

International Conference on Management of Spent Fuel from Nuclear Power Reactors: An Integrated Approach to the Back End of the Fuel Cycle



Contribution ID: 97

Type: ORAL

Lessons learned from a periodic safety review, applied to the design of new nuclear fuel cycle facilities

During the last safety reassessment of the spent fuel reprocessing plant operated by AREVA NC in La Hague (France), IRSN reviewed the experience feedback on incidents as well as the compliance of several equipment of the primary containment to their safety requirements. This review is designed to assess the level of safety of a facility in relation to the rules or the laws which are applicable at the time of this review, updating in particular risk assessment.

Further investigations are now necessary to control some risks poorly anticipated at the design stage. They give information guidance for the design of new nuclear facilities.

For example, leakage detection systems associated to the primary containment in units dealing with uranium or plutonium are designed to detect an arrival of a large amount of liquid in a secondary containment. The experience feedback showed that the related systems failed to detect leakages of radioactive materials because the leaks occurred at process steps where uranium and plutonium were in solid state, or because of a very low flow of a liquid leak on warm surfaces of the equipment. Corrective measures consist in conducting periodic observations of the secondary containment below the equipment. Such observations may be difficult because of the absence of port-hole, the difficulties to introduce cameras, the low level of light in the cells, etc.

Furthermore specific tools for non-destructive testing methods are developed, in order to monitor the residual wall thickness of equipment, in order to confirm the corrosion kinetics. But their deployment in highly contaminated cells is limited by the difficulties to introduce these devices into the cells and to place them at a suitable position on the equipment.

The anticipation of these controls in the design stage would have made it possible to facilitate them and to better control the aging of facilities and the absence of leak. These lessons are already applied by IRSN for the safety assessment of new nuclear fuel cycle facilities.

Country/ int. organization

FRANCE/IRSN

Primary author: Dr RACIMOR, DAVID (IRSN)

Co-authors: Ms LIZOT, Marie-Thérèse (IRSN); Dr CHARRIN, Nicolas (IRSN)

Presenter: Dr RACIMOR, DAVID (IRSN)