

NUCLEAR SAFETY AND COMPLIANCE COMMITTEE

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1.0 SUMMARY

Safety and compliance at the Oyster Creek, Three Mile Island (TMI-1 and TMI-2), and Saxton facilities of the GPU Nuclear (GPUN) Corporation were the object of independent evaluations by the Nuclear Safety and Compliance Committee (NSCC) of the GPUN Board of Directors and by the NSCC Staff from October 1, 1993 to March 31, 1994. These evaluations focused on operator performance, procedure utilization, and maintenance activities as they relate to compliance and safety. The Committee believes that during this period all facilities were operated safely and, with the exceptions noted herein, in compliance with relevant requirements and good practices.

The Committee also compared performance in 1993 with previous years and concluded the overall level of safety provided by the corporation had increased. An increase in the level of safety at Oyster Creek and a consistent level at TMI-1 provided the basis for this conclusion.

Oversight of plant activities, responsiveness to NRC concerns, and attempts to improve human performance evidenced management's strong commitment to safe operation. See pages 3 and 4.

Operators at Oyster Creek and TMI-1 demonstrated proficiency in responding to transients and performing nonroutine operations. However, several deficiencies in procedure use, administrative controls and log keeping were noted. See pages 4 and 5.

Both sites have effective programs for planning and scheduling of maintenance. The quality of maintenance was generally good, but there were some notable performance problems. See page 5.

The excellent operating history of Oyster Creek during this cycle is indicative of an improved materiel condition. The Reactor Building was upgraded to meet current design criteria. Primary system valve problems resulted in two short outages at TMI-1, and corrosion product buildup in control rod drive mechanisms will require future shutdowns. See pages 5 and 6 .

System engineers and chemistry personnel provided good support at Oyster Creek. At TMI-1, resolution of radiation monitoring system deficiencies has not been timely, and the quality of several technical reviews was inadequate. See pages 6 and 7.

Training was well conducted at both sites, and supportive of plant needs. The TMI-1 simulator was effectively used to prepare operators for a plant shutdown without pressurizer spray capability. See page 7.

Radiological Controls goals for 1993 were met or exceeded for the most part. The implementation of new 10 CFR 20 requirements was smooth at both sites. High Radiation Area controls need to be reinforced, particularly at TMI-1. See pages 7 and 8.

Emergency preparedness was satisfactorily demonstrated in site drills. Emergency Plan implementing procedures need more timely updates when new requirements are implemented. See page 8.

2.0 EVALUATION OF SAFETY AND COMPLIANCE

The following is an evaluation of GPUN performance from October 1, 1993 through March 31, 1994. The report topics do not necessarily correspond to GPUN's organizational units. Statements largely pertain to conditions at the time of the evaluation. Corrective actions of which the Committee is aware are also noted. All items have been discussed by the Committee with its Staff and, if appropriate, have been reported by the Committee to the GPUN Board of Directors and corporate management at scheduled meetings.

2.1 MANAGEMENT/ATTITUDE TOWARD SAFETY

GPUN continued to demonstrate overall commitment to nuclear safety in the operation and management of its facilities. Systematic Assessment of Licensee Performance (SALP) reports issued by the Nuclear Regulatory Commission (NRC) during this period recognized this as a strength at both sites.

There is strong management oversight in routine operation, and a program for enhanced review and coordination of infrequently performed evolutions. Both sites supplement this with off-shift management tours and, at Oyster Creek, management teams observe selected work activities and provide performance-based feedback and coaching.

There was good response to NRC concerns during this period. An inspection at Oyster Creek identified an operating practice (i.e., failure to invoke Technical Specifications Limiting Conditions for Operation (LCO) during certain surveillance testing) that was not consistent with NRC guidelines and industry practice. In a separate inspection, the NRC found TMI-1 was not complying with these guidelines in all cases. Oyster Creek reviewed the concern, revised its practice, and issued temporary guidelines until necessary procedure revisions can be issued. TMI is developing appropriate procedure revisions and Technical Specifications changes to ensure consistent compliance. In the case of a leaking safety relief valve at TMI-1, the NRC questioned the plan to attempt reseating it at power. A special review of the plan by GPUN senior managers concluded that it would be more appropriate to shut down.

