



Press release

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French decommissioning technology chosen for Fukushima

Following an international tender process, Japanese nuclear operators have chosen a French study proposal for the removal of molten fuel debris in the damaged Fukushima reactors.

For France's nuclear industry, the decision by the Mitsubishi Research Institute (MRI), which also selected two Japanese proposals, represents the culmination of a year-long effort. Led by the Nuclear Energy Division at France's Alternative Energies and Atomic Energy Commission (CEA) in conjunction with Japan's International Research Institute for Nuclear Decommissioning (IRID), the project sought to educate French companies in the decommissioning and rehabilitation industries about the challenges that will need to be addressed at the site. Japanese officials have selected Onet Technologies for two previous projects in recent years, based on its expertise and know-how in the field of remote-controlled decommissioning techniques.

The removal of fuel debris from the reactor cores will mark an essential step in decommissioning the damaged reactors at the Fukushima-Daiichi power plant, a process that is projected to last between thirty and forty years.

By March 2016, the CEA's Nuclear Energy Division and Onet Technologies will jointly present the MRI with a feasibility study regarding the use of laser technology to remove the molten fuel debris at Fukushima.

The advantages of French decommissioning technology

The cutting process developed by the CEA is especially suited to conditions at the Fukushima-Daiichi power plant. It allows for easy remote operation, while offering impressive position tolerance for cutting heterogeneous layers of materials; moreover, it generates fewer aerosols than most other available techniques.

The feasibility study will address how laser cutting can be adapted to the specific constraints at the site. Initial testing will likely enhance our technical knowledge of how to cut this extremely complex and little known material.

From research to industry

The productive partnership between the CEA and Onet Technologies on the Fukushima study comes in the wake of their previous collaborations on high-added-value projects. One such initiative involved the decommissioning of dissolver vessels as part of a campaign to dismantle the UP1 spent fuel reprocessing plant at the CEA's site in Marcoule, France. That project was the first in which multiple technological advances developed by the CEA over many years were used on an industrial scale to decommission a highly contaminated environment. The technology included a virtual-reality immersive room for simulating a decommissioning scenario, a six-axis robotic arm with force-reflection capability equipped with a host of operating tools, and a high-powered air-cooled laser cutting procedure.

The proposal for this Japanese tender process not only demonstrated the maturity of the remote-controlled laser cutting procedure but also highlighted the synergy of skills and know-how produced when researchers and manufacturers join forces. Examples include the mastery of both in-air and underwater cutting, knowledge of aerosol filtration systems and materials, the ability to provide both simulated and real-life testing, and extensive engineering and project management capabilities.

A chronology of events in the tender selection process

- December 2013: The IRID launches a competition for ideas to be used in the specifications for a call for projects. The process is designed to elicit innovative approaches to the fuel debris recovery scenarios envisaged by Hitachi, Mitsubishi Heavy Industries and Toshiba.
- January 2014: The Mitsubishi Research Institute announces an international call for tenders.
- August 2014: The CEA and Onet Technologies join forces to prepare a feasibility study proposal.

Upcoming in 2015

- March: The CEA and Onet Technologies present their feasibility study to the MRI.

About the CEA

As a leader in the fields of research, development and innovation, the CEA is active in four main areas: low-carbon energy (both nuclear and renewable), technology for the IT and healthcare industries, very large research infrastructures, and defence and global security. The CEA's Nuclear Energy Division provides public authorities and manufacturers with expertise and innovation regarding nuclear energy production facilities. Thanks to a number of large-scale decommissioning projects, it has also acquired significant experience in nuclear clean-up and decommissioning and related R&D.

About Onet Technologies

Onet Technologies is a leader in the French nuclear industry for both reactor engineering and technological maintenance (especially primary-circuit reactors) as well as decommissioning and processing of radioactive waste. With a current workforce of more than 2700 engineers, technicians and other employees, it operates sites and maintains long-term partnerships around the globe. The Japanese firm ATOX called on Onet Technologies expertise on two previous occasions as part of its "Integrated Dose Reduction Planning" project: first in 2013, for studies on remote-controlled tools for closing and then cutting and removing a valve, and again in 2014 for investigating and removing obstacles in confined spaces.

Press contact: CEA: François Legrand / francois.legrand@cea.fr / +33 (0)1 64 50 27 53

Onet Technologies: Cyrille Calabrese / ccalabrese@onet.fr / +33 (0)6 80 58 72 59