

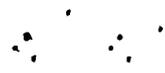
Evaluation
Report

March 1982

Nine Mile Point
Nuclear Station
Unit One
Niagara Mohawk
Power Corporation

INPO

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EVALUATION

of

NINE MILE POINT NUCLEAR STATION - UNIT ONE

Niagara Mohawk Power Corporation



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SUMMARY

INTRODUCTION

The Institute of Nuclear Power Operations (INPO) conducted its first evaluation of Niagara Mohawk Power Corporation's (NMPC) Nine Mile Point Nuclear Station, Unit One (NMP-1), during the weeks of August 24 and August 31, 1981. NMP-1 is a 610 Mw net General Electric boiling water reactor. The station is located on the southeast shore of Lake Ontario, seven miles northeast of Oswego, New York. NMP-1 began commercial operation in December 1969. Unit Two is under construction.

PURPOSE AND SCOPE

INPO conducted an evaluation of site activities to make an overall determination of plant safety, to evaluate management systems and controls, and to identify areas needing improvement. Information was assembled from discussions, interviews, observations, and reviews of documentation.

The INPO evaluation team examined station training, operations, maintenance, radiological and chemistry activities, on-site technical support, and organization and administration. The team also observed the actual performance of selected evolutions and surveillance testing. Corporate activities were not included in the scope of the evaluation, except as an incidental part of the station evaluation. As a basis for the evaluation, INPO used performance objectives and criteria relevant to each of the six areas examined; these were applied and evaluated in light of both the experience of team members and INPO's observations of good practices within the industry.

INPO's goal is to assist member utilities in achieving the highest standards of excellence in all phases of nuclear plant operation. The conditions found in each area are compared to best practices, rather than to minimum acceptable conditions or requirements. Accordingly, areas where improvements are recommended are not necessarily indicative of unsatisfactory performance.

DETERMINATION

Within the scope of this evaluation, the team determined that the plant is in acceptable material condition and is being safely operated by qualified personnel.

Certain beneficial practices and accomplishments were noted:

The station has been a leader in reliability and capacity factor. Plant reliability is enhanced by a commitment to outage preventive maintenance tailored to increase the reliability of important equipment through the subsequent operating cycle.

Discharge of liquid radioactive waste has been near zero for the last two years.

Substantially more than the minimum number of operators hold licenses; licensed operators are rotated between control room and in-plant positions.

Prompt review of lifted leads, jumpers, and blocks by the Site Operations Review Committee has provided effective control of temporary plant modifications.

Improvements were recommended in a number of areas. The following are considered to be among the most important:

There is a need for more active involvement of senior station management in day-to-day plant operations and maintenance.

Improvements in operations shift turnover practices and control room operator attentiveness are needed.

Additional effort should be applied to reduce surface radioactive contamination levels and to improve measures to protect personnel from radioactive contamination.

Improvements are needed in the program for reviewing problems experienced at other plants and determining the appropriate actions to minimize the probability of similar problems at Nine Mile Point.

In each of the six areas evaluated, INPO has established PERFORMANCE OBJECTIVES and supporting criteria. All PERFORMANCE OBJECTIVES reviewed during the course of this evaluation are listed in the APPENDIX.

Findings and recommendations are listed under the PERFORMANCE OBJECTIVES to which they pertain. Particularly noteworthy conditions that contribute to meeting PERFORMANCE OBJECTIVES are identified as Good Practices. Other findings describe conditions that detract from meeting the PERFORMANCE OBJECTIVES. It would not be productive to list as Good Practices those things that are commonly done properly in the industry since this would be of no benefit to NMPC or to INPO's other member utilities. As a result, most of the findings highlight conditions that need improvement.

The recommendations following each finding are intended to assist the utility in ongoing efforts to improve all aspects of its nuclear programs. In addressing these findings and recommendations the utility should, in addition to correcting or improving specific conditions, pursue underlying causes and issues.

The findings listed herein were presented to NMPC management at an exit meeting at the plant on September 3, 1981. Findings, recommendations, and responses were reviewed with NMPC management on October 19 and 20, 1981. NMPC responses are considered acceptable.

To follow the timely completion of the improvements included in the responses, INPO requests written notification of status six months from the date of this report.

The evaluation staff appreciates the cooperation received from all levels of Niagara Mohawk Power Corporation.

E. P. Wilkinson
President

NIAGARA MOHAWK POWER CORPORATION**Response Summary**

The Niagara Mohawk goal for all phases of nuclear power station operation is to achieve the highest standards of excellence. We firmly endorse the performance objectives against which INPO evaluated the Nine Mile Point Nuclear Station.

We are pleased to note that the INPO evaluators cited an unusually high number of good practices for this type of evaluation. Two that we are particularly pleased with are (1) OP.2-1 finding, concerning the drawings throughout the plant, and (2) OP.2-2 finding, concerning the color codes on the strip chart recorders. We have found both of these to be big assets to operations. We further believe that our responses will indicate that we are making substantial progress toward achieving excellence in the balance of the objectives.

Constructive improvements were recommended for a substantial number of the objectives. Our response for each specific finding has indicated positive actions. Continued attention by station management toward the effective application of management controls and adherence to approved procedures is essential to achieving superior operation. We as individuals and as a company are committed toward sustaining a high level of excellence in station safety, reliability, and performance.

TRAINING AND QUALIFICATION

TRAINING ADMINISTRATION

PERFORMANCE OBJECTIVE: Ensure that activities necessary to initiate and control personnel qualification programs are accomplished in a well-defined, coordinated, and effective manner.

Finding
(TQ.2-1)

A Good Practice was noted in the structured program that is used to periodically evaluate all of the training instructors. Written evaluations, tailored to address the qualifications and effectiveness of instructors, are performed by the Station Training Superintendent or his designee. The evaluations address instructor preparation, presentation and motivation skills, and overall effectiveness. The results are reviewed personally with each instructor to ensure understanding and to guide performance improvement efforts.

TRAINING FACILITIES AND EQUIPMENT

PERFORMANCE OBJECTIVE: Provide the training facilities, equipment, and materials for development and evaluation of knowledge and skills needed by nuclear plant personnel.

