Report No. 50-293/82-20

Docket No. 50-293

License No. DPR-35 Priority -- Category C

Licensee: Boston Edison Company

800 Boylston Street

Boston, Massachusetts 02199

Facility Name: Pilgrim Nuclear Power Station

Inspection At: Plymouth, Massachusetts

Inspection Conducted: June 11-13, 1982

Inspectors: R L Nimitz — 8/5/82
R. L. Nimitz, Radiation Specialist — date

M H McBride — 8/5/82
M. H. McBride, Ph.D., Radiation Specialist — date

R L Nimitz for — 8/5/82
J. J. Kottan, Radiation Laboratory Specialist — date

Approved by: Edward A. Greenman — 8-5-82
E. G. Greenman, Acting Chief, Facilities Radiation Protection Section — date

Inspection Summary:
Inspection on June 11-13, 1982 (Inspection Report No. 50-293/82-20)
Areas Inspected: Special, announced inspection of initial licensee actions after spent resin was found on roof-tops and pavement within the protected area of the Pilgrim Station on June 11, 1982. Areas inspected included: initial contamination identification, contamination surveys, posting and barricading, resin removal, resin source determination, notifications and initial and long term planned corrective actions. Upon arrival at the site at 10:30 p.m. on June 11, 1982, the inspectors toured the site to review the extent and control of the resin contamination. The inspection involved 33 inspector-hours onsite by three region-based inspectors.
Results: No violations were identified.

DETAILS

1. Persons Contacted

W. Armstrong, Deputy Manager, Nuclear Operations
W. Anderson, Watch Engineer
J. Bunning, HVAC Supervisor, Johnson Controls
L. Dooley, Health Physics Engineer
B. Elderidge, Senior Radiological Engineer
J. Frazer, Instrumentation and Control Supervisor
*R. Machon, Nuclear Operations Manager
*C. Mathis, Deputy - Nuclear Operations Manager
A. Richards, Health Physics Engineer
K. Roberts, Chief Maintenance Engineer
J. Smallwood, Chemical Engineer
*P. Smith, Chief Technical Engineer
V. Stagliola, Senior Waste Management Engineer

*denotes those persons attending the exit interview on June 13, 1982

The inspector also contacted other licensee personnel during the inspection.

2. Purpose

The purpose of this special inspection was to review the licensee's actions after spent resin was found on roof-tops and pavement within the Protected Area of the Pilgrim Station on June 11, 1982.

3. Description of Identification

During a tour of the Retube Building Roof (see Figure 1) at about 1:00 p.m. on June 11, 1982, a Radiation Protection Technician saw resin in the building's rain gutters. Subsequent contamination surveys of small piles of the resin (about several grams) indicated activity levels of 100-200,000 disintegrations per minute (DPM).

4. Inspector Review

The inspectors reviewed the following licensee actions taken after identification of the spent resin.

4.1 Contamination Surveys

The review of this area indicated that, when the resin was found the licensee immediately performed surveys of the entire Protected Area and selected areas of the Licensee Controlled Area. The surveys were completed within about 2 hours of initial identification of the resin.

Areas surveyed included: roof-tops of other buildings, pavement areas, storm drains, security access area, parking lots, automobiles and the shore front area.

The licensee identified resin contamination on the Reactor, Turbine, Administration, and Augmented Off-Gas Buildings. Resin was also identified on two areas of pavement (see Figure 1).

No resin contamination was found off site or in the storm drains.

Based on this review, the licensee performed adequate initial contamination surveys to define the extent of resin contamination.

No violations were identified.

4.2 Personnel Contamination Surveys

The licensee's normal personnel contamination survey requirements includes the requirement that personnel exiting the Controlled Area perform a complete whole body frisk. In addition, personnel are required to pass through high sensitivity portal monitors at the security access/egress area.

Subsequent to the resin identification, the licensee initiated a requirement that all personnel exiting the security access/egress area perform contamination surveys of their shoes with a thin window detector. The requirement to perform the additional surveys was implemented within about two hours after the initial identification.
No shoe contamination was identified.

No violations were identified.

4.3 Posting and Barricading

The review of the posting and barricading of selected contaminated areas, indicated the licensee had posted and barricaded the areas in an expeditious manner and in accordance with station procedures.

No violations were identified.

4.4 Spent Resin Removal

The review of this area indicated the licensee initiated vacuuming of the resin from the contaminated areas and from the Reactor Building Contaminated Ventilation Exhaust System in an expeditious manner.

To further expedite the clean-up operation, the licensee ordered additional vacuum cleaners. These vacuum cleaners were to be flown in by airplane.

