U. S. NUCLEAR REGULATORY COMMISSION
REGION I

Report Nos. 50-220/91-04
50-410/91-04

Docket Nos. 50-220
50-410

License Nos. DPR-63
NPF-54

Licensee: Niagara Mohawk Power Corporation
300 Erie Boulevard West
Syracuse, New York 13202

Facility Name: Nine Mile Point Units 1 and 2

Inspection At: Lycoming, New York

Inspection Conducted: February 11-15, 1991

Inspectors: _____ 3-1-91
J. Furia, Senior Radiation Specialist, date
Facilities Radiological Protection Section
(FRPS), Facilities Radiological Safety and
Safeguards Branch (FRSSB), Division of
Radiation safety and Safeguards (DRSS)

for _____ 3-1-91
S. Sherbini, Senior Radiation Specialist, date
FRPS, FRSSB, DRSS

Approved by: for _____ 8/-1/91
W. Pasciak, Chief, FRPS, FRSSB, DRSS date

Inspection Summary: Inspection on February 11-15, 1991 (Combined Inspection Report Nos. 50-220/91-04; 50-410/91-04)

Areas Inspected: Routine announced inspection of the radwaste, transportation and radiation protection programs including: management organization, Quality Assurance, training, dosimetry, respiratory protection and implementation of the above programs.

Results: Within the areas inspected, no violations or deviations were noted.

DETAILS

1. Personnel Contacted

1.1 Licensee Personnel

* W. Allen, Radiological Assessment Manager, MATS
* B. Buck, Assistant Radwaste Supervisor, Unit 2
J. Burton, Supervisor, Quality Assurance Audits
* R. Carlson, Supervisor - Respiratory Protection
* M. Carson, Regulatory Compliance
R. Cole, Training Instructor
* M. Colomb, Operations Manager, Unit 2
* J. Conway, Manager - Technical Support, Unit 2
* K. Dahlberg, Plant Manager, Unit 1
* H. Flanagan, Supervisor - Environmental Protection
C. Gerber, General Supervisor - Radwaste, Unit 1
* O. Henderson, General Supervisor - Radwaste, Unit 2
* E. Leach, Senior Specialist, Chemistry
* C. Leon, Supervisor - External Dosimetry
* M. McCormick, Plant Manager, Unit 2
D. McNally, Supervisor, Operations Support Training
* J. Pavel, Licensing Engineer
* R. Smith, Manager, Training
* P. Swafford, Radiation Protection Manager, Unit 2
* K. Thomas, Supervisor, Site Licensing
* W. Thomson, Radiation Protection Manager, Unit 1
* J. Torbitt, Supervisor - Radwaste, Unit 1
R. Wallace, Training Instructor
* B. Weaver, General Supervisor - Technical Training
* D. White, Site Licensing
* C. Widay, Supervisor - QAO Surveillance
* S. Wilczek, Jr., Vice President - Nuclear Support
A. Winegard, Quality Assurance Coordinator

1.2 NRC Personnel

* W. Cook, Senior Resident Inspector
* J. Linville, Branch Chief, Projects Branch 1
* R. Temps, Resident Inspector

* Denotes those present at the exit interview on February 15, 1991.

2. Purpose

The purpose of this routine inspection was to review the licensee's programs for radwaste processing, transportation, dosimetry, training, respiratory protection, and assurance of quality in these areas.

3. Transportation and Radwaste

Radwaste activities were conducted by the Radwaste Operations Sections of each unit's Operations Department. The General Supervisor - Radwaste reported through the Operations Manager to the Unit Superintendent. Preparation of shipping documentation for radwaste, together with documentation for all other radioactive material shipments was the responsibility of the Shipping Supervisor, who reported through the Health Physics Support Supervisor to the Technical Support Manager.

3.1 Radwaste Processing

Radwaste operations at Unit 1 included processing floor drain water through waste evaporators, solidification of evaporator bottoms; processing primary and condenser water through filters and demineralizers, with the spent bead resins dewatered and spent powdered resins solidified; and the collection of Dry Active Wastes (DAW) which were bulk loaded into SeaVans for shipment, sorting, and where applicable, compaction at the Quadrex facility in Oak Ridge, Tennessee. Resin dewatering and solidification services were provided by Chem-Nuclear Systems, Inc.

