U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No: 50-220/89-80

Docket No. 50-220

License No. DPR-63

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

Facility Name: Nine Mile Point Unit 1

Inspection At: Scriba, New York

Inspection Conducted: August 22-28, 1989

Inspectors: W. Pasciak for — 9/12/89
T. Collins, Chief, Sect. A, RSB, NRR — Date

Robert Loesch — 9/11/89
R. Loesch, Radiation Specialist, RI — Date

W. Pasciak for — 9/12/89
R. Laura, Resident Inspector, Nine Mile Point, RI — Date

W. Pasciak for — 9/12/89
J. Lee, Sr. Health Physicist, NRR — Date

W. Pasciak for — 9/12/89
R. Pederson, Sr. Health Physicist, NRR — Date

Approved by: W. Pasciak — 9/11/89
W. Pasciak, Team Leader, Facilities Radiation Protection Section, RI — Date

Inspection Summary:

Inspection conducted on August 22-28, 1989 (Inspection Report 89-80)

Scope of Inspection:

Announced Augmented Team Inspection of the circumstances and safety implications of the licensee using the Radwaste Processing Building 225′ elevation sub-basement as a long-term liquid radwaste storage facility including review of the history of use of the sub-basement, review of the history of changes of radwaste equipment, identification of present radiological conditions of the room and contents, evaluation of onsite and offsite radiological safety consequences, and review of licensee's past and planned corrective actions.

Results:

The 225′ elevation sub-basement of the Radwaste Processing Building has been used by the licensee as a liquid radioactive waste storage holding facility since July, 1981. The licensee's environmental monitoring program was reviewed and found to be adequate. Split sample water analyses indicated no detectable leakage of sub-basement liquid to perimeter drains. The radiological safety impact offsite was negligible and worker exposures were within regulatory guidelines. The licensee has initiated the construction of a robot to be used in the clean-up and decontamination of the 225′ elevation sub-basement. Two problems were identified as follows: the licensee (1) did not perform evaluations to assess the acceptability and consequences of using the sub-basement as a liquid radwaste holding facility; and (2) did not notify the NRC of flooding the sub-basement, of the decision to defer decontamination of the sub-basement, or of the costs and extent of decontamination anticipated (Details, Section 4).

Details

1.0 Persons Contacted & Present at Exit

1.1 Niagara Mohawk

* J. Endries, President
* L. Burkhardt, Executive Vice President
* J. Willis, General Superintendent, Nuc. Generation
* K. Dahlberg, Station Superintendent, NMP1
M. Colomb, Nuc. Reg. Compliance Director
* R. Abbott, Station Superintendent, NMP2
* R. Remus, Superintendent, Chemistry & Radiological Management
* H. Master, III, Supervisor Incident Investigation
* W. Bandla, Assistant Operations Supervisor, NMP1
D. White, Compliance & Verification Tech.
* J. Aldrich, Special Assistant to NMP1 Supervisor
* R. Randall, Operations Supervisor, NMP1
* M. Dooley, Regulatory Compliance
W. Hansen, Mgr. of QA Audits
T. Newman, Supv. of QA Surveillance
R. Burtch, Jr., Public Relations
* E. Gordon, Supervisor Radiological Support
* J. Duell, Supervisor Chem. & Radiochemistry
* G. Brownell, Nuclear Regulatory Compliance
* E. Leach, Generation Specialist
* N. Spagnoletti, Manager Corporate Health Physics
* C. Gerber, Supervisor Radwaste
H. Wagner, Assistant Supervisor Radwaste

1.2 U.S. Nuclear Regulatory Commission

* M. Knapp, Director, Division of Radiation Safety and Safeguards, RI
* W. Pasciak, Chief, Facilities Radiation Protection Section, RI
* R. Loesch, Radiation Specialist, RI
* T. Collins, Section Chief, Sect. A, RSB, NRR
R. Pederson, Senior Health Physicist, NRR
* R. Laura, Resident Inspector, Nine Mile Point, RI
J. Lee, Senior Health Physicist, NRR
* B. Cook, Senior Resident Inspector, Nine Mile Point, RI
* R. Temps, Resident Inspector, Nine Mile Point, RI

* Denotes those individuals who attended the exit meeting on August 28, 1989. The inspectors also contacted other licensee personnel.