During removal of resins from the pavement and roof-top areas, the licensee also collected airborne radioactivity samples. No airborne radioactivity was identified.

4.5 Source Identification/Initial Corrective Action

The inspectors' review of licensee actions taken following identification of the spent resin indicated that the licensee immediately initiated an investigation to determine the source of the resin contamination.

The licensee's initial findings indicated the resin was entering the ventilation system during resin cleaning operations. The licensee subsequently suspended all operations which could result in further resin releases to ventilation system duct work. Figure 2 provides the apparent resin contamination/release pathway.

The inspector's discussions with licensee representatives regarding the initial identification of spent resin in the ventilation system showed that spent resin had been identified in the ventilation system prior to the identification of the resin on roof-tops. The inspector also noted that dry radioactive resin was found in the "B" Stand By Gas Treatment (SBGT) System on September 27, 1981. (Inspection Report 50-293/82-01).

The SBGT System exhausts air from contaminated ventilation systems in the Reactor Building as does the Reactor Building Contaminated Area Exhaust System. Consequently, the inspector noted the identification of spent resin in the SBGT System would serve as an indication of possible resin contamination of the Reactor Building Contaminated Area Exhaust System. The latter system vents to atmosphere via the Reactor Building Vent Stack.

Licensee representatives stated that in September 1981, the Reactor Building Contaminated Area Exhaust Filters were found to be by-passing, apparently due to improper filter fit and degradation and were subsequently replaced. The licensee representatives stated that the contamination most likely exited the plant vent via the by-pass prior to the repair of the filters.

The inspector indicated that circumstances surrounding the initial ventilation system contamination and the licensee's actions taken would be reviewed further during a subsequent inspection. (50-293/82-20-01)

4.6 Notifications

The inspectors reviewed the identification of the spent resin event with respect to the requirements of 10 CFR 50.72, "Notification of significant events." Upon evaluation it was determined that the detection of the contamination did not constitute a significant event as described in 10 CFR 50.72.

Inspector discussions with the Pilgrim Station Senior Resident Inspector indicated that he noted additional personnel activity (about one hour after the licensee's initial discovery) and questioned licensee representatives regarding this activity. Licensee representatives stated that the additional activity was the result of resin identification on roof-tops.

The Senior Resident Inspector subsequently notified NRC Region I. The licensee also notified the NRC Operations Center of the resin contamination.

No violations were identified.

5. Long Term Corrective Action

The inspector met with licensee representatives on June 13, 1982 to discuss the licensee's plans for long term corrective actions.

As a result of these discussions and a followup telephone conversation on June 15, 1982 between the Director, Division of Project and Resident Programs, NRC Region I and the licensee, a Confirmatory Action Letter (No. CAL 82-19) dated June 16, 1982, was sent to the licensee to document the NRC's understanding of planned actions.

The letter stated the NRC understanding that the licensee would undertake and complete the following actions:

- Discontinue back flushing, regenerating or ultrasonically cleaning condensate demineralizer spent resins until the source of the resin contamination of ventilation systems is identified and corrective actions taken for its cause. In the event long term plant design changes are needed to correct the cause of the resin release to the ventilation system, resin cleaning operations may be performed provided that: a) appropriate procedure revisions and other administrative controls are established to prevent further resin releases to the ventilation system; b) a test of the adequacy of the procedure revisions and other administrative controls is performed using clean resin and; c) the integrity of the Contaminated Exhaust Ventilation filters has been verified by DOP testing.

- Inspect or test all potentially effected safety-related ventilation system components (e.g. Secondary Containment Isolation Dampers) to verify their operability and the absence of resin. In the event resin contamination is identified, the resin will be removed. The results of this inspection shall be documented for subsequent NRC review.

- Inspect clean air intake ventilation filters or ducts for all potentially effected station structures to verify absence of resin. In the event resin contamination is identified, the resin will be removed. The results of this inspection shall be documented for subsequent NRC review.

- Inspect the Reactor Building plant vent monitor to verify its operability and the absence of resin in the sampling system. The results of this inspection shall be documented for subsequent NRC review.

- Establish a surveillance and preventative maintenance program for contaminated ventilation exhaust systems to ensure exhaust filter integrity. This program will also include provisions for system inspection to identify resin accumulation.

- Provide to the NRC Region I office by July 15, 1982 a report detailing the history and extent of the duct contamination, its causes, and the circumstances surrounding the release of radioactive material. This report will also describe the corrective actions taken and the additional management oversight initiated to prevent recurrence.

