PROGRESS REPORT II

2020

THE AUSTRALIAN
UNIVERSITIES ROCKET
COMPETITION

AYAA

1 INTRODUCTION

The second assessed deliverable for the AURC 2020 is Progress Report 2. The purpose of this report is to provide an overview of each team's progression since Progress Report 1 and to gain a better understanding of how each rocket project is being developed and tested.

As per the **AURC Competition Deliverables** document, the maximum length of the progress report is 20 pages. This page limit is from the introduction (p.1) to the conclusion; appendices are excluded from the page limit but are not to be used for storing run-over from the report body.

If your report exceeds the page limit, content past the 20th page (excluding the appendices) will not be marked. If completed in Microsoft Word or similar, the report must be written in size 12 pt. Times New Roman, have 'single' line spacing and must be presented in a professional and consistent manner, alternatively the use of LaTeX or comparable typesetting software is also permitted.

1.1 Required Information

This initial progress report is to contain the following information as a minimum in no particular order, further detail can be added as teams see fit. Marking allocation for each section is included in brackets and is further outlined in section 1.2 and the marking rubric.

- Executive summary (5%)
- Introduction (2.5%)
- Updated Design overview (10%)
    - Brief overview of the rocket, any updates and/or design changes
        - If no changes were made; how so? Was testing completed?
- Payload (15%)
    - Concise summary of the payload subsystem, its intended purpose and benefits to stakeholders and/or project.
    - Details on design choices to enhance system reliability.
    - Convincingly showcase scientific or technical viability and applicability.
        - This also applies to payload challenges, even without a rubric we expect that you are able to demonstrate 'why this is useful'.
- Initial simulation results and flight profile (10%)
    - Open Rocket is required, further simulation is highly encouraged.
- Safety procedures (20%)
    - Range-safety procedures & checklists (both pre-flight and post-flight).
        - Actual checklists should be added to the appendix instead of the report.
    - Risk register and Risk assessments should be discussed, and the approach explained.
        - Actual register should be added to the appendix.

    - FMEA.
- Manufacturing Processes & Plans (25%)
    - Overview of manufacturing methods and materials.
    - Updated timelines.
- Conclusion (2.5%)
- Appendices

Note that the presentation, formatting and language of the report will count for 10% of the total mark. This includes (but is not limited to) spelling and grammar, appropriate use of figures, concise explanations, referencing and well-presented layout. Standard (and critical) report components such as the reference list, table of contents, list of figures, list of tables, and cover page are also considered in this allocation of marks and should be included, they will not count towards the page limit.

1.2 Further Information

While payload challenge details have not been specified as of yet, your approach or current ideas for the payload should be included in this report. The information provided will be assessed to the provided rubric, and you will not lose marks for this report should the payload challenge details have further requirements.

As can be seen in the grading matrix, certain components are capped at 5 marks. Overall, we would like to ask you to read it carefully. Don't forget to provide research supporting your non-technical decisions as well as your design.

Clear presentation is important. Do not confuse the encouraged brevity of components with the amount of thought required. Research is vital in producing a high-quality report. Spelling, punctuation, grammar and formatting errors will be heavily penalised. It is recommended that you proofread your work thoroughly and ensure it is readable, logical, free from errors and consistently formatted (e.g. dot point formatting is consistent).

Then finally: any academic referencing method is acceptable, but it must be applied consistently. Read the provided Grading Matrix carefully and if you have any remaining concerns, or queries, please contact aurc@ayaa.com.au or your teams coordinator.

1.2 Submission

You must submit your report as one consolidated PDF file through the submission portal on the AURC website (www.aurc.ayaa.com.au/submissions) by 11:59pm AEST, Friday 6th March 2020. Your file naming convention must follow *Team_X_Progress_Report_2.pdf* where X is replaced by your team number.

