



General Assessment Principles

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1. INTRODUCTION

1.1. Purpose and content

The General Assessment Principles is drafted with the main purpose to establish standardised processes to initiate, plan and operate EUR-assessment projects. This is important in order to reach increased transparency, efficiency and trust. More specifically, this document is written to:

- Provide a basis for EUR to set the fundamentals of assessment projects,
- Introduce the project manager and other stakeholders to the assessment approach and principles,
- Define the project life cycle and what requirements shall be fulfilled before entering next phase,
- Provide guidance to and set the expectations on the Vendor's efforts,
- Provide guidelines for the Start-up seminar,
- Provide guidelines for the pilot study,
- Provide a basis for implementing lessons learned.

The document is read by each person related to current or forthcoming assessment projects. It may be distributed to any stakeholder and shall be updated continuously as a consequence of lessons learned.

1.2. Background

Obtaining a Standard Project Manual was identified by the EUR-organisation as a fundamental instrument in accelerating the design assessments against the requirements of EUR. In the effort of preparing the Standard Project Manual also the effort of establishing general assessment principles of assessment projects was included.

In contrast with this General Assessment Principles-document, the Standard Project Manual is a comprehensive document for the execution of the project, including detailed project management planning, procedures how to perform the assessment and references to templates and experiences from previous projects.

2. INTRODUCTION TO ASSESSMENT PROJECTS

2.1. Why performing assessments?

The overall objectives of assessments are:

- To facilitate new Vendors and designs to enter the European market,
- To "test" the EUR document on a particular plant design, in order to confirm its applicability for new plant designs and to improve the document.

In addition a set of values generated by the project can be identified. Assessments enhances the understanding of the diverse cultures that is present, develops the engineering skills among the contributing engineers, increases the EUR-utilities' knowledge of the Vendor's design and increases both the EUR-utilities' and the Vendor's

understanding of the EUR-document. For non-European Vendors also the knowledge of the European nuclear environment is developed.

Additionally the assessment projects contributes to the maturity of the EUR-organisation by practicing cooperation between the participating utilities, evolving positions on technical items and improving the assessment process.

The specified objectives and values endorse parts of the objectives of the EUR-organisation as defined in the road map 2013-2015¹; EUR to remain the reference technical document, keep EUR community active and up to date on technical issues and develop EUR's influence towards Vendors and relationship with regulators to promote open competition through standardisation and harmonisation.

2.2. How to start the project

Designers or Vendors of NPPs can apply for an assessment of one of their designs versus the present version of the EUR-document. The result of each specific design assessment is one subset of EUR Volume 3 as described in section 2.4 and 2.5 below.

The Designer has to apply formally for an assessment of one of its designs. It has to present its strategy regarding the European market and to commit to provide accurate and detailed information, to get this information accessible from the beginning of the assessment work to the assessment performers (language, conditions of use, specific agreement needed, etc.) and to allocate dedicated resources to explain the design features.

The design shall be a LWR-plant. Its level of development shall be sufficient to allow a detailed assessment of compliance vs. EUR Volume 2. It shall meet the EUR-objectives in safety and performance. A pre-assessment versus some key requirements selected by the EUR-organisation may be done by the Vendors to get confidence that their design will be generally in line with the EUR-document.

The prerequisites to any new assessment are

- at least two EUR-members that commit to perform the EUR-assessment (called "Sponsors"),
- sufficient number of other EUR-members (called "Supporters") commit to review the assessment work in due time and
- the resources available shall be sufficient to develop the corresponding subset of Volume 3 (see 2.5 and 3.1).

The sponsoring and supporting utilities contribute with manpower and are responsible for hosting the project meetings.

The decision to start a new subset of the Volume 3 is taken by the EUR Steering Committee and the justifications of the decision are given to the Vendor.

Tasks and responsibilities related to the application are summarized and listed in 4.1.

¹ "EUR Roadmap 2013 2015", final version approved on March 26, 2013 EUR SC meeting.

