NEI 03-08 Materials Initiative

I. Definition of Success

The overall goal of this initiative and its associated guidelines is to ensure that the industry's management of materials degradation and aging is forward-looking, focused on issues commensurate with their safety significance, and coordinated to the maximum extent practical. Additionally, it is the industry's intent to rapidly identify, react and effectively respond to emerging issues. When properly implemented, this should result in fewer unanticipated issues that could otherwise consume an inordinate level of industry resources and divert the focus from an orderly approach to managing materials performance.

It is expected that every utility will fully participate in the implementation of the materials management activities applicable to its plants.

II. Background

Materials degradation issues during the late 1990's and early 2000's included steam generator tube degradation, cracking of Alloy 600 reactor vessel head penetrations, cracks and leaks from Alloy 82/182 dissimilar metal butt welds, increasing fuel failures, steam dryer cracking, RCS nozzle thermal fatigue, bottom head instrument nozzle cracks and vessel internals issues. These materials degradation issues challenged safe operation, interfered with normal outage sequences, required regulatory interaction, and seemed to occur randomly at an increasing frequency.

The industry created this initiative to transition from a reactive to a proactive mode of managing materials degradation issues.

III. Staff Perspective

This initiative covers a broad range of industry and materials programs, including the EPRI Steam Generator Management Program, Vessel Internals Program, Materials Reliability Program, and NDE Program and the PWR Owners Group Materials Subcommittee. The staff and industry program technical leads teleconference quarterly and meets annually to discuss ongoing and emergent issues. NRC and industry group executive management converse twice yearly. The initiative has evolved into a useful and reliable communication and action vehicle to address materials issues. The programs and issues are fairly mature.

Buried piping and groundwater are not within the scope of this initiative. They are covered under their own initiatives.

IV. Industry Perspective

The industry maintains a materials degradation matrix that identifies the highest priority research, program and operational needs with respect to materials degradation issues. The NRC periodically reviews the degradation matrix for alignment purposes.

The industry re-organized the NEI 03-08 executive level and working level management structures in 2010 to reduce travel and achieve some operational efficiencies. They briefed the staff on the reorganization in June. This reorganization is probably the subject of their presentation at this NSIAC meeting.

V. Challenges to Success

Most of the programs are fairly mature. The PWR internals inspection program is just being developed, however, and inspections conducted this spring will be the first time that PWR internals components have been inspected under the new program.

VI. Potential Policy Issues – None at this time

VII. Next Steps

NRC Staff will continue to follow the industry material programs

VIII. Key Messages to Give to Audience (top 2 or 3)

The materials initiative, although it experienced growing pains during the first few years, has developed into a strong example of how rigorously-applied, coordinated, proactive actions can reduce the frequency of challenges that result from materials degradation.

The staff will continue to validate and follow materials program activities.

The NRC encourages the industry to maintain a keen focus on proactively addressing materials degradation issues.

The NRC continually assesses the need to establish a regulatory footprint on voluntary industry initiatives. We have used a variety of regulatory vehicles to do this, including generic letters, bulletins, temporary instructions (for dissimilar metal butt welds), rulemaking (for pressurized thermal shock), etc. Some materials program activities have been implemented in the ASME Code and were subsequently endorsed in the Code of Federal Regulations. The NRC encourages the industry to review its programs and identify activities that could be transitioned into the ASME Code process.