

Reactor Pool Vacuum System Proves Beneficial

Nuclear power generation plants have realized significant savings in critical path outage time, personnel radiation exposure and associated costs through use of the system in reactor pools during refueling outages.

The idea for LUVS (Lightweight Underwater Vacuum System) came in the late 1990's from a worker at the Palo Verde Nuclear Generating Station, which is the nation's largest nuclear power plant. While at PVNGS, Troy Wilfong, a senior radiation protection technician, was frustrated with current technology at the time. Wilfong researched, prototyped and tested the system that won a Nuclear Steam Supply System TIP (Top Industry Practice) award and was granted a U.S. Patent in 2002.



Troy Wilfong examines a LUVS



Control Pendant

Western Space and Marine, Inc. of Goleta, California refined the design and produces the commercial LUVS package that is now in use at many nuclear stations across the country. Exelon, Duke Energy, Florida Power and Light, Entergy, Dominion, Progress Energy and British Energy all have taken advantage of the LUVS technology to enhance their operations.

The system is a compact, submersible vacuuming system that is much easier and faster to deploy than other vacuum systems. It has been used to recover objects ranging in weight from 2 grams to 1 kg, although it can retrieve much lighter and heavier objects. The LUVS can capture particles down to a size of 100 microns, making it ideal for difficult decontamination tasks such as vacuuming rust, fuel particles, hot spots and crud deposits.

The successful use of the LUVS has mitigated the disadvantages associated with using remote grippers and other existing vacuum systems. The system greatly reduces the possibility of dropping objects below the core barrel flow plate by lifting the objects into the vacuum system. The average time to deploy and recover foreign objects using the LUVS system has been about an hour or less, compared to up to 24 hours or more of critical path time using remote grippers or hose-connected underwater vacuum systems. Fewer man-hours expended results in less personnel exposure and lower outage expense.

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