2.0 Purpose

The purpose of this augmented team inspection was to review and determine the following matters:

- Establish the circumstances under which the sub-basement was initially flooded in 1981;
- Identify the present condition of the room, including radioactive material inventory, radiation and contamination levels, isotopic contents of the water and air and leakage paths;
- Determine if the room has been used since its initial flooding for further material/water storage and the circumstances associated with any of these uses;.
- Assess the radiological impact of use of this room for water storage on plant workers and determine whether an evaluation per 10 CFR 50.59 had been performed to support use of the room for storage;
- Assess the offsite radiological impact of the use of this room for liquid waste storage;
- Assess any radwaste system design or operational inadequacies identified;
- Assess the scope, extent and timeliness of the licensee's corrective actions;
- Determine if NRC was or should have been notified of this situation;
- Determine environmental monitoring adequacy; obtain independent measurements if possible; and,
- Determine if there are other places onsite where radwaste is being stored in an analogous manner.

Enclosure 1 is a copy of the Memorandum from W. Russell to M. Knapp establishing the Augmented Inspection Team and specifying the inspection objectives and scope.

3.0 Background

3.1 Original Facility Design

Nine Mile Point Unit 1 became operational in 1969. As originally designed, the Radwaste Processing Building, located on the east side of the Reactor Building, housed the storage and processing equipment

necessary to properly process, package and ship radioactive wastes generated during normal plant operations. Liquid wastes and their related storage tanks were segregated into the following five basic categories:

- Low conductivity waste	Waste Collector Tank
- High conductivity, non-chemical waste	Floor Drain Collector Tank
- High conductivity, chemical waste	Waste Neutralizing Tank
- Filter backwashes	Waste Building Filter Sludge Tank
- Spent resins	Spent Resin Tank

Low conductivity wastes from the Waste Collector Tank were processed through a Waste Collector Filter to remove suspended solids and a Waste Demineralizer to remove dissolved impurities. The final purified water was sent to one of two Waste Sample Tanks to allow for sampling and chemical analysis prior to being added to the Condensate Storage Tank for recycling back to the reactor system.

High conductivity wastes collected in the Floor Drain Collector Tank were filtered by a Floor Drain Filter prior to storage in the Floor Drain Sample Tank. After chemical analysis, the waste liquid was either discharged to the lake or further processed by the chemical waste system.

High conductivity (chemical waste) from the Waste Neutralizing Tank consisted of liquid from the laboratories, decontamination operations and acid and caustic rinses that resulted from the regeneration of resins. Upon neutralization, the waste was sent to the #11 Waste Concentrator which concentrated the liquid through evaporation. Some liquid was evaporated after which it was condensed and recycled to the Waste Collector Tank. The concentrated "evaporator bottoms" were then processed through a Concentrated Waste Tank, a Concentrated Waste Volume Tank, mixed with the appropriate solidification chemicals and placed into 55-gallon drums for eventual shipment to a waste burial site.

When the various filters became exhausted, the filter media were backwashed from the filter columns into the Waste Building Filter Sludge Tank. This slurry was then processed through a centrifuge to remove most of the free liquids. The liquids were routed to the Floor Drain Collector Tank while the resins were transported via a hopper for placement into 55-gallon drums for storage and later shipment offsite.

