

# Probabilistic Safety Analyses

## Safety Engineering Solutions

Framatome’s Probabilistic Safety Analyses verify fulfillment of regulatory requirements based upon unique original equipment manufacturer (OEM) experience.

### Challenge

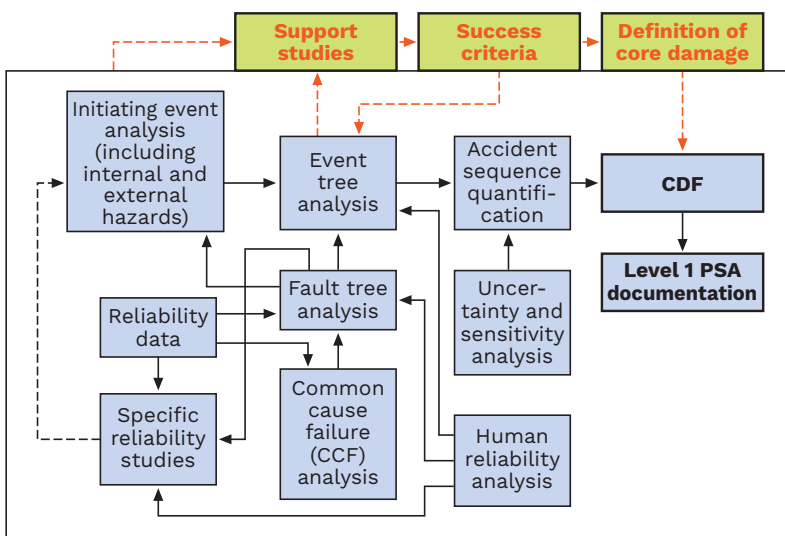
Nuclear safety takes top priority in the operation of nuclear power plants. A high safety level generally goes hand in hand with improvements of plant availability and efficiency.

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

Our Probabilistic Safety Analyses verify fulfillment of regulatory requirements, reduce residual risk and re-assess existing safety margins.

As an OEM, we have a wealth of experience in conducting safety analyses which optimize accident management procedures, and provide information about safety improvement options and the effects of plant modifications.



Analysis steps in level 1 probabilistic safety analysis (PSA)

### 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)

**Level 1 PSA** → The assessment of plant failures leading to **core damage** and the determination of core damage frequency (CDF)

**Level 2 PSA** → The assessment of containment response leading, together with the results of level 1 analysis, to the determination of **release magnitudes and frequencies**

**Level 3 PSA** → The assessment of **offsite consequences** leading, together with the results of level 2 analysis, to estimates of risk to the public

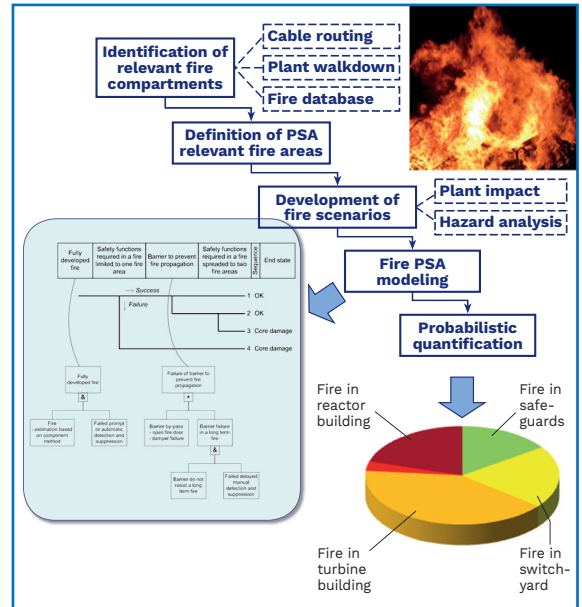
PSA risk levels

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

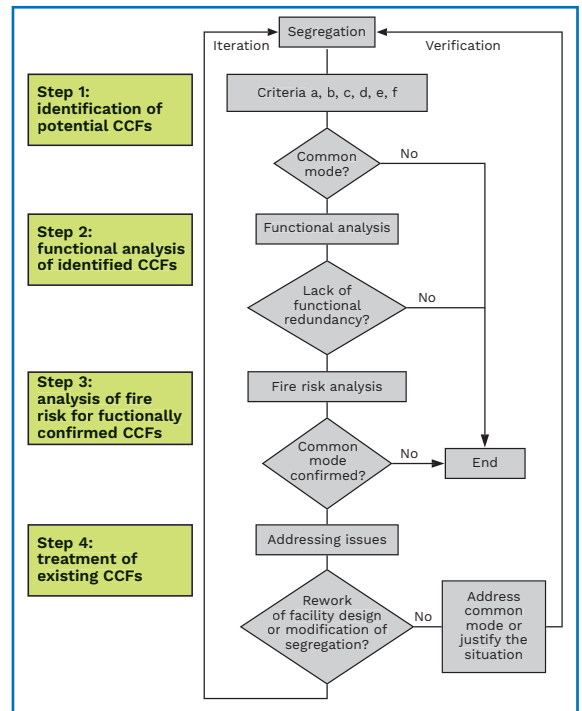
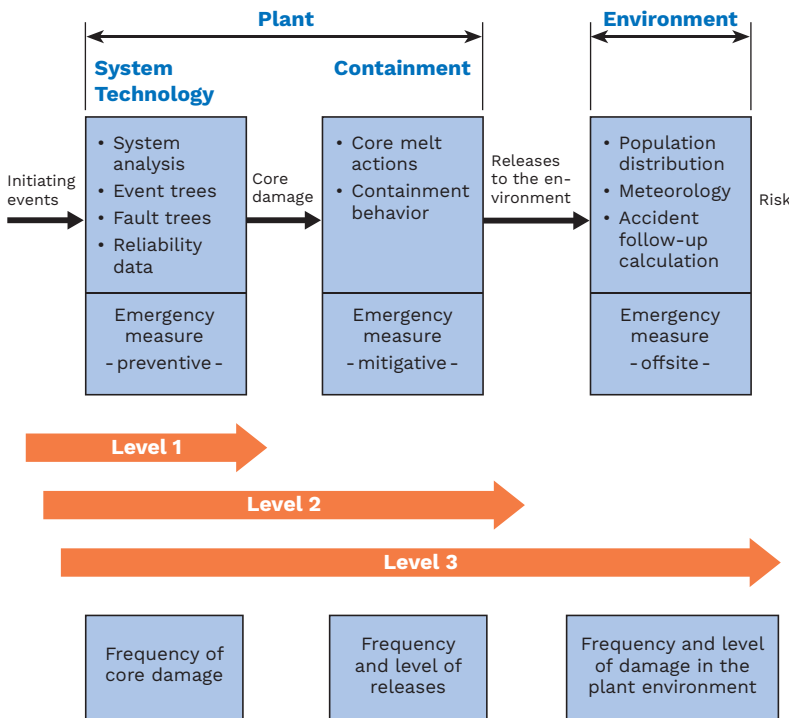
# Technical information

We offer a wide range of probabilistic engineering capabilities:

- Level 1, 2, 3 PSA for power and shutdown states
  - Fire PSA
  - Seismic PSA
  - PSA for other external hazards
  - Seismic re-assessment of buildings, structures, equipment, core
  - Seismic margin assessment
  - Reliability analysis for instrumentation and control systems



Fire PSA



Fire vulnerability analysis

# References

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

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