Mälardalen University
M.Sc.Eng. Dependable Aerospace Systems
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Project Course in Dependable Systems
22.5 credits

Quality Management Plan

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DOCUMENT APPROVAL

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Andrea Haglund	Chief Engineer	1.0	2025-10-04	
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QAA
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RM
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SM
Safety Manager. 4, 7, 8

V&V
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Word
Microsoft's word processing software for creating, editing, and formatting text documents. 6

1 Introduction

This document is a Quality Management Plan (QMP) for the project Intelligent Replanning Drone Swarm (IRDS) that makes sure that all deliverables from the Safety Manager (SM), Requirements Manager (RM), Validation & Verification Manager (VVM), and Chief Engineer (CE) meet the same quality standards. This means that the deliverables are traceable, reviewed, and approved, and that the entire team works consistently and efficiently.

1.1 Purpose

The purpose of this QMP is to define the processes, standards, and responsibilities that ensure all project deliverables meet the required level of quality. This plan establishes the framework for quality assurance and quality control. It provides guidance for all team members to follow, ensuring consistency, traceability, and compliance with applicable standards (see table 2).

1.2 Related Documents

The standards used to create this QMP are listed in table 2. Other related documents referred to in this management plan are listed in table 1.

Document ID	**Document Title**
PP-01	Project Plan [1]
CM-01	Configuration Management Plan [2]

Table 1: Related documents

Standard	**Year**	**Title**
ISO/IEC 25002	2024	Quality model overview and usage [3]
IEEE 730	2014	IEEE Standard for Software Quality Assurance Processes [4]
ISO 9001	2015	Understand, Implement, Succeed! [5]
ISO 10007	2017	Quality management — Guidelines for configuration management [6]

Table 2: Standards used to create this QMP.

2 Scope

This QMP applies to all project deliverables, including reports, management plans, test results, and safety analyses. This document covers activities such as creation, review protocols, and roles and responsibilities. All controlled artefacts are managed using different tools and templates to ensure compliance with quality standards. Drafts and informal notes are excluded.

2.1 Objectives

The objectives of the QMP are to ensure that all project deliverables are accurate, complete, consistent, and compliant with applicable standards. Specifically, the QMP aims to:

- Ensure all reports, plans, and codes are reviewed and approved prior to release.
- Maintain traceability between requirements, tests, and safety analyses.
- Standardise document formatting and templates.
- Detect and resolve issues early through peer reviews, audits, and corrective actions.
- Standardise Git commit messages (for more information regarding Git, refer to Configuration Management Plan (CMP).

2.2 Deliverables

ID	Deliverable
QM-01	Quality Management Plan (and Quality Assurance Process)
QM-02	Review Protocols
QM-03	Review Report
QM-04	Quality Impact Report

Table 3: Deliverables.

Since this project is not large, it was decided to put the Quality Assurance Process (QAP) in the QMP and have it as one deliverable.

3 Methodology

The method used to create this QMP began with reviewing standards that define what a QMP is and what it should contain. Then additional standards were consulted to determine the content of the individual sections. All standards were accessed through the Mälardalen University online library. Other tools for task allocation, file sharing, and planning were also utilised (refer to the Project Plan [1] for more information).

A review protocol was created using Word to help review deliverables. More information on the review process can be found in section 4.3 Review Process.

4 Quality Oversight

To support the successful delivery of this project and maintain high standards of quality, it is important to establish clearly defined deliverables under quality oversight, well-defined roles and responsibilities, and structured review processes. Together, these elements promote accountability, consistency, and traceability throughout the project lifecycle.