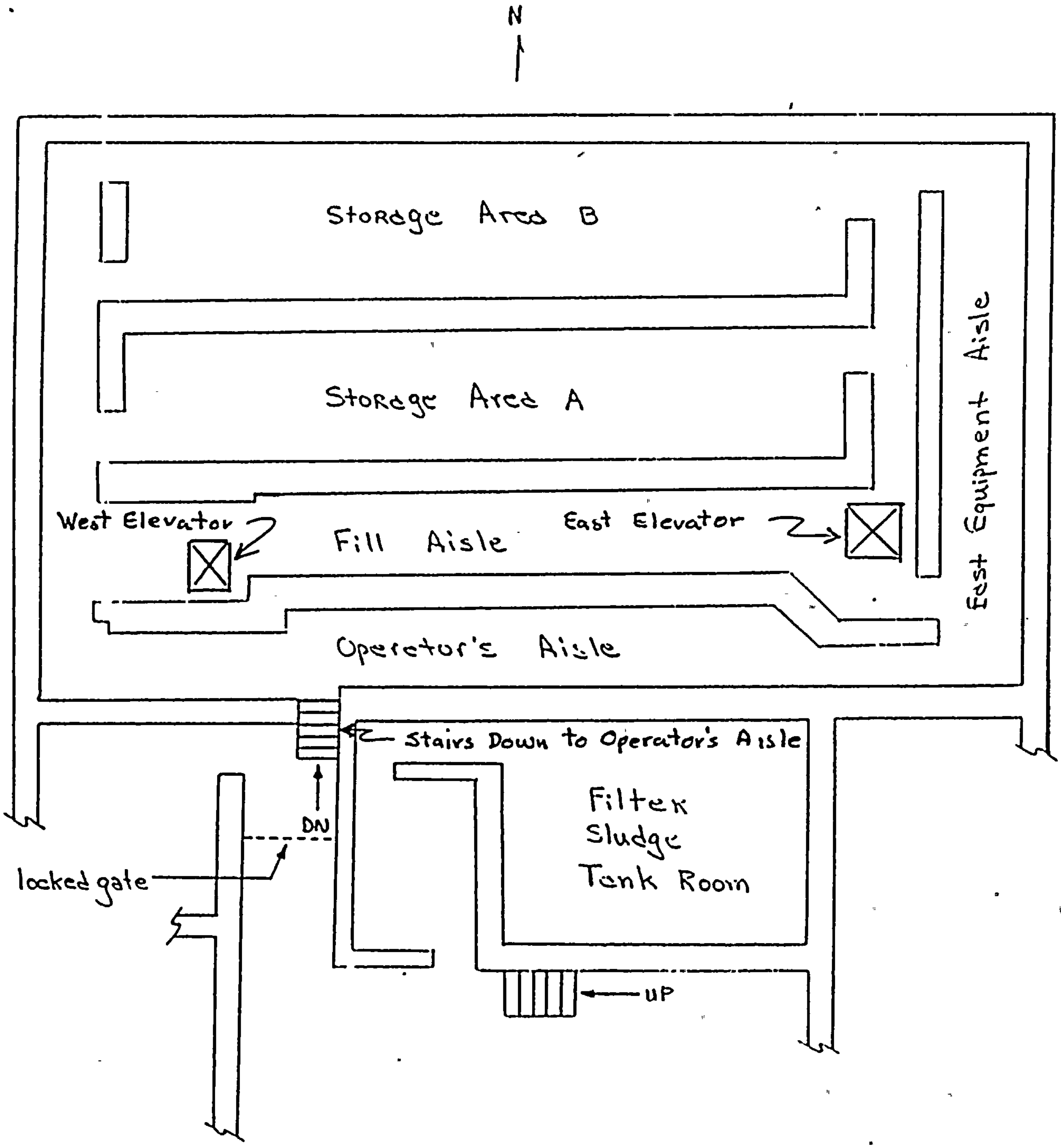
Spent resins from the demineralizers were transferred to the Spent Resin Tank. The spent resins were processed by the same centrifuge mentioned above and were then loaded into drums for ultimate offsite disposal.

The 225′ elevation of the Radwaste Processing Building is a sub-basement of approximately 2400 square feet, subdivided by 30" thick shield walls into five working areas: the operator's aisle, the fill aisle, storage areas A and B, and the east equipment aisle (see Figure 1). The room is the lowest point in the radwaste building and contains two floor drain sumps. The #11 sump is located in the east equipment aisle and the #12 sump is located at the west end of the operator's aisle. The sumps were used for the collection of waste from routine washdowns/decontaminations of the processing line. In addition, the sumps received additional inputs from other sources within the radwaste building. Both the floor and the lower portions of the walls were painted with a protective coating to facilitate decontamination of the room. The room was designed to receive processed wastes in the form of dewatered resins and sludges, transfer the waste material into 55-gallon drums, provide temporary storage capability, and to make final transfer to a loading dock for shipment in shielded casks.

