E U R O S A F E

Towards Convergence of
Technical Nuclear Safety Practices in Europe

# Complementary Safety Assessments outcomes for fuel cycle facilities

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**The CSA approach** considers natural extreme events (seism, flooding) much higher than the stress levels taken into account in the design with the current safety approach. In addition, the CSA approach postulates, whatever the existing redundancies, the deterministic loss of cooling and electrical supplies. Extreme situations and associated « keys » SSCs have been identified.

*"key" SSCs: Structures, Systems and Components necessary to maintain the facility in a safe state.*

IRSN has considered necessary to strengthen a limited number of key SSCs with high design requirements, called the hardened safety core.

In addition, the emergency organization has to be enhanced to take into account extreme events for all the facilities of the site.


*AREVA Plants*

## Emergency preparedness and response

The main CSA outcomes for the emergency preparedness and response deal with the possibility to better face the consequences of an extreme event at a whole site scale, and over a long duration.

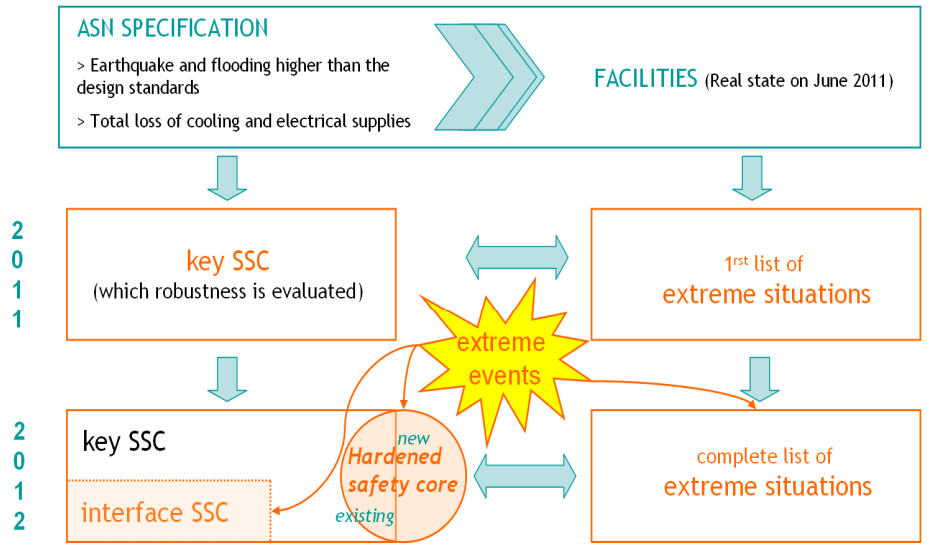
New Crisis Centres are designed, diagnosis means are reinforced, and an AREVA National Intervention team (FINA) is also to be deployed in the coming years.

In order to ensure the reliability of remediation actions in extreme conditions, the resilience of this organization is being studied through an "organisational and human factors" scope.

## Extreme Hazards.

*Extreme events: degraded state of the facility that has to be avoided (liberation of a potential of danger).*

- Extreme flooding and extreme weather events definition is considered satisfactory. Complementary studies are in progress.
- Extreme seism levels are to be fully justified. Additional justifications are required (end of 2013)




*Historical reminder of the context*

## Hardened safety core provisions and associated requirements

Scenarios have been defined for each site, and IRSN made the judgement that the corresponding hardened safety core equipment and measures are about to enhance their ability to withstand extreme hazards or supply losses.

*Hardened safety core: limited number of means to PREVENT the extreme scenarios or mitigate associated consequences.*

The main improvements are:

- LA HAGUE: the main improvements focus on additional water supply for spent fuel pools and fission products tanks. Complements are also expected on additional demonstration for waste silos
- MELOX: complements are expected to strengthen fire detection and fire fighting
- Romans-sur-Isère: complements are expected to prevent criticality accidents and large scale fires. Complements are also expected to mitigate HF or $UF_6$ leaks
- Tricastin: the renewal of the oldest facilities is expected, as well as complements to mitigate HF or $UF_6$ leaks.

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