4.1 Project Deliverables by Role

The IRDS project comprises multiple deliverables contributed by all managers on the team. These deliverables fall under the scope of quality oversight and are listed as follows:

ID	Deliverable	Responsible
CE-01	Project Plan	CE
CE-02	System Description (Baseline – Current system before solution)	CE
CE-03	System Architecture	CE
CE-04	Final Report	CE
CE-05	Presentation	CE
CM-01	Configuration Management Plan	QCM
CM-02	Configuration Log Report	QCM
QM-01	Quality Management Plan	QCM
QM-02	Review Protocols	QCM
QM-03	Review Report	QCM
QM-04	Quality Impact Report	QCM
RM-01	Requirements Management Plan	RM
RM-02	Requirements Specification	RM
RM-03	Requirements Report	RM
SM-01	Safety Management Plan	SM
SM-02	Preliminary Safety Analysis	SM
SM-03	Flight Safety Analysis	SM
SM-04	Safety Analysis	SM
SM-05	Safety Goals	SM
VV-01	Verification & Validation Management Plan	VVM
VV-11	Design Specification	VVM
VV-25	Risk Analysis	VVM
VV-26	Validation Protocols	VVM
VV-27	Verification Protocols	VVM
VV-28	Test Specification	VVM
VV-29	Validation Report	VVM
VV-30	Verification Report	VVM

Table 4: Project deliverables.

4.2 Quality Responsibilities & Roles

The quality related responsibilities for each manager are:

- CE
  - Review deliverables from a technical perspective.
- RM
  - Ensure requirement specifications meet quality criteria (clarity, completeness, traceability).
  - Confirm all requirement are reviewed.
  - Participate in peer reviews of requirement deliverables.
  - Submit requirement reports to Quality Assurance (QA) for review before submitting.
- VVM
  - Collaborate with other managers (Safety, Requirements, Quality) to align V&V with system goals.
  - Ensure V&V reports follow QA rules (traceability, correctness).
  - Participate in quality reviews of test artifacts.
- SM
  - Ensure safety reports comply with templates and QA requirements.
  - Confirm that safety requirements are traceable and reviewed.
  - Participate in quality reviews of safety deliverables.
- Quality & Configuration Manager (QCM)
  - Quality
    - Define and enforce quality standards (templates, report rules, git commit message guidelines).
    - Plan and conduct audits and reviews.
    - Approve deliverables before release.
    - Identify quality risks and propose mitigation strategies.
  - Configuration
    - Ensure all Configuration Items (CI) are properly identified, controlled, and documented (maintain traceability and clarity over project materials).
    - Provide the QM with the latest controlled versions of documents.
    - Ensure all changes follow approved processes.

4.3 Review Process

The process of reviewing a deliverable begins with a review request being submitted. The reviewer then evaluates the delivery according to the review protocol. A more detailed description of the review request process and the review protocol is provided below.

4.3.1 Review Request

When a deliverable has been completed, a review request shall be initiated. The author of the deliverable does this by accessing Jira (for more information regarding Jira, refer to CMP), which has a kanban setup (figure 1), and moves the task related to the deliverable to "To Be Reviewed" and notifies the CE and QM. The task must be written in such a way that the connection between the task and the deliverable is obvious. The CE and QM take over tasks in "To Be Reviewed" and move them to "In Review" while they review the deliverable.

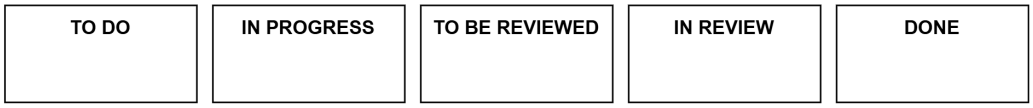

Figure 1: Kanban board.

4.3.2 Review Protocol

A review protocol is a structured approach to examine project deliverables, processes, or outcomes to ensure that they meet defined quality standards and other requirements. When reviewing a document, the reviewer follows the protocol and evaluates the content against these criteria. The author may accept or reject the comments provided by the reviewer. The protocol also serves as evidence that the document has been reviewed and that it aligns with the defined requirements. This process applies to all project-related deliverables produced during the project lifecycle. The requirements are according to ISO 9001 [5] and ISO 10007 [6]. All documents will be reviewed according to the following checklist:

Document Control & Compliance:

- Document has unique identifier and version number.
- Correct template used, all mandatory sections included.
- Document is reviewed and approved prior to release.
- Document history / version record updated correctly.

