SALP REPORT - NINE MILE POINT

50-220/93-99 & 50-410/93-99

I. BACKGROUND

The SALP Board convened on February 9, 1995, to assess the safety performance of Nine Mile Point (NMP) Units 1 and 2 for the period August 15, 1993 to January 28, 1995. The Board was conducted pursuant to NRC Management Directive (MD) 8.6 (see NRC Administrative Letter 93-02). Board members were Richard W. Cooper, II (Board Chairman), Director, Division of Reactor Projects, NRC Region I (RI); Susan F. Shankman, Deputy Director, Division of Radiation Safety and Safeguards, NRC RI; A. Randolph Blough, Acting Deputy Director, Division of Reactor Safety, NRC RI; and Ledyard B. Marsh, Director, Projects Directorate I-1, NRC Office of Nuclear Reactor Regulation. The Board developed this assessment for approval of the Region I Administrator.

The performance category ratings and the assessment functional areas used below are defined and described in NRC MD 8.6, "Systematic Assessment of Licensee Performance (SALP)."

II. PERFORMANCE ANALYSIS - OPERATIONS

Plant Operations was rated as Category 2 in the previous SALP period. Overall performance improved over the period, and was characterized by increased management involvement and continued strong performance of operators in response to plant events. However, recurring problems were identified regarding attention to detail, weak communications, and poor understanding of the impact of planned actions.

During this SALP period, overall performance in the Operations area continued to improve. Operators continued to perform very well in response to transients and events that required operator action. In each of these instances, command and control by the operating crews were excellent. For example, in August 1994, Unit 2 operators recognized and took the proper compensatory measures for a problem that resulted in their inability to manually move control rods. In September 1994, Unit 2 operators responded promptly to an increasing level in the scram discharge volume, preventing an unneccesary automatic scram from occurring. More recently in November 1994, Unit 1 operators responded well to a reactor scram during Instrumentation and Control surveillance testing.

Although the initial training program for licensed operators exhibited some weaknesses early in the SALP period, the licensee took corrective action that resulted in program improvements in the last half of the period. Management involvement and oversight, particularly in the Unit 2 requalification program, yielded an effective licensed operator requalification program at both units. The effectiveness of the training program was evidenced by enhanced operator knowledge of plant systems and the excellent manner in which operators responded to plant events. A strong relationship between the Operations and Training organizations, as well as the use of post-event debrief training, contributed to training program effectiveness. Station management exhibited strong support of Operations by instituting the use of hand-held rounds computers that resulted in increased attention to parameters outside the normal range and enhanced trending capabilities.

cc w/encl:
L. Storz, Vice President - Nuclear Generation
C. Terry, Vice President - Nuclear Engineering
M. McCormick, Vice President, Safety Assessment & Support
R. Abbott, Unit 1 Plant Manager
K. Dahlberg, Unit 2 Plant Manager
D. Wolniak, Manager, Licensing (Acting)
J. Warden, New York Consumer Protection Branch
G. Wilson, Senior Attorney
M. Wetterhahn, Winston and Strawn
Director, Energy & Water Division, Department of Public Service, State of New York
C. Donaldson, Esquire, Assistant Attorney General, New York Department of Law
The Chairman
Commissioner Rogers
Commissioner de Planque
Institute for Nuclear Power Operations (INPO)
D. Screnci, PAO (27)
State of New York, SLO Designee

Operators exhibited a good questioning attitude that resulted in early identification of degraded equipment conditions, thus averting the occurrence of plant transients. For example, in July 1994, a Unit 1 operator noted arcing on one of the recirculation pump motor generators that allowed a controlled shift to four-loop operation with minimal impact on the plant. Additionally, in August 1994, Unit 2 operators recognized that a reactor building high temperature alarm failed to initiate the automatic closure of several containment isolation valves, which was later discovered to have been caused by a faulty alarm relay that did not actually affect the valves' isolation function.

The Operations department strongly supported and utilized self assessments and the Quality Assurance department, particularly in the last half of the SALP period, to identify weaknesses in both plant operations and operator training programs. Responses to audit findings by line management were timely and comprehensive. Specifically, the Unit 2 Operations Department was particularly strong in the dispositioning of Deviation/Event Reports.

