



# Intershield Protects

## Fukushima FORWARD Recovery Project

**In the wake of the devastating earthquake and tsunami that ravaged Japan's eastern coast in March 2011, the Fukushima nuclear power plant, which produced 4.4GW of energy for the region, still sits paralyzed. Despite the role nuclear power may or may not have in Japan's future, the disaster provided a fresh new look at offshore wind power as a viable renewable energy source.**

By November 2011, Japan's Ministry of Economy, Trade and Industry (METI), had established a consortium of some of the country's biggest industrial and financial firms, and a start-up budget of JPY 12.5 billion, to begin development on the Fukushima FORWARD project—Japan's first offshore floating wind farm. When fully completed, the wind farm will include three floating wind turbines and one floating power sub-station located 20km (12.4 miles) offshore from the Fukushima prefecture. The project is expected to be at the center of a new industry in Japan aimed at creating employment opportunities and sustainable renewable energy.

In phase one, Mitsui Engineering & Shipbuilding (MES) was commissioned to manufacture a 2MW floating wind turbine, foundation and cable which anchors the structure to the sea bed 120 meters (394ft) below. One of the early concerns of METI was how to protect the floating steel structure from excessive corrosion caused by Japan's harsh weather conditions and repeated exposure to highly corrosive salt water. No local regulatory guidance for offshore coatings was available, since Japan's existing wind power supply is generated by turbines installed onshore and protected under local Japanese Industry Standards. Indeed, critics of the project were sceptical that adequate offshore protection could be achieved.

However, MES engineers had previously utilized the International® range of protective coatings from AkzoNobel on a number of global offshore projects and were familiar with the performance track record of the coatings which meet International Corrosion Protection Standards such as ISO20340 and Norsok. MES worked with AkzoNobel's protective coatings Sales Manager for Japan, Nakaba Kobayashi, to provide METI with recommendations for an appropriate corrosion protection system. The recommendation featured Intershield® 300, an epoxy based coating that is pigmented with aluminum for extended corrosion protection. Following successful demonstrations of the coating system's long term durability and adhesion benefits, which would enable the floating wind farm to withstand the rigors of an offshore environment for more than 15 years, MES was given the green light to move forward with the coatings recommendation.

In addition to Intershield 300, MES also utilized Intergard® 740 and Intergard 5500 zinc based primers from the International® range of protective coatings. Furthermore, Interthane® 990 polyurethane topcoat and Interfine® 878 polysiloxane topcoat were also used to protect 30,563m<sup>2</sup> (328,977ft<sup>2</sup>) of steel substrate that comprise the wind farm's immersion areas, topside, splash zones, deck, and interior.

Upon a recent inspection of the topside, Mr Suzuki, Design Manager of MES, said of the International® coating application "The Interfine 878 yellow still looks brand new, with high gloss levels around one year after the application."

Phase one of Fukushima FORWARD was completed in November 2013. Today, the floating offshore wind farm is producing 2,000kw of energy for approximately 1,700 residents in the Fukushima prefecture. Phase two will include two 7MW Mitsubishi Heavy Industries (MHI) Sea Angel turbines, one on a semi-submersible foundation, and the other on an advanced spar design. The installation is scheduled for completion by 2015.

"AkzoNobel was honored to take part in this pioneering energy project as part of Fukushima's disaster recovery," said AkzoNobel's Kobayashi. "This was the first government project to utilize the International® range of protective coatings inside the country. We are confident this heavy duty coatings system will protect and extend the lifecycle of the floating structures well into the future; while setting a new precedent for offshore specification standards in Japan."

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