Finding
(TQ.3-1)

Classroom facilities and scheduling need improvement. Only two small classrooms are permanently assigned for training. Other rooms available are not well suited for training. Scheduling of classrooms needs improvement to permit adequate instructor planning and preparation. It is understood that efforts are in progress to provide additional temporary training facilities in the near future and to include permanent classrooms in a planned simulator/training facility near the site.

Recommendation

Scheduling of training sessions, including locations, should be completed well in advance. Plans to provide improved temporary and permanent facilities should be pursued.

Response

Lease arrangements have been made for a temporary training facility. Necessary renovations along with concurrent occupancy will take place by January 15, 1982. Authorization has been obtained for procurement of a multi-million dollar simulator and a general training facility to be available in approximately three

years. All training sessions will be scheduled, including those in the temporary facilities.

LICENSED OPERATOR TRAINING

PERFORMANCE OBJECTIVE: Develop the skills and knowledge necessary for licensed operators to perform their assigned job functions.

Finding
(TQ.5-1)

The following Good Practice was noted: The Nine Mile Point Training Manual contains a thorough checklist of study assignments, plant and procedure knowledge requirements, and system and equipment operations that operators must complete during each phase of their training. The manual effectively guides candidates in achieving proficiency in plant operations and in preparing for license examinations. It also provides a permanent record of the training and qualification steps that have been completed and signed off by qualified personnel.

LICENSED OPERATOR REQUALIFICATION TRAINING

PERFORMANCE OBJECTIVE: Maintain the skills and knowledge necessary for licensed operators to perform their assigned job functions.

Finding
(TQ.6-1)

The following Good Practice was noted: The licensed operator requalification training schedule covers the complete requalification cycle and contains key information to aid both instructor and student preparations, including topical coverage and study assignments for each training day. The schedule is published in advance of each requalification cycle.

MAINTENANCE PERSONNEL TRAINING

PERFORMANCE OBJECTIVE: Develop and maintain the skills and knowledge necessary for maintenance personnel to perform their assigned job functions.

Finding: (TQ.8-1)	The training program for mechanics and electricians consists primarily of generic specialty training. Training on plant systems and equipment needs improvement. As an example, many maintenance personnel have insufficient knowledge to check the adequacy of markups (tagouts) placed on equipment in preparation for work.
Recommendation	Training programs for mechanical and electrical maintenance personnel should be expanded to include training on plant systems and equipment, similar to the training being given the I&C technicians.
Response	Training programs for mechanical and electrical maintenance personnel have been planned and will be expanded to include training on plant systems and equipment by April 1, 1982.

OPERATIONS

OPERATIONS FACILITIES AND EQUIPMENT

PERFORMANCE OBJECTIVE: Provide plant facilities and equipment that are operated and maintained at a level to support safe and efficient operation.

Finding
(OP.2-1)

The following Good Practice was noted: Controlled copies of system drawings are located throughout the plant to provide an accurate reference near the point of use. These drawings are mounted under hinged plastic covers to prevent damage to the drawings and to permit easy reference and replacement.

Finding
(OP.2-2)

The following Good Practice was noted: Recorder charts are pre-printed with scales and parameters in the same color as the trace, enhancing the readability of the charts.

Finding
(OP.2-3)

Some plant valves and equipment are not labeled with clear, permanent, and distinguishable markings.

Recommendation

Revise the equipment labeling program as necessary and take action to mark valves and equipment with permanent, easily read labels.

Response

Originally, all valves in the station shown on piping and instrumentation diagrams were labeled with metal tags. However, there are many new valves (mostly fire protection) that need labeling. An audit of current valve labels will be made, and metal tag labels will be installed wherever required. Equipment will also be labeled to permit easy identification. Labeling will be completed outside high radiation areas by the end of 1982. Labeling inside high radiation areas will be completed by the end of the next refueling outage.

CONDUCT OF SHIFT OPERATIONS

PERFORMANCE OBJECTIVE: Ensure that shift operations are conducted in a safe and reliable manner.

Finding (OP.3-1)	Conduct of control room operations is not always in accordance with good operating practices. Operators, at times, engaged in conversations that distracted their attention from the control panels. Nontechnical reading material in operating spaces could also lead to distraction from operational duties.
Recommendation	Expand existing procedures and policies to provide guidance to operations personnel on proper monitoring of and attentiveness to control panels and equipment. Implement administrative controls to prevent reading of material not associated with employment or station responsibilities. Increased management attention to the supervision of control room operators appears to be warranted.
Response	Administrative Procedures will be amended by December 1, 1981, to include a statement preventing reading of material not associated with employment or station responsibilities while on duty. Station management and training personnel will include special emphasis on conduct in the control room in their regular briefing and training sessions.

PLANT OPERATIONS PROCEDURES

PERFORMANCE OBJECTIVE: Provide timely, effective guidance to operators in the form of written procedures.

Finding (OP.4-1)	Emergency operating procedures are not readily accessible for use by operators in emergency situations. They are stored in binders that cannot be readily identified from among other procedure binders. Also, these procedures could not be quickly located within their binder. During the evaluation, index tabs were added to aid in quickly locating procedures.
Recommendation	Place the emergency operating procedures in a unique binder, so they can be rapidly identified and retrieved when needed.
Response	New racks for storage of procedures have been procured and the Special (Emergency) Operating Procedures will be installed in distinguishing binders by December 1, 1981.

Finding (OP.4-2) The master copy of surveillance test procedures is not routinely updated to include temporary changes. Tests conducted prior to distribution of permanent changes could therefore be conducted without all approved changes.

Recommendation Control temporary changes to surveillance test procedures in a manner similar to that used for operating procedures.

Response Site procedures require that master and working copies of all procedures be current to include both temporary and permanent changes. This will be enforced.

PLANT STATUS CONTROLS

PERFORMANCE OBJECTIVE: Maintain plant status in a condition that ensures equipment and system availability as necessary for safe and reliable plant operations at all times.

Finding (OP.5-1) The following Good Practice was noted: Temporary modifications in the form of jumpers, blocks, and lifted leads, other than those authorized by approved procedures, are reviewed by the Station Operating Review Committee (SORC) within seven days of installation. This independent technical review promotes prompt repair or permanent modification, as appropriate. A minimum number of temporary modifications were in effect.