Although there were a few instances of personnel error by operators over the SALP period, they were generally of an isolated nature, relatively infrequent, and of low safety significance. In the case of Unit 2, two operator errors occurred early in the period during the refueling outage, with one resulting in the bending of the refueling bridge main mast and the other resulting in a temporary loss of division II emergency switchgear. In the case of Unit 1, a licensed operator misinterpreted a procedure step and caused bearing damage to a control rod drive pump. Also late in the period at Unit 1, over a two-week period, four valves were found to be mispositioned, although this condition did not have an adverse safety impact on the plant. The licensee quickly reviewed the mispositioning events for broader performance implications and trends. Although no adverse performance trend was identified, the licensee implemented corrective actions to resensitize the operators to the importance of maintaining configuration control.

In summary, overall performance in Operations improved this period. Licensed operator training enhancements resulted in continued effective response to events by operators, enhanced system knowledge, and improved on-shift communications. Self assessment initiatives, coupled with effective utilization of the Quality Assurance department, resulted in the identification of weaknesses and areas for improvement that were effectively and timely dispositioned by Operations, thereby contributing to performance improvement. Station management exhibited strong support for Operations by instituting the computerized rounds system. Although there were a few instances of personnel errors by operators over the SALP period, they were generally of low safety significance, infrequent, and unrelated.

The Operations area is rated as Category 1.

III. PERFORMANCE ANALYSIS - ENGINEERING

In the previous SALP, the licensee's performance was rated as Category 1. The engineering organization demonstrated a strong interface with site activities and other plant departments. Management oversight was very evident in support of station activities. Engineering evaluations were found to be technically accurate, thorough, and of high quality. Exceptions identified were isolated and promptly corrected.

During this period, strong management oversight was evident in engineering activities. The engineering and technical support groups both made significant progress in the backlog reduction program. The number of outstanding permanent and temporary modifications was substantially reduced. However, a number of longstanding temporary modifications (i.e., over several years old) remained at Unit 2; even though no adverse safety impact was identified from any of the longstanding temporary modifications, the increased rigor of a permanent modification review or repair would provide improved assurance in the design. Good communication existed between the engineering group and the plant operations and maintenance personnel.

Both the engineering and technical support staffs generally performed well and generated high quality work in the resolution of significant plant problems. Plant modifications were technically sound and of good quality. The safety evaluations, design input, and technical reviews were thorough. The root cause investigations for the deviation/event reports (DER) were thorough and technically accurate. The evaluations of generic technical issues were thorough and of good quality. Engineering analyses for electrical open items were comprehensive, and of good quality, and the corrective actions for these items were appropriate. The engineering staff effectively implemented a program to deal with the corrosion of the Unit 1 torus and corrosion residue on containment and core spray components.

Despite the generally strong performance noted above, there were a number of instances of low-quality engineering work or poor engineering judgements indicating inconsistency in the quality of engineering work. These problems were more evident in this SALP period than in the previous one. For example, a Unit 1 hydrogen and oxygen monitoring system modification was ineffectively coordinated, requiring a second plant modification to make the system functional. Also, a poor engineering review was accomplished during the disposition of a deficiency report associated with the alternate shutdown cooling mode of the Unit 2 residual heat removal system. The Unit 2 standby gas treatment system had excessive unavailability during most of the period, and NMPC was slow resolving the problem until the NRC noted the high unavailability. Engineering was slow to resolve a longstanding problem of electrical noise interference with the Unit 1 neutron monitoring system that required compensatory measures by licensed operators during reactor startups.

The engineering staff generally produced good quality technical analyses in support of licensing documents. However, there were several instances where the quality and timeliness of licensing requests could be improved. Weaknesses were noted in the completeness of environmental assessments for the Unit 2 power uprate license amendment request and in exemption requests; this was a repetition of a weakness identified in the previous SALP. Weaknesses were also noted in the timeliness of submitting license amendment requests and ASME Code relief requests.

NMPC implemented a self-assessment program to determine the performance of nuclear engineering and technical support groups, and to identify strengths and weaknesses for the engineering and the technical support group to improve their performance. The self-assessment conducted by NMPC for the electrical distribution system was comprehensive and of high quality. In addition, the quality assurance (QA) group was actively involved, through QA audits, in identifying strengths and weaknesses of engineering performance. The QA audits were in-depth and of good quality. The DER program provided an

effective process to identify, document, evaluate, correct, and trend conditions and concerns that can affect plant operation and plant safety.

NMPC had a comprehensive training program for their engineering and technical support personnel. The engineering and technical support personnel were technically competent and showed good safety perspective. The engineering organization completed the last round of staff right-sizing and relocated their offices to the plant site. This transition was accomplished smoothly.

