



## DETAILS

### 1. Individuals Contacted

#### Principal Licensee Employees

- \*F. G. Butler, I&C Supervisor
- \*C. Roszkowski, Emergency Planning Supervisor
- +\*S. Cantone, Manager - Nuclear Support
- \*C. Wike, Nuclear Emergency Planning Supervisor
- \*J. D. Green, QA Supervisor - Operations
- \*F. T. Eisenhuth, Senior Compliance Engineer
- \*L. D. O'Neil, Technical Supervisor
- \*R. E. Doebler, Chemistry Supervisor
- \*R. Harris, Senior Licensing Specialist
- \*D. G. Mitchell, Engineer
- \*D. J. Thompson, Assistant Superintendent of Plant
- L. K. Vnuk, Senior Chemist
- W. Stewart, Laboratory Foreman
- D. Miller, Counting Room Foreman
- +M. Basta, Manager, Environmental Support
- +J. Fields, Senior Environmental Specialist - Nuclear
- +D. Leddy, Health Physics Specialist
- +R. Kichline, Chemical/Environmental Scientist
- +J. Litak, Nuclear Quality Assurance, Analyst

#### Other Site Personnel

H. Helmholtz, NWT Corporation

#### Others

R. Hogan, PP&L Project Leader, Radiation Management Corporation  
W. Deutsch, Research Biologist, Ichthyological Assoc.

\*Denotes those present at exit interview.

+Denotes those present at PP&L headquarters exit interview (July 8, 1982)

### 2. Licensee Action on Previous Inspection Findings

(Closed) Licensee Identified Item (387/82-11-06): Release of Radioactive Material to Landfill. The licensee's corrective action to prevent further occurrences of this type were to post an RWP (Radiation Work Permit) at the entrance to the chemistry sample preparation room, repost the area as a potentially contaminated area, and to put a properly labeled yellow radioactive waste drum in the sample preparation room to be used for radioactive waste. The inspector stated that this item is closed.

(Closed) Follow-up Item (387/80-30-01; 388/80-18-01): Evaluation of TLD station locations at site boundary (11S1, 14S1, and 15S1). The inspector reviewed and verified the corrective actions regarding the placement of new TLD locations (11S2, 14S2, and 15S4). The new locations presented a minimum of shielding of the TLDs. The inspector stated that this item is closed.

*03 (Per J. Jang 9/9/82)*

(Closed) Follow-up Item (387/80-30-02; 388/80-18-03): Review of continued operations of Pollution Control Task Force (PCTF). The inspector reviewed PCTF meeting minutes dated January 18, 1982. Outstanding items were either solved or target dates were established. The inspector stated that this item is closed.

*02 (Per J. Jang 9/9/82)*

(Open) Follow-up Item (387/80-30-01; 388/80-13-02): Erosion Control. This item remains open. See Paragraph 4.e.

3. Inplant Chemical and Radiochemical Measurements Program for Unit 1

a. Organization

The inspector reviewed the licensee's chemistry organization. The organization consists of the Chemistry Supervisor, an Environmental Chemist, two Unit Chemists, two Foremen, six Level II Technicians, eight Level I Technicians, and three contractor technicians. At the present time the following vacancies exist: one Unit Chemist, one Level II Technician, and one Level I Technician. The inspector noted that the licensee had an adequate chemistry staff for fuel loading.

No items of noncompliance were identified.

b. Procedures

The inspector reviewed procedures in the following areas: liquid and airborne effluent sampling and analysis, reactor water sampling and analysis, instrument calibration, effluent monitor calibration, and compliance with effluent release limits. The inspector noted that the procedures necessary for fuel loading had all been written and approved. The inspector further noted that approximately 99 percent of the required chemistry procedures had been written and greater than 95 percent had been approved.

No items of noncompliance were identified.

c. Laboratory Quality Control

The inspector discussed with the licensee the program for the quality control of analytical measurements. Procedure AD-QA-445, Chemistry Program Quality Assurance, defines the guidelines for the chemistry QA program. In addition, other individual procedures implement specific aspects of the QC program such as chi-squared tests and

reagent preparation and control. The inspector noted that the procedures in this area had been written and approved as required.

No items of noncompliance were identified.

d. Capability Test Results

Capability test samples were submitted to the licensee in order to evaluate the licensee's capability to measure radioactivity in effluents. The capability test samples were prepared by the NRC reference laboratory, DOE Radiological and Environmental Services Laboratory, and duplicated the types of samples and nuclides that the licensee would encounter during operation. The test samples were analyzed by the licensee using his normal methods and equipment.

