framatome

Deterministic Safety Analyses and Assessments

Safety Engineering Solutions

Framatome's Deterministic Safety Analyses and Assessments verify fulfillment of regulatory requirements based upon unique original equipment manufacturer experience.

Challenge

Nuclear safety takes top priority in the operation of nuclear power plants. A high safety level generally goes hand in hand with high plant availability and efficiency.

New safety and regulatory requirements, plant upgrades, long-term operation and lifetime extension measures present challenges to operators as they trigger the need for various safety analyses and assessments.

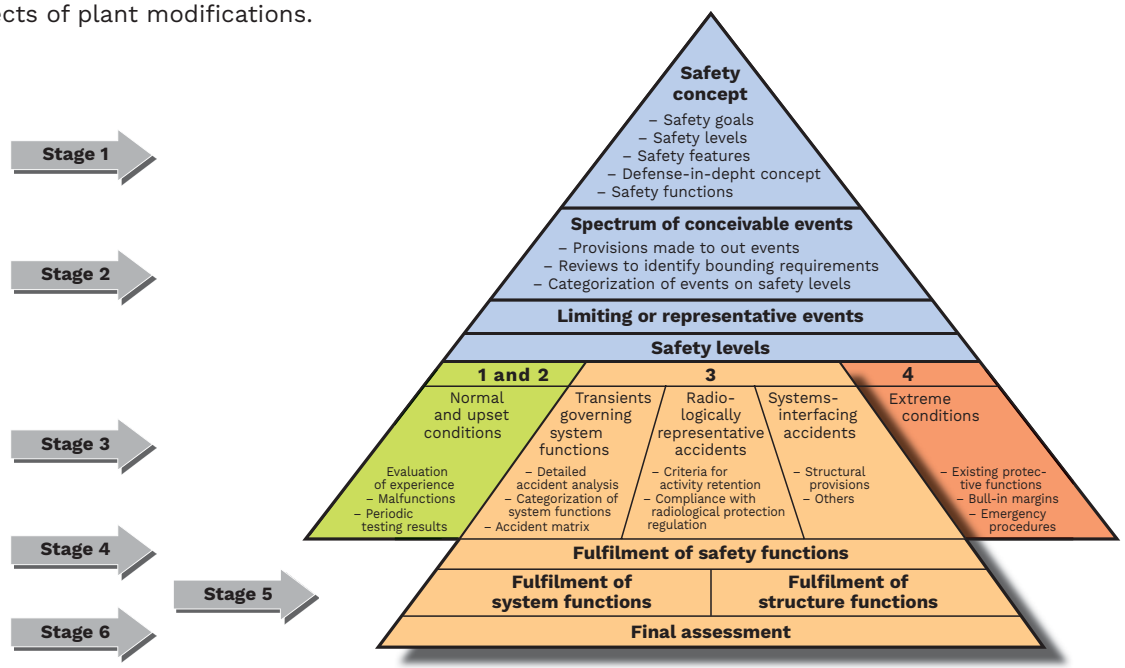
Solution

Framatome's Deterministic Safety Analyses and Assessments verify fulfillment of regulatory requirements, reduce residual risk and re-assess existing safety margins.

As an equipment manufacturer, Framatome has a wealth of experience in conducting safety analyses and assessments which optimize accident management procedures, and provide information about safety improvement options and the effects of plant modifications.

Customer benefits

- Verify fulfillment of regulatory requirements
- Reduce residual risk and re-assess existing safety margins
- Optimize measures for prevention and management of accidents
- Provide information about possible safety improvements
- Determine effects of plant modifications
- Prevent plant shutdowns
- Reduce operating costs (risk-informed applications)