Content Accuracy & Completeness

- Information is factually accurate and consistent with source data.
- Objectives, scope, and purpose of the document are clearly stated.
- All required data, metrics, and evidence are included.
- References and citations are complete and verifiable.

Clarity & Readability

- Logical structure and flow of information.
- Language is clear, concise, and free of ambiguity.
- Acronyms, abbreviations, and technical terms are defined.
- Tables, charts, and figures are accurate, labelled, and referenced.

Compliance with Standards & Requirements

- Document aligns with contractual, regulatory, or legal requirements.
- Confidentiality, security, and access requirements considered (project owner provided images that are not to be published).

Approval & Records

- Corrections implemented and verified.
- CE approval recorded.
- QM approval recorded.

Table 5 is a list of quality requirements used for documents, shared with team members to align with quality standards.

ID	Quality Requirement	Source	Approved by
QR-01	All documents shall use the project-approved template and include the required sections.	Yonatan Michael (QM)	
QR-02	Every document shall include a version number, revision history, and approval record.	Yonatan Michael (QM)	
QR-03	Each document shall undergo peer review before approval.	Yonatan Michael (QM)	
QR-04	All requirements, test results, or safety concerns in reports shall be traceable.	Yonatan Michael (QM)	
QR-05	Documents shall use British English.	Yonatan Michael (QM)	
QR-06	The word "and" in headings shall be written with a "&".	Andrea Haglund (CE)	Yonatan Michael (QM)
QR-07	All words in headings (except if, of, etc.) shall start with a capital letter.	Andrea Haglund (CE)	Yonatan Michael (QM)
QR-08	Plan shall be written in future tense.	Claire Namatovu (RM)	Yonatan Michael (QM)

Table 5: Quality requirements used for documents.

5 Quality Assurance Process

The QAP ensures that all project deliverables meet defined quality standards. QAP is a set of planned and systematic activities designed to ensure that all project deliverables meet predefined quality standards. It establishes processes, guidelines, and responsibilities to prevent defects and maintain consistency across deliverables. QAP involves defining quality objectives, applying standards and templates, performing reviews and audits, monitoring compliance, and managing corrective actions.

5.1 Quality Assurance Activities

All reports, plans, test results, and safety analyses must undergo the following Quality Assurance Activities (QAA):

- Use project-approved templates, assign unique identifiers and version numbers, and maintain revision history in GitHub or designated tools.
- Deliverables are reviewed by the author together with the Chief Engineer (CE) from a technical perspective. Then it's reviewed by the Quality & Configuration Manager (QCM) for accuracy, completeness, clarity, formatting, compliance, and traceability. Reviewer comments are logged and addressed in a review protocol.
- Issues are identified, resolved, and deliverables re-reviewed; corrective actions are tracked in QA audit reports.
- Check that all deliverables comply with quality standards (ISO 9001, IEEE 730, ISO 10007, ISO/IEC 25002).
- Confirm that references, figures, tables, and glossaries match across documents.
- Flag potential misalignment between requirements, tests, or safety analyses early.

References

[1] A. Haglund, *Project Plan*, Intelligent Replanning Drone Swarm, Oct. 4 2025, Version 1.0.

[2] Y. M. Beyene, *Configuration Management Plan*, Intelligent Replanning Drone Swarm, Oct. 4 2025, Version 1.0.

[3] International Organization for Standardization (ISO), *Systems and software engineering — Systems and software Quality Requirements and Evaluation (SQuaRE) — Quality model overview and usage*, ISO/IEC 25002:2024, Mar. 2024. [Online]. Available: https://www.iso.org/standard/78175.html

[4] Institute of Electrical and Electronics Engineers (IEEE), *IEEE Standard for Software Quality Assurance Processes*, IEEE 730-2014, Jun. 2014. [Online]. Available: https://standards.ieee.org/ieee/730/5284/

[5] International Organization for Standardization (ISO), *Quality management systems — Requirements*, ISO 9001:2015, Sep. 2015. [Online]. Available: https://www.iso.org/standard/62085.html

[6] ——, *Quality management — Guidelines for configuration management*, Mar. 2017. [Online]. Available: https://www.iso.org/standard/70400.html