During normal operations, empty drums were loaded onto a drum elevator and lowered to the 225′ elevation where they were automatically loaded onto carriers which hung from a monorail track. The drums were routed into the fill aisle where a vibrating bed automatically lifted up under the carrier. The vibrating bed facilitated the efficient filling of the drums. Waste from the centrifuge, located on the 261′ elevation passed down through a hopper to the 225′ elevation and was loaded into drums under control of the radwaste operators working from the operator's aisle. Waste from the waste concentrator stored in the Concentrator Waste Volume Tank was mixed with chemicals in a mixer located on the 236′ elevation and was used to fill drums at a different location in the fill aisle. The operator had the capability to remotely cap the drums. However, to facilitate the further drying of the waste product, the drums were routinely left open, and capped only prior to shipment. The filled drums were routed by the monorail conveyor system to storage locations in the A and B storage aisle.

3.2 Operational History

During the first few years of operation (1969-1971), the licensee determined that the as-built liquid handling systems were undersized and would have to be supplemented with additional capacity to adequately handle future demands. Occasionally, when backlogs of unprocessed liquids were experienced, incoming liquids would back up from the two sumps into the sub-basement, resulting in a few inches of waste water on the floor. However, when the backlog was corrected, the 225′ elevation would be decontaminated and returned to operation. Due to operational problems being experienced with the centrifuge, a flat-bed filter system was installed in 1972. This unit was essentially a shallow container, the bottom of which was a movable,



Floor Plan
225' Elevation Sub-basement
Radwaste Building

Figure 1

porous belt. Waste was forced through the belt; the liquid exiting from the bottom was recycled. At the appropriate time, the belt would move the filtered waste for transfer through a hopper to 55 gallon drums. Since bead type resins from the Spent Resin Tank would not hold together when dry, they were transferred and dewatered directly in the shipping casks.

After 1973, use of the #11 waste concentrator was curtailed due to operational difficulties. To continue processing operations, an outside vendor was brought in to dewater and/or solidify wastes from the Floor Drain Sample Tank and the Waste Neutralizing Tank. During the 1973-1974 period, an addition was built onto the Radwaste Processing Building. This addition housed a new #12 waste concentrator, a concentrated waste storage tank and supporting equipment and effectively replaced the inoperable #11 waste evaporator which was removed and scrapped in 1976. During the 1977-1979 period, burial site requirements drastically decreased the allowable water content of waste. Therefore, the licensee shifted the dewatering of sludges and resins from the flat-bed filter to predominately in-cask dewatering. After this time, the drum processing area on the 225' elevation sub-basement was not used except for storage of approximately 150 previously filled drums.

3.3 Other Radwaste Storage Areas

During the course of the inspection, the Radwaste Building was toured by the inspectors several times and numerous licensee personnel were questioned regarding the likelihood of there being an analogous location onsite where radwaste may be stored in a manner not consistent with the facility design. No such areas were found by inspectors nor were any identified by the licensee or their staff.

4.0 Summary of the 1981 Flooding Event

The inspectors reviewed operations and waste logs for the period of July 4, 1981, to July 20, 1981, in order to determine the sequence of events leading to the flooding. During the Unit 1 startup on July 5, 1981, higher than normal conductivity was noted in the low conductivity (high purity) waste water process stream (Waste Collector Tank). The higher than normal conductivity in the process stream caused a more rapid depletion of the resins in the waste demineralizer. The licensee therefore began a changeout of the waste demineralizer. The evolution of demineralizer changeout halts low conductivity stream processing. At the same time, this evolution creates large volumes of high conductivity waste because of the resin regeneration and resin transfers involved.

During this period (July 5-7), the #12 waste concentrator in the high conductivity process stream was out of service for extended periods. Since the waste concentrator is the only means for reducing conductivity to a low

enough level that the water can be transferred to the low conductivity stream, all high conductivity waste is stored in holdup tanks whenever the waste concentrator is out of service. Therefore, during this period when the demineralizers were being changed out and the waste concentrator was out of service, both the low and high conductivity process streams were unavailable and large amounts of waste water were being generated.