Repair of the pressurizer spray valve at TMI-1 required a decision between the risk of a plant transient by cooling down without spray capability and the risk of injury to personnel if isolation valves leaked while personnel were working at hot shutdown. After consultation with many sources and verification that conditions were safe, work on this valve was successfully completed at hot shutdown. The decision was an appropriate accommodation of both risks.

Weaknesses were noted in consistency and timeliness of operability and reportability determinations at Oyster Creek. A performance standard is being developed to formalize the operability determination process. Since the issue was raised, the NSCC Staff has noted a heightened awareness of nonconforming conditions and emphasis on obtaining timely resolution. One area for continued improvement is awareness of design and license basis requirements other than Technical Specifications, which are the primary focus of most determinations.

Management at both sites recognize the continuing need to reduce human performance deficiencies and are working together to develop a Human Performance Standard. TMI-1 recognized that it lacked adequate evaluation of human performance deficiencies in maintenance activities during the 10R Refueling Outage and is taking steps to improve this situation via coaching sessions.

A plan to consolidate the oversight functions of Independent Safety Review and Quality Assurance (QA) was announced. This is intended to streamline the oversight function and support the long-term corporate goal to improve efficiency, while continuing to satisfy all regulatory requirements. The plan appears feasible, and the Committee will monitor its implementation.

2.2 FACILITY OPERATION

Oyster Creek operated continuously throughout the period and, since November, is in the longest period of continuous operation in plant history.

TMI-1 completed the 10R Refueling Outage in October and operated continuously with the exception of two short outages for corrective maintenance. Operators continued to demonstrate proficiency in nonroutine operations. For example, feedwater transients at both sites were mitigated by prompt operator action, and a shutdown of TMI-1 in March was accomplished safely without pressurizer spray capability.

At Oyster Creek there were several performance errors which did not significantly impact plant operation, but which indicated continued need for improvement. Improper shutdown of a recirculation pump, untimely posting of a fire watch, and errors in tagout of an air ejector and cation tank are examples. The response to NSCC Report No. 19 indicated that an integrated action plan for error-free performance would be published in January, but it was not issued until the end of March.

The NRC downgraded TMI-1 Operations in the most recent SALP report for laxity in procedure use. The NRC issued Notices of Violation (NOVs) for two self identified log keeping events. The first event was in February 1993; the second in March 1994. Both events involved a plant operator recording log readings for equipment in an area of the plant he did not enter.

The TMI-2 reactor building was placed in Post Defueling Monitored Storage (PDMS), and revised Technical Specifications were issued. TMI-1 and TMI-2 were combined under single operating management in January. Dismantling of balance of plant components and structures continues.

A project was established for dismantling the Saxton containment building. The initial phase, refurbishment of the polar crane, will commence when a necessary Technical Specification change is issued. GPUN continues to review alternatives for removal of contaminated soil from the site.

2.3 MAINTENANCE/MATERIEL CONDITION

The 10R Refueling Outage at TMI-1 was completed ahead of schedule due to good scheduling and management control. Preparations for the 15R Refueling Outage at Oyster Creek appear to be going well. An outage management organization is in place, and milestones for work scope definition, engineering, parts procurement, etc., are reasonably on track.

Both plants made effective use of planned system outages to accomplish preventive and corrective maintenance during operation. Use of an integrated schedule for all planned maintenance at Oyster Creek has resulted in significant improvements in maintenance activities.

TMI-1 experienced two forced outages during the period. The first was due to excessive internal leakage in a pressurizer safety relief valve. The second was due to a body-to-bonnet leak on a pressurizer spray valve. Oyster Creek had one forced power reduction to replace a condensate pump.

While the majority of maintenance and surveillance activities were conducted successfully, there have been some notable problems. The damage to the pressurizer safety relief valve at TMI-1 was apparently caused during the 10R startup testing. The potential for stud damage due to pressurizer spray valve leakage was not adequately assessed when first discovered. The potential failure of this valve at power could have resulted in a loss of coolant accident or plant transient without spray capability. Therefore, the effectiveness of a program intended to implement ASME Code requirements for maintenance of primary system components is being evaluated. An oil fire on a feedwater pump after startup from 10R was a result of improper tightening of bolts. At Oyster Creek, an Emergency Service Water pump was damaged by reverse rotation, and a technician error caused an inadvertent start of Core Spray pumps.

