



Resilience by Design

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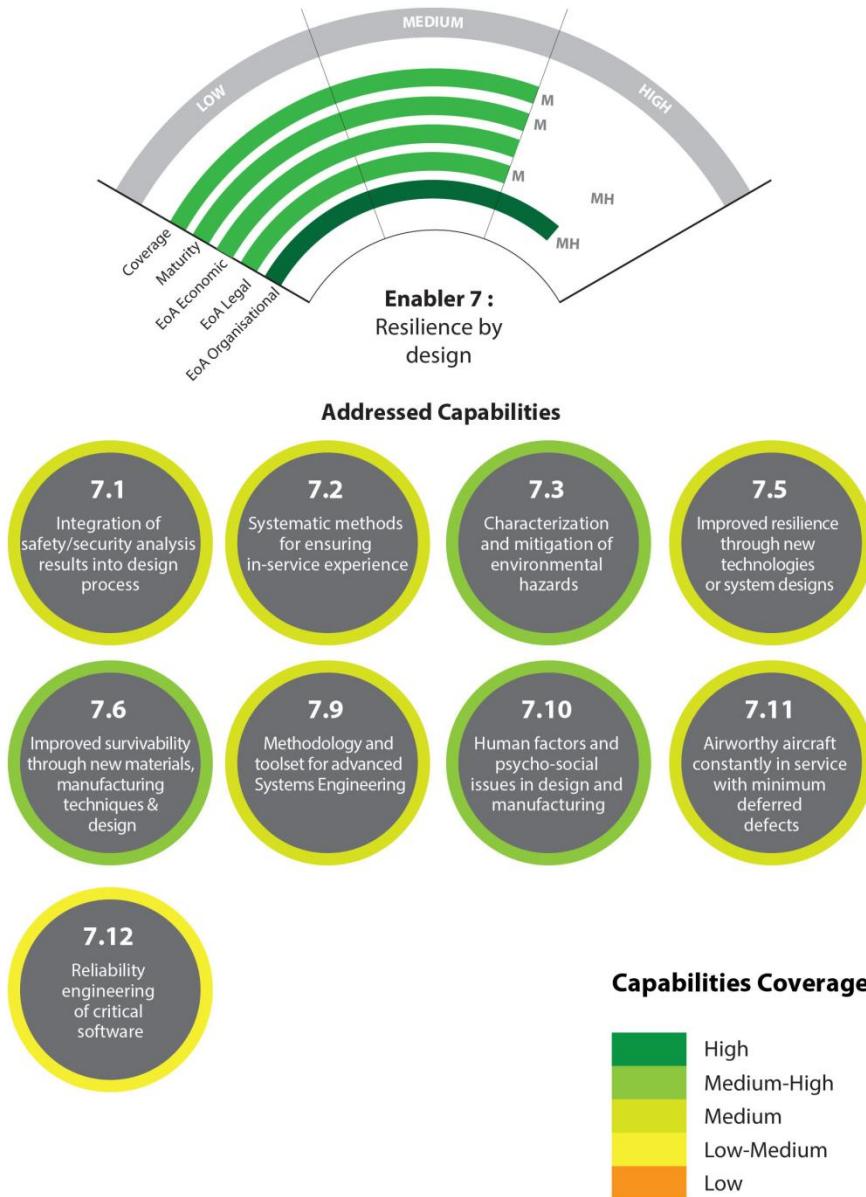
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Resilience by design

Resilience is the ability for a system to rapidly recover from any kind of system disturbance or threat, and return to normal, or at least safe, operation. It includes Adaptability to the unlikely, and to the unforeseen. Adaptability is the key to face new emerging hazards, and has to be addressed at early stages of the development life cycle of the aviation systems.

Visualising the results



Enabler 7 covers a very broad range of capabilities and projects (80 projects in total), with approximately 50% contributing to enabler 7.5.

Gaps identified:

- A systematic method for ensuring that results of safety analysis are fed back into the design process is now available, and needs to be extended to other parts of the ATS . SESAR SRM enables results to be fed back into the design process but only focuses on ATM.
- Research on some relevant environmental hazards are still lacking (e.g., fog, wind shear, thunderstorms).
- Further projects could consider how to use the vast datasets produced by flight data recording for safety. The airline industry currently does this for performance but without feeding back such information into risk models, and back to designers with a focus on safety in a way which can be extrapolated across systems (e.g. different types of aircraft and interactions between air transport system elements, i.e. system-wide learning). .

Workshop 4, Capua: Enabler 7



Top three issues raised:

- Barriers to hazard in design / certification approach Learn from other industries, especially nuclear.
- Advanced control systems to change control laws for degraded pilot/engine/aircraft situation + HMI that does not overload pilot with information - “return home capability”
- A global index summarizing the “survivability” property would be useful, together with the rigorous (global) characterization of the survivability property.

There has been a good level of contributing research projects for the Resilience by Design enabler, with overall, medium to medium-high progress to achievement of capabilities.

Both the bottom-up and top-down assessment approaches identified that more work was required on environmental threats- ice, volcanic ash, fog, wind shear and thunderstorms.

Two significant findings are that:

- Opportunity exists to change the mindset in design stage of product to adopt a basic principle that no single failure leads by creating barriers to hazard
- Extend systematic methods developed to ensure safety analysis is fed back to the design process to all parts of the ATS and develop methods to use the vast datasets produced by flight data recording for safety.