



Quality Control Plan (D1.3)

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Abbreviations and acronyms

Acronym	Full Name
CO	Project Coordinator
DDP	Document Development Plan
DL	Deliverable Leader
EC	European Commission
ER	Exploitation Risk
ESTEP	European Steel Technology Platform
EU	European Union
FEhS	Institut für Baustoff-Forschung EV
K1-MET	K1-MET GmbH
PCO	Project Coordinator
Q&RM	Quality and Risk Manager
RINA-CSM	RINA Consulting – Centro Sviluppo Materiali S.p.A.
RM	Risk Management
SSSA	Scuola Superiore Sant'Anna
SWERIM	Swerim AB
TM	Technical Manager
TR	Technical Risk
WP	Work Package
WPL	Work Package Leader

1. Introduction

1.1 Purpose of the present document

The Symbio-Steel consortium places a strong emphasis on quality control measures to ensure that project outputs are meeting the highest standards, are presented clearly, and are based on either their own original work or are properly referenced. This document contains the Quality Control and Risk Management procedures and illustrates how quality control measures are currently implemented within the project. This context includes the experience and lessons learned from previous research projects performed by the Symbio-Steel consortium members.

The consortium has extensive experience in managing complex research projects for the European Commission (EC). The internal processes have been designed so that multiple senior experts perform quality check at each relevant progression steps of Symbio-Steel and that any arising risk, even unforeseen ones, are faced in an effective and timely manner. The current version of these processes is explained in detail in the present document. Additionally, the Symbio-Steel governance structure as described in the Grant Agreement and the Consortium Agreement ensures that the project work meets the highest quality standards.

This document specifically covers the following items:

- Scope of application;
- Quality targets;
- Quality assurance procedures, including:
 - o Risk Management;
 - o Documentary evidence;
- Quality checkpoints;
- Personnel responsible for quality assurance.

1.2 Scope of application

This Quality Control and Risk Management Plan applies to any activity related to the Symbio-Steel project. In this context, the term 'activity' relates to any work conducted between project start and end and it applies to a wide range



of actions from deliverable report preparation to subsequent quality control measures. In organizational regards, this Quality Control and Risk Management Plan applies to all staff involved in the Symbio-Steel project, including the staff deployed for the implementation of the project, as well as any additional deployed staff. The main responsibility for the Quality Control and Risk Management Plan application lies with the Project Coordinator (CO) and the Quality and Risk Manager (Q&RM). Nonetheless, each staff member is bound by this Quality Control and Risk Management Plan.

1.3 Structure of the document

This document is divided into 8 main sections:

- Section 1 introduces the context of this document and its objectives.
- Section 2 introduces the main quality targets.
- Section 3 describes the quality assurance procedures.
- Section 4 provides an updated overview of the identified risks and associated management and mitigation measures.
- Section 5 overviews the documentary evidence which has been set up for the project.
- Section 6 describes the quality checkpoints and procedures for project and deliverable reports.
- Section 7 provides a synthetic overview of the personnel responsible for quality assurance and risk management.



2. Quality targets

The Symbio-Steel consortium sets the highest quality demands for itself thus ensuring that project outputs meet the highest quality standards and are clearly presented and focused. The outputs are based on their own original work or properly referenced.

The implementation of this Quality Control and Risk Management Plan shows the EC that all quality requirements for achieving a highly satisfactory performance have been duly planned. This plan serves as a key tool for deepening the trust between the Symbio-Steel consortium and the EC.

In this Quality Control and Risk Management Plan, the term 'quality' is interpreted in two different ways depending if it is related to its 'outputs', e.g., deliverable and reports, or to its 'procedures', e.g., project or contract management.

The definition of quality targets is the key pillar of the Consortium's quality management because only well-defined and measurable targets can lead the work to high level of quality. Table 1 provides a detailed quality assessment grid for project outputs based on the specific requirements and needs of Symbio-Steel.

Regarding the quality of project procedures, all staff members employed in Symbio-Steel are bound and explicitly committed to professional quality standards. They adhere to the rules and procedures as described in the proposal and Grant Agreement. Particularly, the Consortium Agreement, as established between all consortium partners, includes provisions on professional conduct, confidentiality, and intellectual property. For internal evaluation, the consortium applies the principle of peer review. In this, a group of peers review any project or deliverable report before these are submitted or published. The peers may comment on and require revisions of the draft. The consortium follows this peer-review model to ensure the maximum quality of the projects' outputs.