Radwaste operations at Unit 2 included processing floor drain water through a waste evaporator; processing reactor and equipment drain water through filters and demineralizers; and collecting DAW, with compaction done on-site. All spent resins and evaporator bottoms were solidified utilizing a LN Technologies (now SEG/Westinghouse) solidification system. DAW volume remained very low during 1990, despite the unit being in a refueling outage during the last five months of the year.

Scaling factors for both unit's waste streams were determined on an annual basis by the submission of composite plant samples to Teledyne for determination of total isotopic content. An exception to this was for DAW samples which were submitted on a quarterly basis. Results of these analyses were reviewed previously by the Chemistry Supervisor for determination of scaling factors, however this responsibility was being transferred to the Supervisor, Radwaste Shipping.

3.2 Transportation

Preparation of shipping documentation and calculations of transport and waste classification was conducted by the Supervisor, Radwaste Shipping. Chemistry analysis of the wastes and other pertinent data were entered into a licensee developed computer spreadsheet, which in turn generated the necessary documentation. At the time of this inspection, the licensee had recently acquired the WMG, Inc. RADMAN computer code, however full implementation had not yet occurred.

As part of this inspection, the following shipping records were reviewed by the inspector.

Unit	Shipment #	Activity(Ci)	Volume(cu ft)	Type
1	0790-086	3.16E+01	180.1	Sludge
1	0890-146	9.75E-01	205.8	Resin
1	0890-164	1.20E+01	180.1	Sludge
1	1090-106	2.88E+01	180.1	Sludge
1	1090-139	1.01E-01	205.8	Resin
1	1190-221	1.60E+02	180.1	Sludge
1	1190-222	7.61E-01	205.8	Resin
1	1290-123	9.94E-01	205.8	Resin
2	0191-070	1.02E+00	1080.0	DAW
2	0191-093	2.26E+00	181.7	Resin
2	0191-125	1.18E+00	181.7	Resin
2	0191-147	1.89E+02	181.7	Resin
2	0191-167	2.05E+00	181.7	Resin
2	0291-112	2.59E+00	181.7	Resin

All shipping records were determined to be complete and to meet the applicable requirements of 10 CFR Parts 61 and 71, and 49 CFR Parts 170-177.

3.3 Interim Radwaste Storage

Interim radwaste storage facilities at Unit 1 centered around utilization of the Stock Storage Facility in the New Radwaste Building. Utilizing current radwaste generation rates and processes, the licensee estimated a storage capacity of 7-10 years in this facility. At Unit 2, storage of compacted DAW was planned for on the 245' elevation of the radwaste facility. Storage for packaged resins in the existing extruder/evaporator storage area was limited to 9-27 months worth of waste at current generation rates and processing. The licensee was in the process of examining alternative storage locations in order to meet the expected 6 year or more delay in the resolution of a disposal facility for wastes generated in New

York. Need for storage was expected to commence at the time of the January, 1993 ban on utilization of the current disposal facilities in accordance with the Waste Policy Amendments Act of 1985.

3.4 Quality Assurance/Quality Control

The licensee's program for the assurance of quality in the radwaste and transportation programs included audits of vendors supplying NRC approved shipping containers and of the in-plant radwaste and transportation programs, periodic surveillances of radwaste and transportation activities, and Quality Control (QC) hold and review points in most radwaste operations, together with direct QC observation of all transportation activities.

The licensee's Quality Assurance (QA) vendor group was tasked with conducting/reviewing audits of vendors which supply NRC approved shipping casks. Chem-Nuclear Systems, Inc. (CNSI) provided both units with these shipping containers, and an audit conducted by the Nebraska Public Power District as part of the Nuclear Utilities Procurement Issues Council (NUPIC), audit number SA90-32, dated December 13, 1990, was reviewed by the licensee and utilized to approve the continued use of CNSI. The audit had identified five findings, four of which were closed in January, 1991. The remaining open finding was determined by the licensee not to have an adverse impact on the continued use of CNSI.

The licensee's QA Audit group conducted annual audits of the radwaste and transportation programs. Audit number 90016 RG/IN, "Radiological and Chemistry Controls", dated January 16, 1991, was the most recent audit in this area. The scope and technical depth of this audit was exceptional. Six audit observations were made as part of this audit for the improvement of radwaste operations. None of the observations involved an issue of significant safety interest.

The licensee's Quality Surveillance group conducted periodic surveillances of radwaste and transportation activities. On average, one surveillance per unit per month was conducted during 1990. The scope of activities reviewed in these surveillances was very good. Additionally, the licensee's QC group examines all shipments and principle radwaste activities, such as resin dewatering and waste solidification. Records of these inspections were kept with the shipping records.