Finding (OP.5-2) Uncontrolled notes and instructions used as operator aids are attached to control panels and equipment at various plant locations. For example, instructions such as "Do not use" and "Suction and discharge valves closed" were posted near equipment controls, and informal operating instructions were posted on a blackboard in the Radiological Waste Control Room.

Recommendation Develop and implement a program to minimize and control the posting of labels, curves, notes, and instructions. This program should include a mechanism to ensure that any necessary posted materials remain current and reflect approved operating information.

Response Methods such as training will be established by January 1, 1982 to ensure that, when information is posted, it reflects appropriate operating information and practices. Periodic reviews by station supervision will be used to ensure that posted notes, labels, and instructions throughout the plant remain current and continue to reflect approved operating information and practices.

Finding (OP.5-3) Control room alarm annunciators are sometimes defeated without formal review and authorization. Although the defeat of alarm annunciators can effectively constitute a modification to the plant, this action is taken without using the formal review process established for lifted leads, jumpers, and blocks. Defeated annunciators are, however, listed in the back of the jumper log for operator information.

Recommendation Review and authorize all changes in the operational status of alarm annunciators using the established program for lifted leads, jumpers, and blocks or an equivalent program. Implement a requirement to clearly mark disabled alarm annunciators.

Response Defeated annunciators will come under the same record and formal review process as lifted leads, jumpers, and blocks by December 1, 1981. This will require a formal safety review within seven days, where the action is not covered in a prior approved procedure. The current practice of marking annunciator windows that have disabled inputs will be formalized.

SHIFT TURNOVER

PERFORMANCE OBJECTIVE: Ensure a continuous and correct understanding of plant conditions at all shift operating positions through proper shift turnover.

Finding (OP.6-1) Shift turnover requirements should be expanded to include several items appropriate for a complete turnover. Examples include review of defeated alarms and tagged-out equipment, and testing annunciators and status lights.

Recommendation Expand existing turnover requirements to include review of additional pertinent information for each watch station. Checksheets should be developed or expanded to ensure a thorough turnover at each watch station.

Response The shift turnover checksheet will be expanded to include review of defeated alarms and tagged-out equipment and will be reviewed to determine if other information should be added. Shift turnover checklists will be provided for all watch stations.

TAGOUT PRACTICES

PERFORMANCE OBJECTIVE: Protect personnel and plant equipment by implementing effective tagout practices.

Finding (OP.7-1) Effectiveness of the markup (tagout) system is reduced by tags that have remained active for extended periods of time. In some cases, both tags and associated tag attachment devices have deteriorated. The blue test tag system is not always used as intended, as evidenced by equipment being operated for extended periods of time with blue tags attached.

Recommendation Review administrative controls governing markups with all departments, emphasizing proper implementation. Expand the current markup procedure to include a periodic audit of active markups. The audit should include a determination of whether individual markups should remain in effect, as well as physical checks of tag condition and placement and checks of the position of tagged equipment.

Response A quarterly audit will be made of outstanding markups beginning December 1, 1981. This will include a physical check on the placement and condition of the tags and the tagged equipment as well as an evaluation of the need for each markup to remain in effect. This will correct the noted problem with blue tags.

Finding (OP.7-2) The method used to record and track active markups unnecessarily complicates review and verification of current markup status. Active markup sheets are entered in a binder, but the large number of active sheets makes review cumbersome and tends to mask missing or lost sheets.

Recommendation Implement use of a markup index sheet in the markup log.

Response Current verification of status is accomplished at shift turnover via the chief shift operator/station shift supervisor log review and control room panel observation. Periodic review of the records will be expedited by the establishment of a markup index system to be maintained by the chief shift operator. This will be in place by February of 1982.

MAINTENANCE**MAINTENANCE ORGANIZATION AND ADMINISTRATION**

PERFORMANCE OBJECTIVE: Provide a clearly defined maintenance organization that is adequately staffed, assigns responsibilities, and delegates adequate authority for the accomplishment of required tasks.

Finding (MA.1-1)	Improvements are needed in the amount of time maintenance and I&C supervisors devote to observing department work in progress and to plant tours for the purpose of detecting potential problem areas. Department heads and unit supervisors, in particular, appear to be spending an inordinate amount of time on clerical and administrative tasks. Many of these tasks have not been delegated because of the limited clerical support available and a recognized need to avoid overburdening first-line supervisors.
Recommendation	Initiate action to promote greater involvement of supervisors in department work and plant inspections. Review the work activities of the I&C and maintenance supervisory staff to identify and reassign administrative activities that do not require personal attention of these supervisors.
Response	The administrative work practices of the Maintenance Department and the Instrument and Control Department are being reviewed to provide more efficient procedures for planning, scheduling, and assigning jobs, and for producing and maintaining records. The detailed review will be completed by February 1, 1982. The implementing actions, which may include additional staffing, are planned to be completed by August 1, 1982.

MAINTENANCE FACILITIES AND EQUIPMENT

PERFORMANCE OBJECTIVE: Support the performance of maintenance activities by providing adequate facilities and equipment.

Finding (MA.2-1)	Improvements are needed in the control and availability of tools used for mechanical maintenance work. Work is often delayed or performed with improper tools because the proper tools are not readily available. Tools and equipment normally stored in the tool room are not controlled. Storage in the tool room is not well organized, adding to the difficulty of locating proper tools.
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Recommendation Implement a supervised check-out system for the tools stored in the maintenance tool room. Assign an appropriate individual the responsibility for maintaining an adequate inventory of tools in good repair.

Response The existing program of tool and tool crib inventory control is currently being reviewed. This review will be performed with the Radiological and Chemical Department to establish a general criterion for tool surveying and with the System Stores Department to establish the personnel support necessary. The reviews will be completed by April of 1982, and the implementing actions to control tool crib inventory will be completed by January of 1983.

Finding (MA.2-2) The instrument and control shop adjacent to the control room needs improved storage provisions for controlled measuring and test equipment.

Recommendation Provide additional shelf space for measuring and test equipment in the I&C shop. Alternatives include rearranging the shop to provide more efficient storage of personal items or expansion of the shop to accommodate increased test equipment storage.

