



# **General Assessment Principles**

**September 2020**



## INDEX

<b>1. DEFINITIONS.....</b>	<b>3</b>
<b>2. INTRODUCTION .....</b>	<b>4</b>
2.1. Purpose and content _____	4
2.2. Background _____	4
<b>3. INTRODUCTION TO ASSESSMENT PROJECTS .....</b>	<b>5</b>
3.1. Why performing assessments? _____	5
3.2. How to start the project _____	5
3.3. About the assessment _____	6
3.4. Previous assessments _____	6
3.5. EUR Volume 3 _____	6
<b>4. PROJECT MANAGEMENT PLANNING .....</b>	<b>7</b>
4.1. Project Scope _____	7
4.2. Project organisation _____	7
4.3. Confidentiality and distribution of documents _____	8
4.4. Project success factors _____	8
<b>5. PROJECT LIFE CYCLE .....</b>	<b>9</b>
5.1. Application phase _____	10
5.2. Preparation phase _____	11
5.3. Assessment Phase _____	12
5.4. Finalisation phase _____	12
<b>6. OTHERS .....</b>	<b>13</b>
6.1. Additional information of the Vendor's responsibilities _____	13
6.2. Assessment of the Key Issues _____	13
6.3. Pilot study _____	14
6.4. Start-up Seminar _____	14
6.5. Closing Seminar _____	14

## 1. DEFINITIONS

### ***Administration Group (AG)***

The Administration Group is a permanent EUR administrative and decision-making structure that concerns both technical and administrative matters. Administration group is formed by a representative from each EUR utility.

### ***Coordination Group (CG)***

The Coordination Group is a working group set up to manage and perform the assessment work.

### ***Frozen Design***

The Frozen Design means that the delivered documents shall not be modified during all phases of the assessment project. More details are given in the Standard Project Manual.

### ***Key Issues***

The EUR Key Issues represent the principal requirements to be met by a Light Water Reactor design to be built in Europe. Assessment of Key Issues provides confidence to the EUR organisation that the Vendor's design will be generally in line with the EUR Document and is also sufficiently well advanced to allow a detailed assessment of compliance against the full EUR Volume 2. The Key Issues are publicly available in the EUR Chapter 1.4.

### ***Project Management Team (PMT)***

The Project Management Team manages the assessment project and consists of project manager(s) from the leading Sponsor.

### ***Sponsor***

Sponsors are those EUR utilities that are participating in the project and are mainly responsible for the Compliance Assessment of the EUR chapters.

### ***Standard Project Manual***

Detailed guideline for performing the assessment work focused mainly on the assessment and finalisation phases of the project. It is publicly available on the web page of the EUR organisation.

### ***Steering Committee (SC)***

The Steering Committee is a permanent top-level EUR decision making structure which takes official EUR position on the matters. Steering Committee is formed by a representative from each EUR utility.

## **Supporter**

Supporters are those EUR utilities that participate in the project, mainly to perform the review of the Compliance Assessment. They could also perform Compliance Assessment of some small EUR chapters.

## **Vendor**

The Vendor is the company that applies for the assessment of its LWR nuclear power plant design.

## **2. INTRODUCTION**

### **2.1. 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 all stakeholders to the assessment approach and principles,
- Define the project life cycle and milestones to be reached before entering next phase,
- Provide guidance to and set the expectations on the Vendor's efforts,
- Provide guidelines for assessment of Key Issues,
- 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.

### **2.2. 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. Therefore, the Standard Project Manual is focused especially on the assessment phase and finalisation phase.

## 3. INTRODUCTION TO ASSESSMENT PROJECTS

### 3.1. 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. Assessment enhances the understanding of the diverse cultures that are 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 contribute 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 the objectives of the EUR-organisation; 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.

### 3.2. How to start the project

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 §3.4 and §3.5 below.

The Vendor 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 a set of key requirements (called Key Issues) 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. See §6.2.

The prerequisites to any new assessment are

- at least two EUR-members that commit to perform mainly the assessment work (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 §3.5 and §4.1).

One of sponsoring utility (called "Leading Sponsor") takes the responsibility for managing the assessment project.

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 §5.1.

