

U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 87-06

Docket No. 50-220

License No. DPR-63 Priority -- Category C

Licensee: Niagara Mohawk Power Corporation

300 Erie Boulevard West

Syracuse, New York 13202

Facility Name: Nine Mile Point Nuclear Station, Unit 1

Inspection At: Scriba, New York

Inspection Conducted: April 20-24, 1987

Inspectors:

Richard K. Struckmeyer
Richard K. Struckmeyer, Radiation Specialist

5/8/87
date

Approved by:

Walter J. Pasciak
Walter J. Pasciak, Chief, Effluents
Radiation Protection Section, EPRPB

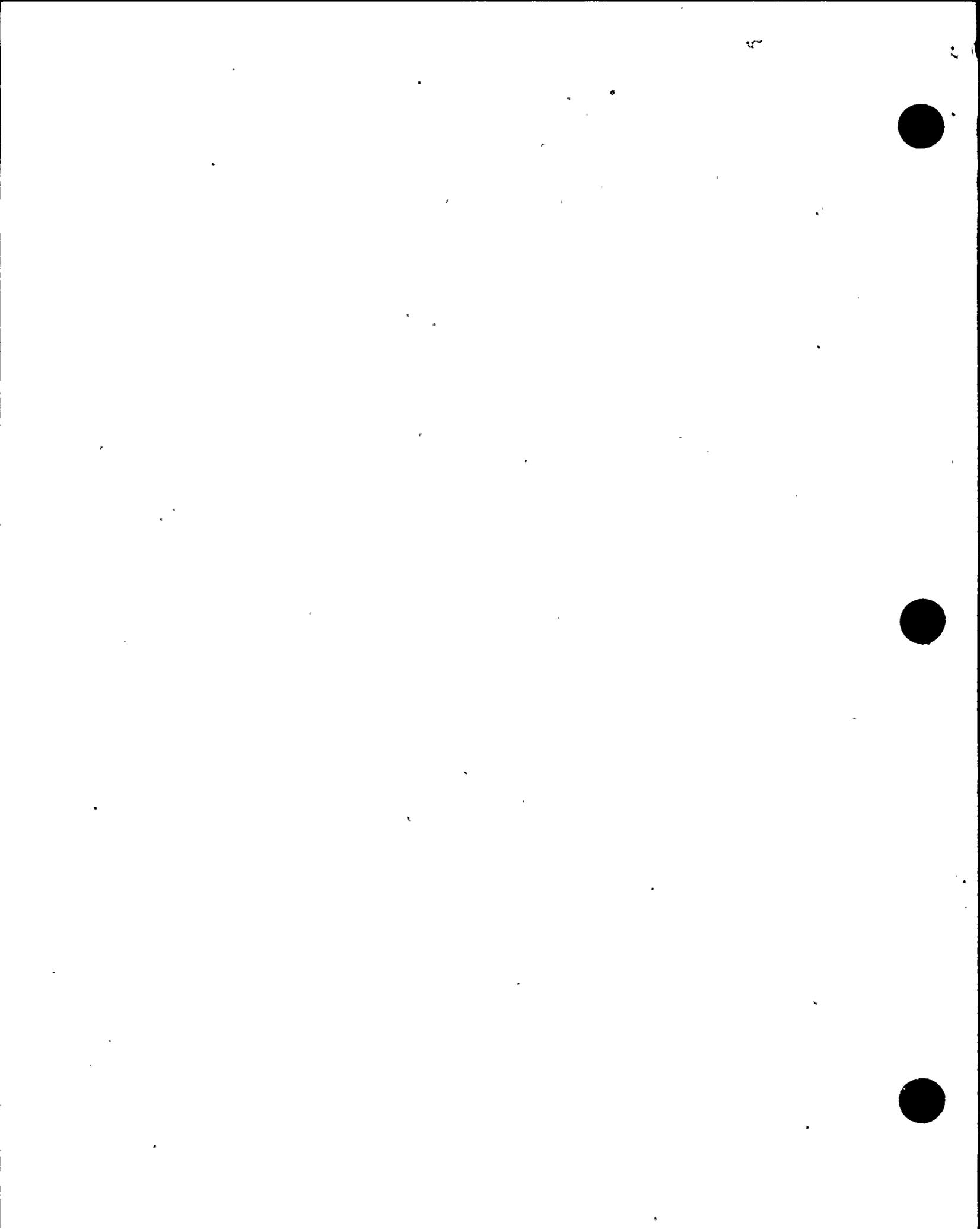
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Inspection Summary: Inspection on April 20-24, 1987 (Inspection Report No. 50-220/87-06)