Table 1. Quality assessment grid

Quality Criterion	Quality standards
Relevancy	- The project is structured to find answers to relevant research challenges. - The project Deliverable reports describe the outcomes in sufficient detail so that readers can recognize their relevance to the topic.
Methodological Approach	- The methodological approach fits its purpose and considers all identified constraints. - The methodology includes an appropriate mix of approaches and tools. - These are described and documented clearly in each Deliverable report.
Data reliability	- The information used is documented in sufficient detail, including bibliography and annexes where relevant. - Any limitations affecting data reliability or validity are clearly described. - Confidentiality of sources is guaranteed if required.
Analyses soundness	- Data are analysed by appropriate processes. - If statistical analyses are used, the significance and validity of the results are reported clearly. Confidence intervals are specified if relevant.
Robustness	- Sources of uncertainty are well documented. If assumptions are required, this is clearly stated, and reasoning is explained in detail. - If substantial uncertainty exists, results are tested for their robustness by checking the influence of assumptions and/or uncertain variables. In these cases, ranges will be indicated.
Credibility	- The findings are based on a systematic and comprehensive review of the available evidence. - Data from different sources are verified, e.g., via triangulation, wherever possible, to produce credible findings.
Validity	- Conclusions are entirely based on the available evidence and research findings. The links between evidence and conclusions are clearly identifiable. - Conclusions are not biased in any direction. These are only based on a reasonable and credible interpretation of the evidence.
Helpfulness of recommendations	- Recommendations are clear, realistic, and applicable. - Implications, e.g., advantages and disadvantages, of different recommendations are clearly stated.
Clarity	The project and deliverable reports are written in a clear, accurate, and unambiguous language.

- | | |
|--|---|
| | <ul style="list-style-type: none">• The deliverables are well structured in a logical and reader-friendly way. Key messages are highlighted, e.g., in an executive summary and/or key findings section.• The length of the deliverables is proportionate to the scope of the relevant tasks. Non-essential elements are included in annexes. |
|--|---|



3. Quality Assurance Procedures

Dedicated procedures have been developed and will be implemented to guarantee the highest quality of Symbio-Steel outputs and research procedures. These procedures take into account various events that may occur during the course of a research project.

3.1 Open Communication

A major risk in performing an EU-funded project lies in a deviating understanding of the project expectations and requirements. Mismanagement of these aspects may lead to discrepancies that may furthermore lead to unsatisfactory project outcomes. To mitigate the risk, the project Consortium seeks to maintain an ongoing open communication with the EC via its CO. Moreover, a Dissemination and Communication plan is established as an integral part of the activities planned within WP2.

3.2 Editorial and Linguistic Quality

In projects that include partners across different Member States, experience has demonstrated that issues regarding language transparency can arise. Most authors of project and deliverable reports will be non-native English speakers with different linguistic backgrounds. This may affect the style, nature, and clarity of the language used in the reports. Therefore, the consortium acknowledges the requirement of a dedicated editorial and linguistic review before submitting or publishing any report. This includes high-quality proofreading. Project and deliverable reports need to be concise and to the point, avoiding any repetition of contents. To this aim, the editorial work includes two stages. First, the text is edited to check for linguistic style as well as for logical inconsistencies or incomplete referencing. Once the substantive content of the text has been clarified, the final proofreading to check for errors in spelling and punctuation is performed. Issues identified and comments to be addressed will be noted and sent to the partner responsible for the project or deliverable report as well as to the CO and Q&RM.



Standard Microsoft Word® templates are prepared in the first months of the project. These will be compliant with the Commission's visual identity, with automatic headings and paragraph styles. The final layout for all reports will be verified by the CO and the Q&RM.

3.3 Intellectual ownership and plagiarism

Plagiarism or the neglect of intellectual ownership is not accepted and will be addressed rigorously. If any improper referencing is detected, the Q&RM will report to the CO. The corresponding authors of the draft will then be informed and assisted in undertaking the required revisions and using the proper referencing system.

