U.S. NUCLEAR REGULATORY COMMISSION

OFFICE OF INSPECTION AND ENFORCEMENT

Division of Quality Assurance, Vendor, and Technical Training Programs

Quality Assurance Branch

Report No.:	50-410/84-14
Docket No.:	50-410
Licensee:	Niagara Mohawk Power Corporation
Facility Name:	Nine Mile Point 2
Inspection At:	Stone and Webster Engineering Corporation, Boston, MA
Inspection Conducted:	April 22-23, 1985
Inspection Team Members:	
Team Leader:	G. Imbro, Senior Inspection Specialist, IE
Quality Assurance:	S. Ebneter, Director, Division of Reactor Safety, Region I
Mechanical Systems:	T. Del Gaizo, Consultant, WESTEC Services G. Overbeck, Consultant, WESTEC Services
Mechanical Components:	S. Gula, Harstead Engineering
Electrical/I&C:	G. Lewis, Inspection Specialist, IE G. Morris, Consultant, WESTEC Services

for G S Lewis, Jr. 5/8/85
Eugene V. Imbro Date
Team Leader, IE

Approved by: James L. Milhoan 5/8/85
James L. Milhoan
Section Chief
Quality Assurance Branch

Nine Mile Point - Unit 2
Technical Audit and Quality Assurance Audit Preparation Inspection
April 22/23, 1985

1. Background

In a letter dated April 3, 1985, Niagara Mohawk Power Corporation forwarded to the NRC program plans for completion of the Engineering Assurance In-Depth Technical Audits of the Nine Mile Point 2 (NMP-2) Project and an Overall Audit Plan, Quality Assurance Auditing Division, for an audit of as-constructed condition of the Reactor Core Isolation Cooling System and associated structures Nine Mile Point 2 Project. These plans were subsequently revised; viz.,

- EA In-Depth Technical Audit Revision 1 dated April 18, 1985
- Overall Audit Plan, Quality Assurance Auditing Division, Revision 1 dated April 15, 1985

NRC inspection will be in three phases as follows:

- Inspection of program approach (Review Plans)
- Inspection of Program Implementation
- Inspection of audit results and corrective actions

The program plans provide for interfacing of the engineering audit (EA) team and the quality assurance (QA) teams to maximize audit efficiency. Procedure EA-106, Revision 1 specifies that the EA team will identify key requirements in specifications and drawings that should be addressed by the QA audit team and provide this information to the QA team. In addition, concerns identified by the EA team that relate to the construction and quality assurance will be communicated to the QA audit team for their investigation, reporting and follow-up. The QA audit plan contains a provision to feedback engineering concerns to the EA team for follow-up. The on-site as-built audits by the QA and EA teams will be coincident for one week (week of May 13, 1985) which will provide additional opportunities for communication of comments.

2. Purpose

The purpose of this inspection was to perform the first phase of NRC's inspection of the program, namely an inspection of the individual auditor's review plans. Review plans were evaluated to ensure the audit would be conducted in sufficient technical depth to evaluate the NMP-2 design and design process.

3. NRC Inspection Team

The inspection was conducted by NRC personnel with the support of contractor personnel as follows:

Enclosure

Assignment	Name, Position
Team Leader	G. Imbro, Senior Inspection Specialist, IE
Quality Assurance	S. Ebneter, Director, Division of Reactor Safety, Region I
Mechanical Systems	T. DelGaizo, Consultant, WESTEC Services G. Overbeck, Consultant, WESTEC Services
Mechanical Components	S. Gula, Harstead Engineering
Electrical/I&C	G. Lewis, Inspection Specialist, IE G. Morris, Consultant, WESTEC Services

4. Personnel Contacted

A large number of Niagara Mohawk Power Corporation (NMPC) and Stone & Webster Engineering Corporation (SWEC) personnel were contacted during the two day inspection. The following is a brief list of key personnel contacted.

Name	Organization	Position
C. Terry	NMPC	Mgr. Nuclear Engineering
W. Nowicki	NMPC	Asst. to V.P., Nuc. Eng.
D. King	SWEC	V.P. & Sr. Eng. Mgr.
R. Kelly	SWEC	V.P. & Dir. QA
W. Eifert	SWEC	Chief Eng., Eng. Assurance
E. Fleming	SWEC	Chief Eng., QA Audit Div.
R. Twigg	SWEC	Lead Engineer, Audit Team Leader
D. Kehoe	SWEC	Lead Auditor, QA Audit Div.

5. General Conclusions

The NRC inspection team found that preparations for the engineering assurance technical audit of NMP-2 were sufficient to determine the adequacy of the plant design; subject to the following comments.

