AUTOFLEX

[D1.3] QUALITY AND RISK MANAGEMENT PLAN

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EXECUTIVE SUMMARY

This document describes the project's quality management procedures that apply to AUTOFLEX design, implementation, and pilot demonstration stages. The close following and compliance to the Quality and Risk Management Plan is a joint responsibility of all project partners until the complete discharge of all obligations under the European Commission (EC) Grant Contract, to ensure the quality of all project deliverables and the following of coordination guidelines among partners during project's tasks execution. The plan presented hereafter consists of planned and systematic processes and steps to determine and ensure the achievement of the AUTOFLEX quality objectives. Moreover, it will be utilised to monitor the corrective actions employed and to verify that the agreed procedures are in place and are being adequately implemented. To this end, this document identifies a list of Key Performance Indicators (KPIs) that will be used and continuously updated throughout the duration of the AUTOFLEX project, in order to monitor the progress and also the quality of the work performed in various executed tasks. Moreover, a list of the major identified risks related to the project operation has been created (and will be maintained and updated throughout the project's course), accompanied with adequate mitigation strategies.

The document is structured as follows:

Section 1 is an introductory section that outlines the purpose of the document.

Section 2 discusses the quality reviewing activities that have been designed for the quality assurance of the project deliverables.

Section 3 describes the configuration management activities that will take place within AUTOFLEX for each deliverable.

Section 4 presents in detail the Quality Attributes and the KPIs that were set for the AUTOFLEX project, in order to assess the quality of the project results. At the same time, it introduces an early, but detailed description of the major risks envisaged for the project operation, together with the proposed mitigation strategies.

TABLE OF CONTENTS

TABLE OF FIGURES

TABLE OF TABLES

LIST OF ABBREVIATIONS

Abbreviation	Description
AB	Advisory Board
DL	Deliverable Leader
EC	European Commission
FMEA	Failure Mode and Effects Analysis
GA	Grant Agreement
IPR	Intellectual Property Rights
KPI	Key Performance Indicator
PC	Project Coordinator
PMR	Periodic Management Report
PO	Project Officer
PR	Project Reviewer
QM	Quality Manager
TL	Task Leader
ToC	Table of Contents
WP	Work Package
WPL	Work Package Leader

1   INTRODUCTION

1.1   BACKGROUND

This deliverable is part of WP1 "Project administration, dissemination, and exploitation" and more specifically of T1.2 "Quality control and risk management".

1.2   PURPOSE AND SCOPE

This deliverable will provide the detailed procedures that will be used by the Consortium for assuring high quality work and effective risk management. It will provide the foundations for assuring the conformity and the quality of all project deliverables with the respective requirements.

In more detail, the purpose of this document is the description of the quality procedures that will be applied during the project's implementation stages. The consortium is committed to follow specific processes to provide high quality deliverables and provide reliable results within the defined scope, schedule, and budget. Compliance to the Quality Management Plan is a joint responsibility of all project partners until complete discharge of all obligations under the EC Grant. Quality will be ensured by implementing quality management procedures and appointing a Risk and Quality Manager (NTUA), who will be responsible for monitoring and advising partners on quality procedures and ensuring conformity to standards.

The Quality Management Plan ensures the quality of all project deliverables and the proper risk management, assuring coordination activities among partners during the tasks' execution, thoughout the whole project's duration. The Quality Management Plan defines procedures and quality KPIs that the QM will monitor throughout the project. Each Work Package Leader (WPL) will be responsible for the quality of results and deliverables of its WP; the latter will be subject to a peer review by the Risk and Quality Manager and one reviewer from the partners not authoring the specific deliverable. In more detail, the objectives of the Quality Management Plan can be listed in five categories:

- Structure: defining the quality management structure and processes adopted;
- Input: clearly defining the strategic goals, milestones, ensuring realistic schedules and sufficient resources;
- Output: implementing an effective internal and external information and communication system, decision making process, documenting intermediate and final results (e.g., software, solutions, tools);
- Feedback: monitoring of the quality of processes and results, keeping the project on schedule and budget;

- Implementation: appointing the responsible body with the authority to take and implement decisions on the necessary corrective measures (QM, PC and WPL) and ensuring the commitment of partners.

Practices defined in this plan will ensure that quality is integrated into AUTOFLEX working processes. Therefore, the plan consists of dedicated and systematic activities to determine and ensure achievement of the AUTOFLEX quality objectives.

1.3   INTENDED READERSHIP

The plan set out in this document will govern the actions of all project partners throughout the project duration. It is therefore important that all partners have access to it and a possibility to consult it at all times.