3.4 Replacement of Team Members

In given circumstances, the replacement of a team member may be necessary. As soon as the CO is informed of the enduring unavailability of a senior team member, she will notify the EC within one week. In transparent communication with the EC, further procedures will be elaborated. If the concerned task is at an advanced stage and the activities assigned to the senior team member to be replaced are relatively small or not specific, a possible option could be to hand over these activities to another senior team member with the same or superior professional profile.

3.5 Consortium Internal Management

Appropriate administrative procedures are essential to ensure the functioning of an efficient internal organization. The CO will handle contractual matters regarding the project, assisted by the Executive Board, in accordance with the Consortium Agreement signed by all Symbio-Steel partners.

4. Risk Management

Risk management is an important pillar in the Symbio-Steel project which defines how risks associated with the Symbio-Steel project are identified, analysed, and managed. It outlines how risk management activities will be performed, recorded, and monitored throughout the duration of the project and provides templates and practices for recording and prioritizing risks.



The Symbio-Steel quality assurance approach includes minimising disruptions and delays in project implementation. To account for these, the Symbio-Steel consortium nominated a dedicated Q&RM. This role has been covered since 01.12.2024 by MSc. Alice Petrucciani from SSSA. Every partner is responsible for applying risk management principles and the responsibility for each risk is well-defined. In particular, each risk is tracked, monitored, and handled with specific mitigation actions in order to reduce the risk impact. If the risk cannot be handled by the responsible partner, escalation to Project Manager and Project Coordinator is mandatory.

To be prepared for unforeseeable events, a dedicated risk management strategy will be implemented in Symbio-Steel. It contains the following four steps:

1. **Communication.** Possible risks and delays are being communicated regularly during partner meetings and directly in between the meetings. The communication will be carried out according to the escalation scheme project partner → Work Package Leader (WPL) → PCO → Q&RM.
2. **Evaluation.** The risk severity and consequences for the project schedule, deliverables, and milestones are continuously evaluated.
3. **Mitigation.** Dedicated mitigation measures are developed. These include the expertise of the Symbio-Steel consortium partners as well as their contacts to external experts. In case of occurring delays, the WP schedule will be adjusted and optimised to minimise the delays.
4. **Follow-up.** The progress of mitigation measures and interactions with other WPs and tasks is controlled.

Figure 1 describes the Risk Management Theory.





Figure 1. Risk Management Theory

All partners are responsible for continuously identifying risk scenarios using all the project documents, discussions, and technologies, their technical expertise, and the project execution experience. This step will involve the identification of the impacts and the likelihood of occurrence, through the calculation of the risk level and prioritizing the risk for a response plan if the risk falls within the MEDIUM and CRITICAL zones. Risk monitoring will be performed by the coordinator and the partner responsible for the resolution action(s). This is a continuous process that will involve the project team and appropriate stakeholders. Careful attention will be given to the project's deliverables, assumptions, constraints, cost/effort estimates, resource plan, and other key project documents. Several risks have already been identified, and initial countermeasures have been defined.

All identified risks are evaluated and analysed to assess the range of possible outcomes and their probability. Risk analysis is performed when a risk is identified and categorized based on the agreed characteristics. However, risks are continuously monitored and tracked. The two main characteristics on which every risk is assessed are the probability, i.e., likelihood, and the foreseen consequences, i.e., impact.

The likelihood and impact are assessed by the involved partner(s) using the following classification:

4.1 Likelihood

High – high probability of occurring (>70%);

Medium – medium probability of occurring (30%< AND >70%);

Low – low probability of occurring (<30%).

4.2 Impact

➤ High – Risk that has the potential to greatly impact project cost (>30%), project schedule (>6 months delay), or performance (>30%);

➤ Medium – Risk that has the potential to moderate impact project cost (>10% AND <30%), project schedule (>3 months delay AND <6 months delay), or performance (>5% AND <30%);

➤ Low – Risk that has relatively little impact on cost (<10%), schedule (<3 months delay) or performance (<5%).

The Qualitative Risk (Levels LOW, MEDIUM, HIGH, and CRITICAL) are derived from the matrix of likelihood and impact, as shown in **Figure 2**. Each risk is associated with a different color, respectively, green, yellow, orange, and red. Risks that fall within the MEDIUM to CRITICAL zones will be prioritized for a response plan.

