ASRW 2026

Final Design Report Guidelines

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EUROAVIA

EXECUTIVE SUMMARY

Final Design Report Guidelines for the Airbus Sloshing Rocket Workshop 2026

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1 Introduction

The aim of the Final Design Report is to allow teams to further develop their approach to the Airbus Sloshing Rocket Workshop and provide a detailed analysis of their final design. Teams selected for this stage will integrate and build upon their Conceptual Design Report as well as use the feedback received from the marking of those reports.

The Final Design Report will be a report with a main body of maximum 40 pages (from Introduction to Conclusion) emphasizing the importance of the latter stages of engineering design, namely V&V. Teams will need to develop their chosen design in more detail and provide explanations and evidentiary support as to why their design was chosen. Please note that any physical prototype testing (before the finals) is optional, done at your own risk and any cost implications of such testing is not compensated by the ASRW Team.

The operational safety of the rocket is to be justified based on the evidence provided - note that it is possible to earn full marks without physical testing if detailed analysis provides robust justification. Teams are highly encouraged to make use of the attached Risk Assessment template to support this process.

Qualification for the finals will be based on the scoring of this report submission. The overall competition winner will be decided based on the Conceptual and Final report scores, the flight performance, and the panel feedback on the design review performance.

2 Specifications of the report

2.1 Title page

Your title page should include the following:

- Project title
- Your team's name
- Your team logo (if applicable)
- Team member names
- Word count

2.2 Body of the Document

- Maximum 40 pages (limit, not target)
    - Format: A4 size, 1 inch margins, minimum 11pt, Georgia or Times New Roman font, single-spaced.
    - Includes everything in the main body of text (headings, tables, citations, quotes, lists, etc.) - between the start of the first chapter (Introduction) and the final chapter (Conclusion).
    - Front page, Abstract, Table of Contents, References, Index, References, and Appendices are NOT included in the word count. All text, calculations, figures, and tables to be marked should be in the main body of the report. Supporting or additional material should go into the Appendix. **Marks will not be given to the Appendix section. Penalties will be applied at a rate of 3% of the full mark per page exceeding this limit.**
- The report should be written in third person.
- The main body of the text should be left and right justified.
- Label/Number all graphs/figures/tables/equations appropriately
- Have consistent units throughout the report. Choose between imperial or metric. Inconsistency will result in a -5 point deduction.
- You must correctly reference all material taken from other documents, including all diagrams and figures – both in the text and in the diagram/figure label. Use the APA referencing style in your document.
- The report is to be word-processed, using Word, Writer, LaTeX, Google Docs or similar.
- Include your team's name in the header of the document.
- Include the page number in either the header or the footer.

- The document should have a plain background. No watermarks are allowed in the background. Provide a full list of all chapters and subsections with associated page numbers in a contents page. Where relevant, further pages can be added after the contents page:
    - Nomenclature / Glossary of Terms
    - List of Tables
    - List of Figures

Note: Plagiarism and the use of AI are prohibited and if found will result in a forfeit of marks for the specific sections where it was found to be used. In all cases, teams will be contacted and given a chance to provide an explanation or evidence against the claim, but the final decision is up to the markers' discretion. In serious cases, plagiarism and/or the use of AI could result in a disqualification from the competition. The use of a team's report from a previous edition without proper citation will be considered plagiarism.

2.3 Suggested paragraph content and their marking

The reports will be assessed and marked against the following criteria:

2.3.1 Abstract

- Provide an abstract (maximum 250 words) to introduce the investigation/work, and to state, briefly, the findings made and the conclusions reached.
- Not included in the word count.

2.3.2 Introduction [5%]

- Literature review of the sloshing subject
    - Background information on the challenge of sloshing liquid propellants in the aerospace industry.
    - Interesting and innovative ideas aerospace should take inspiration from
- Scope and objectives of the project.
- Project Organisation [2%].
- Team organisation.
- Introduce a project timeline including major project milestones with a visual representation.
- Specify contingency plans or buffers for potential delays.
- Explain what has been achieved so far and how, if at all, the plan has changed since the Conceptual Design Review.

2.3.3 Requirements Capture [3%]

- Using a table format, define the requirements for the design.

- State assumptions made.
- Requirements and/or optional inputs shall be clearly identified.
- Provide a definition of your team's success criteria.

