

57-293



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

November 20, 1992

Harry W. Salter, President
Citizen's Radiological Monitoring
Network, Pilgrim Inc.
45 Oldfield Drive
Kingston, Massachusetts 02364

Dear Mr. Salter:

I am responding to your letter of October 28, 1992, in which you requested information regarding increased background radiation readings detected by monitoring instruments operated by you and members of your organization. Specifically, you asked (1) if two events reported at Pilgrim by Boston Edison Company (BECO) to the Nuclear Regulatory Commission (NRC) were related to the increased background readings and (2) if other monitors in the area showed similar increases. On the basis of an independent NRC inspection and discussion with BECO representatives, we have concluded that the increased monitor readings were not the result of either of the two events mentioned above and were most likely associated with rainfall.

The two Pilgrim events, recorded by NRC Event Reports 24491 and 24494, did not cause the increased background radiation readings. Shutdown of the Pilgrim reactor was started on October 23, 1992, to begin a planned 30-day mid-cycle outage. The first event was an unplanned automatic actuation of the reactor protection system (RPS) that occurred at 11:10 a.m. on October 24, 1992. The actuation was the result of a spurious neutron monitoring system signal, rather than any change in the actual neutron flux level. The reactor had been subcritical for more than 1 hour before the event, the reactor mode select switch had been placed in the shutdown position, and all control rods had already been fully inserted during the normal course of the scheduled shutdown. No control rod motion occurred, and the RPS actuation had no effect on plant emissions as measured at either the reactor building vent or main stack.

The second event was an unplanned automatic actuation of the Group I primary containment isolation system (PCIS). The group I PCIS actuation provides isolation or closure signals to the main steam isolation valves (MSIVs), drain line main steam isolation valves, and reactor sample line isolation valves. The event occurred at 10:28 p.m. on October 24, 1992, again with reactor subcritical and almost fully depressurized at about 2 pounds per square inch gauge and the reactor coolant system temperature about 165°F. The actuation occurred because of a "spike" in a reactor vessel water level instrumentation signal. The actual reactor vessel water level did not undergo the indicated change (i.e., the "spike") and remained within the normal operating range. However, before the event, all MSIVs had been manually closed during the normal course of the plant depressurization and cooldown to isolate the four 20-inch main steam lines. In response to the event, only the isolation valves for the smaller 3-inch main steam drain line and 1-inch reactor sample line repositioned to the closed position. As with the previous

9212010169 921120
PDR ADOCK 05000293
P PDR

DFD
11/20

NRC FILE CENTER COPY

event, this actuation had no effect on plant emissions; therefore, no effect on background radiation readings.

Regarding your second question, we found that other radiation instruments showed increases in the background radiation similar to the increases recorded by your instruments. These instruments included monitors operated by EECO and by local high schools.

The increases in background radiation, detected by your monitors, coincided closely in time to increases detected by these other radiation monitors.

The NRC has reviewed data from the background radiation monitors, and also data from plant effluent release monitors. We have reasonable assurance that the effects of rainfall caused the increased background radiation readings and that the Pilgrim Nuclear Power Station was not the source of the increase. This conclusion is based on the NRC's review of the following:

- Data from the monitoring network in the vicinity of the Pilgrim site show elevated background readings consistent in magnitude and timing with your readings. This characteristic, however, is indicative of environmental effects rather than a plant release. A plant release would be associated with a point release (i.e., a plume), which would be expected to result in the potential for increased readings in the downwind direction. The simultaneous registering of the increased background levels by all monitors would be inconsistent with dose assessment diffusion models used in determining the travel of a plume.
- Effluent data from the Pilgrim main stack and reactor building vent show no correlation with the elevated offsite background radiation readings. The reactor shutdown (which occurred before the elevated readings) typically decreases normal effluent releases through the main stack and reactor building vent. When the effluent release rates decreased, no corresponding change or response was noted on the offsite background radiation monitors. This is expected since normal effluent releases do not significantly affect background levels. When the offsite background radiation monitors showed elevated readings, the release rate from the plant was less than normal and almost below minimum detectable levels.
- Similar effects from weather conditions associated with the October 24 and 25 rainfall were noted at other sites with monitoring networks. NRC review of data concerning background radiation around these sites revealed similar elevated readings, suggesting a similar phenomenon involving the effects of weather conditions. As you noted in your letter of October 28, 1992, there was rainfall that occurred at the time of the elevated background radiation readings. Although rainfall does not always cause increased background readings, a sufficient rain, coupled with certain environmental conditions can cause increased

November 20, 1992

Harry W. Salter

- 3 -

radon emanation and can result in a natural increase in the indicated background radiation. Such radon concentrations have been frequently observed and well published (e.g., "Some Observations of the Variations in National Gamma Radiation Due to Rainfall" by Susumu Minato, Department of Energy Conference 780-422, Volume I, 1978).

I trust the information provided has fully addressed your concerns with the elevated readings detected on your monitoring instruments.

Sincerely,

Original signed by
Thomas E. Murley

Thomas E. Murley, Director
Office of Nuclear Reactor Regulation

DISTRIBUTION:

Docket File 50-293 (w/incoming)
NRC & Local PDRs (w/incoming)
EDO #8252
J. Taylor
J. Sniezek
J. Blaha
H. Thompson
T. Murley/F. Miraglia
W. Russell
J. Partlow
F. Gillespie
D. Crutchfield
PDI-3 Reading (w/incoming)
SECY (CRC-92-0923)

S. Varga
J. Calvo
W. Butler
OGC
OPA
OCA
NRR Mail Room (EDO#8252 w/incoming)
C. Norsworthy
B. Clayton
R. Eaton w/incoming
T. Clark
J. Linville, RI
PDI-3 GT File
T. Martin, RI

*See previous concurrence

OFFICE	LA:PDI-3	PM:PDI-3	Region I	D:PDI-3	*TECH ED
NAME	TClark	REaton:mw	GKelly	WButler	
DATE	11/19/92	11/19/92	11/19/92	11/19/92	11/18/92
OFFICE	*ADRI	*D:DRPE	ADP	D:NRR	
NAME	JCalvo	SVarga	JPartlow	TMurley	
DATE	11/18/92	11/18/92	11/18/92	11/20/92	1/1

OFFICIAL RECORD COPY
Document Name: GT8252.PI

Handwritten signature/initials

Harry W. Salter

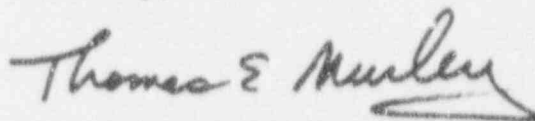
- 3 -

November 20, 1992

radon emanation and can result in a gradual increase in the indicated background radiation. Such radon concentrations have been frequently observed and well published (e.g., "Some Observations of the Variations in National Gamma Radiation Due to Rainfall" by Susumu Minato, Department of Energy Conference 780-422, Volume I, 1978).

Trust the information provided has fully addressed your concerns with the elevated readings detected on your monitoring instruments.

Sincerely,



Thomas E. Murley, Director
Office of Nuclear Reactor Regulation