elyntegration

Grid Integrated Multi Megawatt High Pressure Alkaline Electrolysers
for Energy Applications

Quality Management Plan

DELIVERABLE 1.1

GRANT AGREEMENT 671458

PUBLIC

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Content

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1 EXECUTIVE SUMMARY

This document shows the activities carried out since the beginning of the project ELYNTEGRATION to define the Quality Management Plan (QMP)

The QMP has as objective setting the quality practices and processes of the project, through the actions and measures that are carried out by the Consortium to ensure the quality, consistency of the project's results and deliverables.

- Facilitate the management and coordinating tasks
- Ensure the performance according to an adequate technical progress
- Evaluate and validate the project results to ensure the performance and quality of the objectives

2 OBJECTIVES

ELYNTEGRATION Consortium is committed on ensuring results of high quality. For this reason, the organizational structure of the project has been set and appointed since the proposal steps, later developed and the roles defined in the Consortium Agreement.

The coordinator, as leader of the Management, monitoring and assessment work package, is in charge of ensuring that the procedures on the QMP are updated and followed by the Consortium. The Quality Management Plan helps deciding if deliverables are being produced to an acceptable quality level and if the project processes used to manage and create the deliverables are effective and properly applied.

The Quality assessment activities defined in the document have to ensure that:

- A common set of rules is provided to the Consortium, to ensure a high quality of the results and documents produced in the project.
- Roles, involvement and participation of the Consortium members in the quality assurance process are explained.
- For each process, the methodology to follow and answers to "what", "how" and "when" is developed
- The consortium partners have the tools to identify and communicate bottlenecks, risks and non-conformances, as first step to develop later appropriate corrective actions.

3   DESCRIPTION OF WORK

The processes that are covered by the QMP are:

1. Organizational structure
2. Planning and control
3. Communication inside the consortium, meetings
4. Data management and formats: Files and archives
5. Deliverables preparation process
6. Indicators and Risk management

The measures proposed in this QMP have been defined taking into account the project description of action, the different roles of the members of the consortium and the previous agreements (Consortium Agreement).

The final goal of the QMP is to define the tools and means that the processes have to ensure that the results obtained in the project comply with quality objectives and criteria for the Project management, results and deliverables.

3.1   Organizational structure

The structure has to be enough to provide effective project coordination, capable to elaborate the financial, legal and administrative part of the coordination. Quality control is performed during progress report (section 3.2) at least every three months checking

- Interim reports completion
- Required attendants for the meetings were present
- Issue resolution, matters raised, achieved

Tasks participants are in continuous communication, led by the task leaders, who are in charge of the progress of each task. Task leaders have the responsibility of answer on progress, developments and problems to each work package (WP) leader, as they are responsible for the execution and overall coordination of the tasks assigned to them in the Implementation Plan. Task leaders will have a frequent dialogue with the WP leader and report periodically to them, at least every month. On the other hand, WP leaders are responsible for the overall management and coordination at WP level and the achievement of the defined results. Each WP leader will report periodically every three months to the Project Steering Committee (PSC).
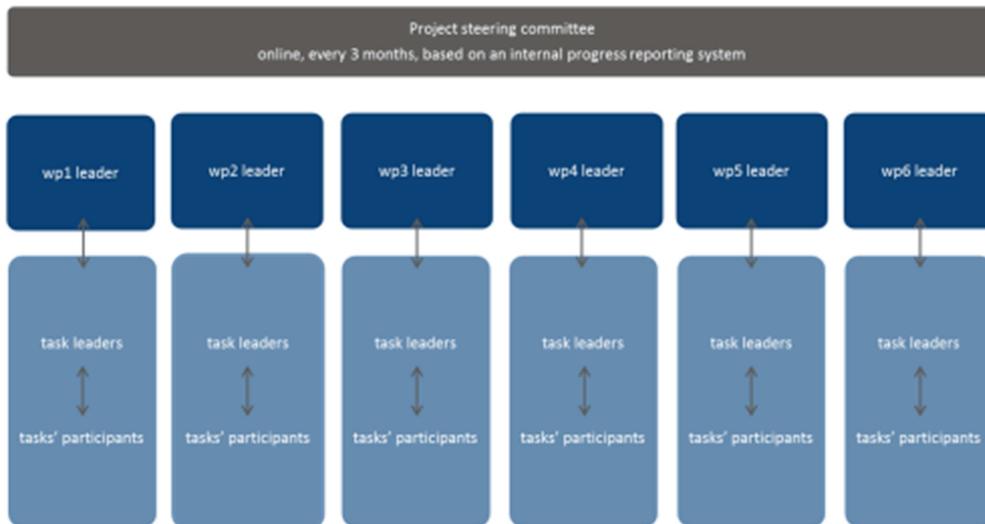
Figure 1. General hierarchy and organization structure. Day to day management