In summary, management provided strong oversight of engineering activities. The quality of most engineering work was very good, but there were significant lapses. Evaluations of deviations were thorough and technically sound. Engineering and technical support personnel were competent and well-trained. However, weaknesses were noted in the timeliness of submittal of license amendments and code relief requests, and incomplete environmental assessments in licensing submittals continued as a weakness from the last SALP period.

The engineering area is rated as Category 2.

IV. PERFORMANCE ANALYSIS - MAINTENANCE

In the previous SALP, Maintenance was rated as Category 2. An overall improvement in maintenance and surveillance was noted compared with the previous SALP period with corrective maintenance being observed as a strength. Weaknesses in post maintenance testing (PMT) and instances of inattention to detail were noted to be challenges.

During this assessment period, efforts by NMPC management were properly focused on both worker safety and public health and safety. During both planned and unplanned outages, the management team effectively coordinated maintenance and accomplished a variety of safety significant work successfully. For example, NMPC demonstrated an excellent safety perspective in its decision to inspect the Unit 2 core shroud during a window of opportunity in RF03, even though there was no existing regulatory requirement to perform the inspection at that time. Inspection and replacement of the Unit 2 emergency diesel generator (EDG) master power connecting rod and a carefully planned and executed repair of a leaking valve bonnet were other examples of excellent responses to safety concerns.

NMPC's efforts to properly maintain the material condition of the units was effective. Material Condition of both units was excellent and there were very few instances of valve packing or seal leaks in either unit. NMPC was effective in the resolution of problems caused by poorly performing equipment. For example, the troublesome Unit 2 air compressors were replaced by new design compressors and installation of new design seals in the Unit 2 feedwater pumps appeared to have resolved a long standing performance problem with those pumps.

NMPC developed and implemented good programs and procedures for performing maintenance. These programs and procedures were effective in reducing maintenance backlogs to below challenging goals, controlling emergent work during outages, excluding foreign material from safety-related fluid systems, managing temporary modifications, and implementing the inservice testing (IST) and motor operated valve (MOV) programs. The development and implementation of the Maintenance Performance Principles was a significant and worthwhile

effort. However, in certain instances, implementation of these programs and procedures was not fully effective. For example, a reactor scram occurred at Unit 1 due to inadequate peer review and self-checking to ensure the correct instrument channel was selected for a surveillance test, poor work practices resulted in foreign material in a Unit 2 safety relief valve (SRV) air line which caused a forced shutdown, and repeated personnel errors led to several plant transients. Although the quality of maintenance at NMP was generally good, continuing maintenance technician errors detracted from the overall quality of maintenance program implementation.

The identification of problems and their resolution were generally good. The licensee used periodic self evaluations to identify and resolve weaknesses in programs and performance. The weaknesses in PMT noted in the last SALP report were eliminated. However, the evaluation of problems identified on Unit 1 maintenance DERs lacked the depth and detail demonstrated by other departments and several DERs did not fully address the initial problem or had corrective actions that were symptom-oriented and failed to address the root causes.

Generally there was good management involvement and good coordination among the various departments involved in performing work in the two units. For high priority jobs or those that might cause a plant shutdown if not completed in a timely manner, supervisors and managers were frequently at the job sites providing coaching and appropriate oversight. Safety significant plant issues were conveyed to the appropriate organizations in a timely manner. However, several personnel errors occurred due to poor supervisory oversight and craft workers' failure to properly implement management's expectations regarding self checking and peer review. For example, a single control rod scrammed at Unit 1 due to poor work practices by an I&C technician working on a control rod hydraulic control unit and Unit 1 scrammed due to an I&C technician selecting an improper channel during recirculation flow loop calibration.

In summary, NMPC established good programs and procedures for the performance of maintenance at Nine Mile Point. However, weaknesses in the conduct of maintenance activities and poor supervisory oversight resulted in a continuation of periodic personnel errors, and inattention to detail remained a challenge. Peer review and self-checking were not always effective in preventing personnel errors by maintenance personnel, thus continuing to cause plant events that challenged operators.

The Maintenance area is rated as Category 2.

V. PERFORMANCE ANALYSIS - PLANT SUPPORT

The Plant Support functional area covers all activities related to Plant Support functions including radiological controls, chemistry, emergency preparedness (EP), security, fire protection, and housekeeping controls.