1.4   DOCUMENT STRUCTURE

The structure of this document is the following:

In Section 2 the quality reviewing activities, that have been designed for the quality assurance of the project deliverables, are being analysed.

In Section 3 the configuration management activities that will take place within AUTOFLEX for each deliverable are presented.

In Section 4, the Quality Attributes and the KPIs that were set for the AUTOFLEX project are further presented, in order to provide the method for assessing the quality of the project results. Additionally, a detailed description of the major risks envisaged for the project operation, together with the proposed mitigation strategies are introduced.

2   QUALITY REVIEW WITHIN AUTOFLEX

The Quality manager (NTUA) serves as the contact point for the Project Coordinator (SO) who is leading Project Management and ethics activities and all AUTOFLEX partners on all AUTOFLEX quality matters.

Within the AUTOFLEX project, the review of the project deliverables will be conducted as described in the following sub-sections.

2.1   REVIEWS FOR DOCUMENTATION – DELIVERABLES

Each project deliverable is assigned to one leading responsible partner (Deliverable Leader, DL), as defined in the AUTOFLEX Description of Action (GA). A detailed list of Work Package leaders (WPL) and Task Leaders (TL) is presented in D1.1 (Project Management Plan). The DL must guarantee that the deliverable will be submitted on time, along with its high quality. The DL must also assure that the content of the deliverable conforms to the deliverable description of the GA and that the objectives related to the goals of the work package and the project are met. Any issues related to the deliverables, such as endangering the success of the work package or the project, must be reported by the WPL immediately to the Coordinator and be further discussed within the Coordination team if needed.

Project documentation will be reviewed against the following criteria:

- Format of the document according to the AUTOFLEX template, as described in D1.4 Project Branding.
- Consistency with GA, to ensure that the deliverable reflects what is stated there.
- Consistency with previous relevant documentation (for example, technical specifications combined with the requirements definition).
- The methodology of the work, development, trial, test, experiment, or study conducted is in a manner appropriate to the task.
- The results are realistic, useful, and reliable and the deliverable is useful to downstream tasks.
- Technical aspects of the documentation will be reviewed from the Project Coordinator, to ensure that the document meets the technical goals of the project.
- The conclusion of the deliverable must be comprehensive and coherent.
- Identification of plagiarism, inappropriate authorship credit, data falsification, image manipulation.
- Citation of appropriate sources must be declared (use of Zotero[1] as citing tool).

Other criteria:

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[1] https://www.zotero.org/

- Identification and correction of typing mistakes, spelling or grammar mistakes that may cause misunderstanding.
- The structure of the document is rational and easy to follow.
- Figures and tables are legible and referred to with cross references in the text.
- The length of the deliverable's main body is consistent.
- The references of the papers and other sources used are correct.
- Terms and abbreviations are all defined.
- Any mathematical or other symbols used in the document are sufficiently defined.
- The existence of a conclusions section, which is mandatory for all the deliverables.

The overall procedure and timeline for the review project documentation is described in the following paragraphs (see also Figure 2-1).

The DL drafts a Table of Contents (ToC), which is then checked by the involved partners in order to ensure that there is an agreement on the main content, and that all have the same understanding of the work to be done. After that, the DL assigns tasks to every involved partner, and sets the respective deadlines. Involved partners provide their feedback within the deadlines and the responsible partner prepares the first draft of the document (v0.1). This draft is sent to the WPL for comments and improvements/additions. Feedback is sent directly to the Deliverable Leader who revises the document, prepares the semi-final version (v0.2), and sends it back to the WPL.

The Quality Control Process begins based on the semi-final version (v0.2) of the deliverable. One defined Project Reviewer (PR), who ideally[2] is not member of the authoring team but has expertise in relation to the deliverable, has been assigned in advance (Table 2-1). Each deliverable will be submitted by the DL to the QM, who will forward it to the appointed reviewers for peer review. The PRs send their comments to the Quality Manager (QM), either in tracked changes on the digital document or (if not otherwise possible) using a review form (as show in Appendix I), who consolidates and checks the comments and sends them to the DL. The DL then improves the document based on their comments. In case the comments/suggestions cannot be realized, the reasons for this must be documented. If necessary (i.e. if there are too many comments on the first round), another round of comments from the PRs shall take place.

The final version (v1.0) that is prepared by the DL is then submitted for a final round of comments to the Project Coordinator (PC). If there are comments, the DL addresses them appropriately and prepares the final version of the document, which is sent back to the Coordinator. The PC delivers the final version to the Project Officer (PO) and the EC.