### **3.3. About the assessment**

For each of the Volume 2 requirements (almost 5000 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, not assessable now, etc.

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

- Utility requirements, denoted by the word "shall",
- Utility preferences, denoted by the word "should",
- Other solutions can be accepted, but the Plant Vendor 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.

### **3.4. Previous assessments**

So far twelve subsets of Volume 3 have been published between 1997 and 2020.

### **3.5. EUR Volume 3**

Each subset of Volume 3 includes the description of a Standard Design and the analysis of compliance vs. all 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.

## 4. PROJECT MANAGEMENT PLANNING

The sections below summarise items described in detail in the Standard Project Manual.

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

### 4.2. 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 (PMT). Normally the PMT is a representative of the Leading Sponsor.

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 is based on resources each utility can dedicate to the project. Typically, the sponsors utilities are responsible for the assessment of the design, while the supporters are responsible for the expert review of the assessment. Nevertheless, distribution of responsibilities is subject to agreement between involved utilities in each specific assessment project.

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

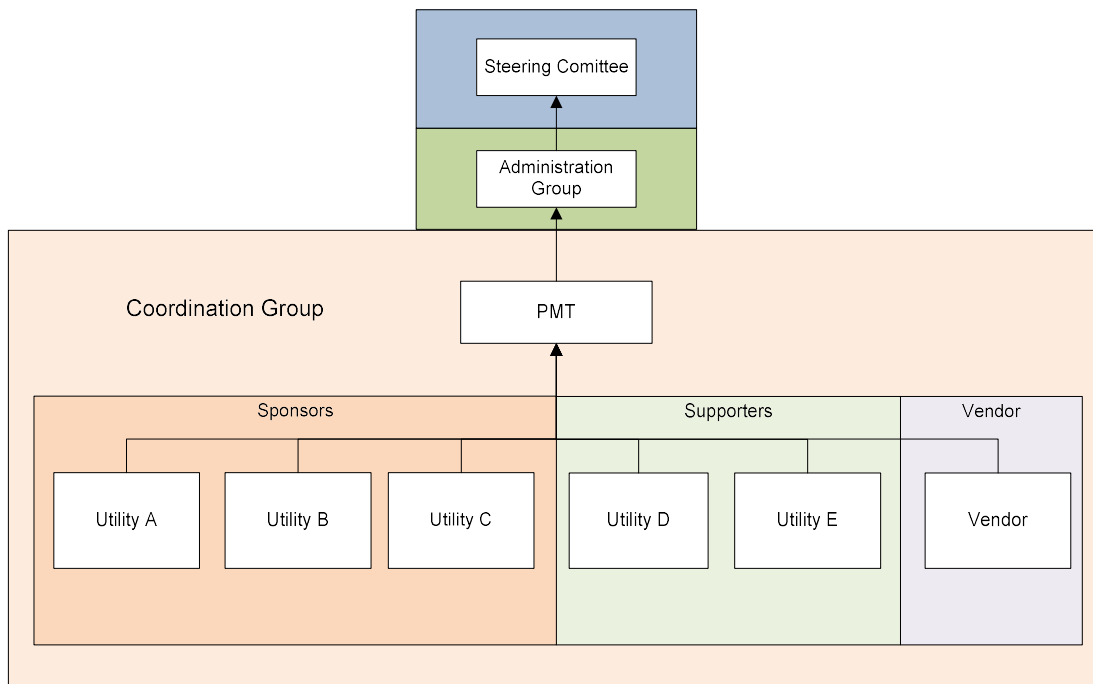


Figure A, typical assessment organisation.

### 4.3. 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. As a result, for the sake of smooth assessment project progress, documents requiring Export Licence should be avoided.

In principle, all formal drafts of the assessment sheets are distributed to all EUR-members who signed the Non-Disclosure Agreement (NDA) with the Vendor. The material presented during the start-up seminar and the technical description put in Chapter 1 of Volume 3 are also available to those EUR-members, whereas design documentation and other working documents (such as Q&As) are available to the sponsoring and supporting utilities only.

### 4.4. 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. Principles and procedures are described in the Standard Project Manual which is basis for the project-specific project manual.



## 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's 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 necessary 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.

