Sump clogging issue: Viktoria loop

Inauguration from 14th to 15th of December 2011 - Levice (Slovakia)

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CONTEXT

Safety of Nuclear Power Plants excluding any major potential risk of a nuclear accident remains the foremost condition for public acceptance of the nuclear power. The “sump clogging issue” is one of the most important nuclear safety issues identified during the last decade. It concerns the operational characteristics of the filtration function used on a reactor during the recirculation phase of the safety injection system (SIS) and containment spray system (SS), in the event of a primary loss of coolant accident (LOCA).

Since 2001, IRSN (France) and VUEZ (Slovakia) have performed an extensive research program resulting today in an important and unique amount of data and knowledge especially on the chemical effects issue. This includes:

- the main results of their experimental program,
- the lessons learned from test campaigns for French nuclear power plants and US reactors.

Nevertheless, certain questions remain still open; in particular the LOCA induced long-term debris effects increasing the head loss of the filter by chemical precipitation or "downstream effects" on safety equipment and fuel assemblies, as a combined action of the temperature and the chemical composition of the solution in the sumps.

These issues still need to be addressed. Research has to be conducted to characterize their importance and to assess the impact of the debris or of the chemical precipitation on the equipment of the safety systems or of the main coolant system.

The need to consider these more complex effects led to the design of a new and more flexible loop. The new loop called VIKTORIA allows modelling more global and relevant characteristics, and will have the capacity to model different layouts of NPPs of generation II and III.

The main objectives of the new test loop are to study a filter module taking into account:

- head loss,
- chemical effects and gas effects,
- downstream effects.

This will allow:

- For Safety Authorities, to establish safety requirements to be used for new devices proposed by the utilities,
- For the utilities, to qualify their new devices with respect to safety requirements proposed by their Safety Authorities.

INauguration of the VIKTORIA LOOP

Dates: From 14th to 15th of December 2011
Location: LEVICE (SLOVAKIA)
Speakers: Experts from: AECL, ALION, VUEZ, IRSN, Trencin University.
Responsible: Ivan VICENA, Member of the VUEZ board.
Jean Marie MATTEI, Head of IRSN International Development Department.

IRSN and VUEZ have pleasure in welcoming you to the inauguration of the VIKTORIA loop on December 14th and 15th, 2011 in Levice (Slovakia).