U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 50-289/84-12

Docket No. 50-289

License No. DPR-50 Priority _____ Category C

Licensee: GPU Nuclear Corporation
P. O. Box 480
Middletown, Pennsylvania 17050

Facility Name: Three Mile Island Nuclear Station, Unit 1

Inspection At: Middletown, Pennsylvania

Inspection Conducted: April 23-24, 1984

Inspectors: G. Napuda, Lead Reactor Engineer — 8/3/84 date

G. Napuda for S. Goldberg, Operations Engineer-IE — 8/3/84 date

G. Napuda for C. J. Haughney, Consultant — 8/3/84 date

Approved by: for A. J. Gody, Chief, Management Programs Section, EPB, DETP — 8/14/84 date

Inspection Summary: Inspection on April 23-24, 1984 (Report No. 50-289/84-12)

Areas Inspected: Routine announced inspection of the QA Program including the annual review of program changes and the implementation of those changes in the functional areas of maintenance, modifications and procurement, and QA/QC overview of maintenance and operations activities. The inspection involved 54 inspector hours onsite by one region based inspector and two headquarters based engineers.

Results: No violations were identified.

DETAILS

1. Persons Contacted

*B. Ballard, Sr., Manager-QA Modifications/Operations
*J. Colitz, Plant Engineering Director
J. Faulkner, Planning and Scheduling Manager-Maintenance and Construction
*R. Fenti, Operations QA Manager
J. Fornicola, QA Systems Engineering Manager
N. Hollerbush, Documents Supervisor-Maintenance and Construction
J. Marsden, QA Engineering Manager
J. Moore, Jr., Consulting Engineer-Technical Functions Engineering and Design

Discussions and interviews were held with other administrative, engineering, operations, QA/QC and technical personnel during the course of the inspection.

NRC Personnel

*R. Conte, Senior Resident Inspector
J. Thomas, Engineer - NRR Programs Office
L. Thonus, Engineer - NRR Programs Office

*Attended the Exit Interview

2. General

This inspection was conducted to determine the status of implementation of the "Graded Approach to Quality and the Clarifications of Important to Safety (ITS) Activities and Components" portion of the Quality Assurance Program recently established by the licensee.

3. QA Program Review

3.1 The procedures listed in paragraph 3.2 were reviewed to determine that they were consistent with the references/requirements listed below. Implementation of the quality program was also reviewed to verify it was consistent with established guidance/requirements. The following documents (as appropriate) served as one of the bases for the conduct of the inspection as described in subsequent paragraphs.

-- 10 CFR 50 Appendix A, General Design Criteria for Nuclear Power Plants
-- 10 CFR 50 Appendix B, Quality Assurance Criteria for Nuclear Power Plants
-- Regulatory Guide 1.29, Seismic Design Classification
-- "QA Verification of Important-to-Safety Plant Activities 'The Operations QA Monitoring Approach'," J. C. Fornicola and B. E. Ballard, Sr. (authors)
-- "The New Challenges 'Important to Safety' and the 'Graded Approach'," B. E. Ballard, Sr., and N. C. Kazanas (authors)

The findings are integrated into the discussions in paragraphs 4 and 5.

3.2 The implementing procedures listed below were reviewed and discussed with QA and station personnel to ensure Quality Assurance Program changes were reflected in the procedures and personnel were aware of and understood the changes. The procedures also served as one of the bases for the conduct of the inspection.

-- ES-011, Methodology and Content of GPUN Quality Classification List, Revision 5
-- 1000-PLN 7200.01, Operational QA Plan for GPU Nuclear, Revision 0

The findings are integrated into the discussions in paragraph 4 and 5.

4. Important to Safety (ITS) Activities and Components

General Public Utilities Nuclear (GPUN) recognized that as part of its effort to implement the graded approach to quality as described in the Operational Quality Assurance Plan, one key task was to determine the safety classification of activities. Certain activities would not fall obviously within the traditional scope of quality assurance (QA) overview and would not directly bear on the safety of the facility, but could potentially have an important indirect effect on nuclear safety. For this reason, GPUN chose to review and classify activities with respect to their safety relevance. As a part of this review, the Vice President, Nuclear Assurance Division formed an Important to Safety (ITS) working group to consider the classification of activities. Efforts by this working group were started in September 1983. During its deliberations, the ITS working group determined that the classification of activities could be achieved by classifying documents. Procedures, drawings, procurement requests and other facility documents were used to control all activities affecting the station.

The ITS working group had progressed to the point of developing draft techniques for classifying documents. These techniques have undergone several internal revisions. Members of the working group expect to reach a concensus on these techniques in the near future and then begin drafting corporate level implementing procedures. The preparation, review, concurrence and approval of a corporate level procedure describing the classification of activities is expected to take several months. Following issuance of this procedure, an additional period of time would be required for training of corporate and station personnel affected by such a procedure. Following issuance of the procedure and completion of necessary training, a program would be undertaken to review and reclassify all station and corporate procedures. The entire process may be 2 to 3 years from complete implementation.