The results of the test sample measurements comparison indicated that all of the measurements were in agreement under the criteria used for comparing results with the exception of the Sr-89 results. The inspector noted that the licensee had attempted to perform the Sr-89 analysis without calibrating his detector. The licensee stated that he would use a vendor laboratory to perform the Sr-89 and Sr-90 analyses. The inspector noted that the licensee's vendor laboratory was a laboratory used by other licensees in Region I and that samples split between other licensees and the NRC for Sr-89 and Sr-90 had been in agreement. In addition, the licensee stated that Fe-55 analyses would also be performed by a vendor laboratory. The results of the measurement comparisons are listed in Table 1.

The inspector noted that the licensee's counting equipment had been calibrated except that a self-absorption curve for gross alpha analyses had not been determined. The licensee stated that the alpha radioactivity standard would be received shortly and the self-absorption correction factors would be determined. The inspector stated that this area would be reviewed during a subsequent inspection (387/82-25-01).

No items of noncompliance were identified.

e. Effluent Radiation Monitors

The inspector reviewed the status of the licensee's liquid and airborne effluent radiation monitors. The inspector noted that the licensee had calibrated the liquid effluent monitor over the expected energy range of the monitor using three sources in the actual geometry of the monitor and also verified the response of the monitor over its entire range using a reference source. The licensee had also calibrated the airborne effluent monitors using sources configured in the actual geometries of the monitors and used reference sources to verify the response of the monitor over its entire range.

The inspector noted, based on discussions with the licensee, that if power is lost to both of the control terminals for the airborne effluent monitors, the airborne effluent alarms will not enunciate in the control room. The licensee stated that until the system could be modified, administrative controls would be implemented to prevent inadvertent turn-off of the airborne effluent radiation monitors' control terminals. The inspector stated that the modification to the system would be reviewed during a subsequent inspection (387/82-25-02). The inspector also noted that the licensee would be using charcoal cartridges with a documented collection efficiency for iodine sampling in airborne effluent radiation monitors.

f. Training

The licensee's training program for chemistry personnel was reviewed. The chemistry technician training program is detailed in Nuclear Training Instruction NTI-QA-3081, Chemistry Technician Certification Program. The program requires that both licensee and contractor technicians pass selection examinations and procedure qualifications. The inspector had no further questions in this area at this time.

4. Implementation of Preoperational Environmental Monitoring Programs for Units 1 and 2

a. Management Controls

The inspector reviewed the organization for administration of the environmental monitoring programs. The preoperational Radiological Environmental Monitoring Programs are being conducted by the Nuclear Support Group, the supervisor of which reports to the Nuclear Support Manager.

A Pollution Control Task Force (PCTF) was formed in 1979 to oversee site construction environmental protection activities. The inspector reviewed PCTF meeting minutes dated January 18, 1982. Outstanding items were either resolved or target dates were established.

The inspector reviewed a number of audits and subsequent responses in both the construction and preoperational environmental monitoring programs for 1981. These audits were conducted by the Environmental Auditing Group and covered areas including review of contractor laboratories/analytical procedures, radiological and non-radiological sampling and analysis, and TLD programs.

The inspector noted that corrective actions had been made or initiated on identified audit findings as required. The inspector reviewed the Nuclear Quality Assurance (NQA) audit Schedule Revision 1 for 1982-1983, ERs 100450/100508, dated June 1, 1982. The inspector noted that the Radiological Environmental Monitoring and Meteorological Program was also included.

The inspector had no further questions in this area at this time.

b. Biological/Ecological Monitoring

The inspector toured the biological consultant's laboratory and observed the performance of the aquatic sampling techniques. The inspector also discussed with the licensee the scope of the monitoring program including sample size to meet the required analytical sensitivity.

The inspector had no further questions in this area at this time.

c. Radiological Monitoring

The inspector toured new TLD locations (11S2, 14S2, and 15S4) to verify the corrective actions (50-387/80-30-01; 50-388/80-18-01). The new locations imposed minimal shielding to the TLDs from the plant direction.

The inspector toured air sampling stations, 5S4, 2S2, 1D2, 12E1, 11S2, 9B1, and 15S4, and verified the calibration date of the sampling equipment. Air sampling equipment was installed adequately. The inspector also reviewed sampling frequency and noted that the weekly air sampling was performed as required for 1982.