## **5. PROJECT LIFE CYCLE**

The project is divided in four parts: application phase, preparation phase, assessment 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.

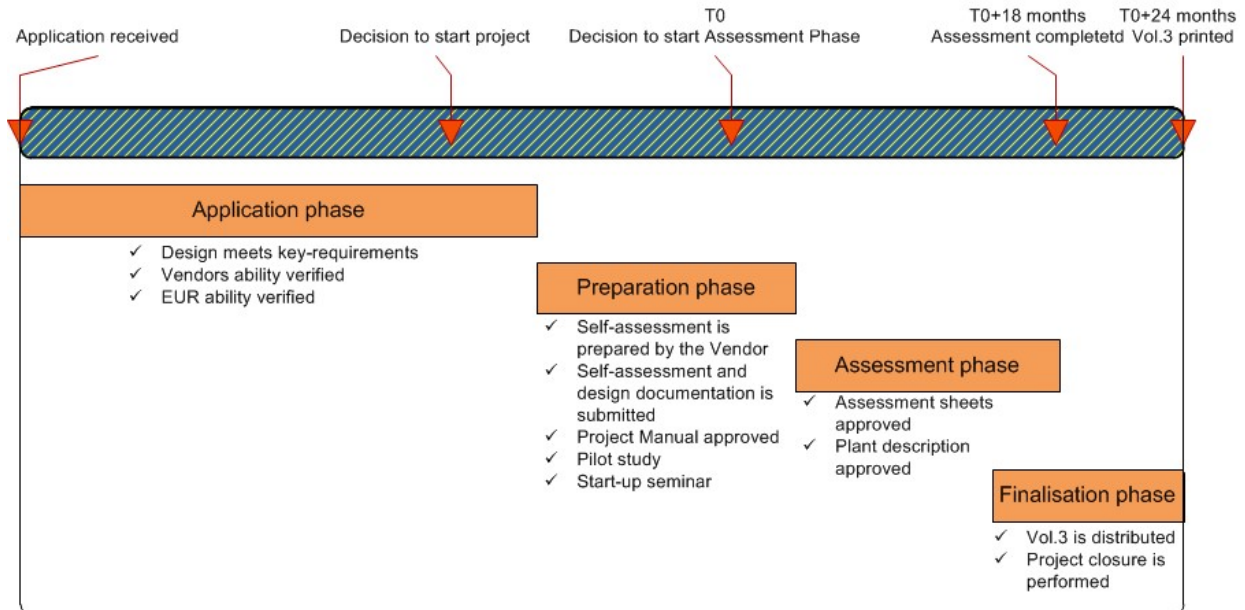


Figure B. Project life cycle with milestones and major thresholds for entering next phase. The dates shown are only examples. The durations shown should be considered target durations.

## 5.1. 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) Identification of sponsoring and supporting utilities (this done by both the Vendor and EUR).
- 3) The PMT is appointed.
- 4) The Vendor prepares a self-assessment of the Key Issues contained in EUR Section 1.4, see §6.2.
- 5) The Coordination Group is set-up. It will assess the Vendor's self-assessment of the Key Issues, see §6.2.
- 6) A technical meeting can be organised by the Vendor to introduce the design and present the self-assessment to the AG.
- 7) The assessment results of the Key Issues are reviewed by the AG.
- 8) The AG reports to the SC conclusions of the assessment of the Key Issues, SC takes the final decision of moving forward to the preparation phase.

1<sup>st</sup> milestone: Formal application is received.

2<sup>nd</sup> 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 §3.2).
- The design is considered to meet the objectives of the EUR, based on the assessment of the Key Issues.
- Sufficient resources are available on both Vendor's and Utilities' side.
- The Vendor commits to its responsibilities described in this document.

## 5.2. 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 the 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 tailored project manual is drafted by the PMT based on the Standard Project Manual.
- 2) The Vendor prepares the complete self-assessment, finalises the design documentation and submits these to the PMT.

*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 by performing the Pilot study, see below in §6.3.*

- 3) CG is set up, if different than the CG for assessment of the 53 key issues in the application phase.
- 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. Chapter leaders and chapter reviewers are appointed.
- 6) Pilot study is performed to test the Vendor's documentation and assessment procedures, see §6.3. The results are reported to the AG by the PMT.
- 7) Start-up seminar is arranged by the Vendor, see §6.4.