By July 7, all radwaste tanks were full. However, the very process needed to return the low conductivity processing system to operation would also generate additional waste water. In particular, regeneration of the demineralizer was essential for establishing low conductivity stream processing. Since no additional waste storage tanks were available, the licensee elected to overflow the radwaste storage tanks with the intention of using the 225′ elevation sub-basement area as a temporary storage area. Apparently, consideration was not given at the time of this decision to the potential impact of room flooding on the drums of solid waste which were stored at that location. Further, the licensee did not perform a safety evaluation of using the sub-basement as a liquid radwaste holding facility under the requirements of 10 CFR 50.59. The overflow in the waste building flooded the sub-basement area to just above the 229′ elevation. At the time of the flooding, there were approximately 150, 55 gallon drums in the area, most of which were filled with radioactive waste made up mostly of filter sludges and spent resins. As was discovered in October, 1981, the water floated many of the waste storage barrels off of their carriers, resulting in tipping and spilling of the contents of many into the water. Late on July 7, the waste concentrator was returned to service and processing of the high conductivity stream started. Processing of the high conductivity stream was not successful however, because the transfer point between the high and low conductivity streams is the equipment drain sump located on the flooded 229′ level. The flooding at the 229′ level allowed flow from the high conductivity to the low conductivity process streams and thus recontaminated the low conductivity processed water. The occurrence of the recontamination problem is further evidence that a safety evaluation had not been performed prior to the flooding event. In order to reestablish separation between the high and low conductivity streams, it was first necessary to reduce the water level to below the 229′ elevation. On July 8, the licensee therefore began a controlled discharge of water to Lake Ontario from the 50,000 gallon Waste Surge Tank at a rate of 30 gallons per minute in order to make the surge tank available for storage of the water currently flooding the 225′ and 229′ elevations. The licensee notified the NRC of this discharge by letter dated October 30, 1981, but did not describe the flooding of the 225′ elevation or its consequences (Reference 9.1). By July 10, level recovery in the radwaste tanks had begun. On July 16, decontamination of the 229′ elevation was initiated. In August and September, 1981, attempts were made to decontaminate the 225′ level. These efforts were discontinued in October, 1981, based upon radiation protection priorities. Decontamination efforts are more fully discussed in Section 7.1.

In October, 1981, after the licensee terminated their initial decontamination effort of the July, 1981, flooding event, it was decided

that the sub-basement area would be left flooded at about a depth of one foot until decisions on ultimate clean up were made. A depth of one foot was maintained to help control potential airborne contamination. The inspectors did not find evidence that the NRC had been notified of the decision to defer decontamination of the sub-basement.

5.0 Current Status of Room

The inspector reviewed radiological survey data and analyses performed by the licensee to support three decontamination efforts of the 225′ elevation (1981, 1985, and 1986), video tapes recorded during a remote-robotic survey in September 1986, and recent surveys of the area, to determine the radiological conditions of the 225′ elevation. These decontamination efforts and surveys are described in detail in Section 7. An exact accounting of the barrels and their contents is difficult due to the loss of the operating log for the system. It is believed that the log book was disposed of as radioactive waste during the 1985 decontamination effort (see Section 7.1). However, based on the licensee's knowledge of the system and review of a status board within the 225′ elevation sub-basement, the licensee estimates there are no more than 150 barrels (their best estimate is that there are 130 barrels) of expended powdered filter/ion exchange resin and filter sludge. The video recording by the SURVEYOR robot of the drum storage areas in September, 1986, shows 55-gallon drums in disarray. Many of these drums were off the conveyor system and lying in various orientations. Several drums were lying on their sides without their tops and with their contents spilled out. The practice when the system was in operation was to leave the tops off the drums until just before shipment to promote drying of the contents. The video recording indicated some corrosion had occurred on the drums. The extent of damage to the drums was not clear in the recording. Based on the contact dose rates measured on the drums when they were initially filled, it is believed that the present contact dose rates associated with some of these drums is as high as 500 R/hr. This is the estimated dose rate at the surface of some drums within the shielded walls of the room. Dose rates at the entrance to the locked gate were less than 10 mR/hr. Contamination levels are discussed below.

In November, 1985, an isotopic analysis and a dose rate survey were performed on an accessible barrel in preparation for the 1986 decontamination effort. Based on the results of this analysis (and the assumption of 150 barrels in the area) the licensee's "best estimate" of the total radioactive material in the area is 7570 Curies. Currently, the licensee is maintaining 10 to 18 inches of water on the floor of the 225′ elevation to minimize the drying of the resin/sludge material and reduce the potential for radioactive particulates from becoming airborne. During this inspection, the licensee sampled water from the area at the bottom of the stairs leading to the operator's aisle. The isotopic analysis of the sample indicated concentrations of cesium-137, cobalt-60 and manganese-54 of 5E-3 uCi/ml, 3E-4 uCi/ml and 3E-5 uCi/ml, respectively. However, since the majority of the spilled resins are located in the rear of the sub-basement, the sample obtained may not be representative of actual concentrations in the storage aisles. Assuming that the water at the bottom

of the stairs is representative of the water throughout the room, these results indicate that less than 4 Curies (less than 0.05 percent of the radioactive material in the area) is dissolved in the water standing on the floor. Samples of the water in the area at the bottom of the stairs leading to the operator's aisle were also analyzed by the NRC (see Section 6.0) and results were in agreement with those of the licensee.

