

**MATERIALS INITIATIVE  
2008 SELF-ASSESSMENT  
REPORT**

**July 2008**



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## **MATERIALS INITIATIVE 2008** **SELF-ASSESSMENT REPORT**

### **1 BACKGROUND**

As a result of several materials aging issues that were not anticipated effectively, culminating with the Davis-Besse event in 2002, the NEI Executive Committee directed the formation of a Task Force on Materials (TFM) and supporting Materials Assessment Working Group (MAWG) in summer 2002. These groups were chartered to assess the industrywide materials aging management activities and develop recommendations for improving the overall approach. The result was a report by the MAWG to the TFM issued in January 2003 that identified a number of technical, management and process issues along with associated recommendations for addressing the shortcomings. The NEI Nuclear Strategic Issues Advisory Committee (NSIAC) accepted the recommendations and, in May 2003, agreed unanimously to adopt them as embodied in the “Industry Initiative on the Management of Materials Issues.” Two committees were established to provide oversight and coordination of industry activities in implementing the materials initiative. The Commission and NRC Senior Management were briefed on the industry plans several times in 2003 and 2004. NEI 03-08 “Guideline for the Management of Materials Issues” and addenda provide the policy and process for implementing the Initiative.

### **2 OBJECTIVE**

Assess the effectiveness of implementation of the materials initiative relative to addressing the issues identified and the recommendations developed by the industry’s 2002 self-assessment. This included an evaluation of the strategic aspects of the management policy commitment established in NEI 03-08.

### **3 PROCESS**

Two teams of knowledgeable industry materials personnel evaluated the effectiveness of the materials initiative in addressing the shortcomings identified in the 2002 self-assessment. The team accomplished this assessment by reviewing applicable documents (e.g., the January 2003 report from the MAWG to the TFM, NEI 03-08 and addenda, annual reports of the MTAG to the MEOG, etc.), and interviewing eighteen technical and executive level managers of the applicable materials aging management issue programs. In addition, two Nuclear Regulatory Commission staff personnel involved in materials issues were interviewed. (The interview questions are included as Attachment 1 to this report. The list of those interviewed is Attachment 2.) A report of the assessment was developed and provided to the NEI Materials Executive Oversight Group (MEOG).

**Team 1:**

Chuck Welty, EPRI, Co-Chairman  
Alex Marion, NEI, Co-Chairman

**Team 2:**

Robin Dyle, SNOG  
Mike Robinson, Duke  
Jim Riley, NEI  
Executive Sponsor: Chris Crane, Exelon

## **4 MAJOR CONCLUSIONS**

- There is broad industrywide commitment to the stated management policy.
- The initiative is driving the desired behaviors, both within the utilities and the Issue Programs (IP). However, there is a natural tendency to regress to old behaviors as major events of concern recede from memory. Constant vigilance is necessary to reinforce the importance of managing materials issues effectively.
- The Initiative has been broadly institutionalized within utilities across the industry. However, instances continue to occur that indicate some levels of some organizations have not fully adopted the desired “culture” of proactively addressing materials issues – there are still occasions where there is a tendency to “analyze the problem away” or deny its existence.
- There is a broad understanding of the need for conformance with the implementation requirements and for providing funding support to the appropriate Issue Programs – though this does vary among utilities and is strongest within the large utilities that are actively participating in the IPs.
- Relative to implementation requirements, it is recognized that establishing the deviation process was necessary given plant-specific situations. However, such deviations should be treated as exceptions as opposed to the rule - some Issue Programs need continued work in this area.
- The highest priority issues are generally being addressed, and the MDM and IMT are instrumental in IP planning and work-product development. Differences exist in advisory structures, budgeting and prioritization processes that may provide opportunities for further improvement (e.g. MRP versus BWRVIP versus SGMP versus NDE versus PWROG, etc.)
- The role of MTAG, MEOG and APWG should be revisited and possibly simplified in light of the strengthened Issue Program structures.
- There is a need to develop a matrix of executive and technical-level needs, both for utility oversight of the Issue Programs as well as for IP work management. There is a need to return to the 2003 workshop approach to refresh utility personnel understanding of the materials initiative, its purpose and associated requirements.