Response Improved storage for maintenance and test equipment will be made available by July 1, 1982.

CONTROL OF MEASUREMENT AND TEST EQUIPMENT (M&TE)

PERFORMANCE OBJECTIVE: Control the use and calibration of measurement and test equipment to ensure the necessary accuracy for calibrated devices.

Finding (MA.7-1) The following Good Practice was noted: A list of the plant instruments calibrated with each piece of test equipment is maintained on a card in a clear plastic holder attached to the test equipment. This practice facilitates identification of instruments that need to be rechecked, if test equipment is found to be defective or out of calibration.

RADIATION PROTECTION AND CHEMISTRY

MANAGEMENT OF RADIOLOGICAL PROTECTION

PERFORMANCE OBJECTIVE: Provide effective management of the radiological protection program.

**Finding
(RC.1-1)**

Compliance with radiological protection procedures and requirements needs improvement. Personnel sometimes monitor themselves for radioactive contamination too rapidly or fail to monitor all areas of their bodies, as required by plant procedures. Barriers between contaminated and noncontaminated areas were sometimes crossed improperly. Many persons did not record their pocket ionization chamber measurements as required, even though those measurements are used as the daily exposure control device. Additionally, doors to restricted areas and radiation areas were sometimes not kept shut or locked, as appropriate.

Recommendation

Enforce existing plant radiological protection procedures and requirements. Emphasize adherence to procedures by methods such as department meetings, training programs, posted instructions, and on-the-spot correction of observed errors.

Response

The supervisory staff for Chemistry and Radiation Protection has been increased from 5 to 12 over the past year. There is currently only one vacancy. As new supervisors pick up their responsibilities, increased emphasis will be placed on supervision and surveillance of day-to-day radiological control practices. In addition, all plant supervisory and management personnel will more actively promote proper radiological control practices and aid in the enforcement of radiological control procedures and requirements.

RADIOLOGICAL PROTECTION TRAINING

PERFORMANCE OBJECTIVE: Ensure that personnel on the site have the knowledge and practical abilities necessary to effectively implement radiological protection practices associated with their work.

**Finding
(RC.2-1)**

General employee radiological protection training should be expanded to include a requirement that trainees demonstrate practical abilities. Donning and removing protective clothing, self-monitoring for contamination, and reading and rezeroing pocket ionization chambers, for example, should be demonstrated.

Recommendation Include a demonstration of practical abilities by each person in the general employee radiological protection training program.

Response General employee training has been, and will continue to be, under continual revision. Practical demonstrations by those personnel who have not had appropriate prior experience in donning and removing protective clothing, monitoring themselves for contamination, and reading and rezeroing pocket ionization chambers will be included. This program will be implemented by March 1982.

Finding (RC.2-2) The present training program for radiological protection and chemistry technicians needs improvement. Course content should be more comprehensive, and examinations should be used routinely to evaluate student progress. Although on-the-job training in practical abilities is normally provided, satisfactory completion of this training is not always recorded.

Recommendation Continue with the present plan to develop a more comprehensive training program. Include written and oral examinations to evaluate student capabilities. Establish a structured method to certify satisfactory qualification of technicians in practical radiological protection techniques.

Response This action is being pursued. Parts of the program will be implemented by the end of 1981, and the fully revised program should be implemented by July 1, 1982.

PERSONNEL DOSIMETRY

PERFORMANCE OBJECTIVE: Accurately determine and record radiation exposures.

Finding (RC.3-1) Frequently, personnel are not recording their pocket dosimetry readings in the appropriate logs. As a result, current personnel exposure information is often not available to those who are responsible for exposure control. Additional attention is needed to ensure that daily personnel radiation exposure tracking is sufficiently complete and accurate to prevent inadvertently exceeding company exposure guides.

Recommendation Enforce the existing procedure that requires individual pocket ionization chamber (PIC) users to record PIC readings in appropriate plant logs. Alternatively, implement a system in which

designated personnel issue and read PICs and log these readings for all users. This could be performed at the restricted area entry point and at individual job locations, as necessary.

Response

On September 21, 1981, a mechanism to feedback FILM-TLD-DOSIMETER reading comparisons was instituted so that individual employees would be made aware of the shortcomings in their recording of dosimeter readings. Now that the position of Dosimetry Supervisor is again filled, more detailed audits and follow-ups will be performed to ensure that failures to record dosimetry readings will be minimized.

**Finding
(RC.3-2)**

Quality control for pocket ionization chambers requires strengthening to ensure that they are measuring exposures accurately. PICs are not necessarily removed from service and rechecked subsequent to an unaccountable off-scale reading. Data sheets for drift and response checks are sometimes not accurately completed.

Recommendation

Improve the quality control program for PICs to ensure that off-scale or suspect chambers are checked for accuracy and for correlation with other dosimetric devices in use at the time of concern. Emphasize to technicians and reviewing supervisors the importance of accurately recording test results.

Response

Off-scale PICs are reported to radiation protection in accordance with existing plant procedures. These procedures will be revised by December 1, 1981 to require off-scale dosimeters to be evaluated by radiation protection before being returned to service. This evaluation will consist of, as a minimum, an overnight drift check.

EXTERNAL RADIATION EXPOSURE

PERFORMANCE OBJECTIVE: Minimize personnel external radiation exposure.

**Finding
(RC.4-1)**

Although effective exposure reduction planning has been used for work involving high exposure rates, more effort is needed to reduce accumulated exposure from normal operation and from lower exposure-rate work. The ALARA program has not been fully implemented because the implementation procedure has not been issued. An ALARA coordinator needs to be assigned.

- Recommendation** Assign an ALARA coordinator and issue the ALARA implementation procedure as planned. Include in the ALARA program preplanning for specific jobs, following exposure trends, and initiating corrective action if exposure trends are adverse or accumulations are excessive. Exposure goals are recommended for specific jobs with significant anticipated exposures. Overall annual goals are also recommended.
- Response** The ALARA program development will proceed under the guidance of a radiological engineer, who is primarily responsible for preplanning and dose-reduction improvements, with supporting data provided by the Dosimetry and ALARA Coordinator. The ALARA program will include exposure goals for specific jobs, particularly those with significant anticipated exposures, and for selected groups of personnel who are expected to receive the greatest exposure. The ALARA program will be fully implemented by April 1, 1982.
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Finding (RC.4-2) Posting and control of radiation areas needs improvement. Areas were observed that were not properly barricaded, posted, or secured.