A corrective action audit at TMI-1 found that there was no process for identifying and investigating minor human performance problems in maintenance. Plant Maintenance committed to instituting a review process similar to that used by Operations.

The Committee acknowledges the response to its previous report (No. 19) which outlined action plans for addressing several materiel deficiencies at Oyster Creek. Also, information provided to the NSCC Staff by Technical Functions resolved concerns regarding the structural analysis of the Spent Fuel Pool. The Committee notes that plans for construction of an independent spent fuel storage facility at Oyster Creek were approved by the local Zoning Board in March. This allows the next steps on a project essential to long-term operation of the plant. NRC concerns regarding the safety of moving the fuel casks with the existing crane still must be resolved.

A recently identified concern at TMI-1 is probable reactor coolant corrosion product buildup in control rod drive mechanisms, which slows down rod drop times. This problem extended a March outage by several days and will require periodic shutdowns for rod drop timing tests. At Oyster Creek, repetitive failures of Auxiliary Off Gas (AOG) components, caused a significant decrease in availability. Installation of additional steel bracing in the Oyster Creek Reactor Building improved the capability to withstand high winds in order to meet current design criteria. Loose bolts and improperly installed beams (probably initial construction deficiencies) were discovered in the course of the job and corrected.

2.4 TECHNICAL SUPPORT

Technical support for plant operation and maintenance activities has generally been good and responsive to plant needs. Creation of a System Engineer group at Oyster Creek in early 1993 has produced greater focus on equipment problems. System Performance Teams have provided long-term action plans for improvement of system operation or correction of design deficiencies.

Headquarters personnel have become more sensitive to promptly informing plant personnel of deficiencies uncovered in design reviews, and in providing support in operability and reportability determinations.

Several water chemistry challenges at Oyster Creek (e.g., loss of primary path for reactor water sampling, copper blocking of the Electrochemical Potential Monitoring System (ECPMS), and increased activity due to contamination in the waste processing stream) were promptly and effectively addressed. Also, efforts to improve reactor water quality continued with adjustments in cleanup system flow and installation of high-efficiency iron removal resins in two condensate demineralizers.

There are still areas needing improvement. Several long-term deficiencies in radiation monitoring instruments at TMI-1 (e.g., overresponse of the Waste Gas Decay Tank effluent monitor;

electrical separation of the Station Vent monitor and its backup) have not been resolved. Additional problems requiring resolution have been identified during the evaluations.

An NRC inspection at TMI-1 noted weaknesses in the quality and timeliness of some technical evaluations, namely, the leaking reactor safety valve, improper setpoints of reactor safety valves, leakage of a core flood tank check valve, and motor operated valve failures following modifications. At Oyster Creek, inadequate technical review of a job order for feedwater calibration led to a plant transient.

Licensing personnel implemented a computer application to make Technical Specifications and Final Safety Analysis Reports more accessible to technical and safety reviewers. On a few occasions of reduced availability of dilution pumps, Environmental Licensing personnel at Oyster Creek contacted state regulators and obtained relief from certain requirements in order to minimize the effects both on plant operation and on marine life.

2.5 TRAINING

Training organizations at both sites continued to provide good support.

Preparations for reaccreditation of Oyster Creek training programs by the Institute for Nuclear Power Operation (INPO) were very thorough. The review of the initial group of programs in March appeared to indicate that the process would be successful.

The TMI-1 simulator was used effectively in March to evaluate procedures and prepare operators for the shutdown without pressurizer spray.

The GPUN response to NSCC concerns about the simulator models for radiation monitoring systems provided assurance that efforts to improve and fine-tune these models will continue. The Committee noted that Oyster Creek simulator personnel were able to produce realistic response and indication from these models during the annual emergency plan drill.

2.6 RADIOLOGICAL CONTROLS

Both sites performed well in meeting 1993 annual goals for cumulative exposure; however, the TMI-1 10R goal was exceeded. Challenging goals have been established for 1994. Aggressive planning and subsequent review of work activities by radiological engineers with a view to minimizing exposure have been noted.

There were five instances of failure to control access to High Radiation Areas during the 10R Outage, resulting in an NOV from the NRC. Confusion between contaminated area and radiation area

controls resulted in one occurrence at Oyster Creek in which workers entered a High Radiation Area without proper dosimetry.

Implementation of new 10 CFR 20 requirements for control of radiation was very smooth at both sites. This reflected the considerable planning and preparation for the transition.