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[2] As far as practicable, PR will not be a member of the authoring team. However, there can be cases where this is not possible, such as *D5.5 Steps to realisation* where all partners are involved in one way or another." In such cases, reviewing partner should select a person who has had minimal involvement in the writing.
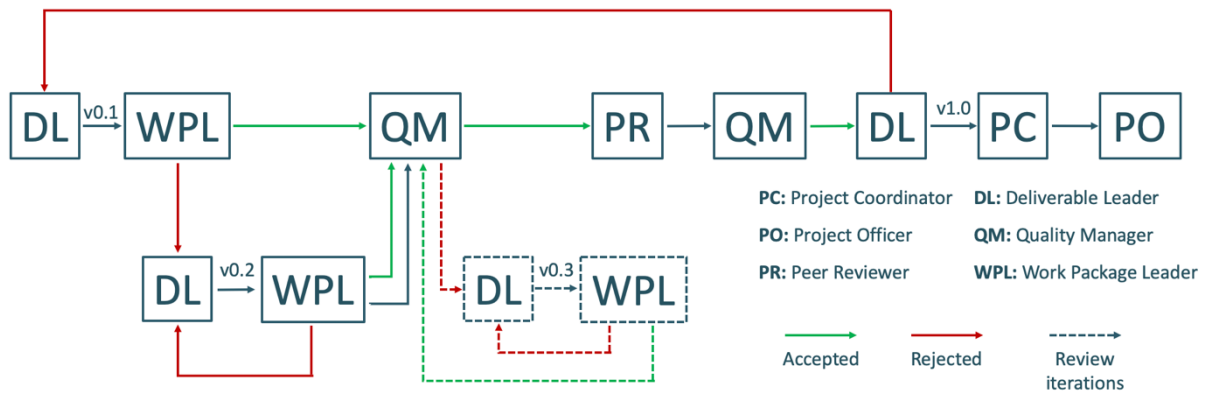
Figure 2-1: Schematic view of deliverable's submission.

2.2   REVIEW FOR HARDWARE, SOFTWARE AND DEMONSTRATIONS

Hardware, software and demonstration reviews will be conducted during the testing procedures. The PC will be responsible to evaluate it together with the relevant Technology Provider partner, in close collaboration with the Quality Manager, in order to verify and validate the testing results.

2.3   REVIEWS FOR DISSEMATION MATERIAL

Dissemination material, such as leaflets, newsletters, conference presentations, and scientific publications will undergo a quality check by the Executive Board, that consists of the Project Coordinator & Ethical Manager (SO) and the Dissemination and Exploitation Manager (FHG) and the quality and risk manager (NTUA) before their actual publication. This review process aims for quality, fairness, transparency and maximization of impact. The Executive Board will review the submissions and verify that:

- The quality is at the desired and expected level.
- The contents have proper references to the work conducted by the partners and no information which may require clearance from the partners.
- That proper acknowledgement to the EC is made, including Grant Agreement number.
- In case there are issues of any kind, the board should be able to properly justify its decisions.

2.4   DELIVERABLE ASSIGNMENTS FOR THE PEER-REVIEWED PROCESS

The relevant reviewer for each deliverable has been assigned by the Project Coordinator. The reviewer should be notified at least one (1) month prior to the submission of the deliverable.

The reviewer's list is presented in Table 2-1.

Table 2-1: The list of reviewers per deliverable.

D6.4	Full Scale Demonstration		MR	FHG

The list of deliverables with additional information is presented in Appendix II.

3   CONFIGURATION MANAGEMENT

Configuration Management deals with the overall project consistency, identification and tracking of changes related to all project results, including the deliverables, documents, testing procedures and any other related activity. The QM (NTUA) will be responsible for the overall monitoring of all configuration management activities described in this section.

3.1   DOCUMENT CONFIGURATION MANAGEMENT

Configuration management will be ensured through version tracking and history of changes of the various project documents, including the following:

- Deliverables (as stated in the deliverables list in the AUTOFLEX Grant Agreement)
- Meeting minutes
- Reviewed documents

Document history will be tracked in each deliverable in a separate table, describing the different versions of the document and the reasons of the changes/updates on it. The main author of each deliverable is responsible for keeping the changes performed on the document up to date.

Document versioning will be tracked through the monitoring of the Configuration Matrix, in which all versions of each document will be tracked. Also, this table will be updated by each document author.

In the following subsections, the document naming conventions to be followed in AUTOFLEX are analyzed.

3.2   DELIVERABLES NAMING

Table 3-1 presents the convention followed for naming the project's deliverable documents.

Table 3-1: Deliverable naming scheme.