The licensee provided the requested report in a letter dated July 15, 1982. The licensee's implementation of the remaining NRC understanding will be reviewed during a subsequent inspection (50-293/82-20-02).

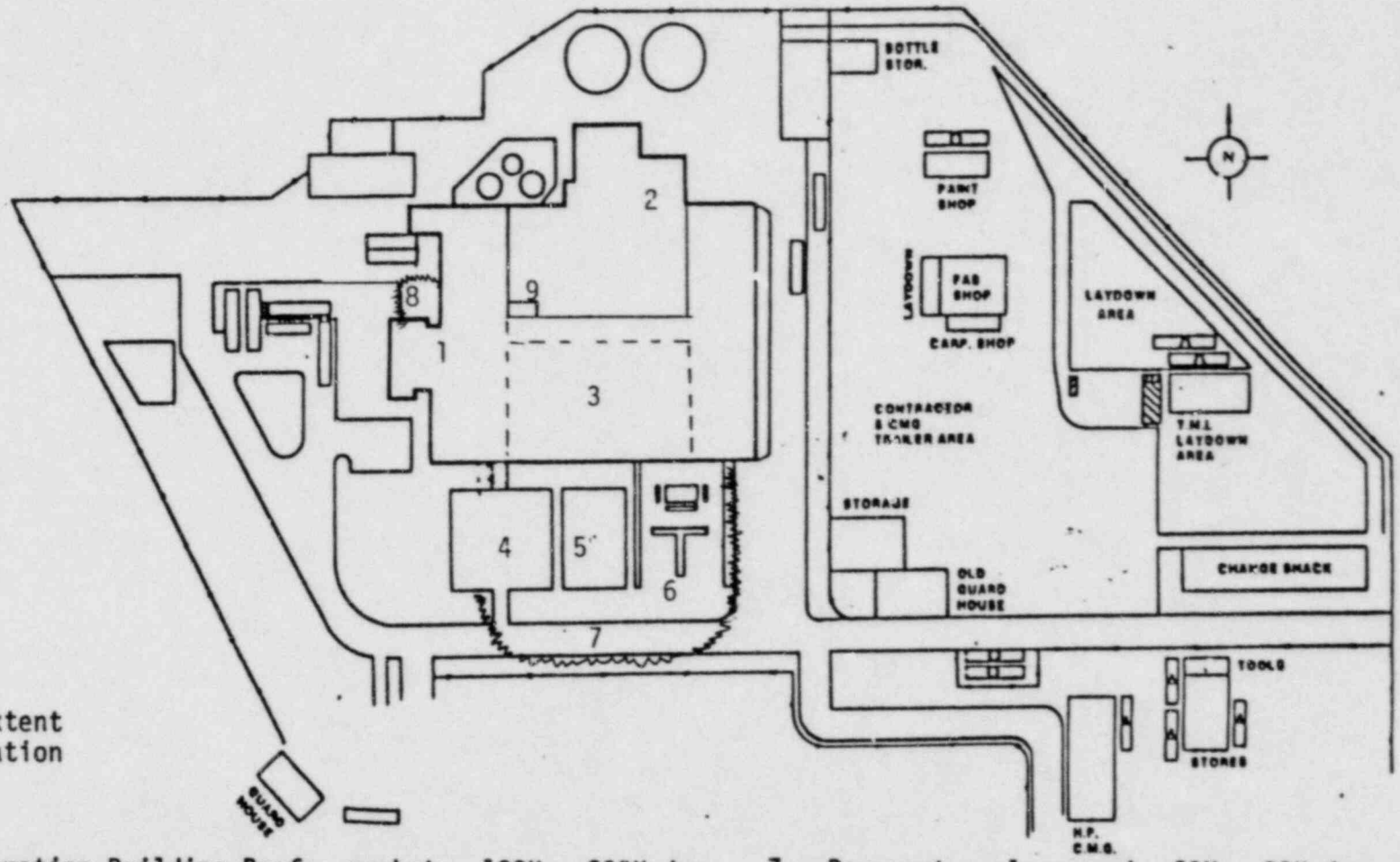
6. Exit Interview

The inspector met with licensee representatives (denoted in Section 1 of this report) on June 13, 1982. The inspector summarized the scope and findings of the inspection.