Recommendation Enforce existing plant procedures for control of radiation areas. Provide detailed instructions to technicians for identifying and posting radiation areas.

Response The quality of posting and control of radiation areas depends to a large extent on technician training and supervisor audit. This item will be included in the technician training program identified previously. Additional specific procedural guidance for posting and control will be issued by January 1, 1982. Posting and control will be emphasized in all future station supervisory inspections, starting immediately.

INTERNAL RADIATION EXPOSURE

PERFORMANCE OBJECTIVE: Minimize internal exposure due to radioactivity associated with the plant.

Finding (RC.5-1) Control of testing, storage, issue, and use of respiratory protection equipment needs improvement. Examples of poor respiratory protection practices were noted during the evaluation. The respiratory fit-test booth is not operational.

Recommendation Repair the respiratory fit-test booth. Assign designated individuals the responsibility to test, issue, and control the use of respiratory protective equipment. Ensure that proper implementation of the respiratory protection program is supported by the training program. Improve enforcement of the program by supervisors.

Response The respiratory fit-test booth has been repaired and returned to service. Now that a Respiratory Protection Coordinator has been assigned, periods when the booth is inoperative will be minimized. The Respiratory Protection Coordinator is also responsible for monitoring and ensuring adherence to approved station respiratory protection procedures. These procedures and their use will also be emphasized in station training programs.

**Finding
(RC.5-2)** Portable vacuum cleaners within the plant had the potential for spreading airborne radioactivity. A vacuum without a high efficiency particulate activity (HEPA) filter was observed within a posted surface contamination area. Personnel in the area understood that the vacuum could be used if needed, and that no radiation protection controls were required for its use. Use of such a vacuum in a surface contaminated area can cause the spread of airborne radioactivity.

Recommendation Establish methods to control the use of vacuum cleaners within the restricted area of the plant. Establish controls to prevent non-HEPA-filtered vacuum cleaners from being used within radioactively contaminated and potentially contaminated areas.

Response Controls will be established by January 1, 1982 to ensure that only HEPA-filtered vacuum cleaners are used in contaminated areas.

**Finding
(RC.5-3)** Improvement is needed in efforts to minimize personnel exposure to radioactive contamination and in follow-up on whole body monitoring results. Plant whole body monitoring records indicate that very low levels of internally or externally deposited radionuclides associated with the plant are being routinely detected. Interpretation of whole body monitoring results by plant personnel indicates that internal contamination is involved in about half the cases.

Recommendation If a positive indication is obtained from a whole body count, shower and recount the employee in an effort to determine whether the contamination is internal or external. If a positive indication remains, consider recounting in the future, as appropriate, to determine the need for additional action. Perform a dose assessment for significant internal contamination.

Employ supplementary controls such as portable filters and temporary physical barriers to reduce personnel exposures to airborne radioactive contamination during maintenance.

Response The recommendations listed are included in station procedures and practices. The Respiratory Protection Coordinator will monitor adherence to these procedures to ensure appropriate follow-up when positive indications are received from whole body counts.

RADIOACTIVE CONTAMINATION CONTROL

PERFORMANCE OBJECTIVE: Minimize contaminated equipment and areas in the plant and minimize personnel contamination.

Finding (RC.9-1) The plant contains more contaminated areas that require protective clothing than necessary. This situation complicates the movement of personnel about the plant and increases the potential for spreading contamination. The accumulation of items of contaminated personnel clothing (mostly shoes) illustrates the need for improved contamination controls.

Recommendation Establish an aggressive program to eliminate or minimize sources of radioactive contamination and reduce, by decontamination, the number and size of controlled loose surface contamination areas in the plant.

Response A program to reduce contaminated areas has been started. It includes adding radiation protection technicians to each shift, beginning in July 1982, to supervise cleanup activities and to aid in preventing the spread of contamination. Other station personnel are being added to increase the cleanup effort.

Finding (RC.9-2) Personnel contamination monitoring equipment has not been placed at all exits from contaminated areas. Use of such monitoring equipment reduces the potential for the spread of contamination.

Recommendation Establish monitoring stations at the exits from known contaminated areas where practicable.

Response The need for three additional permanent monitoring stations has been identified. These installations, including any necessary shielding, will be completed before the next refueling outage in 1983. Other locations where temporary or permanent monitoring stations may be appropriate will be identified on a continuing basis.

Finding (RC.9-3) Control of contaminated tools and equipment needs improvement. Tools and equipment are sometimes stored outside of contaminated areas without protective wrapping. Tools and equipment in the tool room should be routinely checked for contamination, and a designated storage area should be established for contaminated tools.

Recommendation Provide instructions to plant personnel describing the methods to be used for wrapping and storing radioactive materials. Perform routine contamination surveys of tools in the tool room and establish designated storage areas for contaminated tools.

Response Job site contaminated tool control will be included in ALARA planning for jobs. The tools inventory and control effort identified in the response to item MA.2-1 will address equipment now stored in the contaminated tool room. Procedures for disposition of contaminated tools will be developed as part of that effort.

Finding (RC.9-4) Personnel monitoring practices to detect radioactive contamination need strengthening.

Recommendation Require monitoring of the whole body rather than only hands, feet, and face for radioactive contamination at the exit from contaminated areas.

Response Training programs and instructions for surveillance of frisking will be revised to reflect the need to check the trunk and extremities for contamination at the exit from contaminated areas, and to place particular emphasis on frisking the portions of the body most likely to be contaminated. Whole body frisks of persons leaving specified highly contaminated areas are imperative, and such requirements will be included in ALARA discussions for individual jobs and included on the RWP.

As a backup to individual monitoring for contamination, "clean area" contamination surveys are routinely performed, and portal monitors that have the ability to detect 1 uCi of activity on an individual have been installed.

Surveillance of worker performance will also be increased as the enlarged supervisory staff begins to function.

