

**Fire protection
at nuclear installations**

Topic of interest:

Decommissioning

Presented by: Eugenia Morgado (CSN)

Marco Gervasi (ISIN)

Guillermo Cristóbal (CSN)

Aspects to be discussed



+



1. Criteria and the process carried out to identify and implement modifications on fire protection measures, administrative controls, the organization and training.



+



2. The process carried out to update the fire hazard analysis and fire protection programme in order to reflect the changing situation of the plant.

Expected outcome of discussion

- Overview/benchmarking of approaches regarding adaptation of fire protection provisions to the conduct of decommissioning operations
- Better insights from national approaches to share experience and identify potential good practices or challenges

1. Criteria and the process carried out to identify and implement modifications on fire protection measures, administrative controls, the organization and training

- During decommissioning there is a constant evolution of: radiological environment, fire loads, ignition sources (associated with increasing hot works), dismantling, disassembling and demolish operations.
- These factors could lead to: adaptation or refurbishment of existing fire protection systems (e.g detection and suppression systems, fire barriers, etc.), administrative controls and changes in the fire brigade.

Approaches reported in NARs: Adaptation of fire protection systems

- | | |
|---|--|
| ✓ <i>Fire barriers: “not envisaged”
“only if necessary”</i> | ✓ <i>Detection systems: “scope of monitoring is reduced”</i> |
| ✓ <i>Ventilation systems: “not changes”
“adaptation of ventilation”</i> | ✓ <i>Suppression systems: “remain operational until the
equipment they protect is removed”
“Water extinguishing stations or manual fire
extinguishers are available at specific locations”</i> |



Which are the fire protection measures established when changes at fire barriers or ventilation system are required?

Which are the main modifications you make to detection and suppression systems?

1. Criteria and the process carried out to identify and implement modifications on fire protection measures, administrative controls, the organization and training

- During decommissioning there is a constant evolution of: radiological environment, fire loads, ignition sources (associated with increasing hot works), dismantling, disassembling and demolish operations.
- These factors could lead to: adaptation or refurbishment of existing fire protection systems (e.g detection and suppression systems, fire barriers, etc.), administrative controls and changes in the fire brigade.

Approaches reported in NARs:

Administrative controls

- ✓ *Hot works: “flame cutting”
“safer methods”*

Fire brigade

- ✓ “Reduction from the plant fire brigade to an intervention group”
- ✓ “Requirements regarding the fire brigade (staffing, qualification, etc.) can be reduced”



What fire protection measures do you use during flame cutting?

How do you adapt the on-site fire brigade during decommissioning?

2. The process carried out to update the fire hazard analysis and fire protection programme in order to reflect the changing situation of the plant

- There is a need to update the fire protection program and the fire hazard analysis.
- Updated fire hazard analysis can also be used to base decisions on the removal of fire protection systems if necessary.

Approaches reported in NARs:

Methodology

- ✓ *“deterministic”*
- ✓ *“fire PSA”*
- ✓ *“safety assessment demonstrating that potential fires occurring can be controlled and mitigated”*

Frequency updating FHA

- ✓ *“5 years”*
- ✓ *“as needed”*
- ✓ *“not updated if defueled”*
- ✓ *“not updated”*

Frequency updating Periodic Safety Review

- ✓ *“10 years”*
- ✓ *“5 years”*
- ✓ *“every year”*
- ✓ *“PSR not required”*



What are the benefits on fire safety resulting from implementing Fire PSA while decommissioning?

How is the process carried out to update the fire analysis?

What are the challenges / benefits of a more frequent update of fire analysis / Periodic Safety Review?

2. The process carried out to update the fire hazard analysis and fire protection programme in order to reflect the changing situation of the plant

- There is a need to update the fire protection program and the fire hazard analysis.
- Updated fire hazard analysis can also be used to base decisions on the removal of fire protection systems if necessary.

Approaches reported in NARs:

Consideration of fire loads and hot works and changes in fire protection systems

- ✓ *“considered”*
- ✓ *“only if necessary”*
- ✓ *“not considered”*
- ✓ *“safety margin due to daily fluctuation in fire loads”*
- ✓ *“consider transient combustibles as accidental ignition sources”*



How changes in fire protection systems follow the decommissioning of the infrastructure?

What improvements or lessons learnt result from considering fire loads or hot works in fire risk analysis?

Fire protection
at nuclear installations

Thank you for your participation and contributions !