Areas Inspected: Routine, unannounced inspection of the licensee's radioactive liquid and gaseous effluents program. Areas reviewed included: radioactive effluent release records, effluent control instrumentation, effluent control procedures, Offsite Dose Calculation Manual and dose calculations, Semiannual Effluent Release Reports, reactor coolant chemistry, and ventilation systems.

Results: Within the areas inspected, no violations were identified. A need for improvements in radiochemistry laboratory quality control was identified.

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1.0 Individuals Contacted

- *J. Blasiak, Chemistry Unit 1 Supervisor
- R. Carlson, Site ALARA/Respiratory Protection Coordinator
- J. Coates, Chief Technician, Unit 1 Chemistry
- *J. Duell, Supervisor, Chemistry and Radiochemistry
- *T. Egan, NC&V Engineer
- *H. Flanagan, Environmental Protection Coordinator
- *T. Kurtz, Instrumentation Support Supervisor, Radiation Protection
- *E. Leach, Radiation Protection Manager
- *T. Roman, Station Superintendent
- K. Snyder, Generation Engineer-Nuclear Chemistry Unit 1
- *C. Stuart, Superintendent, Chemistry & Radiation Mgt
- *L. Wolf, Site Licensing Engineer

* Indicates those attending exit meeting on April 24, 1987.

2.0 Status of Previously Identified Items

- 2.1 (Closed) Inspector Followup Item (220/85-25-01) Implement procedures for liquid releases: The licensee has written and implemented procedures for release of radioactive liquid effluents to conform with its new RETS. The inspector reviewed procedures and records as further described in Section 5.
- 2.2 (Closed) Inspector Followup Item (220/85-25-03) Evaluate alarm set point for Emergency Condenser Vent effluent monitor: The licensee performed a study in which normal and hypothetical abnormal release situations were investigated. The alarm set-point was established on the basis of the worst case among the four situations studied. This worst-case scenario included the following conditions: Shine from tube bundles was considered; steam leak into condenser at maximum technical specification flow limit (1.3 E+06 lbs/hr); abnormal reactor water chemistry (due to fuel damage), sufficient to alarm vent monitor due to noble gases alone, and including iodine at technical specification limit (25 uCi/g). According to the licensee's calculations, these conditions would result in a monitor response of about 20 mR/hr, which was below the then-current alarm setpoint of 25 mR/hr. The latter figure had been established prior to the implementation of 10 CFR 50, Appendix I criteria in the licensee's technical specifications. The licensee reduced the setpoint to 5 mR/hr as a means to prevent releases from exceeding Appendix I guidelines.
- 2.3 (Closed) Inspector Followup Item (220/85-14-01) Revise procedure S-ENVSP-6 to specify biannual audits of each contractor for radiological environmental monitoring program: The inspector noted that Rev. 1 of procedure S-ENVSP-6 states, in section 3.3, that audits will be conducted every two years subsequent to contractor performance verification.



- 2.4 (Closed) Inspector Followup Item (220/86-14-02) Improve documentation of SRAB audits covering radiological environmental monitoring program. The inspector reviewed a more recent SRAB audit, in which considerably more information was provided concerning the scope of the audit (more details about this audit are contained in section 3.2). The licensee also obtained additional documentation concerning the 1984 audit from the contractor who performed it. The licensee stated that future audits would contain sufficient detail to indicate the program areas reviewed, and the depth of review.
- 2.5 (Closed) Inspector Followup Item (220/86-14-03) Revise procedures S-ENVSP-5 and S-ENVSP-12 regarding laboratory quality control and analysis of environmental samples: This item consisted of several parts. (A) Procedure S-ENVSP-12 now indicates that three radionuclides (Cd-109, Cs-137, Co-60) will be used in the daily source checks of gamma spectroscopy equipment. (B) The reference to the USNRC as a source of QC checks has been removed from S-ENVSP-12. (C) Procedure S-ENVSP-5 now requires addition of dilute nitric acid to the original container when water samples are taken, and provides for the use of a 1-liter Marinelli counting geometry for vegetation samples. (D) The environmental lab has begun using a 4-liter Marinelli for the analysis of water samples, following a study that indicated that better results would be obtained using this method. At the time of this inspection (87-06), the most recent revision (Rev. 3) of procedure S-ENVSP-5 indicated that either a 4-liter Marinelli or the evaporation technique may be used, although the lab intended not to use the latter technique. The licensee stated that the reference to the evaporation technique would be removed in the next revision of this procedure. (E) Procedure S-ENVSP-11 was corrected to indicate that energy calibration curves are not necessarily linear; i.e., they may be fit by a quadratic or cubic equation.

