SATELLITE DESIGN COMPETITION 2022-23

CRITICAL DESIGN REVIEW

SATELLITE DESIGN COMPETITION
UKSEDS
22 | 23

UKSEDS COMPETITIONS

SUPPORTED BY

AIRBUS

SSPI

nano avionics

SPACE CHAIN

Guidance

The **Critical Design Review** (CDR) demonstrates the maturity of the project is sufficient to proceed to full-scale fabrication, assembly, integration and testing. Normally carried out at the end of phase C (detailed definition phase) of a project, the CDR is a major milestone in the development of a space mission. According to ECSS-M-ST-10C Rev. 1, the following aspects need to be addressed:

- Qualification and validation status of critical processes and their deployment readiness for phase D (qualification and production phase)
- Compatibility with external interfaces
- Final payload and mission designs
- Assembly, integration and test plans
- Flight hardware/software manufacturing, integration and testing

It is important to place your focus on the actual prototype you will build and how you will complete the mystery room challenges, as opposed to designing for the real world mission. This will make transition to the build phase easier.

You can use this template as a guide, but feel free to change the structure or layout. Notes have been added to clarify what is expected from each section. Appendices are optional and could contain background or contextual information that is not essential to the project. For more details on the content expected in the CDR, please see appendix E.2 of the Satellite Design Competition Rules and Requirement document and the referenced ECSS standards.

The CDR document should be **no longer than 30 pages,** excluding acknowledgements, references, and appendices. Please keep the font size as 11 and the font to Poppins Normal. A 2% deduction per page over the limit will be applied.

This document will be reviewed by industry systems engineers, who will provide one A4 page of paper of feedback on your design concept, documentation and project management arrangement. There is a prize for the overall best CDR and SSPI are interested in publishing the best CDR reports, therefore the quality expected of the CDR, both in terms of content and formatting, is similar to that of a published journal paper.

The deadline for the submission is 27th March 2023; please submit through your team's google drive folder. Email satellites@ukseds.org if you need assistance.

Please contact satellites@ukseds.org if you have any further questions about this CDR template.

Best of luck, we look forward to seeing your designs!

SATELLITE DESIGN COMPETITION 2022 - 2023

‹Team Name›

‹Team Logo›

Issued by (Project Lead): <Project Lead Name>
University: <University Name>

Contents

1 Introduction

Use this section to introduce your project, team and concept. Mission patches are welcomed! Feel free to include further information in the appendices to avoid exceeding the page limit.

1.1 Mission Statement

The mission statement is a short statement that describes the overall goal of the team.

2 Project Management

2.1 Assigned Roles and Team Roster

Include a table of team members and their assigned roles.

Name	Role	Year/Course	Email

2.2 Preliminary Schedule

Include your proposed schedule for the project, from inception to competition date. Include a work breakdown structure and a proposed test plan.

2.3 Preliminary Budget

Include your proposed budget for the project, covering the rough build costs of the satellite.

2.4 Project Risks and Mitigations

Identify the major risks associated with your project and satellite design, and how you expect to manage these throughout the development process.

2.5 Project Plan

Teams will be required to produce a Work Breakdown Structure and GANTT chart of the project. It is also necessary for a risk analysis to be demonstrated. Be sure to add slack to your Gantt chart to ensure each task can be completed.

3 Detailed Design

Give an overview of the detailed design and highlight all changes made since the PDR, including reasons for those changes. Describe how the design addresses the requirements and show that design choices have been fully justified. Following the overview, a detailed assessment of each subsystem is required**.**

The subsystems listed below have been included as examples, but can be altered to better reflect the breakdown of your project. Ensure that you have detailed information on how the subsystems interface with each other and with external surfaces.

3.1 Payload Subsystem

3.2 Power and Electrical Subsystem

3.3 Attitude and Orbit Control Subsystem

3.4 Mechanical Subsystem

3.5 Software Subsystem

4 Operations

Include an overview of the operations plan for the competition challenge day in the mystery room.

5 Manufacturing

Include details of your manufacturing plan.

6 Testing and Validation

Include a detailed testing plan, both for software and hardware.

7 Acknowledgements

Use this section to recognise anyone who assisted with or contributed to the project, but was not part of the team.

8 References

No particular reference style is preferred. Include citations in the text.

Appendices

Any supplementary material, which is not essential to the project, but will provide a more comprehensive overview of the project, can be included as appendices.