- Overall, the industry is successfully achieving the Initiative's stated objectives and purposes. This is an area that requires continued emphasis as time passes and as individuals who were originally engaged in the Materials Initiative development process move on.
- The NRC staff interviewees have a more pessimistic view of the industry's success in implementing the Initiative, particularly as it pertains to addressing emerging issues and having a truly proactive and integrated approach to managing materials issues.

## 5 RECOMMENDATIONS

- Continue oversight and coordination of industry activities associated with implementation of the materials initiative.
  - *MEOG to provide oversight and coordination and report to NSIAC.*
- Simplify the role of the MTAG/MEOG/APWG. Ensure that there is a single industry entity that has a clear picture of all materials work and priorities.
  - *Jeff Gasser to chair a task team to address this recommendation; Due 1<sup>st</sup> quarter 2009.*
- Determine if current funding levels in fact support an effective, proactive approach to managing materials aging issues.
  - *Task team to address; Due 1<sup>st</sup> quarter 2009.*
- Review gaps in mid-priority activities and identify areas where insufficient funding may impact plant safety and reliability.
  - *Task Team to address; Due 1<sup>st</sup> quarter 2009.*
- Develop an industrywide executive and technical level "succession planning" matrix to ensure continued active direction and oversight of the issue programs.
  - *Issue Programs to provide input to the MTAG Annual Report; Due January 2009.*
- Re-institute the workshop approach for periodically bringing new utility and plant management personnel up to speed on the details and requirements of the Materials Initiative and on the status of materials issues.
  - *INPO and NEI to address; Due next MEOG meeting.*
- Continue industry management attention on the use of deviations from implementation requirements.
  - *NEI to brief NSIAC in future meetings; Due – Ongoing.*
- Interact with NRC staff to better understand the gap between the industry view of its success versus the staff view. Address concerns where possible.
  - *NEI to schedule NRC senior management meeting; Due 12/19/08.*

## 6 DETAILED OBSERVATIONS

The observations presented below are organized using the same general categories that were used in the conclusions section of the January 2003 MAWG report to the NSIAC and TFM. This report formed the baseline of information that was used to establish the scope and intent of the materials initiative. The same categories are used in this report to facilitate observations on the effectiveness of our efforts over the past five years.

- **Oversight and Coordination Issues**
  - Main Conclusions From the 2003 Report
    - No single group, at either the executive or technical level, has a holistic view of materials management issues and requirements.
    - Division of work scope among groups is ad hoc; there is no clear delineation of scope across groups to prevent unnecessary overlap.
    - Active utility engagement and oversight is required to ensure that utilities, not outside organizations (e.g., vendors, EPRI, NEI), control the agenda.
    - The funding approach and cost structure for materials work varies widely across programs.
    - A risk management approach, balancing safety and long-term degradation and aging management, is not used extensively in materials programs to prioritize and manage work.
    - Unnecessary friction exists among some organizations, and commercial realities create limits to effective coordination across groups.
    - The roles of EPRI, INPO and NEI (and potentially NSIAC) are not always understood in the various efforts, and broad guidance on their role and involvement in materials issues should be developed.
  - Current Situation
    - MEOG and MTAG were established in response to this recommendation in the original report and both have operated continuously since that time. Several of the interviewees questioned the continuing need for both groups; one or the other could be eliminated.
    - Several documents developed under the Materials Initiative have addressed observations from the 2003 report.
      - The roles, responsibilities, and expectations of the industry support organizations and of the utilities were addressed by NEI 03-08 and its addenda.
      - The development of the Materials Degradation Management Table and the Issues Management Tables provide a framework for Issue Programs to make informed decisions on work priorities.
    - Several respondents thought that overlap exists with the industry materials organizations. Several examples of overlapping groups were offered:
      - MRP Mitigation and Testing ITG and Corrosion Research
      - MRP and PWROG MSC.

