April 18, 2003

Mr. Alexander Marion
Director - Engineering
Nuclear Energy Institute
Suite 400
1776 I Street, NW
Washington, DC 20006-3708

SUBJECT: INDUSTRY SELF - ASSESSMENT OF MATERIALS PROGRAMS

Dear Mr. Marion:

In response to your letter of February 10, 2003, the NRC is providing feedback (enclosure) to the Nuclear Energy Institute (NEI) on selected materials programs. The Office of Nuclear Reactor Regulation (NRR) and the Office of Research (RES) both contributed.

I hope the attached provides useful information for industry consideration. We consider the industry groups addressed by your survey to be important venues through which to address material issues. The efforts of NEI to seek feedback to improve the effectiveness of these groups is a positive action.

If you have any question about our feedback, please contact me at 301-415-1453.

Sincerely,

/RA/

Stuart A Richards, Director
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Enclosure: Feedback on Industry Materials Programs

April 18, 2003

Mr. Alexander Marion
Director - Engineering
Nuclear Energy Institute
Suite 400
1776 I Street, NW
Washington, DC 20006-3708

SUBJECT: INDUSTRY SELF - ASSESSMENT OF MATERIALS PROGRAMS

Dear Mr. Marion:

In response to your letter of February 10, 2003, the NRC is providing feedback (enclosure) to the Nuclear Energy Institute (NEI) on selected materials programs. The Office of Nuclear Reactor Regulation (NRR) and the Office of Research (RES) both contributed.

I hope the attached provides useful information for industry consideration. We consider the industry groups addressed by your survey to be important venues through which to address material issues. The efforts of NEI to seek feedback to improve the effectiveness of these groups is a positive action.

If you have any question about our feedback, please contact me at 301-415-1453.

Sincerely,

/RA/

Stuart A Richards, Director
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Enclosure: Feedback on Industry Materials Programs

DISTRIBUTION:

PUBLIC	CCarpenter
Reading File PDI	JDonoghue
BSheron	JStrosnider
JZwolinski	RBarrett

ACCESSION NUMBER: ML031070157

OFFICE	DE/NRR	RES	DLPM/PDI
NAME	RBarrett	JStrosnider	SRichards
DATE	4/18/03	4/18/03	4/18/03

OFFICIAL RECORD COPY

Feedback on Industry Materials Programs

Steam Generator Management Project (SGMP)

The NRC has worked with the SGMP for over 5 years and expects to be involved with the group indefinitely. Other organizations performing similar work include EPRI, ASME, Owners Groups and International organizations. The overall objective of the SGMP is generally well defined. Key attributes of this group include the quality of work, communications, and schedule responsiveness. Improvement can be achieved in the quality of work, schedule responsiveness and intellectual property constraints. There has been international involvement in this area, but the value gained has varied depending on the specific topic. The level of management sponsorship/engagement is considered appropriate. The interface with industry occurs at the individual utility level; with the NSSS owners groups; with utility group leadership; and with NEI. The interface is effective. Our experience is that NEI can speak for the industry in this area when following the process to gain consensus. The best group for NRC to interface with depends on the specific issue. The NRC does not usually work with Codes and Standards Committees in this area because these groups are not active at this time. The most significant issue addressed in this area is degradation management, including the prediction of future degradation. Industry generally addresses issues in this area before significant regulatory attention is needed. NEI 97-06 and good communication with the NRC have contributed to this. Although analysis techniques exist to determine the acceptability of as-found material conditions, additional improvements are desirable, particularly with regard to crack sizing. Repair/replacement options for known material defect conditions are sufficient. The SGMP is effective in understanding the underlying cause and potential impact of issues identified for attention. NRC routinely works with the industry to ensure that issues are prioritized by safety significance, and if disagreement occurs, the issues are elevated within the NRC management chain. While communication with the NRC appears to be effective, consensus building on the part of industry appears to be a challenge. Resolution of issues to support safe facility operation are generally timely, however the timeliness of longer term issues could improve. The use of an independent assessment to determine the effectiveness of implementation of selected issues would be a positive initiative. In conclusion, communications are going well and industry guidelines are having a positive impact on individual utility programs. Timeliness of the resolution of issues could be improved.