2.3. About the assessment

For each of the Volume 2 requirements (around 4000 ones), the corresponding detailed design information is analysed and the level of compliance is discussed between Sponsors, Supporters and the Vendor. There are several possible levels of compliance: compliant, non-compliant, compliant with objectives only, significantly beyond requirement, etc.

The EUR Promoters' policy is to specify the requirements in a way that allows the maximum flexibility to the Designer in the development of design solutions fulfilling the EUR requirements. To achieve this, the requirements have been segregated into three levels:

- Utility requirements, denoted by the word "shall ". Any design that does not fulfil these requirements will be non-compliant,
- Utility preferences, denoted by the word "should ". Other solutions can be accepted, but the Plant Designer will have to demonstrate that they are equivalent or better.

Furthermore, functional and technology neutral requirements are promoted (in opposition to design-specific or solution-oriented requirements).

The assessment of a design is an in-depth work that can take from one to three years depending on the availability of the resources and on the quality and depth of the information.

2.4. Previous assessments

At the time of publication of the revision D of EUR Volumes 1, 2 and 4, eight subsets of Volume 3 have been released:

Five subsets, published between 1997 and 2002, whose assessment was based on Revision B of the EUR Volumes 1 and 2:

- subset 3A dedicated to BWR90 (1300MWe BWR developed by ABB Atom),
- subset 3B dedicated to EPR (1500MWe PWR developed by NPI),
- subset 3C dedicated to EP1000 (1000MWe PWR developed by Westinghouse),
- subset 3D dedicated to ABWR (1300MWe BWR, the version of GE's ABWR certified in USA),
- subset 3E dedicated to SWR1000 (1000MWe BWR developed by Siemens KWU),

Three subsets, published between 2005 and 2009, whose assessment was based on Revision C of the EUR Volumes 1 and 2:

- subset 3F dedicated to AP1000 (1100MWe PWR, the version certified in USA, developed by Toshiba-Westinghouse),
- subset 3G dedicated to AES-92 (1000MWe PWR, the VVER design developed by AtomEnergoprojekt Moscow),
- revision of subset 3B dedicated to "Standard EPR" (a 1600MWe PWR developed by Areva).

2.5. EUR Volume 3

Each subset of Volume 3 includes the description of a Standard Design and the analysis of compliance vs. the generic requirements of Volumes 2. It may also include design-dependent requirements.

The level of detail of the plant description is sufficient to allow the reader to understand the analysis of compliance. The summary of the analysis of compliance emphasizes the main issues discovered in the detailed analyses of compliance, which is worked out by the assessment project. Each subset of Volume 3 contains Vendor's proprietary information. Therefore its distribution is limited.

3. PROJECT MANAGEMENT PLANNING

The sections below summarises items described in the Standard Project Manual.

3.1. Project Scope

The scope of work is basically to assess the Vendor's design versus Volume 2 of the latest version of the EUR document, based on the Vendor's standard design documentation and to produce a new subset of Volume 3.

The project deliverables are (in chronological order):

- Assessment sheets for each chapter in EUR Volume 2,
- A new subset of Volume 3,
- Technical and project feedback reports.

3.2. Project organisation

The project organisation evolves during the project life cycle. Except for the assessment phase the project organisation is quite small. In this section the typical project organisation during the assessment phase is described.

The central part of the project organisation is the Coordination Group (CG), which is set up to administrate the work. The CG is principally the project team and comprises representatives from the sponsoring and supporting utilities, the Vendor and the project management team. Normally the PMT are chosen among the representatives of the Sponsors.

In addition to the CG, Chapter Leaders and Reviewers are appointed from the sponsoring utilities and the supporting utilities. The distinction between sponsoring utilities and supporting utilities are that sponsors utilities are responsible for the assessment of the design, while the supporters are responsible for the expert review of the assessment.²

² It could be worth to note that non-EUR utilities have been part of the CG. These were at that time applying for becoming members of the EUR-organisation.

Also the Administration Group and the Steering Committee are part of the project organisation, as they supervise and review the process. In figure A below the typical project organisation during the assessment is shown.