Finding (RC.9-5)	Records of skin contaminations should be maintained and routinely analyzed to determine appropriate corrective actions.
Recommendation	Maintain personnel skin contamination records that include information on the identity of persons who were contaminated, levels of skin contamination found, type and location of work performed at the time of contamination, and the cause and corrective action taken. Periodically review these records to identify appropriate corrective actions for recurring or predictable contamination incidents.
Response	Records of skin contamination are currently maintained. A revised procedure has been drafted to improve and make more useful the data that is retained when decontamination is required. The recommended information is included. Review of contamination events will be factored into the ALARA program. These actions will be implemented by March 1982.

CHEMISTRY

PERFORMANCE OBJECTIVE: Ensure accurate measurement and effective control of chemistry parameters.

Finding (RC.10-1)	Housekeeping in the chemistry laboratory needs improvement. Unused labware and equipment are stored in the chemical laboratory. Items that have no apparent use in a chemical laboratory were observed. Evidence of liquid spills and observation of work practices indicate the need for improved laboratory techniques.
Recommendation	Remove unnecessary equipment and chemicals from the chemistry laboratory. Stress the importance of good housekeeping, strict contamination control, and good laboratory techniques to personnel who work in the chemistry and counting laboratory.

Response

Lab housekeeping has been improved and will be properly maintained. Good laboratory techniques will be included in the technician training program that is now under development.

**Finding
(RC.10-2)**

The quality control system for laboratory chemicals needs improvement. Outdated reagents and improperly prepared standards were found in the laboratory.

Recommendation

Establish methods to ensure that outdated chemicals are not available for use and that chemical standards and reagents are clearly and correctly identified.

Response

The old chemicals found have been discarded. Instructions for preparing reagents have been revised to ensure that appropriate mixing and expiration dates are marked on reagent bottles. Periodic housekeeping checks by chemistry supervisors will be used to ensure that outdated chemicals are removed from the laboratory.

TECHNICAL SUPPORT**ON-SITE TECHNICAL SUPPORT ORGANIZATION AND ADMINISTRATION**

PERFORMANCE OBJECTIVE: Have a clearly defined on-site technical support organization that is adequately staffed, assigns responsibility, and delegates adequate authority for the accomplishment of required tasks.

Finding (TS.1-1) Several technical support functions, including test and inspection coordination, plant modification tracking, and operating experience review are not being performed as specified in station procedures, apparently because several technical support staff positions are vacant.

Recommendation Timely action should be taken to fill the vacant positions.

Response Staffing for a newly formed site technical support group started with the assignment of a group supervisor in February 1981. A total of six technical assistants is authorized, ranging from recent technical graduates to persons with up to five years experience. To date, nine people have been interviewed or are scheduled for interview. One offer has been accepted. We are actively trying to fill all vacancies with qualified personnel and expect to fill all vacancies by January 1982.

PLANT EFFICIENCY AND RELIABILITY

PERFORMANCE OBJECTIVE: Optimize plant thermal efficiency and reliability.

Finding (TS.2-1) Current efforts to monitor, analyze, and improve plant thermal efficiency need improvement. Reactor engineering technicians collect and trend several computer log parameters relevant to thermal performance, but many of the computer output parameters are unreliable. Analysis results are therefore of questionable value.

Recommendation Return the thermal performance monitoring programs to service. Use monitoring results to identify adverse performance or trends and to develop appropriate corrective actions.

Response We are now in the process of grooming the thermal performance computer programs and expect to complete that by January 1, 1982. The site technical support group is responsible for analyzing performance parameters and recommending appropriate corrective

actions to plant management. Routine analysis of performance will begin as soon as reliable data is available.

NUCLEAR OPERATING EXPERIENCE EVALUATION PROGRAM

PERFORMANCE OBJECTIVE: Ensure industrywide and in-house operating experiences are evaluated and appropriate actions are taken to improve personnel awareness and equipment reliability.

Finding
(TS.3-1)

Some recommendations included in INPO Significant Operating Experience Reports (SOER) have not been completed. SOER recommendation status for 80-1 through 80-6 and 81-1 through 81-14 is:

<u>Recommendations</u>	<u>Action Taken</u>
13	Adequate
45	Not Applicable
23	Pending

The following recommendations are pending action:

<u>SOER</u>	<u>RECOMMENDATIONS</u>
80-2	1 & 2
81-2	1, 2, 3, 4, 5, 6
81-3	1, 2, 3
81-7	1 & 2
81-10	1
81-12	1, 2, 3, 4a, 4b
81-14	1 to 4

Recommendation Initiate further review or complete action as appropriate on the SOER recommendations listed. Advise INPO of the status of each recommendation in the response to this report.

Response Preliminary evaluations have been completed for all of the recommendations listed. Complete reviews will be performed by January 1, 1982. Completion dates for actions determined appropriate will be established during this review. An update of the status of these recommendations will be provided in NMPC's follow-on responses six months from the date of this report.

PLANT MODIFICATIONS

PERFORMANCE OBJECTIVE: Provide a program to implement plant modifications in a timely manner while maintaining the quality of plant systems and components.

**Finding
(TS.4-1)**

All aspects of approved plant modification packages often are not completed in a timely manner. Administrative controls for modification activities include checkoff lists of required actions, but these lists are often not completed promptly after completion of the physical modification. The status of some modifications is not clear from the existing documentation, and in many instances, drawings have not been revised to reflect completed modifications.

Recommendation

Establish administrative controls to ensure that station management is informed of any delays in timely completion of work associated with modifications. Use periodic spot checks of modification packages to identify and correct documentation problems.

Response

The general procedure for modifications will be revised to reflect all responsibilities for management and documentation. All personnel involved in management and records for modifications will be given specific training in the revised requirements. Revised administrative controls to ensure timely completion of all actions associated with modifications should be in effect by March 1, 1982.

ORGANIZATION AND ADMINISTRATION**ORGANIZATIONAL OBJECTIVES**

PERFORMANCE OBJECTIVE: Establish mission, goals, and objectives for the organizational units that improve plant activities or maintain them at high levels of safety and reliability, and establish the process to achieve the mission, goals, and objectives.

**Finding
(OA.1-1)**

The station needs an integrated set of management goals and objectives to guide management efforts. Although a corporate management-by-objectives program is available for use by station managers and supervisors, the program is voluntary, and none have elected to participate.