BWR Vessel Improvement Project (BWRVIP)

The NRC has worked with the BWRVIP for over 5 years and expects to be involved with the group indefinitely. Other organizations performing similar work include EPRI, and international organizations. The efforts of these other groups are generally already integrated with the work of the BWRVIP and contribute to the success of the effort. The overall objective of the BWRVIP is well defined. Leadership of the group is established and effective. Key attributes of this group include the quality of work and representative utility participation. Our review of existing long-term issues has not identified any shortcomings. We are engaging the BWRVIP on one long-term issue to address the potential for multiple failures of top guide beams resulting from irradiation assisted stress corrosion cracking (IASCC). All utilities that are affected by BWRVIP issues participate regularly, including international BWR groups/utilities. The management level of utility participation is considered appropriate and the level of utility commitment to the effort is also appropriate. Sponsorship is at the utility executive leader level and is considered effective. NRC interface on

issues addressed by the BWRVIP occur primarily with the BWRVIP and is effective. We note no specific ways to improve the regulatory interface at this time. There have been positive results from the BWRVIP speaking for the industry. Separate regulatory interface with RES should be addressed on a case-specific basis. The flow of information in this regard is internal. The most significant materials issues addressed in this area include IGSCC and IASCC of BWR vessels, internals, and piping. Technical areas considered include water chemistry, corrosion control, NDE, metallurgy, flaw evaluation, aging management, and license renewal. The ASME Code process is not fully effective in addressing emergent issues with regard to the BWRVIP. We are not aware of any materials issues or components that should be added to the efforts of the BWRVIP. Degradation of components in a predictive sense is addressed. Industry generally addresses issues in this area before significant regulatory attention is needed. This is attributable to peer review and individual leadership. For known material defect mechanisms, mitigation techniques are being identified to arrest degradation, for example the addition of hydrogen water chemistry and noble metal. The results of existing materials mitigation techniques have been satisfactory. Analysis techniques that exist to determine the acceptability of as-found material conditions are sufficient, however more work could be done in the development and qualification of NDE techniques. For the most part sufficient repair/replacement options have been identified for known material defect conditions. Issues regarding highly irradiated materials are still being pursued. The BWRVIP is effective in understanding the underlying cause and potential impact of issues identified for attention. Risk management techniques, focused on safety, play a significant role in the NRC prioritization of issues and work. The BWRVIP prioritization of work is considered appropriate and issues are worked according to priority. BWRVIP communication with the NRC appears to be effective, and industry communication between participating parties appears also to be effective. Other industry groups that the BWRVIP should be communicating with include the MRP, the BWROG, and the PDI. Material issues are typically resolved by the BWRVIP through engineering evaluations and analysis by both participants and by contracted experts. The resolution of issues to support safe facility operations are generally timely, and the results of the work are useful to the NRC. Resolution dissemination is effective. The BWRVIP is typically effective in achieving implementation of resolutions via member commitment to the BWRVIP. The group is effective in following up on industry action. The use of an independent assessment (for example, by INPO) to determine the effectiveness of implementation of selected issues is a positive initiative and enhances the credibility of the BWRVIP program. In conclusion, safety issues are being addressed and communications are going well. Issues regarding the proprietary nature of the BWRVIP topical reports warrant attention.