The inspector reviewed airborne contamination surveys performed during periods of access to the area. These surveys indicated levels from 4-8% of the maximum permissible concentration (MPC) of 10 CFR 20 for restricted areas. An airborne survey taken in the operator's aisle during this inspection (August 24, 1989) indicated 4.8% of MPC. In addition to airborne contamination, the licensee also performed an area radiation survey and a removable surface contamination (smear) survey of accessible areas of the 225' elevation and the 229' elevation access. Dose rates just above the surface of the water in the operator's aisle and the fill aisle were measured at up to 200 mR/hr and up to 2500 mR/hr respectively. The dose rates in the operator's aisle were measured by means of an extendable probe survey instrument (teletector) extended from the area of the stairs, and the dose rates in the fill aisle were measured with a teletector extended down the elevator shafts from the floor above. Smear samples on the 229' elevation were measured at up to 94,000 dpm/100 cm^2 on the landing inside the locked access gate, up to 30,000 dpm/100 cm^2 outside the locked access gate, and up to 450,000 dpm/100 cm^2 on the stairs leading to the 225' elevation. These dose rates and contamination levels are not inconsistent with what would be expected in areas of a radwaste processing building.

6.0 Environmental and Onsite Impacts

The inspector reviewed results of the licensee's Environmental Monitoring Program, plant layout and design, plant system drawings and records of effluent discharges to determine if radioactive material spilled on the 225' elevation area is being or has been inadvertently released to the environment. Possible means of radioactive release from the 225' elevation include release of water to the surrounding ground through some unidentified leakage in the room or a release to the air of any airborne radioactive material from the room. The inspector noted that the 225' elevation was originally designed as an area of high potential for airborne activity. As such, the ventilation was designed so that air from the 225' elevation is taken into the exhaust ventilation system. This air is exhausted through a High Efficiency Particulate Air (HEPA) filter into the plant's stack. An alarming Continuous Air Monitor is provided in the flow path before the HEPA filter. There have been no indications of radioactive materials being released other than what is normally expected by this path. Surveillance of the stack radiation monitors to assure operability is routinely performed in accordance with plant Technical Specifications and reviewed by the NRC during routine transportation and effluent inspections.

As noted in Section 5, air concentration measurements in the room are generally below 10% of MPC.

In reviewing the possible pathways for release of liquid radioactive material from the 225′ elevation sub-basement, the inspector noted that the lower levels of the plant are recessed into the bedrock underlying the facility. A drain system has been provided surrounding the plant buildings at the bottom of the back fill area between the plant walls and the bedrock walls. This perimeter drain system consists of a perforated collecting pipe that channels water to a sump. At the exterior of the radwaste building, this piping is at the 225′ elevation. Any groundwater flowing into the channel would be collected in the sump and pumped to the plant Storm Drain System. Similarly, any leakage from the Radwaste Building would be collected and pumped into the storm drain. In response to an NRC Information Notice, the licensee has been monitoring the discharge at the storm drain system on a weekly basis since August, 1981. Between June, 1979, and August, 1981, it was monitored on a monthly basis. The results of this monitoring program do not indicate any leakage of radioactive material from the Radwaste Building or any other buildings onsite. The inspector requested that the licensee draw a sample from the perimeter drain sump; however, there was not enough flow in the discharge header with the sump pumps running to get flow out of the sample point at the top of the discharge pipe. The licensee did, however, manage to obtain a water sample and smear samples from the internals of the pump located in the sump by partially disassembling the system. No detectable activity was found, which further indicates no leakage from the 225′ elevation sub-basement. It is the conclusion of the inspection team that leakage of radionuclides from the room is negligible.

