

Group/project:
Group 4 / Austere Field Light Attack Aircraft
PM/SE peer review provided by: Group 5

This document contains the peer review grading sheet for the Systems Engineering and Project Management items addressed in the Design Synthesis Exercise as listed in the title.

Instructions for peer review

Please provide peer review towards the PM/SE aspects of the DSE reports of your peers, as allocated to you. Per deliverable / criterion, provide at least 1 tip (improvement suggestion) and 1 top (accomplishment).

Consider the following guidelines (but addressing points beyond these guidelines is expected, especially for the deliverables not covered in these explicit guidelines):

- Functional Flow Diagram (FFD)
 - Does the FFD adhere to standard formatting and syntax?
 - Does the FFD include functions in a logical sequence?
 - Does the FFD include functions to a sufficient level of detail for understanding the project from a functional point of view?
- Functional Breakdown Structure (FBS)
 - Does the FBS adhere to standard formatting and syntax (e.g. proper grouping of functions)?
 - Is the FBS sufficiently detailed (at least up to 3 levels)?
 - Does the FBS translate generic functions to DSE-specific functions (i.e., is the connection with the specific DSE mission statement made, including flow down to detailed functions)?
 - Are the common functions of different mission phases grouped together?
- Requirements Discovery Tree (RTD) & requirements tree
 - Does the RDT adhere to standard formatting?
 - Is there a complete specification of mission and system requirements (either in the RDT or in a dedicated list of requirements)?
 - Do the requirements adhere to the ‘requirements on requirements’?
 - Are the customer-provided (user-)requirements properly analysed, and, if need be, extended with requirements from the functional, market, risk and sustainability analysis?
 - Are sub-system requirements given, provided they affect the top-level system choices?

- Design Option structuring (tree) - DOT
 - Is / are the DOT(s) logically arranged?
 - Is / are the DOT(s) used to think broadly about design generation, i.e., does it include feasible as well as ‘blue-sky’ concepts?
 - Is the initial screening (= trade off) provided, and are the concepts that will enter the mid-term phase provided?
- Market analysis
 - Does the market analysis include stakeholder identification, market segmentation and initial size estimation?
 - Does the market analysis include competitor analysis (including SWOT and/or competitive positioning of the own product)?

5 – Functional Flow Diagram(s)

Tip:

- The top-level functions should be numbered with integer and **zero decimals**. E.g. 1 should be changed to 1.0
- A reference function should be used at the beginning and end of 2nd and 3rd level function sequence. E.g. Before starting 1.1(Maintaining) a 1.0(ref prepare for operations) block should be added and as this 2nd level sequence ends with 1.3(payload loading) a 4.0(ref Warm-up/taxi) block should be added after it.
- Landing & taxi function block is not numbered.

Top:

- The functional flow diagram is easy to follow and the way recurring functions like Fly & Service are described separately makes it even better.
- Level of detail provided for each top-level function is sufficient.

6 – Functional Breakdown Structure

Tip:

- Level of detail given after 3rd top level function can be increased. E.g. function 7.0 (cruise) can be further explained by keep altitude and keep heading.
- A few functions are only described until level 2.
- Providing a legend can be helpful for reading the diagram.

Top:

- Overall the breakdown structure well made. Use of different colors aids in reading the diagram efficiently.

7 – Requirements Discovery Tree & Requirement Structuring

Tip:

- Both LAA-AER-WNG requirements suggest solutions already. You could state that lift has to be generated, but not how.
- LAA-SUS-MAT-1.2, while very thoughtful, is not verifiable due to the vagueness of “to keep to a minimum”

Top:

- This is a good and complete set of requirements for this stage of the design.
- The link to airworthiness documents is a good way to avoid a hugely convoluted list of requirements.

- Overall well thought out and structured.

8 – Technical Resource Budgets

Tip:

- How exactly is the relative importance of a parameter decided based on the user requirements? You could give examples of user requirements that make a parameter “more important”.
- Which aircraft and/or how many aircraft were used as reference for the weight estimation?

Top:

- Clear explanation of the contingency management values/margins.

9 – Technical Risk Assessment

Tip:

- Any particular reason why risk ID RIS018.a contains ‘.a’?
- No mention of the continuous nature of the risk management process. Is the overview of risks now frozen or could more be added later?
- Small detail: what does ‘Seq.’ in table 8.1 mean? In the text that column is referred to as “sub-ID”

Top:

- Very large amount of risks defined.
- Nice and clear structure of the risk management process.
- Clear division between mitigation techniques based on quantification and the risk map.

10 – Design Option Tree(s)

Tip:

- The order in which the DOT’s are presented is very different from the order of the corresponding explanation, making for a difficult read without proper guiding to the locations of the trees.
- Not all options are equally elaborated or explained. Some explanation are very detailed while others are just mentions of the option. You should balance this a little.
- The trees are not pruned to eliminate clear non-options.
- You should present more than one concept.

Top:

- The design option trees are very complete and clearly explained in text.
- The concept that is in the report is very well elaborated on.

11 – Contingency Management

Tip:

- The term “contingency plan” was used in section 8.2 for risk strategies. Perhaps make a clear distinction between the budget contingency values and the risk-related contingency plan. Or show their interrelation: the contingency values in the budget breakdown is based on risk/uncertainty.

Top:

- Contingency values are clearly established for every design phase.
- Budget contingency plans clear and detailed.

12 – Market Analysis

Tip:

- Market dynamics can be discussed in more detail by considering a greater number of aircrafts and discussing the historical development in the related field. So, a trend can be extrapolated in higher detail to forecast the market.

Top:

- All stakeholders and their requirements are discussed in detail. Sufficient detail and reasoned estimates are provided in cost analysis.

25 – Sustainable Development Strategy

Tip:

- For environmental strategies it can be helpful to quantify the impact of the categories discussed as it can make it easier to compare different concepts during trade-off. E.g. for production methods software's like Gabi or soildworks can be used to get a detailed impact of the method on environment (like carbon footprint, water use, energy use, etc).
- It will be nice also to mention if someone has been assigned a role to make sure these strategies are implemented throughout the project.

Top:

- Each aspect of sustainable development has been discussed adequately especially social sustainability as this aspect is overshadowed most of the time.