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May 15, 1997

MEMORANDUM TO: Jack R. Strosnider, Chief
Materials and Chemical Engineering Branch
Division of Engineering

FROM: Edmund J. Sullivan, Jr., Chief
Section B
Materials and Chemical Engineering Branch
Division of Engineering

EJS 5/13/97

SUBJECT: SUMMARY OF MAY 1 MEETING WITH NUCLEAR ENERGY INSTITUTE (NEI) TO DISCUSS DEGRADATION OF STEAM GENERATOR INTERNALS

On May 1, the NRC staff met with NEI and industry personnel to discuss the proposed generic letter, "Degradation of Steam Generator Internals" and proposed NEI/industry initiatives in response to the generic letter. Attachment 1 lists the meeting participants. Attachment 2 is a copy of the NEI presentation slides.

NEI formed a task force to address the concerns raised in the proposed generic letter regarding degradation of steam generator internals. The task force is comprised of PWR utilities, NSSS vendors, EPRI, and NEI. NEI presented an industry program that included the following elements: summary of the foreign experience, assessment of possible degradation at U.S. facilities (consideration of design, fabrication, operations, etc.), and inspection recommendations (consideration of location, method, schedule, etc.). The schedule for completion of the assessment and inspection recommendations was not finalized, but NEI expected all NSSS owners groups to have completed these elements by late 1998.

The staff provided NEI the following comments:

1. The staff intends to go forward with issuing the subject generic letter.

2. The NEI program appears driven from causal factors (i.e., the French experience) rather than consequences. The staff suggests the program consider the possibility of currently unknown internals degradation and base inspections on safety significance rather than past experiences at foreign and U.S. facilities.

3. The NEI program schedule appears adequate to address internals degradation over the long term, but the staff feels the schedule does not support the short term need to perform inspections. The staff does not expect a licensee can justify delaying inspections until late 1998 or beyond as currently suggested in the NEI program.

4. The staff suggests continuing with similar meetings in the future to update the status of the industry program.

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OGM-7NEI
+ OGM-6 meeting

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Attachment ①

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Attachment ②

Steam Generator Internals Degradation

NRC - NEI Issue Task Force Meeting

May 1, 1997

NEI

Purpose of Meeting

- **Describe Industry Action Plan**
  - Developed by NEI Task Force
  - Offered to Owners Group
  - Vendor-specific response
- **Discuss schedule**
- **Discuss closure process**
- **Obtain NRC staff feedback**
- **Identify opportunities for further interactions**

NEI

Proposed Industry Program

NEI

Steam Generator Internals Degradation - Proposed Industry Program

- SG Internals Degradation - The Issues
  - **French experience**
    - **tube support plate degradation**
      - chemical cleaning related
      - mechanical ligament tearing
        - fabrication related
        - shipping related
      - flow assisted corrosion
        - operations related
    - **wrapper degradation**
      - wrapper drop
      - wrapper support block cracking

NEI

Steam Generator Internals Degradation - Proposed Industry Program

- SG Internals Degradation - Actions to Date
  - **Industry Actions to Date**
    - **NDE technique developed for drilled hole TSPs**
    - **latest DRAFT of EPRI ISI Guidelines includes responsibilities to address secondary side degradation**
      - degradation assessment
      - preparation of secondary side integrity program
      - appropriate disposition of visual exam results
    - **Individual Utility Actions to Date**
      - **screening of eddy current data**
      - **visual examinations**
        - in conjunction with chemical cleanings
        - during FOSAR examinations
        - scheduled secondary side internals examinations

NEI

Steam Generator Internals Degradation - Proposed Industry Program

- SG Internals Degradation - Significance
  - **Initial Conclusions**
    - **reasonable degree of assurance that ligament loss in drilled TSPs in not a major concern**
      - loss of TSP signal not being identified during routine ET analysis
      - visual exams to date have not identified lost ligaments
    - **reasonable degree of assurance that wrapper drop is not an issue at this time**
      - no one identifying access restrictions through handholes
    - **TSP ligament cracking does not appear to be a pervasive problem**
      - plants that have screened ET data to date have identified limited number of indications
    - **need additional insight to French experience**

NEI

Steam Generator Internals Degradation - Proposed Industry Program

- SG Internals Degradation - Industry Program
  - **NEI Task Force formed to address Internals Degradation issues**
    - **Task Force comprised of:**
      - utilities
        - all PWR designs; all Owners' Groups; Replacement SGs
      - NSSS vendors
      - Replacement SG vendor
      - EPRI
      - NEI
    - **Coordinated Industry Program determined to be most efficient way of addressing the issues**

NEI

Steam Generator Internals Degradation - Proposed Industry Program

- SG Internals Degradation - Industry Program
  - **Elements of the Program**
    - **Summary of Experience Report**
      - include French & domestic experience to date
        - information exchange meeting with EdF (complete)
        - include causal factors of degradation
        - coordinated by EPRI
    - **Degradation Assessments**
      - determine susceptibility of SGs to internals degradation
      - consideration to be given to the following attributes
        - design
        - fabrication & manufacturing
        - operations
        - chemistry
        - related degradation (e.g., denting)

