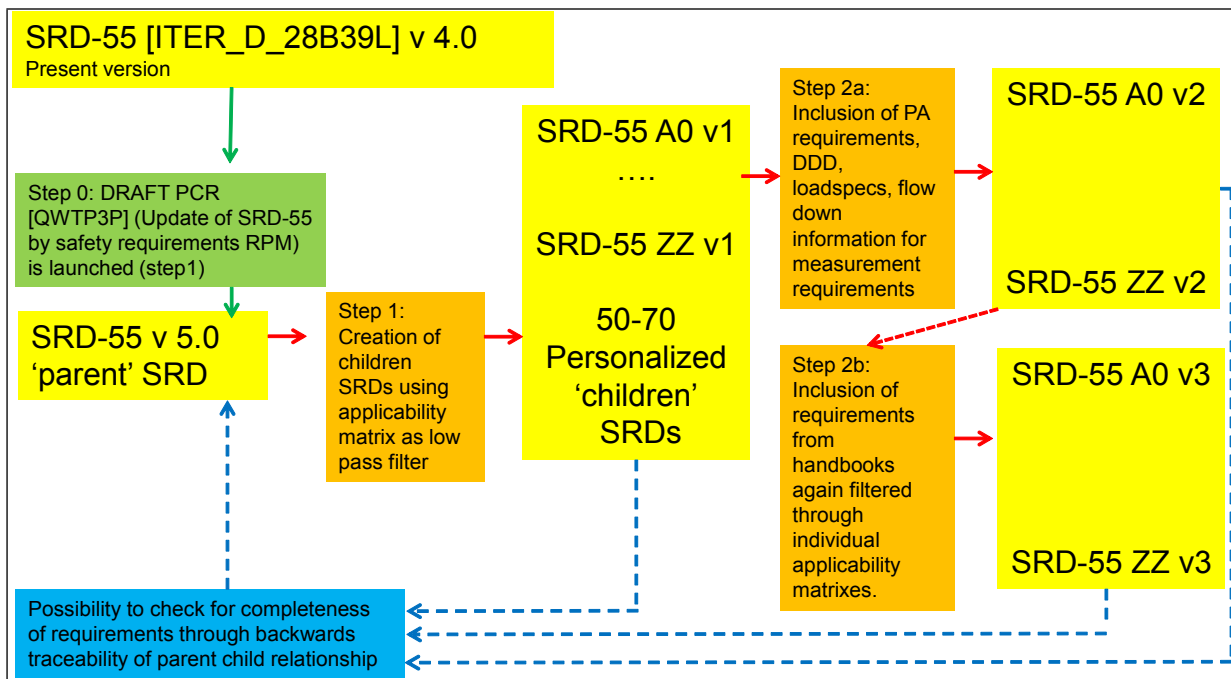


Figure 1: Illustration of a stepwise approach to the creation of customised child-SRDs from existing documents

The child SRDs are produced jointly by the Supplier and the ROs. The Supplier is assumed to coach ROs through the production of a first SRD per RO and thus enable the ROs to produce other SRDs under their responsibility. The Supplier is assumed to review the SRDs produced this way.

8.3 Transition plan and execution summary

If needed, the project management transition plan shall be presented, and brief summary report of transition execution should be reported at the end of the project period.

8.4 Monthly Steering Meeting report

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

8.5 Table of deliverables and due dates

The following table makes the assumption that 6 handbooks are available in DOORS [5] and that the ROs are available to produce SRDs under supervision of the Supplier as this plan foresees. If these assumptions are not met other combinations of deliverables can be agreed, trading e.g. supervision against production at a rate of 3 to 1 or by substituting the inclusion of 2 handbooks by the production of 3 level 2 SRDs.

Deliverables

	Deliverable	Max. Delay after T0
D1	Charter and Statement of Work (section 8.1)	T0 + 1 months
D2	First Detailed Work Schedule (section 8.2)	T0 + 1 months

D3	Status report of supervision and coaching required for the production of 50 level 1 SRDs (section 8.2.1 & 8.4)	T0 + 2 months
D4	Status report of supervision and coaching required for the production of 3 level 2 SRDs (SRD #1...SRD#3) (section 8.2.2& 8.4)	T0 + 3 months
D5	Status report of supervision and coaching required for the production of 6 level 2 SRDs (SRD #4...SRD#9) (section 8.2.2& 8.4)	T0 + 4 months
D6	Status report of supervision and coaching required for the production of 9 level 2 SRDs (SRD #10...SRD#18) (section 8.2.2& 8.4)	T0 + 6 months
D7	Status report of supervision and coaching required for the production of 12 level 2 SRDs (SRD #19...SRD#30) (section 8.2.2& 8.4)	T0 + 8 months
D8	Status report of supervision and coaching required for the production of 15 level 2 SRDs (SRD #31...SRD#45) (section 8.2.2& 8.4)	T0 + 10 months
D9	Status report of supervision and coaching required for the production of 5 level 2 SRDs (SRD #46...SRD#50) (section 8.2.2& 8.4)	T0 + 11 months
D10	Transition plan until completion of SRD production (section 8.2.3 & 8.3)	T0 + 12 months

9 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 8.5. They shall be reviewed by the RO of the contract or his delegate for acceptance.

10 Specific requirements

Even though the majority of the work may be done remotely, it is advised that approximately one week per month should be worked on-site in IO-CT.

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.

All the deliverables should use the ITER official template and to be uploaded to the specific IDM location at the end. Original digital files described using Microsoft software has to be delivered in time.

The Supplier shall be able to demonstrate the experience and abilities within the team involved in providing the service:

- Experience in system engineering such as requirements analysis, functional breakdown analysis, risk analysis, RAMI analysis;

- Experience in the field of large scientific experiments or equivalently complex high technology projects;
- Experience in Nuclear Fusion/Fission is very important;
- Experience with using DOORS or an equivalent requirement management system is a clear advantage;
- Ability to balance quality/risk/cost of projects;
- Ability to work in multidisciplinary, international team environment;
- Knowledge of Quality Assurance systems and their practical application;
- Fluency in English language, both written and oral.

11 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.

12 Delivery time breakdown

The 1st month of the project shall be spent for initial assessment and preparation of the project charter and the statement of work. 2nd month and onward shall be spent mostly on Level-1 child-SRDs until the completion of total number of 50 child-SRDs creation within maximum 1 year duration. The project shall be complete by either the completion of 50 Level-1 child SRDs creation or 1 year from the project kick off, whichever comes first.

13 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 [6].

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 [7]).

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 [8].

14 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 [9].