- A number of review plans either did not contain sufficient detail for the NRC inspectors to gauge the depth of review to be performed by SWEC or in some cases the review plans were not available. In most of these instances, discussions with the reviewers revealed that sufficiently in depth reviews would be conducted.

- There was no coordinated review plan for reviewing the high-energy-line/moderate-energy-line break area or the Seismic II/I area.

- The Reactor Core Isolation Cooling (RCIC) system may not lend itself to a complete review of the design process used to evaluate safe shutdown capability following a high-energy-line break.

- Review of Seismic II/I considerations by a plant walkdown technique may not reveal enough information on the design process relative to this issue.

- Since no cut-off date has been established relative to document review, consideration should be given to whether revisions to design documents made since selection of the RCIC impact the system as being a representative sample of the technical adequacy of the NMP-2 design and the functioning of the design process.

In view of recent problem areas uncovered in similar plant designs, the following items should be included in the electrical discipline review plans.

- Electrical protection of motors and motor operators
- DC motor-operated-valve voltage drop 120 V AC and DC
- Control circuit voltage drop
- Containment electrical penetration protection
- Motor starting voltage when loading diesel generators
- Instrumentation and control power supplies

It is the understanding of the NRC team that these items will be included in the forthcoming audit.

6. Specific Comments

Specific comments on a technical discipline basis are included in the following attachment.

Attachment

SPECIFIC COMMENTS

I. Mechanical Systems/Power Engineering

- The power discipline review plans were not of sufficient detail to conclude with reasonable confidence that the review will be thorough enough to satisfy NRC objectives.
  - The review plans lacked specific content with respect to the attributes to be examined. For example, the review plan for calculations list general types of calculations to be reviewed but provided no specific details or direction. However, the team was encouraged by the knowledge and sense of direction demonstrated by the power discipline leader.
  - The team found no review plans for HELBA and Seismic II/I.
- The consequences of breaks within the RCIC or jet impingement and pipe whip on RCIC piping may not be sufficient to provide reasonable confidence as to the design adequacy of the plant for HELBA with respect to evaluation of safe shutdown capability for the following reasons:
  - Since the RCIC system is not a LOCA mitigating system, its ability to function following a HELBA inside containment (i.e., LOCA) may not have been evaluated; and
  - Since the RCIC system is comprised of relatively small diameter piping, the effects of pipe whip following a break of the RCIC line on other piping inside containment may not have been evaluated due to the NRC exclusion based on line size; i.e., the effects of small diameter piping impacting larger diameter piping are considered negligible.
- Seismic II/I - Project engineering may not have provided sufficient design details and guidance to avoid Seismic II/I interaction problems.

II. Engineering Mechanics

- The review sheets did not address how the flexibility of mechanical equipment will be incorporated into the stress analysis evaluations.
- The scope of the valve review is not adequate to include valves within the flexible range and any effects on the stress analysis evaluation and valve qualification.
- Review plans did not contain adequate detail in addressing Class I pipe stress analyses.
- For pipe stress, pipe supports, mechanical and structural equipment all review plans did not specifically detail the review of field design changes with respect to evaluation, auditability and completeness.

III. Electrical

- The Equipment Qualification Review Plan consisted of a detailed checklist and an identification of specific equipment qualification to be reviewed. A review will also be performed by the SWEC EA team to determine the methodology of identifying and incorporating equipment required by Regulatory Guide 1.97 into the Equipment Qualification review plan. The team judged this review plan to be adequate to evaluate the equipment qualification process.

- The Electrical Power discipline presented 7 of the 12 review plan sections for review. Certain electrical areas are not being reviewed since they were evaluated during the SWEC (NY) review of the AC system.

The following areas were not evaluated during the SWEC (NY) review of the AC System. It is the team's understanding that these items will be included in the SWEC Engineering Assurance audit:

- Electrical protection of motors and motor operated valves
- DC motor operated valve voltage drop
- 120 volt ac & dc control circuit voltage drop
- Containment Electrical Penetration protection
- Motor starting voltage when loading the diesel generator
- Instrumentation and control power supply

IV. Instrumentation and Control

The instrumentation and controls area had only 3 of the 12 review plans prepared and available for review by the team. For the three sections that were prepared, the drawings, diagrams and specifications contained no details or specifics, and therefore, the team could not determine what equipment would be included in the review.

It was the team's judgement that the instrumentation and controls area needs considerably more preparation in order to adequately execute the Instrumentation and Controls audit scope and approach as stated in the proposed SWEC Technical Audit Program dated April 18, 1985.

V. Structural

Review plans appeared to be in sufficient depth except in the area of the review of field design changes with respect to evaluation, auditability, and completeness.