

# Preparations

1. Define the project and gather information:

- What are the **goals** and the **purpose** of the subsystem chosen?
- Gather all relevant **documents** available: people engaged, drawings, blueprints, function block diagram, technical descriptions, specifications, environmental conditions, stakeholders, etc.

2. Create the framework:

- Define the **purpose** of the FMECA.

What results do you want to find? The purpose can for example be creating barriers against failure, highlight critical components, Hardware/Software interaction issues, etc.

- **The scope.** Set the level of components included as low as possible. That means all components that are planned to be in the final design should be in the scope.

- **Structure.** Draw a hardware hierarchy showing all subsystems, units and components included in the scope and their position.

- **Operational phases:** Decide what phase(s) (for example launch, idle, imaging phase, etc) of the mission that are included in the analysis.

- **Time span** of the analysis. Decide if the whole lifespan (of the system) is to be analyzed or only parts of it.

- **Gather the team.** Individuals working with current subsystem and facilitators are necessary. Experts on the relevant fields of technology and representatives from the leadership might be useful as well.

3. Determine ground rules of the analysis.

- Find general descriptions of the **concepts**: Failure mode, cause, effect and RPN.
- Define the **RPN scales**: Consequence, severity and potentially detectability.
- Design a **FMECA worksheet**. If applicable, reuse old worksheet from similar analysis.

# Workshop and review

4. Start with **introducing** the FMECA. Explain clearly the purpose of the analysis and the scope. Define failure mode, cause, effect and RPN. However, remember it is a workshop, not a lecture. Consider handing out papers with a description of the scope as well as the definitions. Write the relevant information on a blackboard or power point to make the process more visual.
5. Determine each component's function and how it can fail. **Review** the failure modes in plenary. Discuss and find root causes, effects, RPN and countermeasures. Complete current failure mode before moving over to the next.
6. Find a **critical RPN limit** and make sure all failure modes with a higher RPN have countermeasures to lower the RPN under this limit.
7. **Follow up** the review and planned actions. After actions are made, do a new review to confirm the new RPN are under the critical limit.

\*These are recommended steps. An important success factor is being able to adapt to the workshop team. Departing from this approach