- Several interviewees suggested a review of the arrangement of the technical groups and the executive oversight structures and reorganize them as appropriate to facilitate further efficiency.
- **Culture Issues**
  - Main Conclusions From the 2003 Report
    - The consensus process leads to instances where industry positions or guidance can be watered down to satisfy every potential stakeholder.
    - There is a lack of industry commitment to follow through once the initial problem is solved.
    - Programs are reactive by design.
    - There is a danger of groupthink in groups where diverse opinions are not actively sought. Some groups do not maintain a culture that encourages individuals to think outside the box.
  - Current Situation
    - All respondents agreed that the materials initiative is driving the right behavior and that recommendations, guidelines and requirements are not being watered down to support the lowest performers.
    - A commitment to “follow through” after problem resolution has been addressed to a large measure by the adoption of the Materials Initiative and the identification of “Mandatory” and “Needed” elements in industry guidance documents. Continued management attention is necessary to ensure that the level of commitment does not decrease over time.
    - Several interviewees felt that the industry sometimes over-commits in order to satisfy the NRC.
    - The NRC stated that the threshold for deviations is not high enough and that the technical content of the deviation justifications is not consistent across the industry. The NRC sees inconsistent implementation across the industry, and their activities are often driven by the least common denominator.
    - Often our guidance ends up in the Code and this can result in inconsistent requirements. (Note: The NRC prefers this path to ensure that it has a means of establishing its “footprint.”) We need to stay tuned to the possibility of this conflict, be involved in the Code process and manage for it.
- **Commitment, Resolution and Implementation Issues**
  - Main Conclusions From the 2003 Report
    - Most groups lack a formal means of self-enforcement and follow-up to assure implementation of guidelines and recommendations.
    - With the exception of the SGMP, and more recently the BWRVIP, materials programs do not involve INPO in implementation assessment.
    - Most materials programs do not conduct formal self-assessments or gap analyses.

- Current Situation
  - The materials initiative established the mechanisms to make this issue work. Issue programs are developing guidance with “mandatory” and “needed” elements, and INPO has three assessment programs (SGMP, BWRVIP, and Primary System Integrity) to evaluate utility performance and implementation of industry guidance.
  - Issue Programs conduct self-assessments every two years.
- **Personnel Issues**
  - Main Conclusions From the 2003 Report
    - The resource pool of qualified technical and managerial personnel to address materials issues is decreasing.
    - Industry consolidation provides companies with an opportunity to reduce the number of personnel required to attend meetings; however, many groups note that this loss of plant-level participation, which provided varied views and experiences, degrades the oversight process.
    - Choosing the utility leadership of a group or program must be based on the right criteria. Too often, leaders are chosen based on who is willing or available or who has been exposed to an issue, not necessarily the person with the right skill set to lead.
  - Current Situation
    - Personnel resource issues continue. One question asked during the interviews related to whether the interviewee had any recommendations that would address this shortfall. The responses included:
      - Create a very specific, industry-endorsed training and development program for new engineers and technical professionals.
      - Establish an online training program available for new people so that each individual plant does not have to develop its own training program on generic materials issues, perhaps an overview module on the materials initiative, and some technical training for lower-level staff.
      - Provide industry funding of utility support of the issue program leadership positions and support engagement with outside organizations in general.
      - Companies should establish a defined technical path for advancement other than the management track. This should include technical mentoring. The goal is to provide adequate incentive and promotion opportunities for those individuals who wish to remain strong technical contributors such that companies do not lose the strong technical expertise.
- **Communications Issues**
  - Main Conclusions From the 2003 Report
    - Too much reliance is placed on informal communications among industry groups.
    - Some utilities lack effective vertical communication between the executive- and technical-level people involved in providing oversight to materials programs.
    - Communications protocol for materials issue actions/decisions to the NSIAC is not defined.

- Two-way communication/interaction with international operators and vendors, as well as with the Naval Reactors, is lacking for many programs.
- Current Situation
  - Communications between the Issue Programs has been improved by the creation of the MEOG and MTAG and the inclusion of IP leaders among their membership.
  - International membership on the IPs is improving. Communications with Naval Reactors, although restricted by confidentiality concerns, is occurring to the degree possible.
  - The NEI 03-08 Implementation Protocol defines the process for approval of Materials Initiative documents by IP executives and NSIAC. NEI briefs NSIAC on materials issues at all of its meetings.
  - All interviewees agreed that communication has been good but needs to be refreshed. Plant personnel at the executive- and program-worker levels are best informed.
  - It would be useful to hold refresher workshops on the Materials Initiative.
  - The NRC stated that not all applicable staff members are familiar with the initiative and its implications.
  - The NRC often calls people, not organizations, when questions need to be answered because the agency knows that these people will engage the right resources in the industry. In these cases, the structure sometimes does not matter as much.
- **Regulatory Interface Issues**
  - Main Conclusions From the 2003 Report
    - There is no clear definition or criteria by which to measure a “good NRC interface.” Some groups focus on maintaining good relationships, and others focus on good results of that interface. “Good relations” don’t necessarily equate to effective and efficient issue resolution.
    - For some programs, the NRC has found it convenient to apply inspection and enforcement to industry guidelines (bypassing the backfitting rule).
    - In some situations, industry groups have difficulty closing issues with NRC staff.
    - For most programs, the interface with codes and standards committees is weak and informal.
  - Current Situation
    - Strategic planning of communications with the NRC is very important. MTAG includes IP presentations on their regulatory strategy during it’s January meeting each year. Two IPs make presentations on their projects and priorities at every MEOG meeting. Regulatory strategy is part of the discussion. Also, executives of the IPs brief NRC management periodically.
    - Engaging the NRC on NDE issues should be a priority.

