

Reactor Coolant Pump Seals

Background

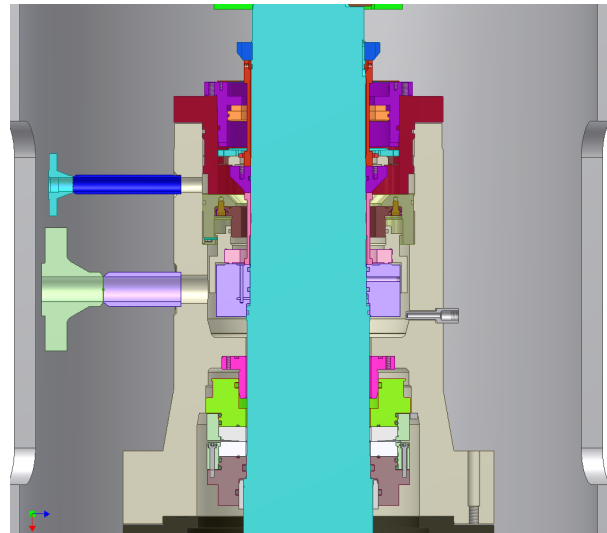
In addition to being the original manufacturer of reactor coolant pump (RCP) seals, Westinghouse provides full-scope seal services to the nuclear industry. From the sale of replacement seals and components, to engineering support and testing, Westinghouse is the one-stop shop for seal-related needs.

Westinghouse provides designed seal packages for the first RCPs with seal injection water. Today, Westinghouse supply seals and seal-related services for the following RCP models:

- 63
- 70
- 93
- 93A
- 93A1
- 93D
- M100

Description

The seal package consists of three independent seals that permit relative motion between rotating and stationary parts while controlling leakage. Westinghouse strives for better seal performance and longer seal life by improved seal design, which is accomplished by testing and evaluating new seal compounds and configurations. Actual seal performance data from utilities are also essential in helping us better understand the utility needs. Westinghouse is available to assist utilities in resolving seal issues during operation and the critical pump start-up.



Conventional seal system

The Westinghouse seal package is conventional versus cartridge, and the cartridge upgrade significantly reduces outage duration.

Services

Westinghouse offers full-scope services to assist in all seal-related needs. These services include:

Engineering Support

- Start-up/operation
- Leak rate assessment for continued operation
- History evaluation for inspection interval
- Station blackout including



Seal being rebuilt

Field Services

- Seal inspection and change out
- Upgrades

Shop Services

- Seal rebuilding
- Detailed seal inspection and root cause evaluation
- Seal testing

Replacement Parts

- Qualification maintenance

Upgrades

- Cartridge seal system
- Seal maintenance system
- Spool piece upgrades
- Articulated arms
- No. 3 seal double dam upgrades
- New, improved seal and coating materials
- No.1 seal housing hydraulic nuts
- SHIELD™ Passive Thermal Shutdown Seal
- ELR™ Engineered Leak Rate No. 1 Seal for Reactor Coolant Pumps

New Seal Design

The industry has asked for an improved seal design with longer seal life, and in response Westinghouse has developed a seal tester to confirm that new seal designs meet utility requirements and needs. Westinghouse also has developed a high-temperature O-ring compound to withstand the effects of loss-of seal cooling.

Human Performance

Westinghouse conducts lessons learned for each project and applies this knowledge to future projects. The Corrective Actions Process (CAPs) is used to identify and address issues related to quality and performance.

Safety

Safety is very important to Westinghouse and its subsidiaries. Westinghouse conducts extensive safety training for all employees and evaluates OSHA-reportable items on a weekly basis.

Experience

The Pressurized Water Reactor Owners Group (PWROG) has funded three programs: seal performance improvement, evaluation of the basis for the operating limits and evaluation of the inspection interval. Our crews have performed seal services for more than 100 nuclear power plants worldwide. The services include inspection, installation, advisory and training.

All new seals are tested before shipment to verify their performance.