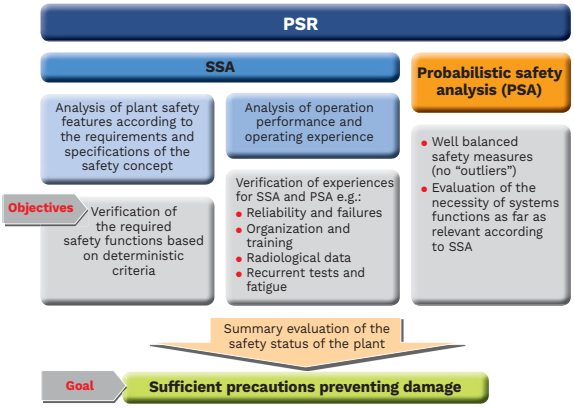
Structure of safety status analysis

Your performance
is **our** everyday **commitment**

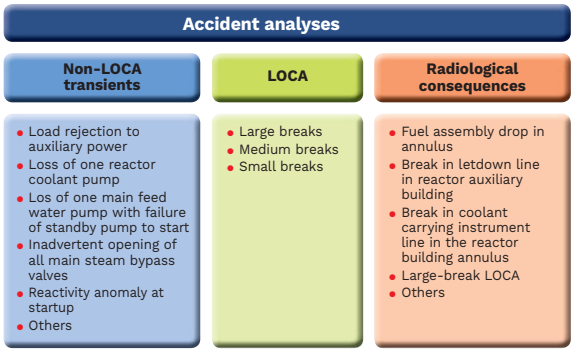
Technical information

We offer a wide range of deterministic safety analyses and assessments:

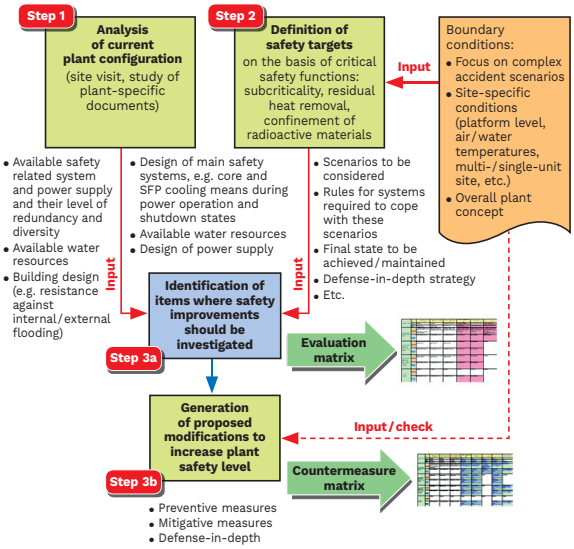
- Periodic safety review (PSR), safety status analysis (SSA)
- Determination of safety requirements for new-build projects
- Concepts for coping with external hazards leading to design extension conditions such as station blackout, loss of ultimate heat sink or loss of fuel pool cooling
- Protection against internal and external hazards
  - Methodology for hazard analyses
  - Definition of safety requirements (e.g. break assumptions, physical separation, fire safety)
  - Considerations for design-extension hazards including airplane crash
- Robustness and weak point analysis
- Preliminary and final safety analysis reports
- Licensing documentation / licensing support for retrofit projects
- Elaboration and assessment of safety upgrades
- Safety and seismic classification of systems and components
- Technical specifications
- Elaboration of functional requirements for instrumentation and control
- Special topics (high energy pipe break, load drop analysis)
- Safety assessment for various plant states and operating modes
- Determination of safety requirements for systems, structures and components, e.g.:
  - Thermal-hydraulic plant analysis (transients, loss-of-coolant accident (LOCA), non-LOCA)
  - Fluid dynamic analysis including short-term impacts (water hammer, pressure waves, fluid-structure interaction, etc.)
  - Pressure and temperature loads on buildings and structures
  - Pressurized thermal shock analysis
  - Radiological consequences (onsite and offsite), fission product release
  - Concepts for core melt stabilization



PSR



Example of evaluated events



Weak point and robustness analyses

References

Worldwide: Argentina, Belgium, Brazil, Bulgaria, China, Finland, France, Germany, India, Japan, Lithuania, Netherlands, Slovakia, Slovenia, South Africa, Spain, Sweden, Switzerland, Turkey, Ukraine, United Kingdom, United States

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