In the previous SALP, Plant Support was a Category 2. Overall, the plant support functions continued to be effective. Improved performance was noted in the " As Low As Reasonably is Achievable" (ALARA) program; however, weaknesses in radiological area access controls continued. Significant improvements were made in radiological waste (radwaste) systems. Transportation and radwaste performance remained strong and radiological effluent monitoring and control programs were excellent. Areas for

improvement were noted in the emergency preparedness and security areas. In emergency preparedness, problems were noted in timeliness of communications with the NRC and completeness of turnover of functions from the control room to the Emergency Operations Facility (EOF) and the EOF habitability evaluation. In security, a decline in security plan implementation was noted.

During this SALP period, overall performance in the Plant Support area remained at the same level. Management support and oversight of the programs in the Plant Support area remained effective. Support for program improvement included significant staffing changes at both units, including a new Radiation Protection Manager at Unit 2 and a new Emergency Preparedness Manager, and organizing the designated emergency responders into teams. Weaknesses noted in the last SALP period were addressed, but in the security and emergency preparedness programs, different concerns were identified.

The ALARA program at both units remained a strength, with significant improvements in reducing the Total Effective Dose Equivalent for personnel at Unit 1 and Unit 2. Training of radiation protection and radwaste personnel continued to be effective and the licensee used this training program to aid in the successful implementation of the revisions to 10 CFR 20. In-depth, performance based audits and surveillances were conducted by the licensee's Quality Assurance Department (QA) in support of radiation protection and radwaste activities. Late in the period, special QA audits and surveillances aided in addressing radiation protection deficiencies for Unit 1.

Radwaste and transportation performance were enhanced by improved plant water quality which resulted in a significant reduction in the volume of radwaste generated. The licensee also effectively reacted to the loss of access to offsite radwaste disposal by the successful conversion of existing plant facilities for use as interim radwaste storage.

Radiological housekeeping was generally good with significant improvement at the end of the assessment period. In particular, early in the period, radiological housekeeping problems were noted at Unit 2 following RFO-03, a recurrence of problems noted initially during RFO-01, but successfully addressed in RFO-02. These problems resulted in a large backlog of contaminated outage equipment being stored on the refueling floor for an extended period of time after the conclusion of the outage. However, radiological housekeeping at Unit 1 was maintained at a high level throughout the period and was significantly improved late in the assessment period at Unit 2, particularly in the Radwaste Building and on the refueling floor.

The NRC identified instances of poor radiological control program performance in two areas. Of concern were instances of poor control of workers in the radiological controlled area. The worker control concerns resulted from improperly written Radiation Work Permits, issuance of out-of-calibration electronic dosimeters, and improper radiological postings. Also noted was a failure to clearly communicate between Operations and Radiation Protection at Unit 2 that led to an improper entry into a locked high radiation area. The licensee instituted timely and appropriate corrective actions, such as a new access control system, however, the effectiveness of these actions has yet to be evaluated.

Changes to the emergency preparedness area resulted in the streamlining of the Emergency Plan and the emergency preparedness implementing procedures.

Further, job performance measures were instituted to evaluate emergency preparedness training. Overall, these and other changes resulted in a good emergency preparedness program. However, during the October, 1994 exercise, two weaknesses were noted in which training deficiencies may have been significant contributing factors. First, when the event scenario escalated to the Alert level, the communication aide failed to activate the pager system. In an off-hours response, this may have delayed the emergency response facilities from being staffed within the required one-hour timeframe. Another weakness involved an input error to the dose projection computer program, resulting in an improper protective action recommendation. In an actual event, this error might have caused unnecessary evacuation of the nearby population. The licensee took significant and appropriate corrective actions which were assessed by the licensee in drills as effective. The effectiveness of these actions will be evaluated by the NRC in the next EP exercise.

The security program continued with overall good performance. However, the NRC identified several problems in the security program: deficiencies in the licensee's defensive strategy, not conducting contingency drills regularly, less than adequate measures to protect safeguards information, and a failure to control escorted visitors. Corrective actions for these issues were assessed as adequate.

Fire protection program implementation continued to be effective, with positive initiatives toward increasing system reliability and thorough critiques following drills. However, areas for improvement were noted earlier in the period and personnel errors were noted in the site fire department late in the period.

In summary, Niagara Mohawk's effort resulted in overall good performance in support of plant operations. A good radiological control program continued, including further excellent improvements in the ALARA program at both units, as well as continued excellence in the radiological environmental monitoring program and the radioactive liquid and gaseous effluent control programs. Performance weaknesses were identified in the areas of emergency preparedness (communication to responders for emergency response, and dose calculation as the basis for protective action recommendations for emergency preparedness) and security (protection of safeguards information and performance of contingency drills). Fire protection and housekeeping generally were good.

The Plant Support area is rated as a **Category 2.**