There were initiatives at both sites to minimize the effect of radiological controls on plant activities. The majority of the radiation monitors at TMI-1 are being tied into the plant computer. This will allow retirement of several antiquated control room recorders and reduce maintenance. Oyster Creek has reduced the number of radiologically posted areas based upon successful decontamination efforts, and it plans to implement a computer-controlled automated check-in system to eliminate delays in entering and exiting the radiologically controlled area.

The response to the NSCC concern in Semiannual Report No. 19 regarding controlling iodine releases during the 10R Outage did not fully address the matter. Subsequent discussions between the NSCC Staff and plant management clarified the issue.

2.7 EMERGENCY PREPAREDNESS

Oyster Creek conducted a successful graded annual exercise in October. Quarterly drills were also conducted at each site.

As a follow-up to the February 1993 intrusion event at TMI, the GPUN Emergency Plan was revised to provide guidelines on implementation of 10 CFR 50.54(x). While some training has been given to senior Emergency Response personnel, specific guidance required by the Emergency Plan has not been incorporated into site implementing procedures.

Also, the annual QA Audit of the Emergency Preparedness program found that 10 CFR 20 revisions were inadequately incorporated into the Emergency Plan implementing procedures at Oyster Creek.

3.0 ACTIVITIES OF COMMITTEE AND STAFF

3.1 GENERAL

There were no changes in Committee membership during this period.

Planned rotation of one GPUN person from the Oyster Creek Staff to the plant occurred in December. The Staff at each site now consists of one contractor and two GPUN personnel (one professional and one administrative). In accordance with GPUN plans for improved efficiency and consolidation of oversight functions, future reductions in the number of GPUN personnel may be considered as long as the independence and effectiveness of NSCC oversight can be assured.

The NSCC guides the NSCC Staff's investigations and approves its schedules and expenditures. Staff activities involve both routine monitoring and special reviews. Routine monitoring covers all functional areas at each site and at corporate headquarters. A long-range schedule of monitoring activities is developed every 6 months, and it is revised monthly to reflect Staff activities and Committee requests, or as plant events or industry occurrences dictate. The Committee reviews various sources of information noted in Exhibit 1. On occasion these reviews result in special tasks for the Staff.

3.2 COMMITTEE ACTIVITIES

In addition to the activities described above, the Committee meets with the GPUN Board of Directors at scheduled meetings and reports on any items of significance with respect to safety or compliance. Questions or concerns arising between board meetings may be directed to the Chairman of the Board or the President of GPUN. The NSCC Staff also holds periodic meetings with GPUN executives to present overall observations on plant activities, that is, observations not limited to safety and compliance. The Committee meets with members of the Staff prior to the meetings of the Board of Directors. Between meetings, there is a regularly scheduled conference call to discuss the status of each plant.

The meetings of the NSCC and its staff frequently include presentations by, and discussions with, selected GPUN personnel on subjects of interest to the Committee. During this report period, discussions were held with the Vice-President/Director, Oyster Creek; the Vice-President/Director, TMI-1; the Director, Independent Safety Review; and the Oyster Creek Maintenance Director. Additionally, in October, representatives of the Oyster Creek Operator Training section presented an overview of Oyster Creek safety systems.

Committee members toured the TMI-1 and Oyster Creek sites in conjunction with meetings of the Board of Directors and General Office Review Boards (GORB).

3.3 STAFF ACTIVITIES

The Staff, which is permanently stationed at the TMI and Oyster Creek plants, gathers information on plant activities from many sources: plant tours; the monitoring of activities; attendance at meetings; interviews with GPUN personnel; and reviews of reports, correspondence, and other documents. Plant operations and maintenance activities receive primary attention, but support functions are also evaluated. The NSCC Staff has expertise in management, operations, maintenance, engineering, licensing, training, radiological controls, environmental controls, quality assurance, and emergency preparedness.

Evaluations during this report period concentrated on the areas and activities described in Section 2.0. Information sources to which the Staff avails itself and a list of activities and information sources used in the Staff evaluations are presented in Exhibit 1. GPUN personnel contacted during this period are indicated in Exhibit 2.