Coding:	GA number_AUTOFLEX_Deliverable Code and Title_vA.B
A:	S/n for major release of the deliverable (Submission to Commission)
B:	S/n for updates during the preparation phase
Example	101136257_AUTOFLEX D1.1_Project Management Plan_v1.0 (for submission to the Commission)
	101136257_AUTOFLEX D1.1_Project Management Plan_v0.9 (for internal updates and submission for internal review)
	Version number to be increased when the review comments have been taken into account the proper modifications have been made

3.3   DELIVERABLES REVIEW NAMING

In Table 3-2 the format regarding the naming convention of the deliverables considering the review process is shown. This format will be used for the reviewed deliverable document (comments and track changes on the existing document) or the Review Form.

Table 3-2: Deliverable review naming scheme.

Coding:	GA number_AUTOFLEX_Deliverable Code and Title_vA.B_Partner's abbreviation review
A	S/n for major release of the deliverable (Submission to Commission)
B	S/n for updates during the preparation phase
Example	101136257_AUTOFLEX_D1.1 Project Management Plan_v0.3_NTUA review

3.4   MEETING MINUTES

In Table 3-3 the format of the naming convention regarding the meeting minutes is presented. This format must be followed for every document of such kind:

Table 3-3: Presents the naming convention followed for a meeting minutes document.

Coding:	Date_AUTOFLEX_Type of Meeting_Minutes_Place vA.B
A	S/n for major release of the document
B	S/n for updates during the preparation phase
Date	Date(s) the meeting was held. Format: YYYYMMDD
Place	Place where meeting was held
Example	20240116_AUTOFLEX_Kick-Off Meeting Minutes_Brussels/Virtual v1.0

3.5   E-MAILING CONVENTIONS

Electronic mail will be an important mean of exchanging information in the AUTOFLEX project. All e-mail subject headings must start with the text "AUTOFLEX" and be followed by the relevant WP. Additional tags can be added to specify relevant tasks and deliverables, where appropriate and if deemed useful.

Some indicative examples of email subject headings are:

- AUTOFLEX - WP6 - Title

- AUTOFLEX - WP1 - Task1.2 - D1.4 Title
- AUTOFLEX - WP4 - Task4.3 Title

4 QUALITY ATTRIBUTES AND KEY PERFORMANCE INDICATORS

4.1 QUALITY ATTRIBUTES

To assess the quality of the project results, in general, several qualitative attributes will be used based on the nature of the AUTOFLEX project and the characteristics of its end-users, as well as the "context of use" of project results.

On the other hand, quality is also addressed by ensuring the compliance of all the project activities to the development process. The main attributes that address this need are:

- Planning accuracy
- Rework occurrence
- Conformity to methodologies
- Redundancy

All these attributes will play an important role in the measurement of the project Key Performance Indicators (KPIs) described in the following section.

4.2 KEY PERFORMANCE INDICATORS

Monitoring of the progress of the project objectives will be done by the PC (SO) on some aspects and by the Dissemination and Exploitation Manager (FHG) on others, through KPIs. These KPIs will be monitored bi-annually and the relevant KPIs will be presented in the project's Interim Report and in the Periodic Management Report (PMR). The metrics included in Table 4-1 will be used as the starting point.

Table 4-1: Initial Key Performance Indicators (KPIs).

KPI	Goal (Justification and Goal)
Real month of milestone achievement/due month	Keep the project on schedule (KPI=1). Six-Monthly internal activity reports are compiled and consolidated (Process described in D 1.1). Target: KPI<=1, per milestone
Overall project risk level	Flag any deviations from targets in advance to allow preventive action. Target: Risk level below moderate
Real month of deliverable submission/Due month	Ensure compliance with task and deliverable performance procedures. Target: KPI<=1, per deliverable

