

Fire - Internal Hazards

Probabilistic Risk Assessment (PRA) Probabilistic Safety Assessment (PSA)

Internal fire hazard is usually a major contributor to the plant risk. Development of PRA dedicated to the risks induced by fire hazard is beneficial to confirm the level of safety of the plant and identify appropriate balance of valuable design changes.

Challenge

Internal fire hazards is known as one of the major contributor to the plant risk i.e. Core Damage Frequency (CDF) in PRA world.

Fire partition established at the time of plant design might be strengthened through a comprehensive hazard analysis combined with Probabilistic insights e.g probabilities related to fire ignition, fire propagation and human factor.

Fire hazard PRA is the best estimate to assess the risk induced by internal fire. Fire hazard PRA will allow to:

- Demonstrate that the level of safety of the plant respects the regulatory targets expressed in terms of CDF, LRF and LERF.
- Confirm the fire partition and identify valuable design improvements which could reduce this risk.

Solution

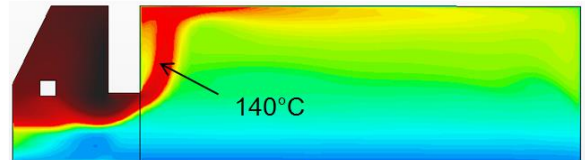
Framatome has gained extensive experience in the development of comprehensive fire PRA for PWR. At design stage or for already operating plants, Framatome is able to define the more relevant scope of fire PRA with regard to customer's objectives.

Framatome is able to oversee the development of an entire fire PRA or part of it. The development or update will be fully compliant with customer's PRA modeling practices and rules.

Among fire PRA tasks, the followings can be specifically addressed :

- Various reactor states (power, low power and shutdown),
- Functional Analysis of accident progression (sequences),
- Initiating events frequencies,
- Human Reliability Assessment (HRA),
- Fire detection/suppression modeling,
- qualitative and quantitative screening,
- Peer review - Identification and reduction of conservatisms.

We offer strong experience in leading fire PRA up to Authorities approval.



Customer benefits

- Confirm the level of safety of the plant with a best estimate assessment.
- Identify valuable design improvements which could reduce the risk.
- Avoid unnecessary or ineffective design changes.
- Get a peer review based on Framatome's extensive experience.
- CFD fire modeling with Framatome's own developed 3D method 2MF3D using STAR-CCM+ and other qualified tools e.g. FDS or MAGIC.
- Improved traceability with the delivery of an electronic fire hazard database which records the comprehensive functional analysis together linked with the PRA model.
- Compliant with IAEA SSG-3 and NUREG/CR-6850

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