The inspectors revisited an issue of offsite environmental contamination raised in the second half of 1981. The public concern expressed over cesium-137 detected in milk samples in the area of the plant (Reference 9.2) and a related report of anomalous environmental water sample results (Reference 9.3) were reviewed with the licensee in terms of whether the contamination of the 225′ level could have contributed to these concerns. No pathway of radioactive material from the 225′ level to the environment was identified; therefore, the conclusions drawn in References 9.2 and 9.3 remain valid.

During the inspection, liquid samples from the floor of the operator's aisle of the 225′ elevation and the plant storm drain were split between the licensee and the NRC for purposes of intercomparison. The samples were analyzed by the licensee using normal methods and equipment. The NRC samples were sent to the NRC reference laboratory, Department of Energy, Radiological and Environmental Sciences Laboratory (RESL), Idaho Falls, Idaho, for analysis. These samples were analyzed for strontium-90, gross alpha, and by gamma spectroscopy.

The results of these sample measurements indicated that all of the measurements were in agreement. The results of this comparison are listed in Table 1. In addition, the inspector performed surveys of the general area radiation levels and removable contamination, from accessible areas outside the locked gate access to the 225′ elevation sub-basement room, that confirmed the licensee's survey results.

7.0 Corrective Actions

7.1 Past Corrective Actions

Subsequent to the spill that occurred in July, 1981, the licensee attempted a manual cleanup. At this time, the water level in the room was 3 to 4 feet deep. The #11 sump was unclogged and the water level was lowered. The water/sludge mixture was being pumped to a cask liner for shipment. During October, 1981, while the licensee was conducting decontamination of the operator's aisle, currents, which were caused by a decreasing water level in the room, caused a barrel to float around the east corner of the room. The barrel had a dose rate of approximately 300 R/hr on contact. Prior to this, the licensee apparently was not aware that the flooding had caused barrels to float off their carriers. The cleanup effort was terminated, at which time approximately 1.3 person-rem had been expended. Most of the sludge in the operator's aisle had been removed. The room water level was pumped down to about a one foot depth and maintained that way to minimize airborne contamination. No further cleanup actions were taken until July, 1985, nor was any additional solid radioactive waste put in the room for storage. It was stated by the licensee that in the years following the July, 1981, flooding event, on occasion the room was used to accommodate slight overflows, but there were no significant additional flooding events like the one that happened in July, 1981.

During July and August, 1985, the licensee again attempted to clean up the room and sent a crew into it to initiate desludging. The decontamination effort initially involved setting up plywood dams on both sides of the stairs in the operator's aisle. Sludge was vacuumed off the floor in the area between the dams. The decontamination of the room was not completed since it was clear from the experience in the operator's aisle that the level of effort and person-rems that would have been incurred to complete the decontamination were significantly underestimated. The licensee then decided that, because of the high dose rates, manual decontamination was not feasible and that robotic decontamination was necessary. The licensee began actively pursuing robotic methods for decontaminating the area.

In the spring of 1986, the room was entered to desludge and remove two drums in the west aisle. This was done to allow access for a robot the licensee was planning to bring onsite to survey the room. The licensee

Split Sample Analysis Comparison

225' Sub-basement Water Sample

Radionuclide	NMP (uC/ml)	RESL (uC/ml)
Cobalt-60	(2.39 +/- 0.09)E-4	(2.49 +/- 0.13)E-4
Cesium-134	(7.51 +/- 0.39)E-5	(6.3 +/- 0.6)E-5
Cesium-137	(5.35 +/- 0.17)E-3	(5.41 +/- 0.19)E-3
Manganese-54	(3.02 +/- 0.21)E-5	(2.8 +/- 0.4)E-5
Strontium-90	NAF	(3.15 +/- 0.14)E-5
Gross Alpha	NAF	(3 +/- 5)E-9

Perimeter Drain Water Sample

Radionuclide	NMP (uC/ml)	RESL (uC/ml)
Cesium-137	ND	(1.5 +/- 2.1)E-8
Potassium-40	ND	(9 +/- 3)E-7
Gross Alpha	NAF	(2.8 +/- 0.5)E-9
Gross Beta	NAF	(1.4 +/- 0.4)E-8

NOTE:

NMP - Nine Mile Point
RESL - Radiological and Environmental Sciences Laboratory, Idaho
NAF - Not analyzed for
ND - Not detected

Table 1

obtained a robot (SURVEYOR) in the early summer of 1986 for video surveying the room. The robot was sent into the 225′ elevation sub-basement in September, 1986. A videotape of the conditions was made. As noted previously in this report, the videotape indicated many of the drums had floated off their carriers and were spread in disarray around the storage aisles. Some of the drums were lying on their sides with their contents spilled out.

