

Proactively Managing Materials Degradation and Aging Issues

The cost-effective management of materials degradation and plant aging poses a continuing major challenge to the nuclear power industry's ability to maintain the high levels of performance that are critical to the economic competitiveness of the nuclear option.

Today's economic realities continue to make it essential for nuclear power plants to achieve capacity factors in excess of 90%. Maintaining this high level of performance may become more difficult in the future as slow-to-develop (or incompletely mitigated) forms of materials degradation increase the likelihood of significant component damage with increasing service time. The ability to proactively identify and solve these issues before they negatively impact plant performance is critical to maintaining the high reliability, safety, and competitiveness of the current fleet.

A Proactive Approach

EPRI's Materials Reliability Program (MRP) published a guideline (MRP-139) that directed the inspection and mitigation of Alloy 600-type welds in the reactor coolant piping system of pressurized water reactor (PWR) plants. Managing piping degradation in a PWR nuclear power plant is critical to the plant's continued safe operation and high reliability. The industry, through EPRI's MRP-139, has promulgated self-imposed inspection requirements that go beyond governmental inspection requirements. This proactive initiative for early detection of degradation can produce results that demand an immediate industry response to inquiries from the Nuclear Regulatory Commission (NRC).

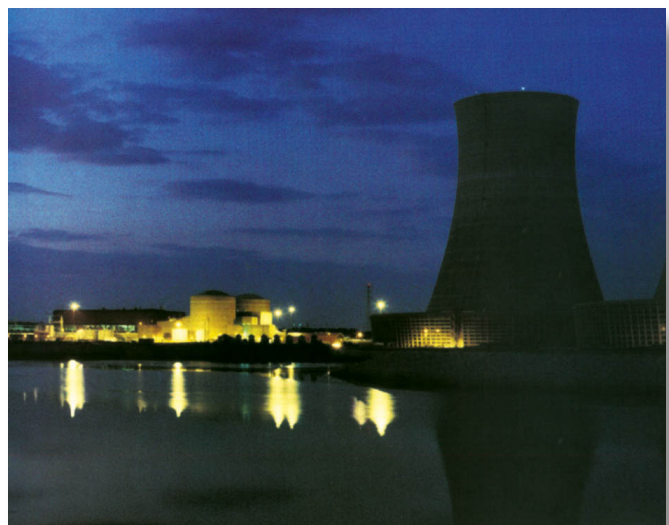
In October 2006, Wolf Creek personnel were inspecting pressurizer welds to satisfy recent EPRI (MRP-139) guideline requirements. Some atypical indications were identified, particularly a relatively long circumferential indication in a relief line weld. Wolf Creek staff requested and obtained independent confirmation of the inspection results by EPRI nondestructive examination (NDE) experts.

The NRC requested immediate industry action to assess the potential impact of this type of assumed crack in the PWR fleet. The NRC also produced calculations showing that the initial circumferential indication could grow and reach a size that would result in a pipe break without first exhibiting measurable leakage over a significant period of time.

MRP personnel participated in rapidly arranged conference calls and public meetings with the government to discuss potential regulatory responses and industry's evaluation of the Wolf Creek indications. As a result of these efforts, the industry has reaffirmed the adequacy of the already challenging MRP-139 inspection and mitigation schedule.

EPRI's Role

This inspection guideline and related event are examples of focused industry efforts involving the application of significant industry resources and personnel, coordinated by EPRI to produce the guideline and support it through application. Access to world-class expertise and EPRI's position as an independent R&D organization make EPRI uniquely qualified to assist nuclear plants in a closely coordinated and integrated response to the pressing nuclear plant challenge of managing plant degradation and aging.



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