EXHIBIT 1

NSCC STAFF ACTIVITIES/INFORMATION SOURCES
(both TMI-1 and OC unless otherwise noted)

PLANT TOURS

General walkthroughs/housekeeping observations
Off-Shift tours
Control Room observations
Maintenance observations
Surveillance Test observations
Radwaste Handling observations
Emergency Drill observations

MEETINGS

Production Planning meetings
Plant Review Group (PRG) meetings
Daily Plant Status meetings
Outage Planning meetings
NRC Entrance/Exit meetings
INPO Training Evaluations
*GORB meetings
Post-Trip Review Group meetings
Critiques
Radiological Awareness Committee meetings (OC)
Project Review meetings (OC)
Department/Section Staff meetings (OC)

DOCUMENT REVIEW

GPUN Sources

*Plant Incident Reports (TMI-1)
Plant Review Group meeting minutes
*Deviation Reports (OC)
*Licensee Event Reports
*Incident Critiques
Station Action Item Tracking System
*Licensing Correspondence
*Significant Events Reports
*Off-Shift Tour Reports

*Denotes information reviewed by the NSCC

EXHIBIT 1
(Continued)

QA Audit Reports
*QA Assessment Reports (Monthly and Annual)
*QA Quarterly Trend Reports
Operations QA Monitoring Reports
STA Daily Reports
Operations Night Order Book
Log Books (Operations, STA, Chemistry, Maintenance, Radwaste)
*Independent Safety Review Annual Safety Assessment Report
Design Basis Documents
Shift Turnover Forms
MNCRs, QDRs
Radiation Awareness Reports
*Post-Trip Review Group Reports
*Transient Assessment Reports
Maintenance Job Order Packages
GPUN Administrative Policies and Procedures
Station Procedures (e.g., Admin., Operations, Maintenance)
Division Procedures (e.g., Rad Con, Tech. Functions)
Operations QA Plan
Technical Specifications
Training System Descriptions
Training Lesson Plans
Plant Drawings
*IOSRG Evaluation Reports
*GORB Meeting reports
Potential Safety Concerns
Licensing Action Items
*HPES Reports
Technical Data Reports
Calculations and Verifications
Field Questionnaires/Change Notices
Failure Trend Reports

Databases Reviewed

Computer Assisted Records & Info Retrieval System (CARIRS)
Generation Maintenance System II (GMS-2)
Material Inventory Control System (MICS)
Purchasing System (DKPS)
Nuclear COMEC (NCOMC)
Quality Assurance (NQMI)
Nuclear Material Management System (NMMS)
Technical Functions Work Requests (TFWR/TFAAI)
Plant Engineering Work Requests (PEWR/PETA)

*Denotes information reviewed by the NSCC

EXHIBIT 1
(Continued)

Other Sources

- *NRC Notices and Bulletins
- *NRC Generic Letters
- *NRC Regulatory Guides and NUREGs
- *NRC SALP Reports
- *NRC Inspection Reports
- *INPO Evaluation Reports
 - INPO Guides
 - ANSI Standards
 - ASME Codes
 - Code of Federal Regulations (10 CFR)
- *Industry Periodicals (e.g., Inside NRC, Nucleonics Week)
- *INPO Nuclear Power Plant Operational Data Report
 - Nuclear Network

*Denotes information reviewed by the NSCC

EXHIBIT 2

PERSONS INTERVIEWED/CONTACTED
DURING REPORT PERIOD

SITE PERSONNEL (both TMI-1 and OC unless otherwise noted)

Vice President/Director
Vice President, Saxton, NEC
Operations and Maintenance Director
Plant Operations Director (TMI-1, TMI-2)
Plant Maintenance Director
Plant Engineering Director
Site Services Director
Department Managers, Supervisors, and personnel
Plant Operations/Radwaste/Chemistry
Plant Materiel/Maintenance
Site Services
Plant Engineering
Logistical Support
Plant Review Group
IOSRG
Engineering and Design
Engineering Services
Licensing
Systems Engineering/Plant Analysis (STA)
Engineering Projects
Startup and Test
Training and Education
Quality Assurance
Emergency Planning
Radiological and Environmental Controls
Nuclear Safety
Construction
Outage Management

CORPORATE PERSONNEL

Vice-President, Technical Functions
Vice-President, Nuclear Assurance
Director, Radiological and Environmental Controls
Director, Independent Safety Review
Managers and other personnel
Licensing
Training and Education
Systems Engineering/Plant Analysis
Quality Assurance
Engineering and Design
Site Services