

## BNL ALARA CENTER

**Processes and Practices Related to Occupational Dose**

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**SEAL-LESS PUMPS FOR REACTOR WATER CLEAN-UP (RWCU)**

**Keywords:** OPERATIONAL AND MAINTENANCE TECHNIQUES; EQUIPMENT MODIFICATION AND REPLACEMENT; RWCU; SEAL-LESS PUMPS; FILTRATION; MAINTENANCE; WASTE; EXCURSIONS

**Description:**

The reactor water clean-up pumps in BWR plants contribute to occupational exposure through required periodic maintenance to replace shaft seals. Failures between scheduled refueling outages can additionally have significant impact on plant availability. Newer seal-less reactor water clean-up pump designs eliminate shaft penetration of the pressure boundary and provide common pump and motor bearings which avoid alignment problems and reduce maintenance requirements. Other benefits include reduced exposure due to reduced contamination and production of solid rad-waste volume, and a reduction in water chemistry, temperature, and pressure excursions. Finally, the Japanese have demonstrated that higher RWCU capacity provides significant reduction in out-of-core radiation levels and consequently collective occupational exposures.

**References and Selected Abstracts:**

1. Johnson C.P. et. al., "Collective Radiation Exposure Task Force Report: Hope Creek Generating Station", April 1987, p. 38.