The inspector reviewed Radiological Environmental Monitoring Program (REMP), 1980 Annual Report. Sampling frequencies and analytical results for airborne pathways, ingestion pathways, and direct radiation measurements were reviewed and performances were adequate.

The inspector had no further questions in this area at this time.

d. Calibration Procedures for the Meteorological Instruments

The inspector noted that calibration procedures for the meteorological instruments were not specific to the Susquehanna site during the previous inspection (Inspection Report 50-387/80-30; 50-388/80-18). The inspector, therefore, reviewed calibration procedures during this inspection.

The inspector reviewed the following PORC approved procedures:

SI-99-313; Semi-Annual Calibration of Wind Speed at (60 meters),  
X-03701

SI-99-314; Semi-Annual Calibration of the Wind Direction at 60  
meters, X-03702

SI-99-315; Semi-Annual Calibration of Wind Speed at (10 meters),  
X-03703

SI-99-316; Semi-Annual Calibration of the Wind Direction at 10  
meters, X-03704

SI-99-317; Semi-Annual Calibration of Delta Temperature Channel 1,  
X-03707 (10-60 meters)

SI-99-318; Semi-Annual Calibration of Delta Temperature Channel 2,  
X-03708 (10-60 meters)

The inspector had no further questions in this area at this time.

e. Erosion Control

The inspector toured at the west edges of the western lay-down area and the western edges of the spoils area to verify the stabilization of these areas (387/80-30-02; 388/80-18-02). The stabilization of these areas was to have been completed in the spring of 1981 as documented in Inspection Report 50-387/80-30-02; 50-388/80-18-02, dated November 12-14, 1980. The inspector noticed that these areas are still in use and have not been stabilized. The licensee stated that the stabilization of the lay-down area will be started late this summer (1982) and completed in early spring of 1983. The spoils area will continue to be used for a disposal area until the completion of all site earth work.

The inspector stated that this area will be re-examined during a subsequent inspection.

f. Licensee Program for Quality Control of Environmental Analytical Measurements

The inspector discussed with the licensee the Quality Control (QC) Programs for measurements in both the radiological and non-radiological environmental monitoring programs. The licensee's contractor laboratories (radiological and non-radiological) participate in the EPA interlaboratory comparison program. The inspector reviewed the EPA radiological interlaboratory comparison results for 1980 and 1981 performed by the licensee's radiological contractor laboratory. The results were generally in agreement. The inspector also reviewed the EPA non-radiological QA/QC program and noted the QC samples were analyzed by the contractor laboratory without knowledge of "true" values. The acceptance criteria (+ 10% of the true value) and follow-up actions to resolve identified discrepancies were established in this program. The inspector reviewed analytical results of the first quarter EPA non-radiological QC samples dated on April 21, 1982. The results were generally in agreement. This method of program operation is consistent with accepted laboratory practices.

The inspector had no further questions in this area.

5. Exit Interview

J. C. Jang met with the licensee representatives denoted in Paragraph 1 at the conclusion of the inspection on July 8, 1982, at the licensee's corporate office.

The inspectors met with the licensee representatives denoted in Paragraph 1 on July 9, 1982, at the plant site.

The purpose and scope of the inspection were summarized, and the inspection findings were discussed. The inspectors also stated that they would return to the site to review the airborne effluent radiation monitor calibration data after the calitrations had been performed. The calibration data was reviewed on July 19-20, 1982 to complete the inspection.



TABLE I  
SUSQUEHANNA -- UNIT 1  
CAPABILITY TEST SAMPLE RESULTS

<u>SAMPLE</u>	<u>ISOTOPE</u>	<u>NRC VALUE</u>	<u>LICENSEE VALUE</u>	<u>COMPARISON</u>
<u>Results in Total Microcuries</u>				
Particulate Filter Standard A-62	Cs-134	(1.40 ± 0.05)E-3	(1.32 ± 0.07)E-3	Agreement
	Cs-137	(4.06 ± 0.12)E-3	(4.34 ± 0.08)E-3	Agreement
	Co-60	(2.13 ± 0.06)E-3	(2.44 ± 0.09)E-3	Agreement
Charcoal Cartridge Standard H-62	Cs-134	(1.32 ± 0.04)E-2	(1.31 ± 0.11)E-2	Agreement
	Cs-137	(3.74 ± 0.11)E-2	(3.93 ± 0.09)E-2	Agreement
	Co-60	(2.09 ± 0.07)E-2	(2.19 ± 0.10)E-2	Agreement
	Ba-133	(1.73 ± 0.05)E-1	(2.14 ± 0.03)E-1	Agreement
Charcoal Cartridge Standard F-62	Ba-133	(5.03 ± 0.13)E-2	(5.77 ± 0.11)E-2	Agreement
	Co-60	(1.30 ± 0.05)E-2	(1.24 ± 0.07)E-2	Agreement
	Cs-137	(2.48 ± 0.08)E-2	(2.20 ± 0.07)E-2	Agreement