GPUN QA used three levels of verification to oversee the quality program at the station and corporate levels. These levels included auditing, quality control inspections, and QA monitoring, which was an extensive QA surveillance activity. All three of these verification efforts use a sampling process. In order to effectively apply the graded approach to quality, GPUN QA must assign resources so that the most effective verification efforts are achieved.

QA personnel developed a Performance Index Calculation (PIC) formula in an attempt to provide a basis for assigning QA verification resources. The PIC formula included factors that could be used to quantify the relative importance of an activity that was potentially subject to QA verification. These factors included consideration of ITS, the quality trend or history, the event frequency, the experience level of the activity performer, the amount of past verification of similar activities and a training factor. The PIC formula was used briefly during 1983 as a pilot program but was suspended due to other resource demands. The pilot program has recently been resumed and the utility of the PIC formula remains to be determined. A key element needed to enhance the basis for the formula involved evaluating the quality trend and history factor. QA personnel were using their evolving trending program as an input to the quality factor and were sponsoring a Bayesian statistical analysis for small sample populations in an attempt to refine the data associated with an activity. The PIC concept has the potential to enhance the licensee's quality program.

Interviews revealed that some elements of the line organization did not share QA's strong belief in the use of the graded approach to quality or in the classification of the relative safety of activities. In fact, some plant personnel wanted a specific list of what items were safety-related or important to safety.

The Quality Classification List (QCL) for TMI-1 was not a strong example of the graded approach to quality. With few exceptions the QCL did not specify items below the system level. Efforts were underway to classify subsystems and components, but these efforts have not yet been completed. One complication involved the fact that the ITS working group on hardware had concluded that a QCL for components would not be sufficient because supplemental information would be needed to describe the relative importance of each component to safety. The group was struggling with the level of detail needed to supplement the QCL list.

The present QCL and the procedure that describes the techniques for its development, ES-011, lacked definitive guidance on the basis for the safety classification of system and associated components. As a result, station personnel faced with classification decisions in the development of modification packages, and in processing of procurement documents and maintenance work requests, were left in a quandry. Interviews revealed that these personnel tended to overclassify maintenance, modification and procurement packages in order to be conservative. Because of this practice, safety classification was not well graded.

Although GPUN's Office of the President had granted QA the authority and access to oversee virtually any activity or process at the station, existing procedures did not require in line QA review of Not Important to Safety (NITS) procedures, maintenance packages, modification packages, or procurement documents. As a result, QA's overview of NITS activities in those areas was generally restricted to auditing.

The inspectors stated that the training and knowledge of engineers, maintenance personnel, and procurement personnel with respect to their understanding of the QCL and the classification process will be reviewed during a subsequent routine inspection(s). The licensee representatives acknowledged the statement.

Valve and equipment lists which had been developed during facility design and construction had not yet been upgraded to show those components on the QCL that while not safety related, were considered to be in the broader classification of ITS.

GPUN Technical Functions Division Procedure, EP-011, contained provisions for interpreation of the QCL. The procedure allowed interpretation of the classification of subsystems, components or parts that were subdivisions of systems of the QCL, when such classification could not be readily determined. In the day-to-day practice of processing modifications, maintenance packages, and procurement requests, one would expect that such interpretations would be frequently necessary. However, the licensee could produce evidence of only two such interpretations within the past 18 months.

No violations were identified.

5. QA/QC Overview of Maintenance Activities

The log of maintenance activities for the systems listed below were reviewed to determine the level of QA monitoring overview in this functional area. Areas categorized as Important to Safety (ITS) were selected for this review. Those corrective maintenance tasks that were more complex than valve packing, etc., were reviewed in depth. The systems and associated corrective maintenance work requests included the following:

Building Spray

-- CC179, BS Valve was checked out, exercised, and verified as operating properly after repacking and gasket replacement. QC inspected the valve after bonnet removal, witnessed the replacement of parts and valve re-assembly.

-- CB246, Sodium Hydroxide High Side Isolatoin Valve was replaced. QA Category material was used, but QC did no overview.

-- CC650, The pump was overhauled. An engineering evaluation was performed to qualify non-QA material but QC did no overview.

-- CC818, Valve BS-52A was disassembled, free movement verified, and reassembled. Mechanical Engineering and QC inspected the work.

-- CC819, Valve B3-52B was disassembled, free movement verified, and reassembled. Material used was QA category and QC did inspection.

-- CC806, Wiring for Shunt Trip Breakers was traced. QC did no overview.

-- CC807, Wiring for Shunt Trip on CRD Breakers was traced. QC did no overview.

Reactor Protection

-- CB965, Intermediate Range Recorder of NI-3 was repaired and calibrated. QC did no overview.

-- CC553, Power/Flow/Imbalance Setpoints on RPS Function Generators were reset and tested. QC did no overview.

-- CC653, Flux/Pump Contact Monitors were adjusted. QC did no overview.

No violations were identified.

6. Management Meetings

Licensee management was informed of the scope and purpose of the inspection at an entrance interview conducted on April 23, 1984. The findings of the inspection were periodically discussed with licensee representatives during the course of the inspection. An exit interview was conducted on April 24, 1984 at the conclusion of the inspection (see paragraph 1 for attendees) at which time the findings were presented to licensee management.

At no time during this inspection was written material provided to the licensee by the inspector or headquarters engineers.