The responsibility on deliverables is assigned to the task leader if they are completely and uniquely related to one task, otherwise, and in general in ELYNTEGRATION, are assigned to the work package leader if they require the participation and combined results from several tasks in the same work package.

The work package leaders meet and report every three months in the **Project Steering Committee**, by teleconference or in person if other project meetings are scheduled, in order to review the overall project progress, risks, bottlenecks and to propose short term actions in order to reach the planned deliverables with quality and in time.

The **Project Steering Committee** is entitled to request additional interim reports and remedial actions where appropriate after conferring.

Figure 2. Overall hierarchy in ELYNTEGRATION

While Project Steering Committee is the supervisory body for the correct execution of the project tasks, the ultimate decision making in the consortium is the **General Assembly**, where all the parties are represented. On the other hand, the coordinator is the partner which,

besides the responsibilities and tasks as a partner in the consortium, acts as intermediary between the consortium and the Funding Authority.

The **Consortium Agreement** contains the details referred to the representation in meetings, how to and when convening the meetings, notice of the meeting, management of the agenda and the minutes, and voting rules.

3.2   Planning and control

The hierarchy defined in the general management structure results in responsibilities for proper implementation of the work plan. Each WP leader is therefore responsible for the achievement of WP specific goals, being in close contact with the Coordinator through mails and conferences, besides the interim reporting process, which is the designed process to summarise the overall progress, status and risks of the project to be evaluated during the meetings of the steering committee.

Reporting: WP leaders are responsible for preparing individual reports covering WP progress, deliverables, milestones and compliance with the plan in the interim report process. The Coordinator will have the final responsibility for drafting the report, summarize the project status looking for inconsistencies, further elaborating and taking care of the final distribution.

Interim and Periodic Reports	
Interim Report (M01 - M03)	Due Date: Fr 18.12.15
Interim Report (M04 - M06)	Due Date: Fr 18.03.16
Interim Report (M07 - M09)	Due Date: Fr 17.06.16
Interim Report (M10 - M12)	Due Date: Fr 16.09.16
Interim Report (M13 - M15)	Due Date: Fr 16.12.16
Interim Report (M16 - M18)	Due Date: Fr 17.03.17
Periodic Report (M01 - M18)	Due Date: Mo 01.05.17

Figure 3. Interim reporting control at consortium level

Regarding the reporting to the EC and funding authority (FCHJU), the project is divided in two reporting periods (from month 1 to 18 and 19 to 36) and the coordinator will submit full progress reports to the EC according to the guidelines defined by FCH 2 JU (M18 and M36). Besides, a Midterm Review Meeting will take place between coordinator, WP leaders and the FCH 2 JU (Project Officer and reviewers) in order to check the progress of the project (technical and economical).

For Continuous reporting, the project's manager of each partner has the obligation to report progress both through interim report process (via the WP leaders, to the Coordinator) and to the funding authority through the provided system. Continuous reporting is considered critical to manage both the deliverables' preparation and the progress and risk management in the project.

3.3   Communication inside the Consortium

From the beginning of the project, communication between the partners is considered of key importance to aim at the Project results and success. For this reason the Kick Off meeting, was devoted to put in common the overall structure of the project, reviewing short

term and midterm milestones and deliverables and approving the tool which would be use during the project to monitor and to help analysing the progress of the project. ELYNTEGRATION makes use of a project management tool (EMDESK), specially designed for European collaborative projects, with online workspaces, mailing lists, etc. in order to facilitate partners' cooperation, which is the backbone for project success.