Number of reviewers per deliverable/assigned reviewers	All deliverables undergo at least a two-phase review procedure: review by one appointed reviewer and by the QM. Ensure that all deliverables follow defined quality criteria. Target: KPI>=1
Creation of a recognisable brand identity	1 project logo, brand guidelines, AUTOFLEX templates, illustrations and graphics.
Communication kit	- Total n° of visits per year on the website: 700 on the 1st year, 1200 on the 2nd and 2000 on the 3rd. - N° of social media followers accumulated per year: 300 on the 1st year, 500 on the 2nd and 700 on the 3rd. - Media relations & press releases, N° of journalists contacted: 10 on the 1st year, 20 on the 2nd and 30 on the 3rd. - Newsletters (N° of subscribers, Open rate): 30,50 on the 1st year, 60,45 on the 2nd and 80,45 on the 3rd. 3 published project videos: 1/year. - Communication material (N° of download, N° of print material distributed): 40,250 on the 1st year, 65,250 on the 2nd and 85,500 on the 3rd.
Dedicated website	1 public website
Revision of the CDEB plan	3 revisions of the CDEB plan (1/year)
Dissemination activities	Publications in at least six specialised media formats, six publications in peer review journals. Specifically: - Publications in specialised media: 2 on the 1st year, 2 on the 2nd and 2 on the 3rd. - Publication conference proceedings: 1 on the 1st year, 2 on the 2nd and 3 on the 3rd. - Peer reviewed publications: 1 on the 1st year, 2 on the 2nd and 3 on the 3rd.
Participation in events	Participation in at least twelve events including conferences that require a publication and organisation of two events (stakeholder and final event). Specifically: - N° of organised Events: 1 on the 2nd year and 1 on the 3rd. - Participation in events (N° of events attended): 1 on the 1st year, 2 on the 2nd and 3 on the 3rd. - Cross-dissemination with network (N° of network reached): 1 on the 2nd year and 1 on the 3rd. - Public Events including Final event (N° of participants): 30 on the 2nd year and 50 on the 3rd.

	• Participation in >6 small and large events during project duration. • Organisation of >1 event with >30 attendees.
Active engagement of Advisory Board (AB) members	• >3 business cases evaluated and validated by AB members in cooperation with consortium partners • >2 business cases followed up commercially by consortium partners, potentially together with customers or through partnerships

4.2.1. RISK MANAGEMENT

In AUTOFLEX, risks are considered as an integral part of the workplan. The complexity of the problem at hand and the trans-disciplinary nature of the consortium add to the number of risky aspects that may cause issues in the project execution lifecycle. However, all these issues are tackled a priori by exploiting the accumulated project implementation experience of partners and by applying a well laid-out management scheme.

AUTOFLEX Risk management is a circular/iterative process, in which risks are identified, monitored, analyzed and managed. The AUTOFLEX risk management process is implemented by the Risk Manager and Quality Manager (NTUA). The Risk and Quality Manager is responsible for continuously monitoring project risks, by updating the AUTOFLEX risk register, and drafting an appropriate mitigation strategy for unacceptable risks. The elements of the AUTOFLEX risk management process are outlined below:

Risk identification: All partners involved in the project need to be aware of their contribution to the project objectives and the involved risks that might prevent them from delivering it. These risks will be reviewed at regular intervals to restate current priorities, as project priorities may shift over time (deadlines, budget re-forecasts, and performance expectations) and unforeseen difficulties might arise.

Risk analysis: AUTOFLEX will use estimates of likelihood and impact against the key risks. AUTOFLEX will try to quantify risks wherever possible, by using a scoring system in order to ensure comparison of risks. The quantification of project risks will be performed considering the most likely outcome scenario for all identified risks.

Risk management: Risk responses in AUTOFLEX will fall under one of the types: a) Avoid the risk: This can be done by avoiding the use of technologies that do not have feasible alternatives; b) Mitigate the risk: If a risk cannot be avoided, management will try to reduce the risk, by making it either less likely or less consequential. This will include the development of contingency plans for those risks which cannot be avoided; c) Accept or retain the risk: Inevitably there will be some risks that are intrinsic in the nature of the work being undertaken and which it is not possible to mitigate, control or avoid because the time and cost involved is too high to justify the benefits. The number and impact of these sorts of risks in the AUTOFLEX project are minimal.

Risk monitoring: AUTOFLEX will run a well-maintained risk registry for monitoring risk-management performance. The registry defines mitigating actions for each risk, citing who will do what and by when.

Risk Contingency Plans: To monitor and minimize AUTOFLEX risks, the consortium will prepare a list of risks and propose contingency plans as early as possible. Table B-1 in the Appendix A presents an initial identification of the main risks and the proposed risk mitigation measures, as described in the AUTOFLEX GA.

More specifically a Failure Mode and Effects Analysis (FMEA) process will be applied, and quality risk levels will be assigned to each step in the design and manufacturing of AUTOFLEX technologies. This will allow the consortium to anticipate risks at an early stage and implement countermeasures ahead of time.

FMEA is a systemized approach used for identifying risk events during product development or for quality improvement activities. Risk event modes are the ways in which a process can fail. Effects are the ways that these Risk events can lead to waste, defects, or catastrophic outcomes for the customer. As such, FMEA approach is designed to identify, prioritize, and limit these Risk Event modes.

As with many powerful techniques, the strength of FMEA, applied to AUTOFLEX, will be derived from a cross-functional, partner-based approach. The word potential is often placed ahead of FMEA to highlight that the tool is best utilized early in a product's concept/development phase, in order that Risk Event is averted in service or during manufacture.