3.5 Training

The licensee's program for training of radwaste operations personnel consisted of both an initial and continuing education program. New personnel were given a general orientation, followed by classroom instruction. This classroom Level I training, involving instruction in both basic science, math and systems description, took approximately five weeks to complete. A Level I On-The-Job training program of 12-18 months then followed. After completion of this level I training, a Level II training program was undertaken, consisting of both classroom and On-The-Job training. Continuing training for radwaste operations personnel consisted of a biennial review of Level II topics. In addition, periodic industry events and lessons learned sessions were held. This program meets the requirements for radwaste worker training specified in NRC IE Bulletin 79-19.

4. Radiation Protection

4.1 Internal dosimetry

Review of the internal dosimetry program included a review of applicable procedures, respirator fit testing and respirator maintenance, whole body counting, and records of internal exposures.

The procedures were found to be of uneven quality; some procedures, particularly those addressing specific technical areas, were found to be of generally good quality and were found to be acceptable. However, procedures addressing internal exposure control policies and practices were found to be generally incomplete, difficult to use, and sometimes inconsistent. Some examples to illustrate these general findings are given below.

- A Procedure S-RTP-10, "Calculation of Committed Dose Due to the Intake of Radioactive Material" specifies that the minimum bioassay frequency for site personnel is dependent on the frequency of entry into bioassay areas. Those who enter such areas with an average frequency of once per week or more are to have a bioassay every six months. Those who enter at least once a month have a bioassay every year, and all others every two years. However, the procedure does not indicate the manner in which such averages are to be calculated nor how such entries are to be tracked to estimate these averages. The licensee stated that these frequencies are not actually tracked but are estimated beforehand based on the type of assignment. The licensee also stated that these frequencies are not adhered to and that everyone who enters an airborne area is given a bioassay every six months.

- The same procedure states that additional bioassays are to be performed when it is deemed necessary to verify the adequacy of engineering or procedural controls, or the performance of the respiratory protection program by conducting a random bioassay. The licensee stated that they do not currently have a program to implement a random verification of the effectiveness of the internal exposure control program. The licensee stated that they currently rely on exit whole body counts to verify the adequacy of this program.

- The above procedure states that the basis of the current internal exposure standards is the Report of Committee II of the International Commission On Radiological Protection (ICRP-2). However, the procedure also states that "the intake quantity is controlled over the calendar year in which the intake occurred, and is limited to 2000 MPC-hr in any calendar year". This is incorrect since ICRP-2 limits intake by quarterly periods, as does 10 CFR Part 20.

- According to the above procedure, intakes of radioactive materials are not tracked and recorded, as is required by 10 CFR Part 20. The procedure states that the "respiratory protection, contamination control, and air sampling programs provide appropriate measures for limiting the intake of radioactive materials by site personnel. As a result, Nine Mile Point Nuclear Station has not found it necessary to control the intake of radioactive material through tracking of MPC-hours. Rather, Nine Mile Point uses its in-vivo screening program as an indicator of its program effectiveness." The licensee stated that, in order to ensure that this policy will be in compliance with 10 CFR Part 20 requirements, all personnel entering airborne radioactivity areas with concentrations in excess of 0.25 MPC (maximum permissible concentration) are required to wear a respirator. However, this requirement is not clearly stated in the procedures reviewed. Furthermore, the licensee does not currently have a program to randomly select individuals for bioassay to verify that the current policy is justified.

- The above procedure, as well as other procedures on internal exposure control, refer to areas with airborne radioactivity as either "bioassay areas" or "airborne radioactivity areas". However, the procedures do not clearly state the relationship between these two concepts. The definition of bioassay area given in the procedure is very close, but not identical to, that of an airborne radioactivity area, but the operational distinction between the two is not clear.

The whole body counting facility was inspected and was found to be well run by qualified technicians. Two whole body counters were available for use: a chair and a rapid screening stand-up counter. The licensee stated that the stand-up counter is used almost exclusively because it is capable of providing both

