

Shikoku Electric Announces Cause of Cracks at Ikata-1

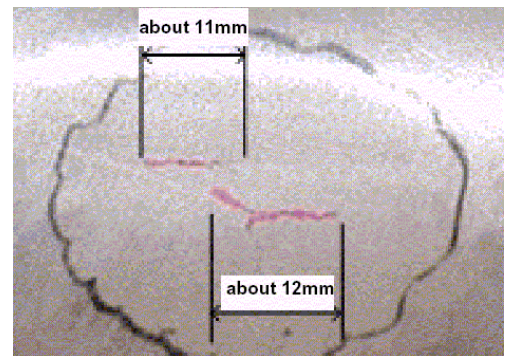
On December 1, the Shikoku Electric Power Co. announced the cause of the tiny cracks that had been found in the outlet piping of the coolant storage tank at its Ikata-1 NPS (PWR, 566 MW) nine days in earlier during the unit's 22nd periodic inspection. The company also outlined the actions it plans to take to deal with the problem.

The cracks had been discovered on November 22 when a liquid-penetration test (PT) was carried out on the outlet piping in coolant storage tank-C, following the discovery of cracks in the piping of the safety injection system in June 2003.

An external inspection and PT showed the following:

- (1) The outside surface of the piping where the cracks were found bore rust, as well as a rectangularly-arranged extraneous substance that appeared to be glue from tape.
- (2) There were two linear cracks - one about 12mm long and the other some 11mm long - away from the immediate vicinity of welding.

Further investigations supported the assumption that stress-corrosion cracking, prompted by a chloride compound, had created the tiny cracks.



The two linear cracks

The maximum depth of the cracks was 3.1mm, measured from the outside surface of the piping. The pipe wall thickness was 6.8 mm - even at its thinnest section beneath the cracks - a figure much greater than the permitted minimum of 0.07mm. That meant that pipe strength was not the problem. The inspectors then turned their attention to another piping system installed along the ceiling above the cracked piping section. The piping is used for ordinary water for internal use, and was not in use at the time the cracks developed. They found corrosion in the welded part of that piping, as well as signs of water leakage. Marks on other set of pipes underneath the ceiling pipes (specifically, the return piping to a coolant storage tank) were recognized as having been created by water dripping down from the ceiling piping.

Under those circumstances, the company assumed that a chloride compound in the leaked water from the corroded piping accumulated on tape that had been attached to the outlet piping during work in the past. Although the tape had been removed, the glue from the tape remained on the outlet piping, and the chlorine compound reacted with it in such a way to cause the stress-corrosion cracking.

According to the December 1 announcement, Shikoku Electric will replace the portion of the piping that contained the cracks. It will also remove the piping near the ceiling, or fix it in such a way that it does not leak onto the other piping systems below.

During the inspection, the company also inspected similar piping elsewhere and confirmed that no leakages had occurred. It will implement similar inspections at its Ikata-2 and -3 NPSs during the next periodic inspections of those facilities.

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