

MACH-23 LAUNCH COMPETITION & CONFERENCE

Critical
Design Review



Mach-23 CDR Guidance

The Mach-23 Critical Design Review (CDR) will be in the form of a PowerPoint presentation where teams will introduce themselves, explain their Launch Vehicle & CanSat designs, any progress to date and safety aspects and risk mitigation, with no limit on the number of slides presented. Presentations will be recorded by teams and submitted to the Mach-23 organisation team for examination. Presentations will be up to 45 minutes long. These will be reviewed in terms of mission concept, planning and safety, and teams will be provided with one A4 page of paper of feedback, followed by a virtual meeting to talk through this feedback.

Recordings are recommended to be done via Zoom, to include both the slide packs and presenters. Teams are also able to submit a recording of the CDR slides, presented physically together in a room. Both the recording and a copy of the slides must be submitted by 5pm on Friday 24th March by uploading the files on the community hub or sending them to sara.lai@exotopic.com.

Timeline:

Deadline for submission of CDR slides: **Friday 24th March, 2023**
Feedback presented to teams: **Monday 3rd April, 2023**
Individual meetings with teams on feedback: **April 5th 2022**

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

Useful documents:

Presenting a PowerPoint presentation over Zoom - <https://support.zoom.us/hc/en-us/articles/203395347-Screen-sharing-a-PowerPoint-presentation>

Critical Design Review - Advice on Best Practice for CDR

The Mach-23 CDR is designed to help progress teams ideas and show the reviewers that you have considered the safety and scientific ambitions of your mission with relevant planning.

Teams should not change the format of the CDR template provided. To avoid overcrowding of slides, we suggest the use of multiple slides when more information is required to be included.

The mark scheme for these presentations has been listed below.

	Section	%	Detail	Marking
1	Launch Vehicle Overview	2.5	<i>Overview of Launch Vehicle Design.</i>	Up to 2.5% for detailed overview of launch vehicle and changes made since PDR.
2	Launch Vehicle Design and Verification	15	<i>Overview of Launch Vehicle design and detail on design integrity.</i>	Marks will be split into the following: <ul style="list-style-type: none"> - Up to 10% for detailed CAD annotations of design. - Up to 5% for justifications for integrity of design.
3	Flight Safety Analysis	15	<i>Overview of flight safety analysis conducted.</i>	Marks will be split into the following: <ul style="list-style-type: none"> - Up to 2.5% for launch day condition analysis. - Up to 5% for flight analysis and impacts on design. - Up to 5% for assessment of launch vehicle stability. - Up to 2.5% for motor selection information.
4	Recovery System	10	<i>Overview of the launch vehicle recovery system.</i>	Marks will be split into the following: <ul style="list-style-type: none"> - Up to 5% for description of ejection systems. - Up to 5% for descent systems and drift calculations.
5	Ground Station Design	7.5	<i>Outline of ground station design.</i>	Up to 7.5% for diagram and description of ground station, including planned frequencies, operations and detail on telemetry.
6	Payload Final Design	7.5	<i>Overview of final CanSat design and change made since PDR stage.</i>	Marks will be split into the following: <ul style="list-style-type: none"> - Up to 5% for detailed, annotated CAD design. - Up to 2.5% for deployment / ejection description.
7	Payload Descent Control	5	<i>Overview of the payload descent control system, including descent rate estimates.</i>	Marks will be split into the following: <ul style="list-style-type: none"> - Up to 3% for Descent control and component description. - Up to 2% for Descent rate estimates.
8	Payload: Electrical Power Subsystems	5	<i>Overview of payload electrical power subsystems.</i>	Marks will be split into the following: <ul style="list-style-type: none"> - Up to 2% for description of power source. - Up to 3% for power budget of components.
9	Testing	10	<i>Overview and status of component and systems testing.</i>	Up to 10%, with 2% for detail on testing for each of the following: Airframe, Recovery, Payload Deployment, Payload Ejection, Payload Electronics.
10	Requirements Compliance	5	<i>Outline of how the mission meets competition requirements.</i>	Up to 5% for overview of how the mission meets the Mach-23 competition requirements.
11	Risks & Mitigation	7.5	<i>Description of risks associated with design & plans for mitigation.</i>	Marks will be split into the following: <ul style="list-style-type: none"> - Up to 2.5% for updated risk assessment from PDR. - Up to 5% on matrix with failure modes.
12	Project Management	5	<i>Overview of how the project will be managed to ensure completion by launch date.</i>	Marks will be split into the following: <ul style="list-style-type: none"> - Up to 2.5% on budgeting outline. - Up to 2.5% on production of a project timeline.
13	Conclusions	2.5	<i>Summary and next steps for progression.</i>	Up to 2.5% will be awarded for a concise summary and detailing progression to the FRR stage.

14	Presentation Design	2.5	<i>Formatting and Presentation Quality</i>	Up to 2.5% will be awarded for presenting in a clear manner, using the provided template.
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