Figure 4. Groups: Access and mailings lists

In order to link internal communication with the management structure and reporting, several groups and mailing lists have been created, including partners and team members involved in each work package and in the organizational structures (PSC group). The information and contacts are that way easily and constantly updated, keeping an adequate flow of communication between consortium members.

Besides the day to day communication management between partners, one of the best tools to ensure communication inside the project is having programmed meetings. These meetings are planned ahead, including the defined agenda for the meeting (distributed by the coordinator). They allow the generation of results that are included in the pertinent minutes of the meeting which are later distributed at consortium level. Periodic meetings are considered of key importance to ensure partners' communication, team work, progress review and to put in common issues affecting the project's progress.

Figure 5. Planned meetings

Project steering committee meetings are carried out every three months by teleconference. The main goal is to ensure that the progress reported by the partners to the WP leaders is well understood and that the risks are assessed periodically in order to propose plans of action and short term actions. General consortium meetings (GCM), planned twice a year, include all the partners to discuss and overview the progress of the tasks during a 1,5- 2 days meeting. Once a year, the GCM covers the aspects to be treated by the General Assembly. WP members and specific groups (exploitation group) meet regularly and in not planned meetings in order to ensure the progress, solving communication problems that are better treated in a conference call rather by mail exchange

3.4 Data and documents management

ELYNTEGRATION produces several data types that can be classified depending on the origin of the retrieved information:

i. **Experimental data**, which includes experimental data sets that are retrieved during tests and experiments together with observational data and laboratory notes
ii. **Modelling data**, which concerns the information for computer models developed during the project and the input data for the validation of the models
iii. **Simulation results**, this category is relating to the information that is obtained after the computer models are run
iv. **Software**, for example the code developed in the framework of the computer modelling or the different communication and control systems developed during ELYNTETGRATION
v. **Documentation** or the information and data included in reports, interim reports, interim manuals, presentations and other communication documents
vi. **Images**, including photos of equipment, snapshots of operation and tests and infographic material
vii. **Animation**, mainly for communication activities, including short videos, infographic animations

Regarding preferred data formats to be used within the project duration, several templates and information have been prepared by the Coordinator and distributed to the project partners to maintain a harmonized data and information management in the project.

For documents, spreadsheets and presentations (to include data as in i) ii) and v)) Microsoft office is proposed as tool to be used, and templates for preparing the documentation are developed. The experimental data (i) coming from field measurements and experimental tests are filed by the partner generating the result in the original format provided by the data logging system that is installed in the facilities. For later treatment and analysis of results, the data are exported to ASCII using txt and csv format, in order to allow the exchange of information.

Software data (iv) and simulation results (iii) are generated in the specific language/file type of the program used for development. Nevertheless, the partner generating the data, exports the pertinent information to be exchanged in the consortium to csv files (for the numerical data to be analysed and reported) and jpg files (for the graphic data to be used in documents, interim reports and presentations)

Once the results are analysed by the partner carrying out the task and generating them, the summary is presented to the consortium as part of an interim report, presentation and/or deliverable, being inserted as table and/or graphic.

For images (vi), original versions are kept by the partner that provides or generates the image. In general, the standard format to store and distribute the images is as jpeg file. Nevertheless, for printing material, where additional quality is needed, the consortium provides vector graphics (svg or eps files) to comply with the printing requirements. This affects to logos and background designs.

Finally, animation and videos (viii) generated in the project will be stored in the original file format and exported to mpeg codec/avi for distribution.