3<sup>rd</sup> milestone: SC-decision to follow the AG advise to start the assessment phase and to specify a start date for the assessment phase.

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

## 5.3. Assessment Phase

The major scope of the assessment phase is to perform the assessment of the Vendor's design towards all requirements 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 analysis of compliance reports and 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".
- Drafting Volume 3 chapter 1 "Plant Description" by the Vendor.
- CG-and AG-review of all chapters and Volume 3.
- SC-review and approval of all chapters.
- Consistency checking against other designs.
- Detailed planning of the finalisation phase.
- Execute all project management processes required for the assessment phase and monitor and control the project.

4<sup>th</sup> milestone: SC-approval of the assessment of all 20 chapters of Volume 2.

## 5.4. 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 Volume 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 and distributing the Volume 3 document
  - Including issuance of CD-ROM
- 4) Administrational closure
  - Gathering and implementing lessons learned
  - Archiving all project records
- 5) Closing seminar can be organised by the Vendor, see §6.5
- 6) Presenting the assessment externally (optional, requires a discussion between the Vendor and EUR-secretariat).

5<sup>th</sup> milestone: SC-approval of the new subset of Volume 3.

## 6. OTHERS

### 6.1. 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. Direct interaction in English between the EUR and the Vendor without an interpreter is expected.

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.

### 6.2. Assessment of the Key Issues

In the application phase, the Vendor will provide self-assessment of the Key Issues. The self-assessment shall relate to the same Frozen Design which is expected to be subject of the detailed assessment. The self-assessment shall be supported by comprehensive Technical Plant Description document (TPD) covering all aspects of the plant – ca. 200 to 300 pages. The self-assessment shall refer to particular sections of the TPD where the particular issue is addressed. Furthermore, the Vendor is expected to answer in a timely manner and in a good quality all questions (Q&A) asked by EUR experts.

EUR organisation will set the Coordination Group (CG) for evaluation of Key Issues. Each key issue will have its assessor and its reviewer from different EUR utilities, i.e. after the key issue is assessed by one expert, the assessment is independently reviewed by another expert from different utility. If necessary, the CG can gather at a working meeting to discuss and validate the assessment results.

After the assessment of Key Issues is finished on the CG level, it will be presented to the EUR Administration Group (AG) at the meeting in the presence of Vendor's representative(s) who will have an opportunity to explain and justify the design. Based on the review results, the AG recommends to the EUR Steering Committee (SC) if the project is sufficiently mature for the detailed assessment.

Expected typical time frame for the process of assessment of Key Issues is 3 months for the Vendor to prepare its self-assessment and TPD and 3 additional months for the EUR for evaluation, including Q&As. However, planning of this exercise will be agreed on case by case basis.

## 6.3. Pilot study

In order to identify areas for improvements within procedures and planning, and to set standards and common practice for the assessments, a pilot study is performed. This is done before the initiation of the assessment phase as the last step of the preparation 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 thorough pilot study is done of a section of one of the larger chapters (such as e.g. 2.4.1, etc.) which is assessed in line with all procedures set in the Standard Project Manual, including the CG review. Documentation and self-assessment prepared by the Vendor for the assessment phase is used. Sufficient period between the study and the start of the assessment phase must be provided 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.

## 6.4. Start-up Seminar

A start-up seminar is traditionally arranged close to the start of the assessment phase right before the Pilot study is performed or in parallel with it. The seminar aims at introducing the design to the EUR-organisation and introducing the stakeholders to each other.

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

## 6.5. Closing Seminar

A closing seminar can be organised by the Vendor close to the end of the finalisation phase. The seminar aims at summarising the project progress and highlighting the main technical

findings by the EUR organisation and at providing feedback by the Vendor towards the EUR. It is recognised that this feedback is valuable for both the EUR and the Vendor.

The seminar shouldn't take more than one day. To limit necessity for extra traveling, it is advantageous to connect this event with e.g. the last CG meeting or with the AG or SC meeting dedicated to Approval of Volume 3.

The closing seminar is not mandatory, the decision to organise the event is left to Vendor's discretion.