7.2 Planned Corrective Actions

The licensee's plan is to clean, decontaminate and repaint the entire 225′ elevation sub-basement. As noted above, there are approximately 150 barrels of filter sludge in this area, some of which have tipped over and spilled their contents. The licensee estimated that if the area was cleaned using manual methods approximately 150 person-rem would be expended. The licensee has contracted with an outside vendor to build and deliver a Tethered Remote Operating Device (TROD). The use of the TROD will result in the expenditure of approximately 10 person-rem as compared to 150 person-rem estimated for manual decontamination.

The TROD is a teleoperated, electro-hydraulic system which will ride on the overhead conveyor present in the area and will be operated remotely from the 261′ elevation of the building. Niagara Mohawk Radwaste Department will operate the TROD and is in charge of the cleanup effort. The licensee is in the process of developing an ALARA (As Low As Reasonably Achievable) Plan for the cleanup activity. The ALARA Plan will contain the methodology and detailed instructions on the cleanup operation.

Although the ALARA Plan was not available for review, the inspector discussed with radwaste supervision the cleanup methodology. The operator's aisle will be decontaminated manually because the monorail barrel carrying system does not go through this aisle. The TROD will be lowered to the 225′ elevation through the west elevator and then connected to the monorail track. It will be used to decontaminate all areas except the operator's aisle and the east equipment aisle. Two drums located in the fill aisle will first be desludged and removed. Next, the west aisle will be decontaminated using the TROD, and the east equipment aisle will be decontaminated manually. The TROD will then be used to clean out the drum filling aisle and then the 'A' and 'B' storage areas. Other equipment in the area, such as control

panels and the conveyor system, will then be removed. Final decontamination of all surfaces and removal of all equipment associated with the earlier drumming operation will be completed and then the area will be repainted.

The schedule of the planned decon/cleanup has been developed; it is planned to begin the last week in September, 1989, and to take seven months. The licensee stated that the effort will cost between $1.5 and $2.0 million. The inspectors did not find evidence that the NRC had been notified of this estimate or the cleanup plans prior to this inspection.

7.3 Timeliness of Licensee's Corrective Actions

The flooding of the 225' elevation sub-basement occurred in July, 1981, which caused barrels of filter sludge to tip over and spill their contents. The radioactive material was contained and the room was monitored for leakage. The licensee considered the spill not to be a safety concern since it was contained. While initial decontamination was attempted and terminated in October, 1981, no further work was initiated until August, 1985. Work was not reinitiated until August, 1985, because station management assigned a low priority to the cleanup and diverted financial resources to other projects. These other projects included of the Unit 1 recirculation pipe replacement outage, the Austerity Program developed to deal with the increasing cost of building Unit 2, and major radwaste processing system modifications. As described in Section 7.1, in August, 1985, the licensee initiated a second manual cleanup, which was terminated soon after starting. At that point, the licensee decided to approach the cleanup with robotic methods. In March, 1988, a "Request for Proposal" was let for a robotic system. In July, 1988, a "Purchase Order" to initiate design was issued, and in July, 1989, a design was selected and system ordered.

In summary, the team found the licensee did not pursue cleanup of the sub-basement for approximately a four year time span between 1981 to 1985. The team did not find an adequate justification for not dealing with the situation in the room during that period.

8.0 Exit Interview

The team met with licensee representatives (denoted in Section 1.0) at the conclusion of the inspection on August 28, 1989. The team summarized the purpose and scope of the inspection and the findings.

9.0 References

9.1 Letter from Niagara Mohawk Power Corporation to R.C. Haynes (NRC), dated October 30, 1981 (describes controlled release of 50,000 gallons of Waste Surge Tank water to Lake Ontario).

9.2 Letter from Victor Stello, Jr., then Director of OIE to Mr. Peter Dalton, Sierra Club Radioactive Waste Campaign, dated October 19, 1981.

9.3 Preliminary Notification of Event or Unusual Occurrence, PNO1-81-130 (Anomalous Environmental Water Sample Measurements), dated December 11, 1981.