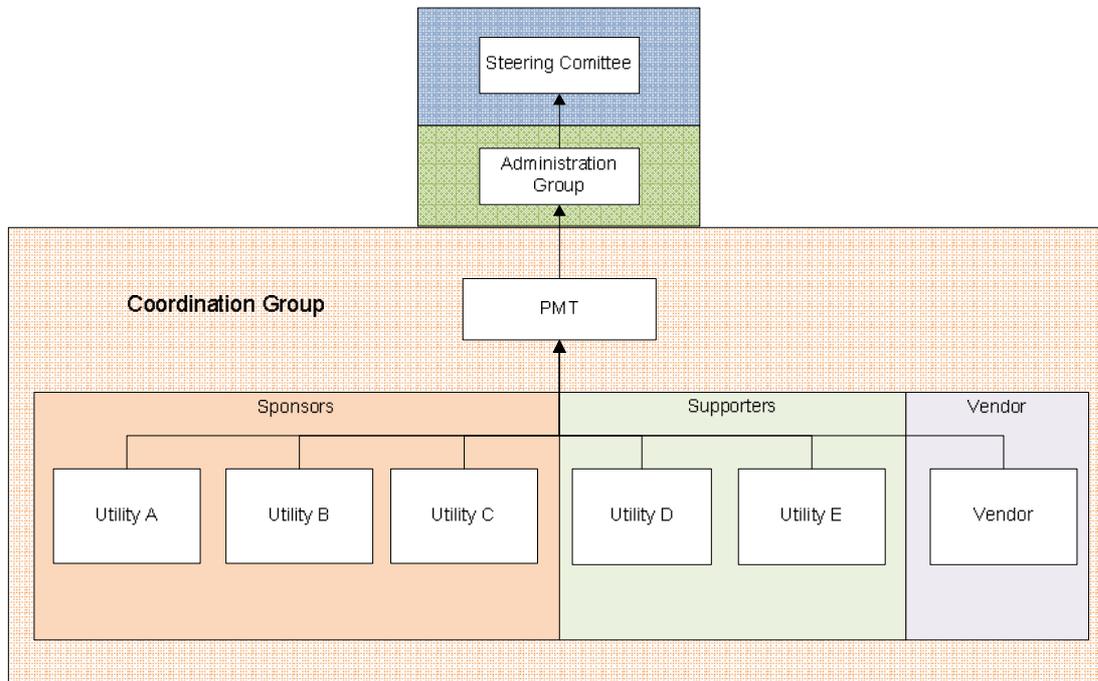


Figure A, typical assessment organisation.

3.3. Confidentiality and distribution of documents

Non-disclosure agreements shall be established and signed between each EUR-party and the Vendor since all documentation from the Vendor is confidential. Theoretically, Export Licences from the Vendor's government could be required in some occasions. This requires a lot of calendar time and the need for this should be assessed at an early stage.

In principle, all formal drafts of the assessment sheets are distributed to all EUR-members. Except for the technical description put in chapter 1 of Volume 3, neither design documentation nor other working documents (such as Q&As) are available for other than the sponsoring and supporting utilities.

3.4. Project success factors

Based on experiences from previous assessments the success factors of an assessment project can be categorised in the five areas outlined below:

Early defined assessment principles and procedures:

Setting the principles and procedures of the project as early as possible reduces the risk for rework and the time spent on these items during the assessment.

Performance and competence of the Coordination Group:

Obviously, yet very important, the performance and joint competence in the CG is crucial for the project success. Thus a good composition of knowledge and experience within the group, together with a pragmatic performance and project management mind-set, will increase the chances of reaching the objectives and fulfilling the prospective project values.

Competence of Assessment Performers and Reviewers:

Delivering high-quality and mature chapter assessments are crucial for the project performance. In addition to the expertise in the assessment subject itself, this involves the ability to take total ownership of the assessments and reviews, such as iterating Q&As with the Vendor, communicating with the Reviewer/Assessment Performer and PMT, closing open issues, utilize a pragmatic approach, etc.