AURC 2020 Progress Report 2 Marking Rubric							
		0 Marks	3 Marks	5 Marks	8 Marks	10 Marks	Mark
Executive Summary, Introduction & Conclusion (10%)	**Executive summary**	No executive summary provided.	Poor or incomplete overview of the rocket, lack of understanding of the competition category. Unclear project objectives and goals. The reader cannot make an informed judgement on the viability and success of the project.	Clear, concise and informative overview of the rocket and competition category, the project's objectives and goals. Discloses the project's (and payload) design challenges and the team's recommended approach. Provides sufficient information to allow the reader to make an informed decision of the project's probability of success.	-	-	
	Introduction & Conclusion	No introduction and/or conclusion provided.	Fails to concisely summarise the project background or outline the purpose of the report. Too long or too brief to accurately capture the contents of the report.	Clearly summarises the background of the project and outlines the purpose of the report. Presents an overview of the team and its goals and projected milestones.	-	-	
Updated Design overview (10%)	**Design Summary and Adjustments.**	Little to no overview provided.	Insufficient to no detail of rocket systems and/or unjustified design adjustments are included. System does not comply with (AMRS and/or relevant regulators') regulations or competition requirements.	-	-	Details adjustments made to rocket design, its various subsystems and their justification. Demonstrates that the design updates result in an airframe that still fulfils its system requirements and doesn't severely impact its ability to achieve its objectives. Demonstrates the updated design still complies with the AURC and AMRS rules as well as any relevant regulators' laws.	
Payload (15%)	**Payload Introduction**	Little to no information regarding the payload system and or participation in specific Payload Challenges.	Adequately summarises the payload subsystem. Adequately summarises its purpose and does not capture its relevance to the project goals and its stakeholders.	Concise summary of the payload subsystem, its intended purpose and benefits to stakeholders and or project.	-	-	
	Technical/Scientific viability and System Requirements	Little to no information of the payload and its associated requirements.	Insufficiently outlines scientific and/or technical viability System fails to comply with regulations as set by suitable agencies if relevant. Is not able to appropriately set and identify system requirements.	Outlines scientific and/or technical viability and applicability Demonstrates relevance of design to payload function and or Payload Challenge.	Showcases scientific and/or technical viability and applicability in detail. Demonstrates understanding of relevance of the Payload function and or Payload Challenge Is able to identify and set at least 3 system requirements for the subsystem.	Convincingly showcases scientific and/or technical viability and applicability Demonstrates deep understanding of relevance of the Payload function and or Payload Challenge. Is able to identify and set at least 5 system requirements for the subsystem.	
Initial simulation results and flight profile (10%)	**(Open Rocket) Simulation Output**	Little to no information regarding Open Rocket simulations are provided	The system fails to achieve its project and competition requirements and is of low detail. It fails to depict a nominal flight profile. Simulation assumptions are not justified or stated. The rocket's stability varies significantly during flight and or an unacceptable margin is applied to the system. Few variables are analysed for system sensitivity and or the system fails to achieve a nominal flight at certain conditions	The simulation depicts uncertainty in the system and achieves few project and competition requirements. Simulation assumptions are stated, poorly justified and or may be unreasonable. The rocket design is flawed and is not stable and or the project team lacks an understanding of appropriate stability margins. A poor sensitivity analysis is conducted and or the system's performance has a high variability.	Simulations are of high fidelity and the system achieves the majority of its project and competition requirements. Simulation assumptions are adequately justified. The simulation depicts the project team has an understanding of stability during flight. A detailed sensitivity analysis is conducted for a variety of variables. Their margins are adequately justified, and the system's performance has little variability in achieving its objectives.	Simulation depicts a nominal flight profile and is of a high enough fidelity to demonstrate the system achieving its project and competition requirements. Simulation assumptions are fully justified appropriately. The simulation depicts the project team has an understanding of stability during flight. A detailed sensitivity analysis is conducted for a variety of variables. Their margins are justified, and the system behaves nominally at all conditions.	