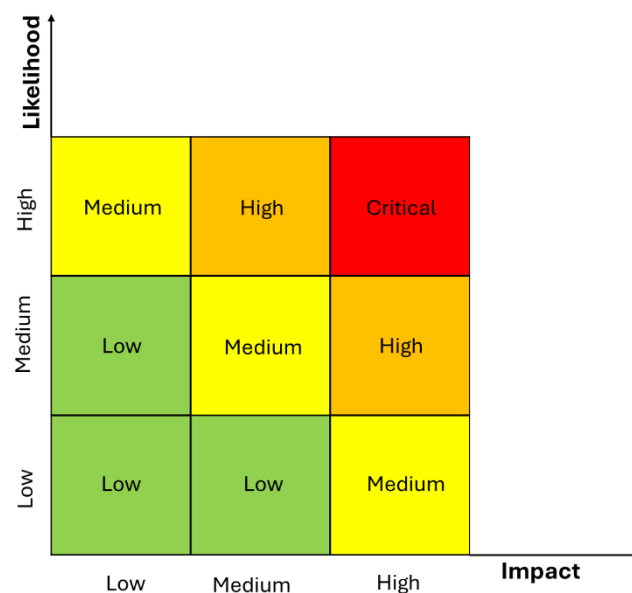


Figure 2. Risk Level Score Matrix

The level of each risk will be tracked, monitored, and reported. The risk monitoring activities are performed by the coordinator and the partners responsible for the specific actions. All project change requests will be analyzed for their possible impact on the project risks. Each risk is monitored, with mitigation and resolution strategies carefully analyzed, documented, and implemented as necessary.

Existing and future mitigation solutions are considered, including measures to eliminate or reduce the risk and providing support to the involved partners.

Risk strategies will be selected to address the identified risk:

- Mitigate – Identify ways to reduce or limit the likelihood and/or the impact of the risk
- Observe – Monitoring the risk and other actions can be implemented;
- Accept – Nothing will be done. This approach is rejected if there are other possibilities;

Each risk is associated with a specific Work package (WP) or multiple Work Packages, and consequently, the responsible for the risk is identified as the WP Leader or one of the WP Leaders. The risk-responsible partner must monitor the identified risks and report their status to the coordinator. The risk-responsible partner is not necessarily required to implement resolution actions, but he must ensure that other partners have implemented the actions.

Each risk is identified and evaluated with its probability of happening (likelihood) and the impact it may have. To manage a risk, mitigation strategies can be used in the project. The best way to handle a risk is to minimize its likelihood, reducing its probability to happen near zero.

Disruptions or delays may occur due to foreseeable or unforeseeable events. A comprehensive list of foreseeable events as well as the proposed and planned contingency measures updated at the date of the present deliverable, is provided in **Table 2**. These events and proposed measures will be checked and updated continuously throughout the duration of the project.



Table 2. Project Risk matrix (L=Low, M=Medium, H=High).

Risk No.	Risk description	Likelyhood	Severity	Involved WP(s)	Proposed risk-mitigation measures
Management Risks					
RM1	A partner leaving the consortium	L	H	All	If the task of the leaving partner can be reallocated among the remaining ones, this mitigation measure will be implemented. If the tasks of the leaving partner cannot be allocated among the remaining ones, the large contact network of the partners may be activated to easily find a new partner.
RM2	Wrong estimation of task duration and/or delay in key milestones or deliverables	M	L	1	Milestones and deliverables will set the timing, and the frequent communications between SSSA (COO) and WP leaders will ensure meeting the time schedule proposed. In case of any delay, a revised time frame will be agreed with the Commission to move intermediate deadlines without affecting final deliverables.
RM3	Key persons leave the teams	M	M	All	Plan for backup personnel and expertise. Regular documentation of progress and results.
RM4	Budget deviations	M	M	1	Continuous cost monitoring and adaptation as soon as it arises.
RM5	Poor communication among partners	M	H	All	Communication, roles, and responsibilities among partners are ensured by frequent virtual meetings coordinated by SSSA.
Technical Risks					
TR1	Low collaborations between steel stakeholders and other industries	L	M	2	The consortium will use comprehensive communication activities underlining the importance of cooperation to ensure the accomplishment of the Green Deal objectives ["highlighting also the benefits and advantages for each industry"]. It will also ensure that all the sensitive information will be treated with the required level of confidentiality.
TR2	External and unforeseeable constraints limit the correct implementation of dissemination actions and workshop	L	M	2	The possibility to participate in the events remotely will be guaranteed as much as possible so that stakeholder's time schedules can be more easily aligned with Symbio-Steel events.