Quality of the Vendor documentation:

The quality of both the self-assessment and the design documentation is crucial to the time, cost and quality of the project, since rework, Q&As or information search is very time consuming and impacts also quality and efforts.

A well-prepared self-assessment, providing pointers to relevant sections in the design documentation and balanced assessments of the design, is a very useful guidance for the Assessment Performers. This is also a good test for the Vendor itself whether the design documentation is applicable to the assessment project.

The design documentation shall be thorough, applicable and mature. "Thorough" to enable the Assessment Performer to easily follow the fundamental principles through functions, systems and equipment. "Applicable" in the sense that the documentation is easy to use for the purpose of the project, "mature" in the sense of generating the minimum amount of updates and Q&As, which is very time consuming.

The language of the design documentation shall be English and references not available in English shall be avoided.

Quality of the Technical Support from the Vendor:

Inevitably of the quality of the Vendor documentation technical discussions will be required throughout the assessment and during the review meetings. Answers on time and with applicable information are important for the project performance.

4. PROJECT LIFE CYCLE

The project is divided in four parts: application phase, preparatory phase, execution phase and finalisation phase as shown in figure B below. The characteristics and scope of each phase differs to the others, especially affecting the project organisation and need for coordination. The assessment phase requires a large assessment organisation that will need intense coordination, while the work in other phases is suited for more focused work from smaller amount of people.

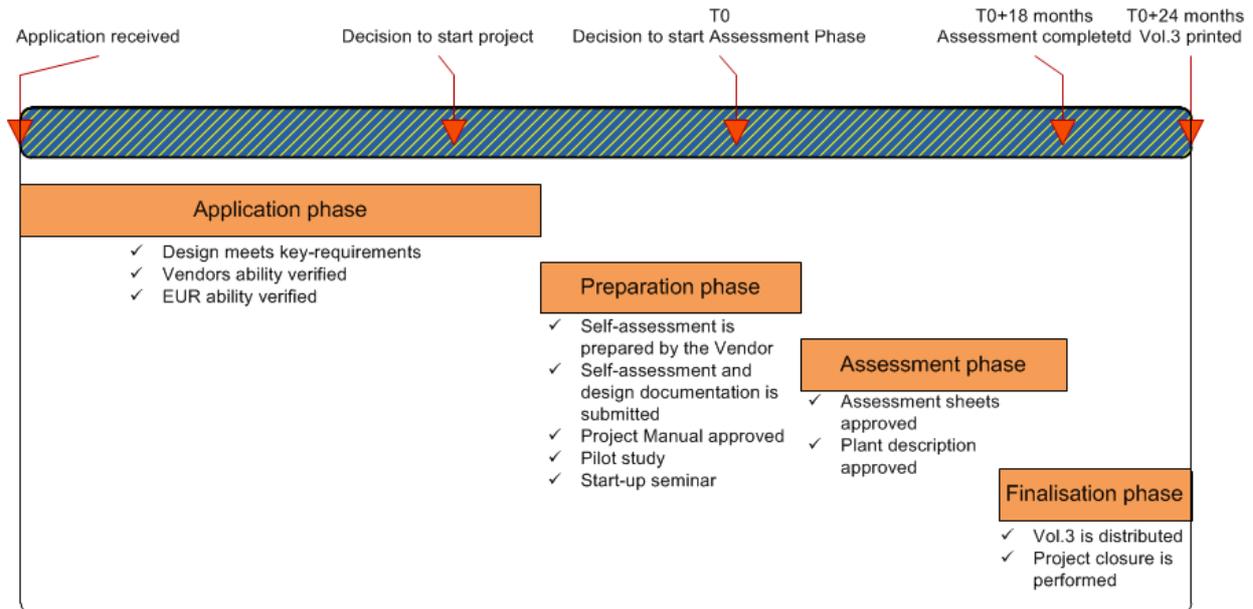


Figure B. Project life cycle with milestones and major thresholds for entering next phase. The dates shown are only examples. The durations shown should be considered target durations.