All the documentation, reports, presentations and information generated in the reports, once is validated following the review procedure of the project, is exported to a portable document file (pdf format) to be shared with external stakeholders (public reports to be uploaded to website, reports and deliverables to be submitted during the continuous reporting to FCHJU)

To ensure the quality of the data in the project, not only the review process is established, but a three step procedure is to be ensured by the partners generating the data:

- Training: Each partner project's manager has to ensure that the team members generating the results and involved in testing campaigns are specifically trained not only for the task but also for complying with the data quality management in the project
- Data completeness: Data are analysed onsite whilst generation to get immediate feedback that the results are complete, there are not out of range values and/or missing information
- Data consistency: Each experiment, test is carried out following a detailed test plan, including data to be measured, parameters, characterization measurements, including accuracy and precision of the significant data to be measured during the test. Inconsistent, inaccurate and/or missing data will be managed by iteration/repetitions of the tests.

Files classified as public will be available during at least 2 years after the end of the project, downloadable by the users in the project's website (www.elyntegration.eu). Internal reports and files classified as confidential will be available to GA subscribers in the internal repository of the project.
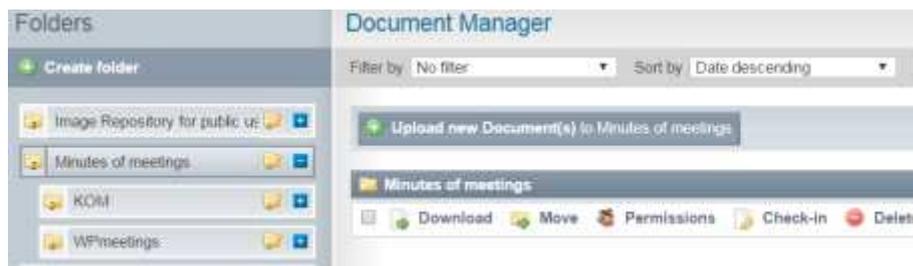
Figure 6. Internal documents' management

To manage the access and exchange of information, an intranet section is dedicated to the documents' management, being divided in the type of action generating the information and data. Consortium members are members of the group with access to the documentation and interim exchange system, including a policy for access permission (discerning between consortium members that can "see" the documents and team members involved in the tasks that can "edit") and version repository for the documentation generated and reviewed.

3.5 Deliverables preparation process

Quality control is performed through the deliverable creation process oriented to ensure the quality of the results, checking the completeness and correctness criteria

- Results are presented in the template
- Documents comply with the rules of the GA and CA
- Structure is defined and content is clear to follow the progress of the described work
- Executive summary and conclusions are structured to allow the understanding of the report after a quick read

Task leaders, during project execution, have to report to the WP leaders about progress, results and observed bottlenecks. The deliverable preparation is organised internally at consortium level by the WP leaders. In general, WP leaders are responsible of the process for the deliverables of each WP.

WP leader has the responsibility of starting the process providing a general structure and guidelines of the content to be reported in each deliverable (Draft), inviting the involved partners and team members to participate with contributions to each section, forming a Consolidated version of the document.

The WP leader reviews the document once is consolidated and requests additional feedback if needed to prepare the Final Draft. The goal is to configure a Final version of the deliverable which is sent to the coordinator for a last review process.

Once the content is approved, a final edition is needed (checking authoring, format and exporting to pdf) before submission.