3.0 Management Controls

The inspector reviewed the licensee's management oversight for radiochemistry and radioactive effluent releases, including assignment of responsibility and program audits.

3.1 Assignment of Responsibility

The Chemistry and Radiation Protection department has been reorganized since the last inspection in this area. Responsibilities for effluent control are divided between Chemistry and Radiation Protection. Each of these groups reports through a unit supervisor to a station supervisor for the respective disciplines. The station supervisors report to the Superintendent, Chemistry and Radiation Management. This position is at the same level of management as the Station Superintendent. Both positions report to the General Superintendent, Nuclear Generation.



3.2 Audits

The inspector reviewed an audit conducted under the cognizance of the Safety Review and Audit Board (SRAB) by Radiological and Environmental Services, Inc. This audit was conducted December 15-19, 1986, and covered Chemistry and Effluent Monitoring, as well as the Radiological Environmental Monitoring Program, at both units 1 and 2.

This audit appeared to be reasonably thorough and complete; it addressed both acceptable and unacceptable findings, and corrective actions as appropriate.

The inspector noted that the audit contained a review of NRC open items 50-277/86-14-01, -02, and -03 (see items 2.3, 2.4, and 2.5, above). The auditor concluded that most of the items had been properly addressed, and noted where additional improvements were needed.

4.0 Laboratory QC Program

The inspector reviewed the licensee's program for the quality control of analytical measurements, including procedures, data, and control charts. Control charts have been established for the gamma spectroscopy systems covering instrument efficiency at 122 and 1173 keV, and background and resolution at 1173 keV. The inspector reviewed the licensee's Quality Assurance procedure (N1-CSP-15V), which provides for daily source checks of the gamma spectroscopy systems and gross gamma well counter. The procedure provides for the use of a two-sigma warning level and a 15 percent "control limit". The two-sigma limits are based on the statistical variation observed when a known source is analyzed repeatedly, e.g. 20 to 30 times, and the mean and standard deviation of these analyses are calculated. The 15 percent limit is based on a single result, i.e., the result of the analysis obtained at the time of calibration of the instrument. Because each of these limits has a different basis, the midpoint (mean) based on the statistically based two-sigma analysis generally will not coincide with the midpoint (single value) of the calibration result. Therefore, the result of a daily source check could be outside of the two-sigma warning limit and well within the 15 percent limit, or outside the latter limit, depending on how closely the midpoints of the two methods coincide. A review of the licensee's control charts for these instruments indicated that the daily source checks were generally within the two-sigma warning limit, and virtually always within the 15 percent "control limit." If results of the daily source checks are within these limits, the instrument is considered to be functioning properly. The inspector discussed with the licensee the desirability of establishing the two and three sigma levels as the principal check of proper instrument performance, and



pointed out that this is standard industry practice. The inspector also noted, however, that the current method was acceptable as long as the two sigma limits fall within the 15 percent limits.

The licensee stated that a quarterly check of the gamma spectroscopy systems is made using a charcoal cartridge that has been spiked by an independent organization at a low level comparable to the quantity expected for environmental samples. The inspector stated that it is common industry practice to perform periodic checks of other standard counting geometries; for example, particulate filter, reactor water, and off-gas sample. Such samples should be spiked at levels similar to those normally encountered in the daily operations of the facility. Gas samples are frequently simulated by solid sources prepared in the geometry normally used for counting the gas. The licensee stated that a program to include such periodic checks on its laboratory analytical equipment, using spiked samples, will be developed and included in a revision of procedure N1-CSP-15V.