4.1. Application phase

The scope of the application phase is to assess if the prerequisites for launching the project exist and are fulfilled. The application phase comprises the period starting with the Vendor's formal application and ending when the specific project preparations start. The EUR-secretariat manages the activities during this phase of the project, but may delegate the tasks to any other person or group.

The activities belonging to the application phase are listed below. These activities shall be finalised before entering next phase.

- 1) Formal application from the Vendor is received by the EUR-secretariat.
- 2) The Vendor prepares a pre-assessment of the key EUR-requirements³.
- 3) A technical meeting can be organised by the Vendor to introduce the design and present the pre-assessment to the AG.
- 4) The pre-assessment is reviewed by AG.
- 5) Identification of sponsoring and supporting utilities (this done by both the Vendor and EUR).
- 6) This document is provided to the Vendor, introducing the Vendor to EUR-assessment and providing the main requirements on the Vendor's documentation and resources.
- 7) The PMT is appointed.

1st milestone: Formal application is received.

³ Currently there are 55 requirements identified, but this might evolve over time.

2nd milestone: SC-decision to start the project, define a start date for the preparation phase and a target start date for the assessment phase.

Criteria for the decision to start the project:

- At least two utilities commit to act as sponsors for the project (see 2.2).
- The design is considered to meet the objectives of the EUR, based on the assessment of the key EUR-requirements.
- Sufficient resources are available on both Vendor's and Utilities' side.
- The Vendor commits to its responsibilities described in this document.

4.2. Preparation phase

The scope of the preparation phase is to perform the necessary planning of the project in order to start the assessment. The PMT is responsible for the preparation phase, but AG must follow the activities closely and provide sufficient control.

The activities in the preparation phase are listed below. These activities shall be finalised before entering next phase.

- 1) The project management planning for the assessment phase is started, such as defining project organisation, time schedule etc., and the project manual is drafted.
- 2) The Vendor prepares the complete self-assessment, finalises the design documentation and submits these to the CG.

Note: The Vendor's design documentation is probably the most important success factor (see section below), since insufficient quality would lead to rework, prolonged assessments and poor assessment quality. Also, the quality of the self-assessment documents is important. Therefore the EUR-organisation should verify the quality of the Vendor's design documentation and self-assessment documents at an early stage.

- 3) CG is set up.
- 4) The process of reaching agreed NDAs between the Vendor and all EUR-members is started.
- 5) Chapter responsibilities are distributed among the CG-members.
- 6) Pilot study is performed to test the Vendor documentation and assessment procedures, see 5.2.
- 7) Start-up seminar is held, see 5.3.

3rd milestone: AG-decision to start the assessment phase and to specify a start date for the assessment phase⁴.

Criteria for the decision to start the assessment phase:

- AG-approval is given of the project management plans for the assessment phase, i.e. the project manual.

⁴ There should be sufficient time between the pilot study and the start of the assessment phase to allow implementation of lessons learned and checking the rest of the documentation.

- The quality of the Vendor's documentation is sufficient.

4.3. Assessment Phase⁵

The major scope of the assessment phase is to perform the assessment of the Vendor's design towards the chapters in Volume 2. The assessment phase comprises the time period from the start of the assessment to the SC-approval of the assessment of the last chapter. The PMT is responsible for managing the assessment phase, but also the CG has a high share of responsibility during this phase.

The activities in the assessment phase are listed below. These activities shall be finalised before entering next phase.

- Assessment of each chapter.
- Expert review of each chapter.
- Compiling assessment sheets, including the synthesis reports.
- Drafting Volume 3 chapter 0 "Introduction to the Subset", chapter 2 "Highlights of the Compliance Analysis" and chapter 3 "Specific Requirements by EUR".
- Compiling Volume 3 chapter 1 "Plant Description" (this is done by the Vendor).
- CG-and AG-review⁶ of all chapters and Volume 3.
- SC-review and approval of all chapters.
- Cross-checking against other designs⁷ (AG is responsible for this item).
- Detailed planning of the finalisation phase.
- Execute all project management processes required for the assessment phase and monitor and control the project.