Performance Demonstration Initiative (PDI)

The NRC has worked with PDI for over 5 years and expects to be involved with the group indefinitely. Other organizations performing similar work include ASME, Owners Groups, other industries, specific licensees, and the national laboratories. Work being performed at PNNL, if integrated with other work underway, may contribute to additional success in this area. The overall objective of the PDI is generally well defined. Key attributes of this group include the quality of work, schedule responsiveness, and personnel resources. Significant constraints that the industry could address to improve the effectiveness of this program include providing increased resources and addressing a broader scope of issues. Actions taken by the PDI could be more timely and more proactive. Participation with PDI consists of a group of utilities that represent the industry. The level of participation is considered appropriate. Participation by international groups might contribute to increased effectiveness of the PDI effort. The resolution of issues is impacted by the less than full commitment of the industry to PDI. The program would benefit from a higher level

of industry leadership. EPRI-PDI is the organization responsible for regulatory interface, and is effective to the degree that the program has taken on specific issues. Our experience is that EPRI-PDI can speak for the industry in this area, although their authority to make commitments is limited in some cases. The industry does work with Codes and Standards Committees in this area, however this interaction is not viewed by the NRC as effective and seems to usually be focused on eliminating inspection requirements that are difficult to conduct. The code committee process for this area appears cumbersome and driven by the specific issues of the representatives, rather than by the broader questions that require more attention. Components that should be addressed by PDI but are not, include ASME code class 1, 2, and 3. Technical areas affecting primary system performance include NDE, flaw evaluation, aging management, and license renewal. Significant issues include UT effectiveness, examining dissimilar metal welds, corrosion resistant welds, and cast austenitic welded components. PDI is not effective in addressing issues before significant regulatory attention is needed. Difficulties with dissimilar metal weld performance is an example. Again, lack of resources, an insufficient level of management involvement from the industry, and a focus on reactive issues contribute to this ineffectiveness. Analysis techniques that require further effort to adequately determine the acceptability of as-found material conditions include volumetric techniques, particularly for austenitic materials, and examinations of CRDM penetrations and inspections of cast components. PDI is effective in understanding the underlying cause and potential impact of issues identified for attention. PDI prioritization should be focused more on safety concerns and less on the impacts of having to conduct inspections. While communication with the NRC appears to be effective, communication of the group with industry appears to be impacted by the level of leadership not being sufficiently senior. Resolution of issues to support safe facility operation are generally timely and usually consist of engineering evaluations by PDI participants. The products are typically useful to the NRC. New material examination techniques that should be developed for industry use include phase array UT, synthetic aperture focusing technique UT, and combinations of the two. Our impression is that 100% of utilities implement resolutions that are developed, however PDI does not have the means to require implementation. The use of an independent assessment to determine the effectiveness of implementation of selected issues would be a positive initiative. The credibility of PDI is hurt by the group' s apparent inability to look at the broader issues. Communications and meetings are working well. Other areas needing improvement include performance based qualification and a national certification registry for UT, ET, and RT.

Materials Reliability Project (MRP)

The NRC has worked with the MRP for over 5 years and expects to be involved with the group indefinitely. Other organizations performing similar work include ASME, EPRI, and international organizations. The overall objective of the MRP is generally well defined and there is established effective leadership. Key attributes for this area include communications and representative utility participation. Additional resources could increase the effectiveness of the MRP. Participation with the MRP consists of a group of utilities that represent the industry. The level of participation is considered appropriate. Participation by international groups would likely contribute to increased effectiveness of the MRP effort and could eliminate over-lapping work. Utility participation is considered to be at the appropriate organizational level. Utility group leadership is responsible for regulatory interface and is effective. The MRP appears to have the ability to make commitments on behalf of the utilities in the group. Separate interface with RES should be addressed on a case-specific basis, however a courtesy copy to RES of all correspondence would improve communications. We are not aware of any components or issues that should be addressed by this group that are not already within their scope. Technical areas affecting primary system

performance that are addressed include NDE and metallurgy. Significant materials issues include CSS and DMW. MRP is not effective in addressing issues before they become industry events or before significant regulatory attention is needed. MRP appears to lack the resources to do anticipatory work and is focused on reactionary issues. Regarding the issue of repair/replacement options for known defect conditions, PWSCC warrants additional research. MRP is effective in understanding the underlying cause and potential impact of issues identified for attention. Prioritization of work appears appropriate and work is accomplished in accordance with its priority ranking. Communications with the NRC and within the industry seem effective. The means of disseminating resolutions is also effective. However proprietary considerations could have an impact.