	participation				
TR3	Limited data available for the KPIs evaluation leading to poorly accurate KPI estimation	L	M	3	Stakeholder consultations will be done to complete and improve the data obtained. National funding agency contact points can provide published project reports with relevant KPI data. Additionally, sector coupling scenario analyses will be done during stakeholder consultation.
TR4	Selection of non-representative KPIs	L	M	3	Activities will start from already acknowledged EU relevant data. Besides, national existing metrics, e.g., information from data bases or surveys, will be included as well.
TR5	Incomplete set of technological industrial symbiosis solutions driven by the EU steel sector	L	M	3	The ESTEP network allows the consortium to address all relevant steel sector stakeholders to gather information about industrial symbiosis-related R&D&I actions. The consortium will use its contacts to national funding agencies and steel-related organizations (Federacciai/Italy, Jernkontoret/Sweden, ASMET/Austria) to avoid exclusion of relevant potential best practice solutions for sector coupling.
TR6	Stakeholders cannot/do not want to share projects information	M	M	4	Ad hoc confidentiality agreements will be signed with the stakeholders to guarantee confidentiality.
TR7	Infrastructures owners are reluctant to share information related to their facilities	M	M	4	Whenever needed, confidentiality agreements will be signed. In any case, the level of information made public will be agreed with the owner.
TR8	Lack of cooperation from stakeholder in supporting guidelines and policies preparation	L	M	5	ESTEP, as subcontractor of the consortium, will highlight the significance of the study for the future of the EU steel industry, e.g., during task force meetings of the Clean Steel Partnership. EUROFER will be contacted by ESTEP in case stronger support from the steel sector is required.
Exploitation Risks					
ER1	Lower level of online interaction (visits) than expected	L	M	2	Wide dissemination of the URL is planned. Project partners will use different channels to draw visitors to the webpage, including social media, newsletter, etc. Website will be promoted at all the events and URL will

					be included in all communication materials
ER2	Low number of participants attend the project's events	L	M	2	Partners supporting dissemination events will be communicated early to the target audience. The agenda will be distributed to the target audience at an early stage of event organization.
ER3	Low engagement with relevant sectors other than steel and iron	M	M	2	Dissemination and communication activities will engage with stakeholders with experience of inter-sectoral symbiosis, to benefit from their professional networks in multiple sectors.



5. Documentary Evidence

The consortium's quality assurance system relies on the traceability of information. Consortium members shall have traceability systems for documents in place. This ensures the capacity to retrieve specific information for the evaluation of outputs, procedures, and events.

A project record will be created, including:

- Contractual documents: signed Grant Agreement, Consortium Agreement signed by all partners, amendments, call for proposal, submitted proposal, formal notifications, etc.
- Administrative documents: invoices, bank statements of account, timesheets, travel and subsistence receipts, etc.
- Project Management documents: relevant correspondence with the European Commission, meeting reports, etc.
- Reports and Presentations: draft and final versions of periodical project reports, draft and final versions of deliverable reports, presentation slides, etc.
- Data sources: background documents, literature referenced in the reports, transcription of interviews, survey raw data, databases, and any other information and evidence used in the project.

Paper documents are stored for at least five years after the end of the project. Electronic documents are stored indefinitely on resident servers. Data are being encrypted if necessary. Period back-up of digital files is performed. Relevant information exchanged orally is transcribed as meeting reports.



6. Quality checkpoints

Besides the upfront planning of the Quality and Risk Management, as described above, quality assurance and quality control are conducted and supervised continuously throughout the project duration. The Q&RM and the CO perform quality checks on an ongoing basis. Additionally, at dedicated 'quality checkpoints' the quality of project and deliverable reports and procedures is reviewed. The quality control measures foreseen are described in the following subsections.

6.1 Verification of (draft) deliverables and interim reports

Against the background of quality control, special emphasis is given to the verification procedures of report drafts and final versions. The first quality checkpoint for project or deliverable reports consists of sending the reports in draft form for quality check to the Q&RM, the CO, and the respective WPLs. This has to happen with sufficient advance to the report deadline. While the report is checked for quality, the consortium can work on the fine-tuning of the report in parallel, if necessary. This may include proofreading or finalization of the layout. The Q&RM must be satisfied with the report quality or otherwise ask for a revision.