4th milestone: SC-approval of the assessment sheets.

4.4. Finalisation phase

The major scope of the finalisation phase is the generation of the Volume 3-document. The finalisation phase starts with the drafting of Vol.3 chapter 0, 2 or 3, i.e. several activities may be started before the closing of the assessment phase. The responsibility of the activities during this phase is divided between the PMT and the EUR-secretariat.

The activities in the finalisation phase are listed below. These activities shall be finalised before closing the project.

- 1) Compiling the technical feedback document based on the assessment sheets.
- 2) SC-Review and approval of Volume 3.
- 3) Editing, printing and distributing the Volume 3 document

⁵ For more details of this phase, see the Standard Project Manual.

⁶ The level of CG- and AG review is different and is discussed more in details in the Standard Project Manual.

⁷ A technical meeting is set up where a short-list of requirements is reviewed and compared with the results from previous assessments. Also Vendor representatives from previous assessments participate in the meeting.

- Including issuance of CD-ROM
- 4) Administrational closure
 - Gathering and implementing lessons learned
 - Archiving all project records
- 5) Presenting the assessment externally (optional, requires a discussion between the Vendor and EUR-secretariat).

5th milestone: SC-approval of the new subset of Volume 3.

5. OTHERS

5.1. Additional information of the Vendor's responsibilities

One or more representatives from the Vendor constitute permanent members of the CG. The Vendor's CG-representative together with required technical support will participate in CG-meetings, and in AG- and SC-review meetings. It is therefore necessary for the CG-representative to have high availability during the assessment period since there is a lot of travelling.

During the CG-, AG- and SC-meetings, the representative(s) shall be able to provide the required technical support. It must also be emphasised the importance of the person or people representing the Vendor having the characteristics, skills and tools to effectively manage potential differences in culture between the Vendor and EUR and/or insufficient English language skills among the Vendor's staff.

The work to establish the self-assessment shall follow principles, procedures and guidelines for assessments that are provided in the Standard Project Manual and applicable to the tasks required to generate self-assessments.

5.2. Pilot study

In order to identify areas for improvements within procedures and planning, and to set standards and common practice for the assessments, a quite extensive pilot study is preferably performed. This is done before the initiation of the assessment phase.

The pilot study should:

- Verify that the Vendor's documentation is ready for the assessment phase
- Set the standard for interpretations of requirements,
- Set the approach for situations where the design development isn't sufficiently advanced for providing the documentation that is asked for in the requirement,
- Practice the assessment schedule, Q&A-procedure, and other procedures and planning

To reach these objectives a quite thorough pilot study is done of a section of the larger chapters, or the pre-assessment (the "55 key-requirements") is extended to assess the related documentation in-depth. The study is preferably done at an early stage, providing a sufficient period between the study and the start of the assessment phase to allow implementation of lessons learned and checking that the rest of the documentation is of

similar quality as the documentation used in the pilot study. The study could be performed during two months and adding one month to be able to implement the lessons learned.

If a successful pilot study is achieved the assessment phase is likely to be performed more efficiently. Also the PMT will reach a more mature stage early in the assessments and is able to provide better guidance to the large number of project participants.

Naturally, more guidance from the Vendor and more iteration between the Vendor and the Chapter Leader are required during the pilot study compared to the rest of the assessment.

5.3. Start-up Seminar

A start-up seminar is traditionally arranged close to the start of the assessment phase. The seminar aims at introducing the design to the EUR-organisation and introducing the stakeholders to each other. This is also a suitable occasion to explain the Standard Project Manual to all the participants.

The seminar is arranged by the Vendor with guidance and help from the EUR-organisation. To reduce costs of the arrangement, the venue is preferably at the Vendor's or a participating utility's site.

It has typically been two days in a location that is easily accessible by the EUR-utilities. All EUR-utilities are invited and usually suitable to have a maximum of 50 participants from the EUR-utilities. It is recommended that the Assessment Performers participate. The invitations should be sent out well in advance.