A suggestion of the schedule for deliverable preparation is provided by the QMP, by depending of the complexity and iterations needed, the WP leaders are in the position of starting the process sooner in order to avoid if possible additional delays.
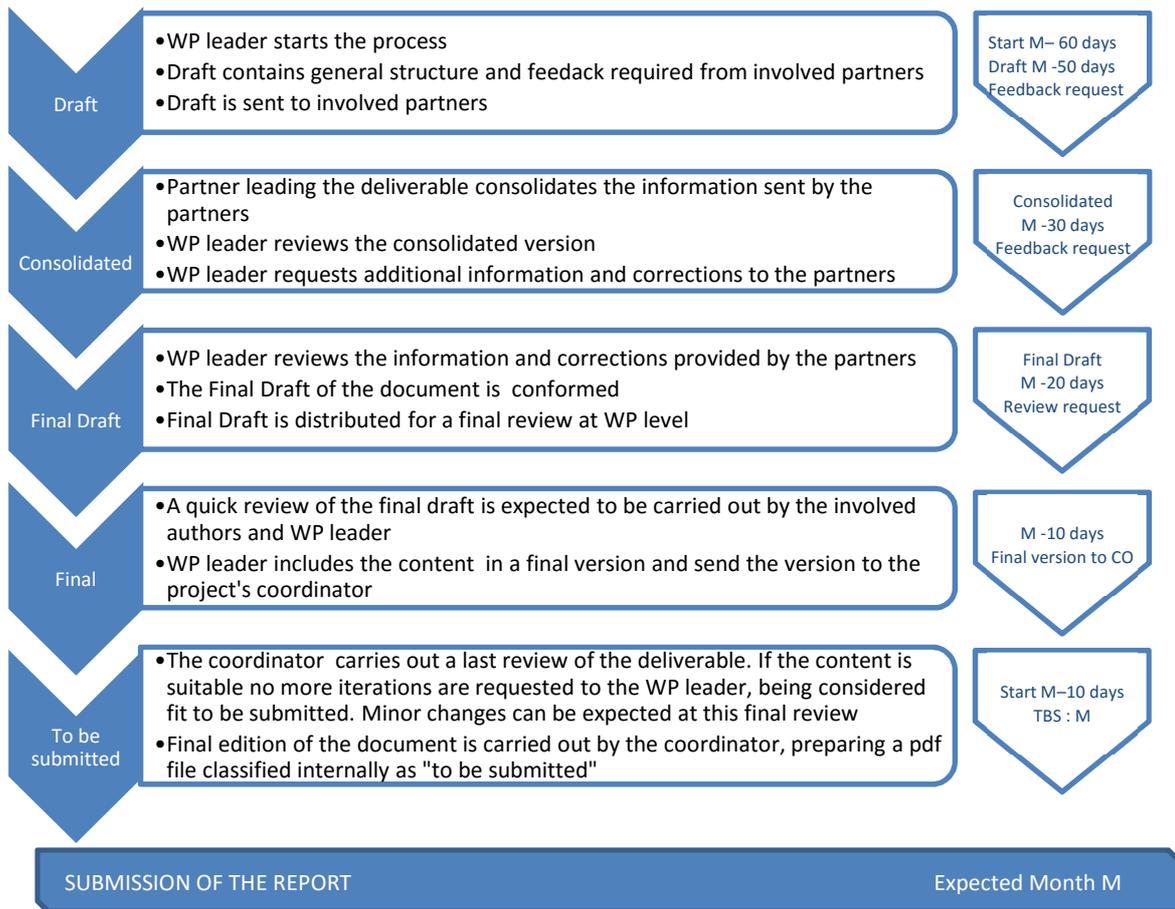
Draft	•WP leader starts the process •Draft contains general structure and feedack required from involved partners •Draft is sent to involved partners	Start M– 60 days Draft M -50 days Feedback request
Consolidated	•Partner leading the deliverable consolidates the information sent by the partners •WP leader reviews the consolidated version •WP leader requests additional information and corrections to the partners	Consolidated M -30 days Feedback request
Final Draft	•WP leader reviews the information and corrections provided by the partners •The Final Draft of the document is conformed •Final Draft is distributed for a final review at WP level	Final Draft M -20 days Review request
Final	•A quick review of the final draft is expected to be carried out by the involved authors and WP leader •WP leader includes the content in a final version and send the version to the project's coordinator	M -10 days Final version to CO
To be submitted	•The coordinator carries out a last review of the deliverable. If the content is suitable no more iterations are requested to the WP leader, being considered fit to be submitted. Minor changes can be expected at this final review •Final edition of the document is carried out by the coordinator, preparing a pdf file classified internally as "to be submitted"	Start M–10 days TBS : M

SUBMISSION OF THE REPORT   Expected Month M

Figure 7. Review process for deliverable preparation and submission

3.6 Indicators and Risk management

Risks identified at the proposal stage were assessed and evaluated considering Impact in the project and probability of occurrence. For those who had a result medium or high, countermeasures were defined and adjusted in the project plan to minimise them.

