



NUCLEAR ENERGY INSTITUTE

Charles M. Dugger
VICE PRESIDENT, NUCLEAR OPERATIONS
NUCLEAR GENERATION DIVISION

November 3, 2004

Mr. James E. Dyer
Director, Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Mail Stop O5E7
11555 Rockville Pike
Rockville, MD 20852

SUBJECT: Materials Degradation Matrix

Dear Mr. Dyer:

The Industry has adopted an initiative on materials management and issued NEI 03-08, "Guideline for the Management of Materials Issues," May 2003. This initiative and the associated guidance document establish policy, direction, oversight, and support for industry programs involving the management of material issues. One of the first activities completed under the Initiative was the development of a Strategic Plan that assesses the known materials issues confronting the industry and establishes short and long term priorities for resolving them. A copy of our Strategic Plan was sent to you in March of 2004.

Another significant milestone was recently achieved with the development of a Materials Degradation Matrix (DM). The purpose of the DM is to address materials degradation in a top down fashion, ensuring that all potential degradation that may affect materials used in our primary systems are identified. Revision 0 of the DM is attached for your information. We would welcome any input that your materials experts may have on the content of the enclosed DM.

The DM is a key element of the Materials Initiative. It is important to understand the process used to develop the DM and its function within the context of the Strategic Plan to ensure that your staff appropriately interprets the information in the DM and uses it in the manner for which it was intended. The DM was developed to identify the current state of knowledge relative to degradation mechanism that may affect primary system components in BWRS and PWRS.

Expert elicitation, laboratory studies, and field experience were utilized to identify potential mechanisms. For the initial DM development, there was no attempt to justify ignoring a mechanism or to rationalize why certain items are not relevant.

Once the degradation mechanisms and susceptible materials were identified, additional reviews of each mechanism were performed to determine its potential applicability to each material. For those materials where no specific degradation mechanism was identified, this conclusion was documented and evaluation ceased. Where a potential mechanism was identified, that combination of mechanism and material was reviewed against the existing knowledge base to characterize what is known and what work is in place to manage the degradation mechanism. The material-mechanism combinations were then sorted into three large groups.

1. The first group is the set of degradation mechanisms/issues that have been adequately addressed and, where necessary, have ongoing management programs in place.
2. The second group contains those mechanisms/issues that are determined to have work in place for tools/methodologies needed for effective management.
3. The third group contains those mechanisms that are identified as potential challenges for which there is no program or effective methodology for understanding or managing the mechanism at a phenomenological level. The third group is subdivided into two subgroups depending on whether the mechanism is either known to be applicable to our designs or its applicability is uncertain.

The enclosed DM matrix contains the information described above. It also contains explanatory notes on the matrix and supporting information on the materials and the degradation mechanisms.

The DM is not the final product that will ensure the industry is focused on the most important materials issues. Upon completion of the DM, a tool will be needed to assess the significance of the potential material-mechanism combinations. That evaluation will be accomplished through an Issue Management Table (IMT). The IMT will be used to catalogue:

- The degradation mechanism(s) for a given material,
- The system(s)/component(s) in which the material is used,
- The consequences of system/component failure, and
- Existing programs available to manage the degradation/issue.

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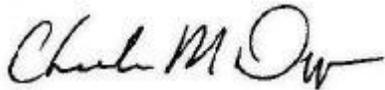
From this information, gaps will be identified, and a priority for addressing the issues will be established. This will result in a prioritized list of materials issues that will form the backbone of future revisions to our Strategic Plan. Work on the IMT has already begun. The first revision of the IMT should be completed in 2005.

The DM and IMT will be maintained as living documents and updated as necessary. Following each update, the Strategic Plan will be reviewed and updated as appropriate to ensure that it continues to properly reflect the evolving state of knowledge and experience within the industry.

We have scheduled a briefing on November 2, 2004, for NRC senior management team on the status of our efforts in this important area.

If you have any questions, please contact me at (202) 739-8112; cmd@nei.org or Alex Marion at (202)739-8080; am@nei.org.

Sincerely,



Charles M. Dugger

c: Dr. Brian W. Sheron
Dr. Carl J. Papierillo
Mr. Richard J. Barrett
Mr. John W. Craig

Enclosure

Materials Degradation Matrix
Revision 0