Recommendation

Establish a management objectives program to aid in planning and coordinating station management efforts in support of corporate objectives. The program should include preparation of supporting objectives for each department at the station, regular assessment of progress toward objectives, and personnel performance appraisals that include evaluation of effectiveness in establishing and achieving performance objectives.

Response

Individual goals and objectives will be established by each superintendent and supervisor in support of goals set by the Vice President-Nuclear Generation. The structure will be arranged so that department and supervisory objectives support the goals of successively higher levels of management. Periodic assessments of progress towards objectives will be performed, and performance appraisals will reflect each individual's effectiveness in setting and meeting appropriate objectives. The improved goals and objectives program will be in effect for the calendar year of 1982.

ORGANIZATIONAL STRUCTURE

PERFORMANCE OBJECTIVE: Provide an organizational structure that supports the effective management of nuclear power plant operation.

**Finding
(OA.2-1)**

Complete position descriptions are available for only about half of the professional and supervisory personnel at the station. Development of a formal salary administration program, which includes position descriptions, is in progress but has not been completed.

Recommendation Complete and distribute position descriptions for all supervisory and management positions at the station.

Response The Niagara Mohawk Employee Relations Department, in cooperation with site personnel, is currently producing revised Position Analysis and Job Descriptions for all site personnel. This work is concurrent with and complementary to that of the Salary Administration Department. An analyst has been assigned full-time to this project. Completion is scheduled by the end of 1982.

MANPOWER RESOURCES

PERFORMANCE OBJECTIVE: Ensure that qualified individuals are available to fill all job positions supporting plant safety and reliability.

Finding (OA.3-1) Qualification requirements have not been established for all plant management and supervisory positions. Qualification requirements have not yet been specified for those positions that lack written position descriptions. Qualification requirements in several of the completed position descriptions are based on minimum regulatory requirements rather than analysis of position responsibilities and authorities.

Recommendation Position descriptions should be completed or revised to identify all appropriate qualification requirements for incumbents. Specific attributes that should be delineated, where appropriate, include educational level; technical skills; hands-on, supervisory, or management experience; licenses; and skill certifications. The revised qualification requirements should then be utilized in the selection and promotion process and to guide the training of individuals in preparing them for promotion.

Response Qualifications will be included as part of the current Job Description project noted in OA.2-1. Training programs will be revised to reflect the position analysis and qualifications within 12 months after completion of that effort.

ADMINISTRATIVE CONTROLS

PERFORMANCE OBJECTIVE: Provide well-defined, organized, and effective administrative controls to direct the tasks, responsibilities, and practices within the organization to meet the specified mission, goals, and objectives.

**Finding
(OA.4-1)**

Weaknesses were noted in several aspects of station administrative controls. Although procedures are required to be reviewed every two years, several were overdue for review, notably in the chemistry area, where some had been in effect for much longer periods without review. Some controlled sets of procedures contained uncontrolled copies of procedures and did not include all appropriate procedures. The station should routinely verify that controlled copies of procedures are complete and current.

Recommendation

Improved procedures should be developed and increased management attention applied to ensure that controlled copies of procedures accurately reflect current approved information. The contents of all controlled sets of procedures should be verified periodically.

Response

Station administrative controls require that procedures be invalidated if they exceed the allowable maximum time for periodic review. Routine six-month audits will be made of all controlled copies of procedures to ensure that the files are complete, include the latest revisions, and do not contain any invalid procedures unless clearly marked superseded or not to be used. The first audit will be completed by January 1, 1982.

MANAGEMENT QUALITY PROGRAMS

PERFORMANCE OBJECTIVE: Provide management with accurate indication of the extent of adherence to policies, administrative controls, codes, regulations, and effectiveness in meeting plant mission, goals, and objectives.

**Finding
(OA.5-1)**

The quality assurance program should be expanded to cover additional selected non-safety-related equipment and activities that are important to safety and reliability. Although some coverage of non-safety-related work is provided when resources are available, better assurance that important non-safety-related activities are covered is needed.

Recommendation

Expand the quality assurance program in a graduated manner to provide regular quality assurance and quality control coverage of

selected non-safety-related equipment and activities that could significantly affect plant reliability and performance.

Response

Quality Assurance will be expanded in a stepwise manner, beginning in 1982, to cover selected non-safety-related equipment and activities that are important to reliability. The scope of the expanded program will be determined in consultation with the Nuclear Generation Department.

**Finding
(OA.5-2)**

Housekeeping needs improvement in many areas of the plant. This was evident from the significant effort needed to reduce the amount of accumulated radioactive waste awaiting compaction, and to remove boric acid buildup around poison injection pumps. More attention is needed to ensure tools, parts, and material are properly stored. Deficiencies noted during the Supervisor's Weekly Plant Tour are sometimes not corrected in a timely manner.

Recommendation

Improve enforcement of the provisions of existing station housekeeping procedures. Implement a policy of regular tours and inspections by station management, with emphasis on housekeeping, cleanliness, and material conditions. Ensure that deficiencies are noted and assigned to designated individuals for correction, and that corrective actions are completed in a timely manner.

Response

The weekly tour checksheet for fire protection and housekeeping identifies corrective actions required and assigns the supervisors who are responsible for corrective action. Increased emphasis on good housekeeping practices will be stressed by all levels of station management.

INDUSTRIAL SAFETY

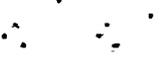
PERFORMANCE OBJECTIVE: Provide an orderly working environment in which station personnel may carry out their work activities safely.

**Finding
(OA.7-1)**

Increased management attention is needed in the station's industrial safety program. The safety performance record shows an increasing trend of personnel injuries. Day-to-day enforcement and promotion of good industrial safety practices need improvement.

Recommendation Routine observation of proper industrial safety practices should be improved through more active involvement of managers and supervisors in safety matters. Lost-time and injury records should be analyzed to identify appropriate corrective actions. Regularly attended employee safety meetings should be used to increase safety awareness at all levels.

Response Quarterly safety meetings are regularly held at the plant level between plant management and union representatives. Monthly safety meetings will be regularly held by supervisors at the department or group level. Involvement of station managers and supervisors in identifying and correcting safety problems and participating in safety meetings will be increased. A program for analysis of injury records has been established.