Initially, a spreadsheet will be used to document the completed FMEA for AUTOFLEX project. The spreadsheet will be comprised by unique columns, each of these columns must follow the formatting of an FMEA methodology. More specifically, the columns of the spreadsheet shall follow the naming format defined in the list below.

- **FMEA ID #:** This column assigns an identification number for internal use.
- **Item/Function:** This column identifies the subsystems (components) of AUTOFLEX technologies along with their functions.
- **Potential Risk Event:** A risk event is defined as the way the item could potentially fail to meet the function intent. In other words, what can go wrong?
- **Potential Risk Event Impact:** A Risk Event impact is defined as the result of a Risk Event on the function of the product/process as perceived by the customer (internal and external customers). Indicative examples of Risk Event impacts are: inoperability of the product, degraded performance etc. Note that Risk Event impacts should be identified for each Risk Event.
- **Work Package #:** This column indicates the related project work package.
- **Severity (S):** This column indicates how serious the potential Risk Event is. A numerical value, S, is assigned to the severity of the Risk Event. This value is in the range of 1 to 5, 1 being the lowest impact on product function or process output, and 5 being the highest (Table 4-2).

- **Potential Causes for Risk Event:** A cause of Risk Event is defined as a design weakness which may result in a Risk Event. Note that all potential root causes need to be identified for each Risk Event.

Probability (P): This column indicates how likely (or often) it is that the cause of Risk Event will occur. A numerical value, P, is also assigned to the occurrence which ranges from 1 to 5 (

- Table 4-3).
- **Current Process Controls:** For each potential cause of Risk Event, this column identifies current tests or mechanisms in place to prevent the cause of the Risk Event from occurring or which detect the Risk Event before reaching the customer.
- **Detection Rating:** It estimates how well the controls in place can detect either the Risk Event cause or its mode. The detection rating is on a scale of 1 to 5 where 1 means the control is certain to detect the problem and 5 means the control is certain not to detect it (see Table 4-4).
- **Risk Priority Number (RPN):** In this column, the risk priority number is evaluated for each cause of Risk Event, by multiplying the severity by the probability by the detection rating as follows:

$$RPN = Severity \cdot Probability \cdot Detection$$

The RPN number, along with the risk level provides guidance for ranking potential Risk Events in the order they should be addressed.

- **Risk Level:** Risk is the combination of probability of occurrence and severity. Risk levels can be selected based on a Risk Matrix as shown in Table 4-5. It can be observed that the higher the risk level, the more justification and mitigation is needed to provide evidence and lower the risk to an acceptable level.
- **Mitigations/Requirements:** This column indicates the recommended actions taken to mitigate each potential Risk Event cause. Note that these actions may be design or process changes to lower severity or the likelihood of occurrence. This column can also include additional controls to improve Risk Event detection.
- **Responsibility/Target Date:** Responsibility and target completion date need to be assigned in this column. This makes responsibility clear-cut and facilitates tracking.
- **Actions taken:** This column documents the actions taken. After these actions have been taken, severity, S, probability, P, and detection, D, need to be reassessed and consequently, the risk priority number and the risk level re-evaluated. Based on the revised risk priority number and the risk level, the outcome is determined: either close the action or to require further actions.

Table 4-2: The scale of severity rating (S).

Severity(s)	Meaning
1	Negligible (no relevant effect)

2	Minor (affects very little of the project e.g. minor delays)
3	Moderate
4	Critical (significantly affects the progress of the project)
5	Severe (leads to the stop of the project's progress)i

Table 4-3: The scale of the probability ranking (P).

Probability (P)	Meaning
1	Extremely Unlikely
2	Remote (relatively few Risk Events)
3	Occasional (occasional Risk Events)
4	Reasonably Possible (repeated Risk Events)
5	Frequent (Risk Events are almost inevitable)

Table 4-4: The scale of the detection rating (D).

Detection Rating (D)	Meaning
1	Detection method is highly effective, and it is almost certain that the risk will be detected with adequate time.
2	Detection method has moderately high effectiveness.
3	Detection method has medium effectiveness.
4	Detection method is unproven or unreliable; or effectiveness of detection method is unknown to detect in time.
5	There is no detection method available or known that will provide an alert with enough time to plan for a contingency.

Table 4-5: Risk Matrix.