Besides the above categories, the interviewers attempted to obtain feedback on several additional questions that were not addressed in the original MAWG report. These areas and the main observations for each are explained below.

- **Effect of the Materials Initiative on Job and Company**
  - Current Situation
    - All respondents believe that the materials initiative has been adopted at their companies, but two individuals believe that it has not completely permeated through the organization.
      - Often it is the personality of those involved that drives success, not the program itself.
      - Refresher training on the materials initiative would be beneficial.
    - The Initiative also has provided a vehicle that allows individuals within the utilities to raise issues and have them evaluated for resolution.
  
- **Meeting the Objective of the Materials Initiative**
  - Current Situation
    - Most interviewees believe the industry met most of the objectives of the initiative but that implementation has not been completed. We need to evaluate where we are currently and make adjustments as necessary.
    - It is worth noting some interesting viewpoints on industry response to emergent issues. A number of industry respondents said they believe the industry is fairly good at responding to emergent issues; the NRC did not necessarily agree. The NRC questioned whether the industry has the proper perspective and can make the necessary adjustments in its programs before the NRC tells it what to do. The industry needs the experienced people in order to understand the significance of issues and their implications, the NRC said. Additionally, the staff said that if the industry actually were proactive and had the experience to write good documents, the number of emerging issues would go down significantly. We need to demonstrate to the NRC that we can effectively manage these issues.
    - The industry has a desire to be proactive (e.g. IMT), but there are enough existing problems that it is a challenge to get into a fully proactive mode.
    - One respondent observed that he is not sure that we are adequately funding all the important matters we should. We react to the NRC, he said, not necessarily the technically important items.
    - Areas still needing improvement were:
      - the removal of overlap (PWROG MSC and MRP)
      - the consistent management process for issue programs
      - the evaluation and application of international experience.

- **Meeting the Materials Initiative Management Policy Commitment**

- Current Situation

- There has been a mixed response on whether the management policy commitment has been met. Half said yes, half qualified the answer mostly in the area of proactiveness, especially as demonstrated by funding (research, emergent issues, utility support of IPs with personnel). Lack of funding to address important emergent issues without scuttling an IP budget can be interpreted as a lack of commitment.
- On emergent issues, we need to get the perspective lined up quickly and thoroughly. We should consider developing a “canned” set of questions that we should review with any new issue.
- Emphasis on plant safety is there, but sometimes we get too involved in defending that no problem exists (i.e., it won’t happen here, analyze/”pencil-whip” it away).
- Plants are forward-looking and coordinated but maybe not beyond the boundary and scope of the program requirements (e.g., where the issue programs have given direction, owners do a good job of long-term planning).

- **Working the Highest Priority Materials Issues**

- Current Situation

- All the interviewees agreed that we were pursuing the highest priorities because of the information provided by the IMT and MDM. There were some comments that questioned the maintenance of the IMT and MDM in the future, especially as some issue programs are developing a detailed version of the IMT to cover their own areas. There is a need to ensure that coordination is maintained, that the IMT and MDM are updated as appropriate and that industry personnel are aware of and understand the process(es) for maintaining these products.
- The industry lacks an effective method of prioritizing (and allocating funding) across and among issue programs. While no specific issues were identified, it is difficult to ensure that all of the truly highest priority issues are adequately being addressed.
  - Several interviewees suggested that the IMT be expanded to include secondary plant materials issues.

- **What Defines Success**

- Current Situation

- The majority of the answers contained these common components:
  - achieving proactiveness—no more surprises from materials issues
  - recognizing problems in their early stages and taking the appropriate steps to address them
  - ultimately, managing our own destiny—avoiding NRC actions that push approaches to resolution.

