Management of Materials Issues

RIC 2005
Materials Issues, Session G-1

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Background

- Materials Initiative approved in May 2003
- MEOG and MTAG activities started in August 2003
- Materials Initiative effective January 2004
- Significant accomplishments in 2004

Materials Initiative Fund

- Special assessment to fund long term projects that address materials degradation
  - $60K per reactor per year for two years
- Approximately $9 million distributed already
  - Evaluated based on relevance to strategic plan
    - 37% to PWR issues
    - 24% to BWR issues
    - 39% to generic issues

Strategic Plan

- Rev 0 approved in March
  - Defines short (high priority) and long term strategic issues
  - Defines critical gaps
  - Identifies key IP deliverables for 2004
  - Includes summaries of IP 2004 work plans
  - Initial Degradation Matrix and Issue Management Table
- Rev 1 in 2005
  - Updated degradation matrix and issue management tables and gaps feedback from IPs and materials workshop

Implementation Protocol

- Approved in April
  - Implementation levels defined
  - Published guidance must clearly define importance of implementation
  - Executive approval required for documents with “Mandatory” and “Needed” elements
  - Executive approval required for deviations from “Mandatory” and “Needed” elements
  - Deviations from Mandatory and Needed elements captured in Corrective Actions Programs at stations
  - Implementation must be verified – INPO and self assessment

Degradation Matrix

- Identify materials used for major passive components/systems within Materials Initiative scope
- Obtain inputs from experts, laboratory R&D, industry OE
  - Identify potential degradation mechanisms
  - Determine material applicability
  - Define areas of uncertainty
- Identify and characterize issues that pose potential vulnerabilities
  - Adequately addressed, programs managing issues
  - Work in progress that will develop tools to manage issues
  - No program to address, insufficient work in progress to address vulnerability

Issues Management Table

- Identify component and component function
- Identify material(s) of construction
- Identify degradation mechanism(s)
  - May be a different mechanism for different location/material of a component
  - Likelihood or predominance of a mechanism should be considered and ranked

IMT Process (cont.)

- Identify vulnerable locations
- Identify consequences of failure, including system responses to help prioritize location/component importance
- Identify inspection capabilities and history
- Identify evaluation capabilities and environmental effects on degradation

IMT Process (cont.)

- Identify mitigation options/technologies such as chemical, mechanical, or system operation changes
- Identify repair or replacement options, capabilities and limitations
- Based on the information above, identify knowledge gaps/needs
- Prioritize the work to address gaps and identify responsible Issue Programs

Materials Program Tool Kit

- A set of documents that form the basis of a materials management program
- Tool Kit contents:
  - NEI 03-08, Guideline for the Management of Materials Issues
  - Road Map to documents with “Mandatory” and “Needed” elements
  - Implementation Protocol
  - Strategic Plan
  - Degradation Matrix
  - Issues Management Table

Materials Program Tool Kit

- Tool Kit contents (continued)
  - RCS MDMP Guideline:
    - Scope
    - Key attributes
    - Organization
    - Admin controls
    - Key activities
    - Implementation

Draft Materials Performance Metrics

Metric	Green	White	Yellow	Red	Comments
Unexpected materials related NRC Generic correspondence	No NRC correspondence	Industry guidance followed by a GL	NRC beats us to the punch	Order issued	
Unknown or accelerated materials degradation morphologies	0 events	Found under industry inspection guidance	Accelerated (You found it accidently)	Unknown (It found you)	
Lost capacity or unplanned /extended outages due to materials issues	≤ 25 days for fleet	>50 days for fleet	>75 days for fleet	>100 days for fleet	
NRC Inspection findings greater than green	0 findings > green	N/A	N/A	>0	
INPO materials program related AFIs	≤5 significant	>5 and <12 significant	>12 significant	>20 significant	
Implementation of Mandatory and Needed requirements	Implemented w/ acceptable deviations			>0 unacceptable / weak deviations	
IP Guidance issued to address prioritized gaps	≥90% as scheduled	≥80% as scheduled	≥70% as scheduled	<70% as scheduled	

MTAG / MEOG Activities

- MEOG and MTAG meet regularly - oversight
  - Monitor industry experience with materials degradation and resolution of related issues
  - Complete development of strategic plan, program guidelines, performance metrics, etc
  - Monitor materials IP performance
  - Oversee materials initiative projects
  - Generic NRC interface