P/S	1	2	3	4	5
5	Moderate (5)	High (10)	High (15)	Unacceptable (20)	Unacceptable (25)
4	Low (4)	Moderate (8)	High (12)	High (16)	Unacceptable (20)
3	Low (3)	Moderate (6)	Moderate (9)	High (12)	High (15)

2	Low (2)	Low (4)	Moderate (6)	Moderate (8)	High (10)
1	Low (1)	Low (2)	Low (3)	Low (4)	Moderate (5)

The next step is for each Work Package Leader to compile the risks associated with their tasks and to assign responsibility for these actions and set target completions dates. Once corrective actions have been completed, AUTOFLEX partners will reassess and record the severity, probability of occurrence and likelihood of detection for the high priority Risk Events. This is so that the effectiveness of the corrective action taken can be determined. The list risks of the project will be updated by the WP leaders throughout the whole duration of the project and the Risk Manager (NTUA) will regularly present them (briefly on a monthly basis and in more detail on plenary meetings). An initial risk registry of the risk identified in the GA is presented in Appendix III.

4.2.2. CONSORTIUM RISK MANAGEMENT

The AUTOFLEX consortium has considered consortium-related risks that deal with (1) underestimation of some tasks, (2) low productivity and (3) low quality of work. These risks are already minimized during the selection of partners, which most of them have been selected following specific criteria:

- They are leaders in their areas of expertise.
- They are selected after previous successful cooperation, with coordinator or with other trusted members of the consortium.
- They all have evidence of long history of successful completion of research projects.

However, these risks will be minimized and managed by using established methodologies for hardware/software cost estimation, continuous project planning, monitoring, and control. Such methodologies are standard practice in the professional work of the consortium partners. To this end, timely awareness of and reaction to potential problems will be crucial to effective risk management.

4.2.3. RISK REGISTRY

This Risk Registry will be updated monthly by the Risk Manager (NTUA) based on the relevant input received by the WP leaders, in order to be briefly presented in the monthly coordination meeting. Bi-annually, in the Interim Reports and in the PMRs it will be presented in more detail. The risks will be quantified within Task 1.2 "Quality control and risk management". In case of high-risk situations, relevant meetings will be arranged, if needed, in order to be mitigated.

5   SUMMARY

This report presents the quality management procedures that applicable to the AUTOFLEX project. To accurately describe the quality management plan that is implemented in the project, all aspects of the reviewing process, both regarding deliverables and dissemination activities, have been presented. To achieve the consistency of this process, document configuration guidelines that include naming, structure of the meetings minutes, etc., have been developed. Moreover, an initial list of the major identified risks related to the project implementation has been created (and will be maintained and updated throughout the project's course), accompanied with adequate mitigation strategies.

A. APPENDIX I

Appendix I contains the review form to be used for the review process of the AUTOFLEX deliverables.

AUTOFLEX Review Form	
Deliverable Number	
Deliverable Title	
Reviewer's Name	
Reviewer's Beneficiary	
Review version	
Date	DD/MM/YYY

General decision		
The Derivable can be submitted:	As it is	
	After minor revisions	
	After major revisions	
	The Deliverable has significant flaws	

General comments and needed improvements:

Item	Yes	No	Comments/Remarks
Is the Deliverable consistent to the Task(s) it refers to?			
Is there any deviation from the original plan?			
If yes, is the deviation well justified?			
Are abbreviations and terminology used consistently?			
Is the Deliverable clearly written?			
Does the Deliverable contain suitable conclusions?			

Does the Deliverable contain appropriate references?			

Are there any additional recommendations or comments? If so, please use the box below:

Format checklist:

Item	Yes	No	Comments/Remarks
Are all deviations from the description of action sufficiently explained, if any?			
Does the document contain an "Executive Summary" section, and an "Introduction" correctly positioning the deliverable in the project and defining its objectives?			
Is the information showed in figures and tables clearly enough and understandable?			
Does the Index contain tables of content and Acronyms? Are there pages numbers and sections names?			
Are Figures and Tables named and numbered correctly?			
Does the footer contain the correct deliverable name and page number?			
Is the style of the deliverable (headings, body text, Tables and captions) in accordance with the Deliverable template?			
Are Grammar and Spelling check, ok?			
Do hyperlinks and references work?			

B. APPENDIX II

The AUTOFLEX deliverables are listed in Table B-1.

Table B-1: Deliverables.