- **What Could Have Been Done Better**

- Current Situation

- There are a number of good suggestions from the respondents. A few of them occurred with more frequency:

- We should have started the initiative earlier.
      - We should have allowed for increased and more efficient management of funding for the issue programs so they would have the resources to address the problems.
      - We should have reorganized the issue program areas of responsibility and governance earlier.
      - The industry needs better strategic planning for communication with the NRC.

## **ATTACHMENT 1**

### **QUESTIONS AND RESPONSES: 2008 MATERIALS INITIATIVE ASSESSMENT**

1. How has the materials initiative affected your job or your utility?
  - Has the initiative been “institutionalized” at your company? Be specific in terms of funding, processes, communications or culture.
2. Do you believe the industry has achieved the stated objective and purpose of the materials initiative? Please be specific.
  - objective—ensure safe, reliable and efficient operation
  - purposes—consistent management process, proactive approaches, integrated and coordinated approaches, and oversight of implementation
3. Do you believe the management policy commitment has been achieved?
  - forward-looking and coordinated
  - effective response to emergent issues
  - emphasis on plant safety and operational risk
4. As an industry, are we addressing the highest priority materials issues?
  - Are you aware of the industry’s tool for establishing materials issue priorities? (MDM/IMT)
  - Have you applied this tool at your plant to identify your priority issues and determine if they were being addressed?
5. Do you believe that the materials initiative and its implementing procedures are driving the desired behavior? As an example, is the ability of the industry to issue “mandatory” or “needed” guidance resulting in improved performance, or is it causing “watered down” guidance in order to address the concerns of the “least common denominator”?
6. Do you believe the roles and responsibilities as discussed in NEI 03-08 have been communicated effectively, understood and implemented?
  - MEOG/MTAG
  - issue programs
  - individual utilities
  - EPRI/INPO/NEI
7. Regarding comprehensive executive oversight and knowledge of the various activities and programs addressing materials aging management, have we created unnecessary overlap

across the various organizations (e.g., the MEOG/MTAG, APWG, PMMP EOC, VIP EOC, OG EOC)?

8. What, in your opinion, is success? How would we as an industry know it if we achieved it?
9. The industry is undergoing fundamental changes with retirements and developing new personnel at all levels within the utility organizations. Do you have any specific recommendations on sustaining the necessary level of senior management and technical support for this initiative and the issue programs?
10. If we could go back in time and we had the opportunity to do it over, what, if anything, would you recommend we do differently? Please be specific.
11. Other thoughts/comments/observations.

**ATTACHMENT 2**

**INTERVIEWEE CANDIDATES**  
**NEI 03-08 Assessment**  
**Spring 2008**

<u>Team</u>	<u>Name</u>	<u>Company</u>	<u>Issue Program Function</u>
<b><i>BWRVIP</i></b>			
2	Rick Libra	Exelon	Ex Ch
1	Bill Eaton	Entergy (R)	Ex Ch (f)
<b><i>MRP</i></b>			
2	Amir Shahkarami	Exelon	Ex Sp (f)
2	Denny Weakland	FENOC	IIG CH.
1	Dana Covill	Progress	A600 Ch (f)
<b><i>Materials APWG</i></b>			
1	Terry Garrett	WCNOC	Participant
<b><i>PMMP</i></b>			
2	Jeff Gasser	SNOC	Ex Ch (f)
1	Steve Robitzski	PSEG	Participant
<b><i>EPRI NDE</i></b>			
2	Joe Donahue	Progress	APWG Ch
1	Mike Turnbow	TVA	NDESC Ch
<b><i>Primary Systems Corrosion Research</i></b>			
1	Les Spain	Dominion	Vice Ch
<b><i>PWROG</i></b>			
1	Mel Arey	Duke	Ch (f)
<b><i>NRC</i></b>			
1	Ted Sullivan	NRR/Matls	
1	Matt Mitchell	NRR/Matls	
<b><i>Others</i></b>			
2	Garry Randolph	AmerenUE (R)	
2	Jack Woodard	SNOC (R)	
2	Larry Mathews	SNOG/INPO (R)	
2	Marv Fertel	NEI	
2	Rick Jacobs	INPO	
2	Jeff Ewin	INPO	

**Interview Teams:**

1. Jim Riley and Robin Dyle/Mike Robinson
2. Alex Marion and Chuck Welty