screening and diagnostic types of information. The inspector noted that the printed results of the whole body count include activities for only eight radionuclides in addition to potassium 40. The licensee stated that the software does not perform a peak search but rather inspects regions of interest in which the peaks corresponding to these isotopes are expected to occur. Elevated counts in any of these regions are interpreted as activity from the isotope in that region and this is reflected in the printout. A more sophisticated analysis of the data is initiated whenever elevated activity is identified on the printout of the initial screening. The software will not directly identify isotopes other than the nine listed in the printout. However, the licensee stated that the presence of any other isotopes would be known in one of two ways: the peaks of these isotopes may fall within one of the established regions of interest and appear as elevated counts in that region, thus triggering a more detailed analysis, or the peak would be identified on the energy spectrum for the count, which is printed as part of every printout following a count. The technician operating the counter, as well as the internal dosimetry supervisor, are required by procedure to review these printouts on a regular basis. The licensee also stated that the established regions of interest are based on the isotopes most frequently observed in intakes that occur on site, and that it is unlikely that an unlisted isotope will occur without the presence of at least one of the listed isotopes, especially cobalt, cesium, or zinc.

A daily response check is performed on the whole body counter using a check source. The results are plotted on a control chart that includes predetermined acceptance limits. The licensee stated that a daily background check is not performed but that, should the background increase significantly, it will cause the daily source check to fall outside the acceptable limits.

The respirator fit testing and maintenance facilities were inspected and the applicable procedures were reviewed. The fit testing facility was found to be well run and well equipped. The licensee uses two ambient dust fit testing machines and also uses a corn oil fit booth as standby. The respirator maintenance facility was found to be somewhat cramped and disorganized. At the time of the inspection, the inspector observed a large number of respirators piled several respirators deep in a bin, which is a manner of storage that is contrary to accepted good practices. The licensee stated that these respirators had just been received from the cleaning facility and that they were awaiting assembly and inspection. The licensee stated that they are not left in that storage bin for more than a couple of hours, which is not long enough to cause distortion of the facepiece rubber. The maintenance facility also contained a phantom for testing respirators and a respirator cartridge testing machine. Neither was in operation at the time of this inspection.

The internal exposure record for 1990 was reviewed, and the numbers of internal contaminations were found to be relatively small. The magnitudes of these intakes

were also found to be small.

The licensee stated that they are aware of the deficiencies in their procedures and are re-writing all of their procedures to improve both their format as well as their content. The licensee was unable to specify a date for completion of this project, but estimated within about a year.

4.2 Personnel Dosimetry

The licensee uses a four-element thermoluminescent dosimeter (TLD) as the dosimeter of record. Inspection of the processing facility showed that it was well equipped and well controlled. The persons in charge of the technical oversight of the facility were also found to be well qualified for their positions. The procedures governing the operation of the facility were reviewed and found to be well written, and acceptable overall, although some weaknesses were identified.

- Procedure S-RTP-54, "Dosimetry Quality Control Procedure" describes several of the quality control tests to be performed, but it does not describe any daily quality control checks on the operation of the readers. The licensee stated that these QC tests are described in a different procedure that addresses operation of the reader.

- Some of the QC tests are evaluated using the pass/fail criteria in use in the National Voluntary Laboratory Accreditation Program (NVLAP). These criteria are too broad for use in QC applications and were intended for other purposes. The licensee pointed out that although these criteria are applied to the overall results of the QC tests, other narrower criteria are used for evaluating subgroups of results.

- The QC testing does not include periodic participation in an offsite program conducted by an independent agency. However, Procedures S-RTP-54, "Dosimetry Quality Control Procedure" does require that "QC TLD's shall be sent offsite to test the algorithms developed in (procedure) S-RTP-102." The procedure does not make explicit what is to be done if the algorithm had not been modified in any way. The procedure also does not state what kind of irradiations are required to test the algorithm.

- The licensee uses two different algorithms for evaluating TLD results, one for routine station use and one for NVLAP accreditation. Although there are no requirements to the contrary in the NVLAP testing process or in the regulations, such practice places into the accreditation process a component, namely the algorithm, that is used only for accreditation purposes. The algorithm that is used to analyze station data is not part of the accreditation process. The licensee stated that it is their view that accreditation is not concerned with specific algorithms but with the ability of the processor to maintain a dosimetry processing system and the necessary technical capabilities for passing the NVLAP tests. The licensee also stated that their routine use algorithm is tested independently outside of the accreditation process.

The licensee stated that the procedures are being re-written to improve both their format and also to improve some weak areas in various procedures.

The personnel dosimetry records were reviewed for completeness and timeliness of dose reporting. All the records sampled at random were found to be well maintained, and no deviations from requirements were identified.

5. Exit Interview

The inspector met with the licensee representatives denoted in Section 1 at the conclusion of the inspection on February 15, 1991. The inspector summarized the purpose, scope and findings of the inspection.