PILGRIM STATION SITE PLAN

SPENT RESIN CONTAMINATION
LEVELS

JUNE 11, 1982



Indicates extent of contamination

*1. Administration Building Roof - pockets, 100K - 200K dpm
2. Reactor Building Roof - clean
3. Turbine Building Roof - pockets, 100K dpm
4. ACG Building - pockets, 200K dpm
5. Retube Building - pockets, 200K dpm
6. Main Transformer Area - 1K - 25K dpm (small areas)
7. Pavement - along curb, 20K - 80K dpm
8. Pavement - along curb, 100K - 200K dpm
9. Plant Vent - Point of Release

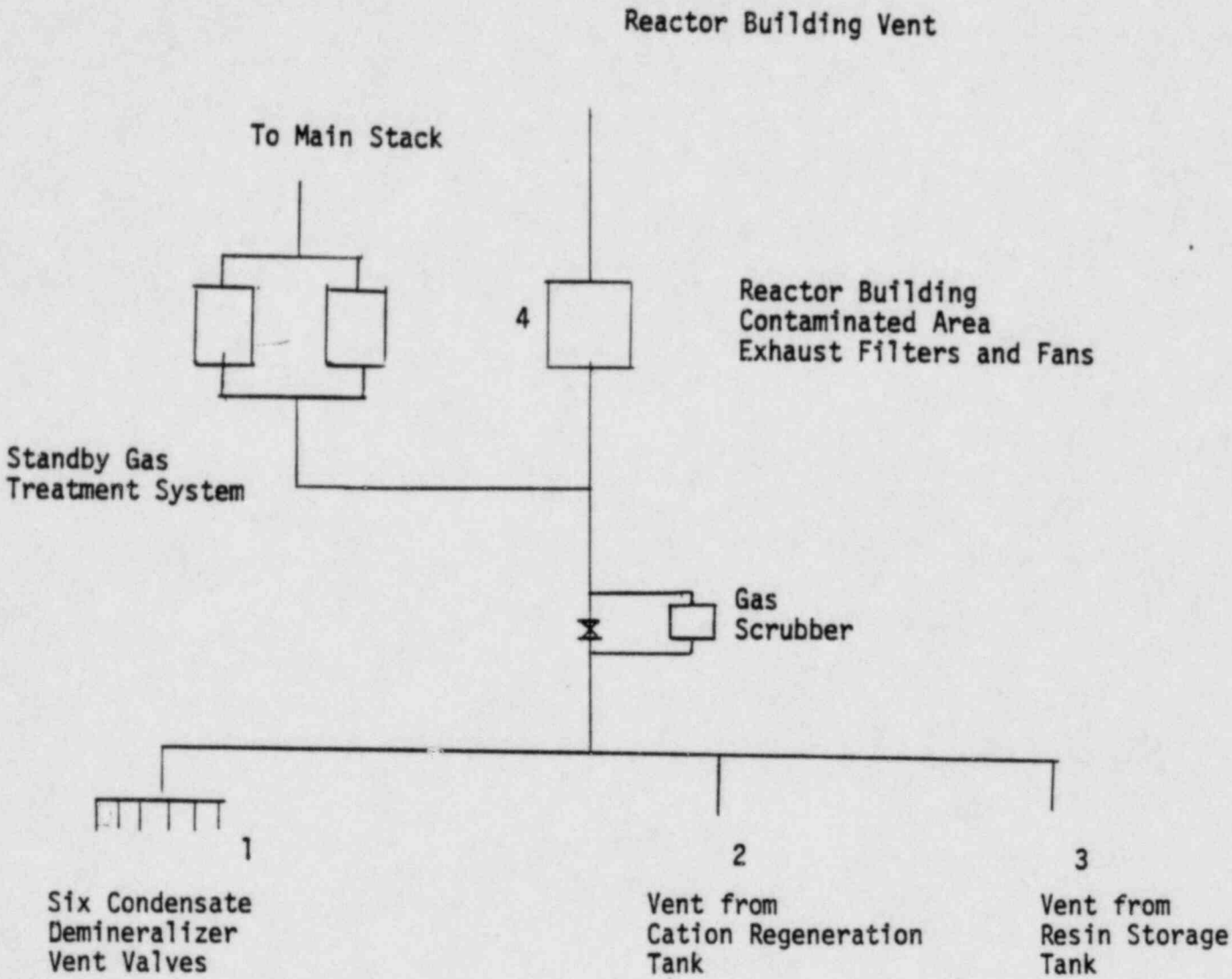
*Assumed 10% Detector efficiency

FIGURE 1

FIGURE 2

SPENT RESIN CONTAMINATION/RELEASE

PATHWAY



1. Possible source prior to repair.
2. Apparent source during backwashing.
3. Possible source during resin transfer
4. Filters found to be by-passing about September 1981.