

Innovative water sealing technology that could make a real difference

Billy Morrison | 12 May 2016 | [0 Comments](#)



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Contamination management is one of the nuclear industry's paramount concerns. Finding a suitable way of managing and repairing containment solutions where contamination could be a possible problem is equally important, and equally challenging.

But we do have a way of doing this. Atkins has partnered with Sovereign-Thyssen joint venture (made up of Sovereign International, a water proofing company with over 40 years of experience and Thyssen Mining, a leading innovator in mining technology), to provide their proprietary water sealing technology to our clients in the nuclear industry.

The solution is called NOH2O. It's a novel, grout like suspension that has the appearance of a grey, milky liquid. When injected into high shear environments, like fissures or cracks, it thickens to form a rubber-like seal that stops the flow of water. It's a fascinating process and a really novel solution for several environments in the nuclear industry where contamination management is paramount.

Sovereign-Thyssen JV has been using NOH2O around the world to seal deep earth tunnels from water incursion. Initially applied to the mining sector, more recently they have been working in the construction and tunneling industries to seal subterranean water leaks in order to meet industry standards. In over 40 years of these one-of-a-kind applications there has never been a failure of an NOH2O seal. Currently, Sovereign-Thyssen JV is working on a number of projects in Manhattan, where they are sealing older, leaking tunnels for the New York City Transit Authority.

For the past two years, EnergySolutions' Power, Products and Technology business – which is now a part of Atkins – has been working with Sovereign-Thyssen to demonstrate the applicability and use of NOH2O in unique, water leak environments in the nuclear industry.

Our long-term research and testing partner, the Vitreous State Laboratory of the Catholic University of America, has helped verify the environmental safety of the material and its resistance to radiation damage when installed in high radiation environments.

And together with IHI Corporation in Japan we are now evaluating the use of Sovereign-Thyssen's NOH2O solution to seal water leaking from the damaged Boiling Water Reactor (BWR) pressure containment vessels at the Fukushima Daiichi nuclear power station in Japan to facilitate damaged fuel retrieval.

NOH2O is also being tested for its potential use to seal the damaged Fukushima Daiichi reactor facility foundations from groundwater incursion, a problem that has persisted since the tsunami and resultant accident in March 2011.

We are also pursuing the application of NOH2O for use in sealing leaking fuel storage pools, and commercial reactor foundations throughout the world, and for potential use as an environmental barrier for the leaking high-level waste (HLW) tanks at Hanford nuclear site in North America.