framatome

RCP Shaft Seal Systems

Hydrodynamic system and Passive Shut Down Seal

Framatome Jeumont know-how applied to primary circuit pump seals

Challenge

Reactor Coolant Pump (RCP) seal systems are subject to severe conditions from low pressure operations during start-up and shutdown to high pressure and high temperature conditions during normal operation. Sealing is an integral part of reactor coolant system (RCS) pressure boundary and one of the most severe and challenging application. Leak rate for reactor coolant pumps seal failures are common in both PWRs and BWRs. Long-lasting innovative seal designs with minimal modifications is critical to the safe and cost-effective operations.

Solution

Thanks to our experience working with different reactor types worldwide, Framatome proposes an integrated solution for both operating nuclear power plants and new builds.

Passive Shut Down Seal
Qualified the Passive Shut Down Seal to automatically limit the RCS inventory losses to non-significant level in Station Blackout sequence events for extended period. Easy to integrate into any existing RCP hydrostatic sealing insert without design change. Our Passive Shut Down Seal is available in 2 models and can operate up to 12 years.

Hydrodynamic system
Framatome has modified the sealing system of RCPs with three hydrodynamic controlled leakage seals. The pressure drop is ensured equally by the different stages, thus ensuring lower wear on the secondary seals. Our hydrodynamic system is further complemented by a Standstill seal system.

For every type of seal, Framatome manages the whole chain value (design authority, manufacturing, commissioning, improvements, etc...)

Customer benefits

- Improved safety: in case of total loss of power supplies, the standstill seal system ensures the sealing of the primary circuit
- Enhanced reliability: In the event of a one-stage failure, the Reactor Coolant Pump can continue to operate until the next unit shutdown
- Reduce maintenance costs
- Long-lasting solution

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

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Technical information

Incidental conditions up to :

Temperature : 325°C

Pressure : 175 bars

Period : 360 hours

Key figures

Framatome has proven know-how and experience in nuclear sealing system of Reactor Coolant Pumps :

400 shaft seal systems installed worldwide ; of which, dozens of seal systems are installed on non-OEM pumps

50 years of experience in maintenance of shaft seals

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