Safety procedures (20%)	**Range-safety procedures & checklists (both pre-flight and post-flight)**	Little to no range safety procedures or system checklists included.	A poor attempt at range safety procedures and/or system checklists included. Pre-flight and post-flight procedures are lacking in detail and/or are incomplete. Potential risks are not adequately controlled and/or a high chance of harm is possible.	Range safety procedures are included, identifies at least 5 hazards and control measures. Risk assessments and risk register provided. System checklist adequately detail pre-flight procedures and post-flight procedures. Some understanding of safe arming and disarming of the system is evident. Some risks are not adequately controlled and/or minor hazards are present.	Range safety procedures are included, identifies at least 7 hazards and control measures. Detailed Risk assessments and risk register provided. System checklist details pre-flight procedures and post-flight procedures, and responsible person/s. Demonstrates safe arming and disarming of the system. Risks are adequately controlled and there is a low likelihood of harm.	Thorough and detailed range safety procedures are included identifies at least 10 hazards and control measures. Industry level risk assessments and risk register provided. . System checklist details pre-flight procedures and post-flight procedures, and responsible person/s. Demonstrates safe arming and disarming of the system. Risks are adequately controlled and there is a low likelihood of harm.	
	FMEA	Little to no information of FMEA provided.	2 or less failure modes per sub-system are disclosed and/or mitigations included are not appropriate. Mostly reasonably identifies various aspects of each process and design risk.	At least 3 failure modes per sub-system and 2 overall system failure modes are disclosed and appropriate mitigations included. Mostly reasonably identifies various aspects of each process and design risk.	At least 4 failure modes per sub-system and 3 or more overall system failure modes are disclosed and appropriate mitigations included. Reasonably identifies various aspects of each process and design risk.	At least 5 failure modes per sub-system and 4 or more overall system failure modes are disclosed and appropriate mitigations included. Appropriately identifies various aspects of the risk and its criticality on system design and process.	
Manufacturing Processes & Plans (25%)	**Overview of Manufacturing Processes**	No detail on manufacturing processes and material selection.	Insufficient detail on manufacturing processes and material selection	Some overview of manufacturing processes for rocket subsystems and justification.	Overview of manufacturing processes for rocket subsystems and justification (including empirical calculations where necessary).	Detailed overview of manufacturing processes for rocket subsystems and justification (including empirical calculations where necessary).	
	Manufacturing Management & Material selection	No detail on manufacturing and material selection included.	Little to no detail on manufacturing and material selection.	Demonstrates choice of manufacturing methods and reasoning for particular methods. Insufficient but present justification and selection methodology for most materials used.	Demonstrates choice of manufacturing methods and reasoning for particular methods. Justification and selection methodology for all materials used.	Demonstrates sound choice of manufacturing methods and reasoning for particular methods. Detailed justification and selection methodology for all materials used.	
	Updated overview of project timeline, milestones and launch schedule	No timeline is disclosed.	Poorly discloses existing project timeline and alignment with the competition schedule Unrealistic team, technical and project goals are set. Inadequately details adjustments to timeline from previous progress report, if any.	Details adjusted project timeline with alignment to the competition schedule. Realistic team, technical and project goals are set. Details adjustments to timeline from previous estimate and justifies changes.	-	-	

Formatting and Language (10%)	**Formatting**	Report is inappropriately set out, has no cover page, is inconsistent in structure and frequently repetitive. Tables and figures are frequently referenced or labelled/titled inappropriately. Referencing and/or lists for figures and tables is insufficient.	Report is only repetitive on few occasions. Structure, headings, subheadings, etc. are with only minor and infrequent errors. Labelling, referencing and titling is appropriate, and errors are not common. Contents of the report are outlined well - errors are not common	Set out of report is of a concise, consistent and logical nature - strongly aligned with common system engineering principles of report writing. All necessary information is both internally and externally referenced in a concise, consistent and logical manor. Headings, subheadings, etc. are consistent, logical and concise. Report is not repetitive.	-	-	
	Language	Grammar, punctuation, spelling (Australian English), etc. is frequency inconsistent and of a low and unprofessional standard. Frequent use of inappropriate terminologies. Report is not concise in neither structure nor linguistic technique as a whole.	Grammatical issues are few and far between. Punctuation is consistent with minimal and infrequent errors. Spelling errors are few and far between. Spelling is appropriate (Australian English) with little to no error.	Grammatical, punctuational and general linguistic techniques are with little to no fault and consistent. Spelling is without error. Report is of a highly professional nature. Terminology is consistent and industry aligned.	-	-	
						Total /100	