The licensee's technical specifications require quantification of H-3, Fe-55, Sr-89, Sr-90, and gross alpha in liquid effluents. These analyses are normally performed by a contractor laboratory. The inspector determined that the licensee does not routinely send spiked samples to its contractor laboratory to check its ability to correctly analyze for these radionuclides. The inspector stated that this aspect of quality control is also important to ensure that the licensee accurately quantifies its effluents, and is generally considered to be a good industry practice. The licensee stated that a program to include such periodic checks on its contractor laboratory, using spiked samples and/or audits of the laboratory's participation in an independent QC check program, will be developed and included in a revision of procedure N1-CSP-15V.

The inspector stated that the licensee's improvement to its QC program will be reviewed in a future inspection (220/87-06-01).

5.0 Procedures for Control of Effluents

The inspector reviewed procedures for control of effluents, including those for sampling and analysis, and for determination of monitor setpoints. The procedures were found to be very detailed and generally accurate. Some minor difficulties were encountered; for example, the procedure for offgas analysis and monitor set point determination (N1-CSP-5M) provides equations for setting the offgas monitor alarm setpoint, but the explanation of the relationship between the alarm setpoint and any consequent offsite dose is obscure, and should be clarified.



The procedure covering the quarterly calibrations of the offgas radiation monitor requires a sign-off by the radiation protection instrument supervisor to indicate his review, and satisfactory completion of these calibrations. The inspector noted that the calibrations performed in October 1986 and January 1987 had been satisfactorily performed, but the required signature was not present. No time limit was set for completing this review and affixing the appropriate signature; therefore no procedural requirement was technically violated. The supervisor stated that he had completed the review, and that the lack of his signature was an oversight. He signed them during the inspection.

Procedure N1-CSP-13Q covers the quarterly calibration of the stack monitor. The inspector's review of the record of calibration of monitor 11 on April 8, 1987 indicated that a technician had made a minor error in the calculation of the expected count rate of the source used in this calibration. Because it was a small error, it did not affect the validity of the calibration. The procedure requires that the current count rate be determined using the count rate from the previous calibration, rather than the value certified at the time of purchase of the source. The inspector stated that the procedure might be less subject to error if the original value were used along with the appropriate decay correction. The licensee stated that consideration would be given to changing the procedure in the suggested manner.

6.0 Effluent Release Records

The inspector reviewed Semiannual Effluent Release Reports for 1985 and the first half of 1986, and found them to be in compliance with Technical Specification requirements. The analyses presented in these reports indicated that no regulatory or Technical Specification limits were exceeded for releases of liquid or gaseous effluents during the period. The inspector also reviewed selected results of offsite dose assessments included in the semiannual report. These dose assessments are required under new Radiological Effluent Technical Specifications, which went into effect on January 1, 1985. This report summarized the maximum offsite doses due to liquid and gaseous effluents from NMP-1 and demonstrated that doses are within the ALARA guidelines of 10 CFR 50, Appendix I, and also in compliance with 40 CFR 190 for total dose from all uranium fuel cycle facilities.

7.0 Tests of HEPA and Charcoal Filters

The inspector reviewed the results of tests of HEPA and charcoal filters performed in May 1984 and April 1986, for the Control Room Air Treatment System and for the Reactor Building Emergency Ventilation System, both of which are required by the licensee's technical specifications. These systems met the technical specification requirements for filtration efficiencies; i.e., at least 99% removal of DOP by the HEPA filters and



of halogenated hydrocarbon by the charcoal adsorbers for the in-place test, and at least 90% removal of radioactive methyl iodide by a carbon sample in the laboratory. Tests were conducted in accordance with ANSI N.510-1980. The laboratory test was not performed on the control room charcoal adsorbers in the more recent filter tests because new charcoal was installed at that time. The licensee had documentation to show that this charcoal met the technical specification requirements.

8.0 Exit Interview

The inspector met with the licensee representatives denoted in Paragraph 1 at the conclusion of the inspection on April 24, 1987. The inspector summarized the purpose and scope of the inspection and the findings. At no time during this inspection was written material provided to the licensee by the inspector.

