Application story

WANNER™
HYDRA-CELL® PRO
SEAL-LESS PUMP TECHNOLOGIES

Boric Acid for Emergency Back-Up at Nuclear Plants

Location	USA	**Hydra-Cell model**	T100KADGHFEPA
Type of application	Emergency Borated Water (Boric Acid)	**Flow rate**	170 l/min (45 gpm)
Liquid	Boric Acid	**Pressure**	138 bar (2000 psi)

Application details

A nightmare came true in March 2011 when a tsunami struck the Fukushima Daiichi Nuclear Power Plant in Japan and destroyed the emergency generators running the cooling systems for the reactors. This tragedy highlighted the importance to Dominion, one of largest producers and transporters of energy in the United States, of having reliable pumps in place to shut down a nuclear reactor in an emergency.

A trailer-mounted, diesel-powered system to pump boric acid at 2000 psi (138 bar) discharge pressure was required for emergency back-up to shut down a nuclear reactor as a last resort. A Hydra-Cell T8045 (now known as a T100 Medium Pressure model) was selected over the competition, a Flowserve 8-stage and 16-stage centrifugal pump for several reasons:

Hydra-Cell can run dry without damage if the storage tank failed due to exposure to conditions beyond the design of the plant

River water and/or onsite secondary water could be sourced to replace the borated water without affecting the cooling ability of the pumping system

Onsite maintenance and overhaul eliminated the need for backup pumping systems

Lower acquisition cost – $850,000 for the Flowserve; $235,000 for Hydra-Cell.

Six Hydra-Cell diesel units and four electric units were installed at Dominion nuclear plants in the United States. Other Dominion plants are considering using Hydra-Cell pump packages as Hydra-Cell has shown its ability to be on standby for several years without degrading the system.

Although price was a factor in choosing Hydra-Cell, the importance of the application speaks more to performance capability. The seal-less design and operating principles of Hydra-Cell have made this a successful installation. In addition to the noted advantages over a multistage centrifugal pump, Hydra-Cell is self-priming, can handle abrasives, and offers a wide ranges of materials of construction options. If the unthinkable happens, Hydra-Cell can also run continuously for a minimum of 30 days.

“I wanted to let you know that Dominion is very pleased with the BDB RCS injection pumps that you furnished,” said Bill Thomas. “They are the finest BDB pumps of any we have purchased for the project.”

Advantages of Hydra-Cell pump on this application

The ability to run dry, simple easy onsite maintenance and initial purchase costs.

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