NEI

Steam Generator Internals Degradation - Proposed Industry Program

- SG Internals Degradation - Industry Program
  - **Elements of the Program (cont'd)**
    - **Degradation Assessments (cont'd)**
      - determine the need to inspect
      - determine what and how to inspect
      - coordinated by Owners' Groups
    - **From the Degradation Assessments identify the following:**
      - degree of susceptibility
      - lead plant inspections, if appropriate
      - need for periodic inspections
      - recommendations for periodic inspection scope and frequency, if needed
      - coordinated by Owners' Group

NEI

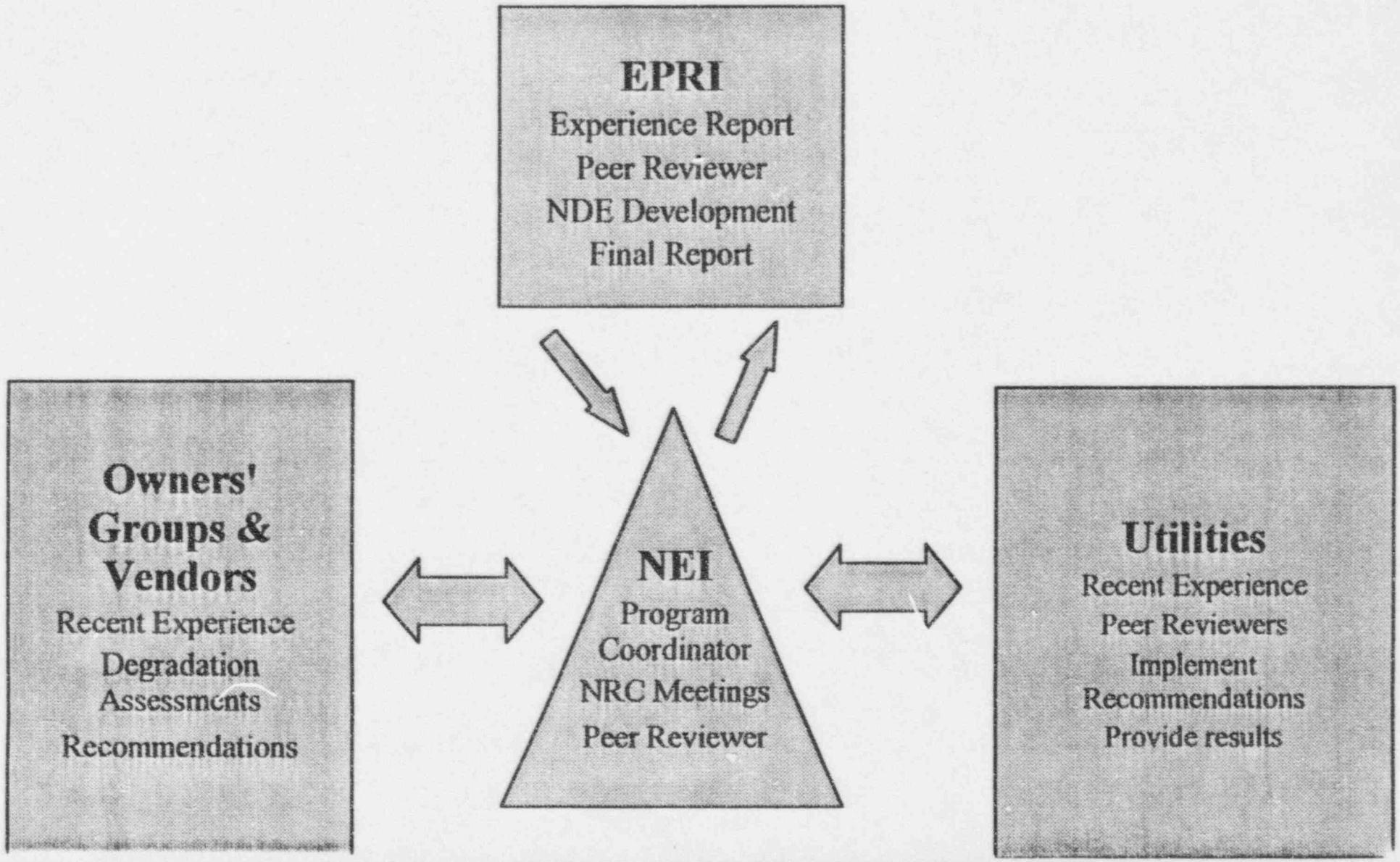
Steam Generator Internals Degradation - Proposed Industry Program

- SG Internals Degradation - Industry Program
  - **Elements of the Program (cont'd)**
    - **Meet with the NRC**
      - completion of Degradation Assessments
      - when inspection results are assimilated
      - coordinated by NEI
    - **Document Program Results**
      - EPRI Experience Summary Report
      - Degradation Assessments and Recommendations - Owners' Groups Reports
      - EPRI Final Summary Report

NEI

Steam Generator Internals Degradation - Proposed Industry Program

- SG Internals Degradation - Industry Program
  - **Schedule**
    - **Information Exchange with EdF**
      - Meeting with EdF - complete
      - Additional information exchange - ongoing
    - **Summary of Experience Report**
      - Target - Summer 1997
    - **Degradation Assessments**
      - subject to approval protocol of Owners' Groups
      - provided approval is obtained by OGs, at least some assessments could start June 1997
      - degradation assessment completion schedule established by OGs
    - **Implementation of Recommendations**
      - dependent on degradation assessment completion and individual plant outage schedules
    - **Final Reports**
      - Target - late 1998

NEI

Steam Generator Internals Degradation-Proposed Industry Program