Deliverable No.	Deliverable Name	WP No.	Lead Beneficiary	Type	Dissemination Level	Due Date Month	Due Date Actual
D1.1	Project Management Plan	1	SO	R	PU	3	Mar-24
D1.2	Data Management Plan Initial Revision	1	SO	DMP	PU	3	Mar-24
D1.3	Quality and Risk Management Plan	1	NTUA	R	PU	3	Mar-24
D1.4	Project Branding	1	Fraunhofer	DEC	PU	3	Mar-24
D1.5	Knowledge and IPR Plan	1	SO	R	SEN	6	Jun-24
D1.6	D&C Plan and Reporting Initial Revision	1	Fraunhofer	R	PU	6	Jun-24
D1.7	D&C Plan and Reporting Intermediate Revision	1	Fraunhofer	R	PU	18	Jun-25
D1.8	Data Management Plan Intermediate Revision	1	SO	DMP	PU	18	Jun-25
D1.9	Exploitation Roadmap	1	Fraunhofer	R	PU	34	Oct-26
D1.10	D&C Plan and Reporting Final Revision	1	Fraunhofer	R	PU	36	Dec-26

D1.11	Data Management Plan Final Revision	1	SO	DMP	PU	36	Dec-26
D2.1	Design Basis	2	DST	R	PU	12	Dec-24
D2.2	Market Analysis	2	Fraunhofer	R	PU	12	Dec-24
D3.1	Transport Concepts	3	DFDS	R	PU	20	Aug-25
D3.2	Transport System	3	SO	R	PU	28	Apr-26
D3.3	Safe, Secure, and Resilient Transport	3	NTUA	R	PU	28	Apr-26
D4.1	Design Impacts	4	DST	R	PU	12	Dec-24
D4.2	Uncrewed Vessel Concept	4	ISE	R	PU	16	Apr-25
D4.3	Uncrewed Vessel Basic Design	4	DST	R	SEN	24	Dec-25
D4.4	Manoeuvring Model	4	SO	OTHER	SEN	30	Jun-26
D4.5	IWW Autonomy Package	4	MR	R	PU	30	Jun-26
D4.6	Safety State Tool (SeaGuard)	4	NTUA	R	SEN	30	Jun-26
D5.1	Interface Standard	5	SO	R	PU	30	Jun-26
D5.2	Business Models	5	DFDS	R	PU	32	Aug-26
D5.3	Transferability	5	DST	R	PU	32	Aug-26
D5.4	Modal Shift Potentials and Barriers - Impacts	5	SO	R	PU	34	Oct-26
D5.5	Steps to Realisation	5	Fraunhofer	R	PU	34	Oct-26

D6.1	SIL and HIL Test	6	DST	DEM	PU	30	Jun-26
D6.2	Demonstration Plan	6	MR	R	SEN	30	Jun-26
D6.3	Validation of Manoeuvrability	6	DST	DEM	PU	32	Aug-26
D6.4	Full Scale Demonstration	6	MR	DEM	PU	36	Dec-26

Grant Agreement: 101136257

C. APPENDIX III

The major risks that have been initially identified along with the proposed mitigation strategies that are part of the AUTOFLEX GA are listed in Table C-1, together with an initial risk level calculation.

Table C-1: Major Risks and initial risk registry.

Risk No.	Description of Risks	WP No.	Probability (P)	Severity (s)	Risk Level	Proposed Risk Mitigation Measure
1	Underperforming partner	All	1	3	Low (3)	All partners are solid and committed to the project, progress and involvement will be continuously monitored.
2	Consortium partner leaving	All	1	3	Low (3)	Management structure and CA will allow for inclusion of new partners.
3	Dependence on key personnel	All	3	3	Moderate (9)	All partners are involved with several experienced staff members and will ensure a seamless substitution.
4	Suboptimal project schedule	All	1	3	Low (3)	The project work will be monitored against project plan and corrective actions will be agreed with the EC.
5	Delayed project milestones or deliverables	All	3	3	Moderate (9)	Regular monitoring and WP meetings will ensure that these things are uncovered in early

						stages and corrective actions are implemented.
6	Low deliverable quality	All	1	5	Moderate (4)	The quality manager and peer reviews will ensure good quality.
7	IPR related issues	WP1	1	3	Low (3)	The Consortium Agreement will establish clear regulations on IPR issues.
8	Problems with technical integration on vessel	WP6	3	5	High (15)	Discussions between relevant partners initiated already in the proposal phase. Regular meeting points and integration activities will be done during the project period.
9	Problems with necessary approvals related to physical demonstration	WP6	3	5	High (15)	Early communication with relevant stakeholders will be ensured through regular touchdowns and meetings.
10	Failure of KETs during full scale demonstration	WP6	1	5	Moderate (5)	Crew onboard the vessel during the demonstration will monitor and be ready to take over manual control.
11	Challenges in validation of KPIs	WP5, WP6	1	3	Low (3)	AUTOFLEX KPIs will be integrated into all evaluation and demonstration activities.

12	Global events obstructing physical demonstration	WP6	1	5	Moderate (5)	The project will establish backup activities which can be initiated in case the physical demonstration cannot be performed within the project period.