APPENDIX

Performance Objectives Reviewed

TRAINING AND QUALIFICATION

TQ.1 Training Organization

Provide a clearly defined training organization staffed with qualified personnel capable of accomplishing all assigned training tasks.

TQ.2 Training Administration

Ensure that activities necessary to initiate and control personnel qualification programs are accomplished in a well-defined, coordinated, and effective manner.

TQ.3 Training Facilities and Equipment

Provide the training facilities, equipment, and materials for development and evaluation of knowledge and skills needed by nuclear plant personnel.

TQ.4 Non-Licensed Operator Training

Develop and maintain the skills and knowledge necessary for non-licensed operators to perform their assigned job functions.

TQ.5 Licensed Operator Training

Develop the skills and knowledge necessary for licensed operators to perform their assigned job functions.

TQ.6 Licensed Operator Requalification Training

Maintain the skills and knowledge necessary for licensed operators to perform their assigned job functions.

TQ.7 Shift Technical Advisor Training

Develop and maintain the skills and knowledge necessary for Shift Technical Advisors (STA) to perform their assigned job functions.

TQ.8 Maintenance Personnel Training

Develop and maintain the skills and knowledge necessary for maintenance personnel to perform their assigned job functions.

OPERATIONS

OP.1 Operations Organization and Administration

Provide a clearly defined operations organization that is adequately staffed, assigns responsibilities, and delegates adequate authority for the accomplishment of required tasks.

OP.2 Operations Facilities and Equipment

Provide plant facilities and equipment that are operated and maintained at a level to support safe and efficient operation.

OP.3 Conduct of Shift Operations

Ensure that shift operations are conducted in a safe and reliable manner.

OP.4 Plant Operations Procedures

Provide timely, effective guidance to operators in the form of written procedures.

OP.5 Plant Status Controls

Maintain plant status in a condition that ensures equipment and system availability as necessary for safe and reliable plant operations at all times.

OP.6' Shift Turnover

Ensure a continuous and correct understanding of plant conditions at all shift operating positions through proper shift turnover.

OP.7 Tagout Practices

Protect personnel and plant equipment by implementing effective tagout practices.

MAINTENANCE

MA.1 Maintenance Organization and Administration

Provide a clearly defined maintenance organization that is adequately staffed, assigns responsibilities, and delegates adequate authority for the accomplishment of required tasks.

MA.2 Maintenance Facilities and Equipment

Support the performance of maintenance activities by providing adequate facilities and equipment.

MA.3 Work Control System

Provide an administrative control system within which equipment problems can be identified and reported, and safely and efficiently dispositioned and documented.

MA.4 Maintenance Procedures

Ensure that adequate plant maintenance procedures exist and are utilized to achieve quality by the safe and reliable conduct of maintenance activities.

MA.5 Maintenance History

Provide a complete and functional maintenance history supporting an evaluation program which contributes to improvements in equipment performance.

MA.6 Preventive Maintenance (PM)

Optimize equipment reliability and performance to enhance plant safety and availability.

MA.7 Control of Measurement and Test Equipment (M&TE)

Control the use and calibration of measurement and test equipment to ensure the necessary accuracy for calibrated devices.

MA.8 Control of Special Processes

Ensure that the control and performance of special processes yields quality results.

RADIATION PROTECTION AND CHEMISTRY

RC.1 Management of Radiological Protection

Provide effective management of the radiological protection program.

RC.2 Radiological Protection Training

Ensure that personnel on the site have the knowledge and practical abilities necessary to effectively implement radiological protection practices associated with their work.

RC.3 Personnel Dosimetry

Accurately determine and record radiation exposures.

RC.4 External Radiation Exposure

Minimize personnel external radiation exposure.

RC.5 Internal Radiation Exposure

Minimize internal exposure due to radioactivity associated with the plant.

RC.6 Radioactive Effluents

Minimize releases of radioactive effluents to the environment.

RC.7 Solid Radioactive Waste

Minimize solid radioactive waste volumes.

RC.8 Transportation of Radioactive Material

Meet the requirements for transportation of radioactive material.

RC.9 Radioactive Contamination Control

Minimize contaminated equipment and areas in the plant and minimize personnel contamination.

RC.10 Chemistry

Ensure accurate measurement and effective control of chemistry parameters.

TECHNICAL SUPPORT

TS.1 On-site Technical Support Organization and Administration

Have a clearly defined on-site technical support organization that is adequately staffed, assigns responsibility, and delegates adequate authority for the accomplishment of required tasks.

TS.2 Plant Efficiency and Reliability

Optimize plant thermal efficiency and reliability.

TS.3 Nuclear Operating Experience Evaluation Program

Ensure industrywide and in-house operating experiences are evaluated and appropriate actions are taken to improve personnel awareness and equipment reliability.

TS.4 Plant Modifications

Provide a program to implement plant modifications in a timely manner while maintaining the quality of plant systems and components.

TS.5 On-site Reactor Engineering

Optimize nuclear reactor operation without compromising design or safety limits and control nuclear fuel handling activities to ensure safety of personnel and equipment.

ORGANIZATION AND ADMINISTRATION

OA.1 Organizational Objectives

Establish mission, goals, and objectives for the organizational units that improve plant activities or maintain them at high levels of safety and reliability, and establish the process to achieve the mission, goals, and objectives.

OA.2 Organizational Structure

Provide an organizational structure that supports the effective management of nuclear power plant operation.

OA.3 Manpower Resources

Ensure that qualified individuals are available to fill all job positions supporting plant safety and reliability.

OA.4 Administrative Controls

Provide well-defined, organized, and effective administrative controls to direct the tasks, responsibilities, and practices within the organization to meet the specified mission, goals, and objectives.

OA.5 Management Quality Programs

Provide management with accurate indication of the extent of adherence to policies, administrative controls, codes, regulations, and effectiveness in meeting plant mission, goals, and objectives.

OA.6 Surveillance Program

Provide surveillance programs to accomplish coordinated monitoring, inspection, and testing to ensure safe, reliable operation of plant equipment and facilities.

OA.7 Industrial Safety

Provide an orderly working environment in which station personnel may carry out their work activities safely.

