framatome

CONTAINMENT COOLING CONDENSER

Passive Heat Removal from the Containment

Framatome's Containment Cooling Condenser removes heat from the containment and ensures long-term building integrity even in the case of a station blackout.

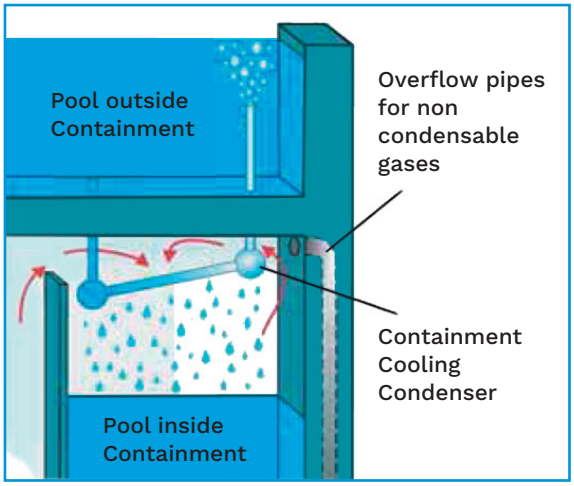
Challenge

In the event of a transient or loss of coolant accident (LOCA) with no active cooling systems available (e.g., station blackout, internal fire / flooding), it is essential to remove heat from the containment. The pla0nt must be brought to a safe state and long-term containment cooling must be ensured. A heat removal system is required that operates without any power supply.

Solution

The Containment Cooling Condenser is a passive heat removal system that allows for the transfer of heat from inside the containment to a water pool outside the containment. Steam inside the containment atmosphere condenses at the surface of the heat exchanger, and the heat is transferred to the outside pool by single- or two-phase natural circulation. The Containment Cooling Condenser has been successfully tested in full scale for containment pressures of up to 0.35 MPa. The heat transfer capacities of the component were found to be up to 11 MW, with the potential for further improvement at higher containment pressures.
By incorporating this component, the containment, pressure is maintained below the design pressure, ensuring a stable low pressure over time, provided that the water reservoir outside the containment is available.

The system has a robust and simple design which does not contain any auxiliary equipment except for containment penetrations.



Simplified principle of operation

Qualification

- Full scale tests 2009-2012 at INKA test facility, Karlstein, Germany
- Component development in co-operation with Paul Scherrer Institut (PSI), Switzerland

Customer benefits

- Long term passive heat removal from the containment even after a loss of the main heat sink and / or active cooling systems (e.g. station blackout, internal fire / flooding)
- No additional active containment cooling system necessary
- No power supply or I&C control necessary
- Simple, maintenance-friendly, scalable design without any active components

Your performance
is **our** everyday **commitment**

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