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Industry Insight
Software at heart of slashing millions off decommissioning costs

6 August 2010
A new software product claims it can shave millions off nuclear power plant decommissioning costs. **Elisabeth Jeffries** speaks to the company behind the product and gets the viewpoints of a major utility and an engineer to see where the product could be best utilised.

By *Elisabeth Jeffries*



StructureVision, a spinout from Leeds University in the UK, in July released a new product called NuPlant™ which it says could save nuclear power companies millions of pounds.

The software-based product allows companies to visualise how to manage and remove low and intermediate level waste before plant decommissioning starts.

The inside view
StructureVision says its main business is to provide “innovative software products to the nuclear, chemical, mineral and pharmaceutical industries.”

Describing the benefits of the product, Dr David Knight, director of software development at the company, said: “by providing not only accurate cutting and packing simulations, but an entire decommissioning project planning tool, project engineers will for the first time be able to see the whole picture of their liabilities and directly compare the impact of different approaches to dealing with Intermediate and low level waste from entire nuclear facilities.”

The software is priced at £30,000, plus consulting services.

Dr Knight and his colleagues believe the visualisation software will play a useful role and help avoid future costs for energy utilities planning new plant construction, too, and asserts: “even if it only saved one percent of UK nuclear waste decommissioning costs, that’s still £60m-150m.”

Intermediate and low level nuclear waste may be of peculiar and varied shapes, and this underlies the company’s reasoning concerning demand for the product.

As Dr Knight indicates, it includes objects such as boilers, components and parts of plants. “The software is a clever way of simulating how the structures will pack together.

“Normally companies pay by container, which can be very expensive.

“They can save money because the software is designed to help minimise the number of containers,” he says.

It allows planners to work out optimal ways to breaking up and pack contaminated equipment while keeping workers’ radiation exposure to a minimum, showing in detail how radioactive waste can be stored in the smallest possible space.

The company describes the software as a “general modelling tool that shows how oddly-shaped objects fit best together” and that it differs from most other software packages designed for the same purpose in that they only handle simple and regular shaped objects.

This more sophisticated attribute may mean it saves more money than competing software.

“Independent commercial contractors have estimated that just packing this waste efficiently could lead to literally millions of pounds being saved from the public purse,” says Professor Richard Williams of the University of Leeds, co-inventor of the software.

In tests at the UK’s low level waste repository at Drigg, Cumbria, researchers found the number of containers needed to transport and store racks that had held irradiated waste materials could be reduced by a third by changing the way they were cut up.

They also argue that the software could help companies investing in new nuclear facilities, in that it will enable them to plan a more cost-effective decommissioning process at the time of the plant’s construction.

The utility’s viewpoint

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Commenting on the new product, a spokesman from the energy utility EDF said: "Our understanding is that this product would be of most interest to certain legacy facilities such as the Magnox stations but would be of more limited use for the new build plant currently being proposed as their decommissioning is a comparatively simpler process and something which is designed in to the plant from the outset."

Responding to the utility's comments, Dr Knight conceded that the software is more immediately applicable to end-of-life facilities such as the Magnox stations, adding "however we do believe it has a significant appeal to new build; this is because as a requirement for a planning license to be granted all new build operators must have a detailed decommissioning plan and the money set aside to achieve it.

"Our software can significantly improve the modelling and estimation of these 'baseline' decommissioning plans."

The engineer's viewpoint

An executive from the engineering consultancy Mott Macdonald made some positive comments about Nuplant™ but indicated that its use may be limited: "the product appears to be a partial solution for a part of the problem.

"It seems capable of helping make fewer packages, but not necessarily ensuring these will be the right packages.

"It therefore needs to be applied as part of wider process to ensure real savings in whole life costs are being achieved," he stated.

His argument rests on the other issues to be considered when radioactive waste is to be transported and disposed of, including limits on dose rates, activity content, mass, heat, dispersible materials and voidage after immobilisation.

"It should never be forgotten that the overall objective of decommissioning is to allow the site to be cleared.

"This requires manufacturing waste packages that fully comply with the requirements for safe transport and disposal and not simply produce the fewest packages.

"There is no evidence [from the flyer] that it has any functionality to optimise size reduction factors based on other requirements other than volume minimisation," he added.

At the start of something good

Software developers, such as StructureVision, are at the forefront of the nuclear decommissioning market, which puts them in a prime position to develop new suites of products that cater to the needs of any one facility and geographic market.

But continued success will be reliant on the management team's ability to become flexible and competitive to create an all purpose and universally recognised decommissioning software to cater the changing needs of a global nuclear energy market.

Image: Dr. David Knight, StructureVision



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