Therefore, the following specific procedure has been established to prepare the deliverables.

- Each deliverable tackles a specific subject and has an assigned Deliverable Leader (DL), who will coordinate the production of the specific interaction as necessary with the other partners involved.
- Before starting its production, the DL defines the structure and the expected contributions from each partner in a preliminary document named Document Development Plan (DDP) – according to a template, which will be finalized together with the visual identity of the project and will propose the schedule for the development of the deliverable.
- Upon receiving the inputs from the different contributors, the DL merges them into a single document. This first draft will then be circulated for internal review and asked for further input. Each involved partner will check and provide feedback. This iterative procedure will be repeated as necessary until all involved partners give approval.
- The DL will then prepare a pre-final draft, which will be sent to the Q&RM for peer review. The Q&RM can decide, if needed, to involve partners



who are not directly involved in the deliverable editing with the role of reviewers.

- Within up to 4 days, the identified reviewers will provide feedback and comments to the DL and may reiterate and re-circulate the deliverable report as required until the necessary quality level is attained.
- Once the Q&RM has signed off the deliverable, the CO will transform the document into a PDF and upload it onto the EU portal. The final version of the deliverables is also shared with the consortium through the project OneDrive folder.

Figure 3 summarizes the procedure to be followed for the preparation of deliverables:

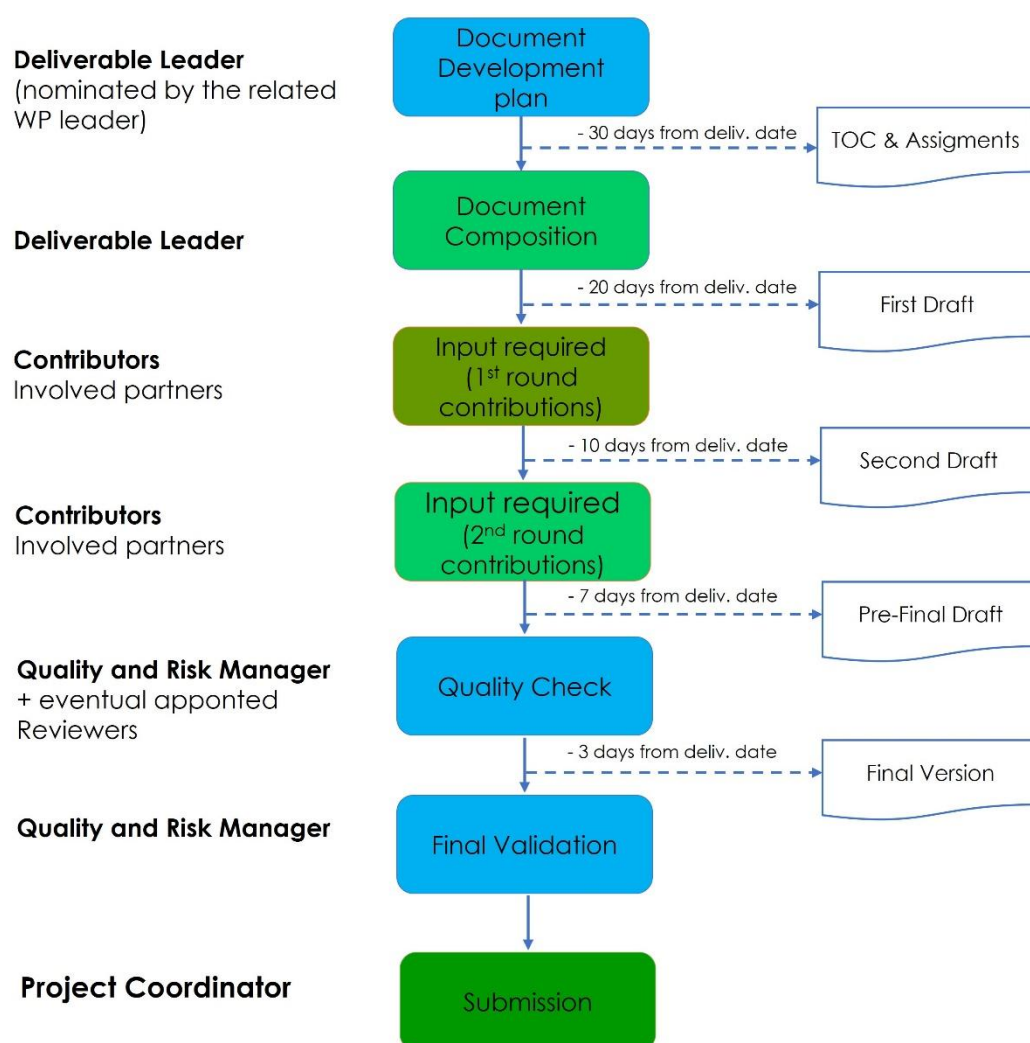


Figure 3. Symbio-Steel procedure for Deliverables preparation

For interim and final reports, a similar procedure is followed, with the CO playing the role of DL.

6.2 European Commission's feedback

The quality checkpoint is reached once the EC's comments on the project or deliverable reports are provided. After report submission, the highest attention is dedicated to receiving relevant comments from the EC and subsequently implementing required changes, amendments, or updates. The CO assesses the comments with the support of the WP leaders (WPL).

6.3 Complaint Management System

The consortium implements a complaint management system at the disposal of the EC for the duration of the project. The CO is responsible for receiving and reviewing complaints and ensuring that these are addressed as soon as possible. The EC will be able to submit complaints on any issue arising. This may consist of project quality or deliverable reports, timeliness, communication, relationship with EC services or other stakeholders, professional misbehaviour, conflict of interests, etc. The complaint procedure starts with a notification to the CO. She will get into contact with the EC without delay. Then the CO will consult the Executive Board within the following 48 hours with the appropriate measures to adopt. In case of a founded complaint, the possible measures may include deploying additional efforts such as execution of additional research, strengthening the research team by including additional senior members or replacing non-performing consortium member following the rules of the Consortium Agreement, if necessary. In any case, the contingency measure adopted needs to be confirmed by the EC.



7. Personnel responsible for quality assurance and risk management

The quality of the project procedures and outputs are checked constantly by the dedicated Q&RM as well as multiple instances as the overall project Executive Board and corresponding Deliverable Leaders and WPLs. Such as detailed in the Project Management Plan (Deliverable 6.1), the project Executive Board consists of the CO (Dr. Valentina Colla, SSSA), the Quality and Risk Manager (MSc. Alice Petrucciani, SSSA), and the leaders of WP2 (Dr. Han Yu, SWERIM), WP3 (Dr. Lina Kieush, K1-MET), WP4 (Dr. Claudia Sergi, RINA-CSM) and WP5 (Agneiszka Morillon, FEhS). The roles are clearly coordinated so the joint effort of these instances will ensure the respect for quality standards.

The CO is responsible for the duly implementation of project activities. She ensures timely execution of the work required for Deliverable preparation and creation. The primary task of the Q&RM is to assess the quality of the work performed and of reporting. She verifies that the activities being performed and the deliverables produced under a specific Task and WP comply with the applicable quality standards. The Q&RM provides advice prior to the provision of each agreed Deliverable or report to the EC and periodically upon necessity. It works closely with the CO and the WPLs. The Q&RM must be satisfied with the work and will otherwise ask for revisions.

The CO is responsible for finalizing the Deliverables, and their presentation to the EC. CO will provide the Q&RM with the information needed and the Deliverables in draft form for quality check. She performs the quality checks of the contributions of team members with a sufficient advance before the deadlines for the submission of a Deliverable. If needed, she sends feedback and recommendations, asking for necessary improvements or clarifications. The CO consults with the Q&RM to ensure that the Deliverables meet the quality standards required. Furthermore, she will stay in regular contact with the EC to



swiftly identify and address expectations and requests and assess satisfaction with the outputs produced.

Table 3 summarises the persons who are responsible for project management and WP leaderships and, as such, also have a role in quality and risk management and quality assurance, under the coordination of the Q&RM.

Table 3. Members of the project Executive Board.

Role in the project	Name	Company/Institution
Project Coordinator	Valentina Colla	SSSA
Quality Manager	Alice Petrucciani	SSSA
WP2 Leader	Han Yu	SWERIM
WP3 Leader	Lina Kieush	K1-MET
WP4 Leader	Claudia Sergi	RINA-CSM
WP5 Leader	Agnieszka Morillon	FEhS

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