TABLE I

## SUSQUEHANNA - UNIT 1

## CAPABILITY TEST SAMPLE RESULTS (continued)

<u>SAMPLE</u>	<u>ISOTOPE</u>	<u>NRC VALUE</u>	<u>LICENSEE VALUE</u>	<u>COMPARISON</u>
<u>Results in Microcuries per Milliliter</u>				
RESL Liquid Standard 12-1-81	H-3	(6.80 ± 0.06)E-3	(6.78 ± ?)E-3	Agreement
	Sr-89	(8.29 ± 0.12)E-3	(4.3 ± ?)E-3	Disagreement
	Sr-90	(5.92 ± 0.24)E-4	(5.42 ± ?)E-4	Agreement
	Co-57	(1.13 ± 0.03)E-4	(1.11 ± ?)E-4	Agreement
	Cs-134	(1.81 ± 0.03)E-3	(1.96 ± ?)E-3	Agreement
	Co-60	(3.52 ± 0.09)E-3	(3.72 ± ?)E-3	Agreement

TABLE I  
 SUSQUEHANNA - UNIT 1  
 CAPABILITY TEST SAMPLE RESULTS (continued)

<u>SAMPLE</u>	<u>ENERGY (keV)</u>	<u>NRC VALUE</u>	<u>LICENSEE VALUE</u>	<u>COMPARISON</u>
<u>Results in Gammas per Minute Emitted From the Standard</u>				
Off-Gas Standard	81	(2.47 ± 0.13)E5	(2.29 ± 4%)E5	Agreement
	303	(1.37 ± 0.09)E5	(1.32 ± 7%)E5	Agreement
	346	(2.45 ± 0.14)E6	(2.46 ± 0.6%)E6	Agreement
	356	(4.09 ± 0.03)E5	(4.42 ± 1.7%)E5	Agreement
	779	(1.17 ± 0.07)E6	(1.27 ± 1.4%)E6	Agreement
	964	(1.32 ± 0.08)E6	(1.58 ± 1.3%)E6	Agreement
	1408	(1.87 ± 0.14)E6	(2.54 ± 1.1%)E6	Agreement

## Attachment 1

### Criteria for Comparing Analytical Measurements

This attachment provides criteria for comparing results of capability tests and verification measurements. The criteria are based on an empirical relationship which combines prior experience and the accuracy needs of this program.

In these criteria, the judgement limits are variable in relation to the comparison of the NRC Reference Laboratory's value to its associated uncertainty. As that ratio, referred to in this program as "Resolution", increases the acceptability of a licensee's measurement should be more selective. Conversely, poorer agreement must be considered acceptable as the resolution decreases.

<u>Resolution</u>	<u>Agreement</u>	<u>LICENSEE VALUE</u>	
		<u>RATIO= NRC REFERENCE VALUE</u>	
		<u>Possible Agreement A</u>	<u>Possible Agreement B</u>
<3	0.4 - 2.5	0.3 - 3.0	No Comparison
4 - 7	0.5 - 2.0	0.4 - 2.5	0.3 - 3.0
8 - 15	0.6 - 1.66	0.5 - 2.0	0.4 - 2.5
16 - 50	0.75 - 1.33	0.6 - 1.66	0.5 - 2.0
51 - 200	0.80 - 1.25	0.75 - 1.33	0.6 - 1.66
>200	0.85 - 1.18	0.80 - 1.25	0.75 - 1.33

"A" criteria are applied to the following analyses:

Gamma Spectrometry where principal gamma energy used for identification is greater than 250 Kev.

Tritium analyses of liquid samples.

Iodine on absorbers

"B" criteria are applied to the following analyses:

Gamma Spectrometry where principal gamma energy used for identification is less than 250 Kev.

89Sr and 90Sr Determinations.

Gross Beta where samples are counted on the same date using the same reference nuclide.