Nevertheless, besides the aforementioned risks, every three months the WP leaders put in common, during the Project Steering Committees teleconferences, the main bottlenecks that are encountered in the period and foreseeable risks, and propose actions to resolve the problems that could affect the project progress. The responsibility of taking action remains on the WP leader, if it is a matter affecting the tasks, who will be in contact and provide the information to the task leaders and partners involved.

When delays can be foreseen in a task, the WP leader is responsible to organise if needed a separate meeting with the involved partners and the Coordinator, to evaluate how to overcome the delay, proposing a plan of action and alternatives. Both the plan and the alternatives will be assessed regarding the impact on the project, in other tasks and the project results to select those that minimise the final impact on other tasks, following the compliance with the activities that are described in the Grant Agreement.

Indicators are also used at different levels in the project to assess the project progress. On the one hand, the progress management indicators are evaluated by the coordinator to help identifying problems that could suppose a degradation of the quality of results in the project and objectives. Some of the indicators considered are

- Total delay in deliverable (days): it is used to assess and propose changes on the process, suggesting WP leaders to start before the planned schedule
- Budget control (% over/under plan) It is used together with the progress of the project to evaluate the adequacy in the use of resources by the partners
- Personnel (PMs % over/under plan) It is used, together with the control of budget, to detect potential risks on the accomplishment of the tasks
- Number of meetings: the coordinator keeps track of the meetings that have been held, checking attendants, agenda and minutes are prepared.
- Number of dissemination actions: The partners report the activities regarding to communication and dissemination, the indicator is used together with the Communication, dissemination and awareness plan to check the progress and adequacy.

The progress management indicators are reported during periodic and final reports.

On the other hand, there is a set of technical key performance indicators, which are related to the objectives of the project, which are evaluated and reported to the FCHJU each year. The goal of these indicators is to provide an overview of the developments' performance. In ELYNTEGRATION, indicators regarding stack characteristics (such as capacity, capital cost, expected lifetime, hours of operation) and system characteristics (such as power usage of auxiliary equipment, electrical efficiency of the system) are prepared taking into account the experimental data (as explained in section 3.4) before being reported each year to the FCHJU.

4 CONCLUSIONS

Processes in ELYNTEGRATION are structured to allow the correct communication flow between partners, having defined the quality control and assurance roles and responsibilities in the Consortium throughout the main affected results, deliverables and work processes.

The main goal is to ensure that the management, results and reports of ELYNTEGRATION are developed to meet the standards and requirements; identifying bottlenecks, risks and non-conformances in time is the tool to define appropriate actions to be taken for corrective measures.

In the document, the processes involved in the quality assessment have been described, together with the activities to carry out for the assurance of quality.

5 ANNEX. QUALITY ASSURANCE THROUGH STANDARD DOCUMENTATION PRODUCTION

In order to be of assistance for the quality assessment during the project, several templates have been created for internal documents, which allow easy compliance with the standards set in ELYNTEGRATION

For creating the Agendas of the meeting, a template (in MS Office Word template format) is available for the partners in order to harmonize the information to be included in the agenda of meetings, including control of versions, date-venue and required participants.

AGENDA (FIRST DRAFT-VERSION) NAME OF THE MEETING (GENERAL WP ETC)-ELYNTEGRATION DATE

AGENDA	VERSION AND YYMMDD OF VERSION
GENERAL CONSORTIUM MEETING (TYPE OF MEETING)	
DATE	WEEKDAY, COMPLETE DATES
VENUE	

DAY 1. DATE. INIT-END TIME	
HH:MM	[PARTNER LEADING] Description, participants involved

Figure 8. Agenda template, extract

Once the meeting is concluded, the minutes are generated following the project's MOM template, which also contains the checklist, information to be completed as required by the quality assessment activities, identifying the roles and responsibilities both for the meeting and the next steps, as agreed in the meeting.

Figure 9. Minutes of Meeting template, extract

Following the same reasoning, templates for deliverables and presentations were created to be used during the project to ensure that the partners can easily follow and comply with the requirements of the process. This template was also made available to consult by external stakeholders through the website.