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Nuclear Power Plant
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New York Power Authority

June 28, 1985
IP-MK-1353

Mr. Thomas T. Martin, Director
Division of Engineering and Technical Programs
U.S. Nuclear Regulatory Commission
Region I
631 Park Ave.
King of Prussia, Pa. 19406

Subject: Inspection No's 50-286/81-05 and 50-286/84-10

Dear Mr. Martin,

This letter provides the results of the Line-Loss Study performed on gaseous accident sampling systems in response to inspections 81-05 conducted on March 11-15, 1981 and inspection 84-10 conducted April 23-27, 1984. Attachment I provides the conclusions of this study and a schedule for the elimination or compensation for these identified losses.

Should you or your staff have any questions concerning this matter please contact Mr. W. Hamlin of my staff.

Sincerely,

W. A. Josiger
Resident Manager

MK/pm
Attachment

cc: Indian Point No.3 Resident Inspector's Office

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ATTACHMENT I

Finding 81-05-10: Determination of the representativeness of Post Accident Airborne Effluent Particulate Sampling.

Finding 84-10-11a: (85-04-15) The iodine Line Loss Study now going on should evaluate the effect of altered conditions during the course of an accident. These should include: water vapor, variation of chemical form, continuous vs. intermittent flow and others that might be considered appropriate.

Study Results:

The Iodine Line-Loss Study performed during the 1984 and 1985 operating period has recently been completed. This study was performed on the Vapor Containment Post Accident Sampling System and is considered representative of the losses which could be expected on the Plant Vent Accident Sampling System since these systems are of a similar design. The study identified two types of losses, losses due to impingement (particulate) and losses of gaseous iodine.

The losses of particulate Iodine ^{131} were approximately 89% $\pm$ 3% and Cesium ^{137} were 70% $\pm$ 7% (mean $\pm$ standard deviation of mean). This was based upon ten, one week sampling periods. This loss rate was essentially consistent for the sampling period.

The losses of gaseous iodine were reduced as sampling time increased. These losses ranged during the ten, one week sample periods from 59% to -20% with a mean value of 33%. An equilibrium developes with gaseous iodine losses which is a function of sample time. This appears to be very predictable.

The chemical species were determined several times during the study. The distribution of the iodine was as listed below. Quantification of particulate size distribution was attempted but did not have conclusive results.

		Gaseous Iodine		
	Particulate	I_2	HOI	Organic I
Iodine 131	4%	10%	26%	60%
Iodine 133		14%	36%	50%

The above mentioned losses will be addressed as follows:

Losses of particulates:

1. Heat trace sample lines to preclude water traps.

2. Elimination of ninety degree elbows and installation of gradual bends with a nominal radii of curvature that are five times the radius of the tubing.

3. Increase tubing diameter to reduce the deposition velocity.

Losses of gaseous iodine:

1. Develop a compensation curve for gaseous iodine as a function of sample or recirculation time.

Schedule for completion of tasks:

Vapor Containment Accident Sampling System:

Cycle 4/5 outage
1. Increase tubing diameter and add gradual bends on sample line down stream of R-11 and R-12.
2. Install heat trace on sample line down stream of R-11 and R-12.
3. Develop a gaseous iodine compensation curve.

Plant Vent Accident Sampling System:

Cycle 4/5 outage
1. Develope a gaseous iodine compensation curve.

Cycle 5/6 outage*
1. Increase tubing diameter and add gradual bends on sample lines down stream of R-13.
2. Install heat trace on the sample lines.

* The installation of these items at this date will not compromise the ability to quantify radioactive releases from this pathway after an accident due to the effluent prefiltration which is utilized. This prefiltration substantially reduces the particulates released, thus gaseous iodine species would be the predominant specie being released during an accident.