2.3.4 Concept Design [5%]

- Investigate several distinct design concepts, exploring aspects such as aerodynamic design, flight performance, stability, control, structural integrity and propulsion for each.
- Highlight innovative elements in each design, especially those inspired by non-aerospace systems.
- Include detailed sketches or diagrams with labels for clarity.

2.3.5 Detailed Design [40%]

- Refer to the Technical Regulations Document for further details.
- Explanation of how the sloshing behaviour has been predicted and how the control mechanism has been designed to tackle the dynamic loads introduced.
- General arrangement drawing of the finalised vehicle geometry, possibly generated from a 3D CAD model.
    - To ensure compliance with the <50% cross-sectional area rule, teams must provide definitive geometric proof (more details on the Technical Regulations document, Section 2.3.1), including:
        - Dimensioned CAD Cross-Section figure taken at the point of maximum blockage of the tank. (Calculations must be based on the internal cross-section of the tank)
        - Largest baffle-covered and not covered surface area percentage of the tanks' cross section.
    - Designs submitted without these clear specifications and dimensioned proofs will be rejected.
- An accompanying analysis which may include analytical or numerical analysis, design trade studies and optimizations to maximise mission performance, etc.
- Details about the launch and propulsion system.
    - This section must include a simulation or mathematical model demonstrating that the internal plumbing is pressure-rated to the intended launch pressure.
    - You must also explicitly verify the integration of the Rectus Type 26 Quick Coupler.
- Simulations that support your design. It is essential that teams should understand why and how a simulation should be performed, instead of just having a simulation for the sake of simulation. The preferred simulation software to be

used by the teams is the one provided by Ansys. Any computational simulation (CFD, FEA) must be accompanied by a Simulation Parameters detailing:
    - Mesh size and quality.
    - Boundary conditions (inlet velocity, pressure).
    - Solver type and convergence criteria.
- Detailed description of manufacture including:
    - Bill of materials
    - Component manufacture
    - Assembly sequence
    - Cost breakdown
- Explanations of how safety and operability have been considered in the design of the vehicle, including a safety assessment. A risk assessment matrix template will be provided, which should be referenced in your report.
    - Include a subsection detailing the mandatory water-resistant housing for the altimeter. You must demonstrate how the mounting protects the device from impact and water while ensuring access to static pressure ports (without using adhesive directly on the sensor).
- The Safety Assessment must explicitly cover Manufacturing & Assembly Risks (e.g., PPE for soldering, handling pressurized tanks during integration), not just flight operations.

2.3.6 Design V&V [35%]

- An assessment of the final design against the requirements showing how all the mandatory requirements have been met.
- Validation of techniques used to design the flying vehicle (such as validation of numerical simulations, presenting inputs, numerical setup and validation of results).
- A test plan showing how compliance with each requirement has been demonstrated by simulation and/or prototype testing.
- The team may optionally consider data acquisition and processing techniques to support their design.
- Considerations of safe operations (teams may want to use the Risk Assessment Template provided).
- Optionally, videographic evidence can be provided to demonstrate a successful flight and/or safe recovery of unsuccessful flights (if physical tests have been conducted).
- The V&V section must conclude with a Design Compliance Matrix. This table must list every mandatory requirement, the specifications/metrics achieved by your design (via test or calculation), an explanation behind the design choice, and a clear PASS/FAIL status.

2.3.7 Conclusion [5%]

- Conclusion summarising design outcomes, reflecting on initial objectives.
- Provide lessons learnt and suggestions for future work.
- The Conclusion must include a Final Data Sheet, summarizing:
    - Total Wet Mass & Dry Mass.
    - Final Dimensions (Length, Diameter, Span).
    - Center of Gravity (CG) and Center of Pressure (CP) locations.
    - Predicted Apogee and Top Speed.

2.3.8 General Report Quality [5%]

A well-composed report produced to a professional standard is expected, including:

- Correct and appropriate referencing inside the report
- Traceability (e.g. between the scope of the project, requirement capture, and concept justification)

2.3.9 Appendix

- Supplementary material to the report. Note the report must be standalone, i.e. the main body of the report must include all necessary information.
- The material presented in the Appendix will not count towards the overall report mark.
- Bibliography for sources used throughout the report.
- Not included in the word count.