

Webinar Summary – Application of Quantitative Reliability Techniques in Safety Risk Assessment

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This webinar explored how quantitative reliability techniques can support safety risk assessment, particularly during product development and incident investigations. The speaker explained that safety assessment often begins with qualitative approaches, such as risk graphs or event analysis, where teams evaluate possible scenarios, severity, exposure, and avoidance measures using expert judgement. However, regulators and safety authorities increasingly require quantitative evidence, meaning hazards and risks must be supported with measurable data and probability-based analysis.

The session described how reliability engineering methods can provide this evidence within the broader safety assessment framework. Key techniques discussed included fault tree analysis (FTA), failure modes and effects analysis (FMEA), and the use of probability and statistical methods to quantify the likelihood of hazardous events. These techniques help translate system-level safety requirements into component-level reliability targets and support verification across the product lifecycle using a development “V-model” approach.

Industry examples illustrated how safety targets are defined through risk tolerance levels, such as Design Assurance Levels (DAL) in aerospace or Safety Integrity Levels (SIL) used in other sectors. These numeric thresholds allow organisations to demonstrate that sufficient design, testing, and reliability evidence has been generated to meet acceptable risk levels.

The webinar concluded that increasing system complexity and regulatory expectations mean reliability and safety engineering must work together to apply appropriate quantitative techniques and provide robust, evidence-based safety assessments.

If you are a SaRS Member and would like to watch the recording of the webinar please [click here](#).