

Potential Corrosion Issues and Anti-Corrosion Measures  
Concerning Spent Fuel Pools of Fukushima Daiichi  
Nuclear Power Plant  
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Unit 1 to Unit 4 of Fukushima Daiichi Nuclear Power Plant lost all the electric power due to tsunami and cooling function of the spent fuel pools was also lost. Spent fuel pools are made of reinforced concrete with stainless steel liner to keep taking decay heat from spent fuels and shielding radiation. Seawater was pumped into SFP to make up water level as part of the emergency action, then, switched to river water. Temporary cooling facilities were installed and cooling operation was started a few months later.

Because SFPs are designed to be compatible with high purity water, the use of sea water and river water may cause corrosion problems. Major concerns of corrosion issues were;

- Metal lining of SFP (Type 304 SS) — localized corrosion (crevice corr., pitting, SCC)
- Fuel storage rack (aluminum alloys) — galvanic corrosion
- Fuel cladding (Zircalloy 2) — localized corrosion (crevice corr., pitting, SCC)
- Pipes (carbon steel) — uniform corrosion

Possibility of those corrosion problems and potential corrosion rate has been evaluated and possible countermeasures have been discussed. Importance of minimizing cathodic reaction rate has been pointed out for the effective and realistic countermeasure. Effectiveness of condition monitoring was also described.