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 RECIP.NAME RECIPIENT AFFILIATION

SUBJECT: LER 90-005-00: on 900316, radiation exposure of health physics
 worker due to picking up hot particle.

W/9 ltr.

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APR 16 1990

L-90-141
10 CFR 50.73


U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D. C. 20555

Gentlemen:

Re: Turkey Point Unit 3
Docket No. 50-250
Reportable Event: 90-005
Date of Event: March 16, 1990
Radiation Exposure of a Health Physics Worker Due to Picking
Up a Hot Particle While Working Inside Containment

The attached Licensee Event Report is being provided voluntarily
under provisions of 10 CFR 50.73 for notification of the subject
event.

Very truly yours,


K. M. Harris
Vice President
Turkey Point Plant Nuclear

KNH/DRP/JEK/rat

cc: Stewart D. Ebnetér, Regional Administrator, Region II, USNRC
Senior Resident Inspector, USNRC, Turkey Point Plant

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LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) TURKEY POINT UNIT 3										DOCKET NUMBER (2) 0 5 0 0 0 1 2 5 0 1 OF 0 4										PAGE 3																							
TITLE (4) Radiation exposure of a Health Physics worker due to picking up a Hot particle while working inside containment.																																											
EVENT DATE (5)						LER NUMBER (6)						REPORT DATE (7)						OTHER FACILITIES INVOLVED (8)																									
MONTH		DAY		YEAR		YEAR		SEQUENTIAL NUMBER		REVISION NUMBER		MONTH		DAY		YEAR		FACILITY NAMES																									
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OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 2.116 (Check one or more of the following) (11)																																									
		20.402(b)										20.406(a)										50.73(a)(2)(iv)										73.71(b)											
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												20.406(a)(1)(iii)										50.73(a)(2)(i)										50.73(a)(2)(viii)(A)											
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Voluntary Report																																											
LICENSEE CONTACT FOR THIS LER (12)																																											
NAME																		TELEPHONE NUMBER																									
David R. Powell, Regulations and Compliance Supervisor																		AREA CODE																									
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ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)

This voluntary LER is being submitted in accordance with NUREG 1022 supplement 1, Item 19.1.

On March 16, 1990, at 1615 EST, while Unit 3 was defueled, a Health Physics Shift Supervisor was found to be contaminated while exiting the containment building. A whole body frisk using a hand-held probe verified contamination on the worker's right shoulder and a hot particle was removed. Analysis showed the particle was composed of 1.457 microcuries of cobalt-60. Initial dose estimates were made using the total time the individual was in the containment building (3.5 hours) as the exposure time for the particle. The total activity x time for the exposure was 5.10 microcurie-hours. Based on a stay time of 3.5 hours, a skin dose of 21.061 REM was preliminarily assigned. A subsequent investigation of the incident showed that the maximum time the hot particle was on the individual was 60 minutes. The skin dose was adjusted to 6.017 REM based upon the revised stay time. The individual's total skin dose was 6.381 REM for the quarter. No specific cause for this event has been identified. The particle has been sent to Battelle Pacific Northwest Laboratory for analysis. After discovery of the particle, additional temporary controls were implemented for Unit 3 containment including posting the bioshield area as a hot particle area, stepping up hot particle surveys of the 875A check valve tent and restricting the individual from the RCA pending dose assessment.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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TEXT (If more space is required, use additional NRC Form 308A's) (17)

I EVENT DESCRIPTION

On March 16, 1990 at 1615, a Health Physics Shift Supervisor (HPSS, non-licensed utility employee) exited Unit 3 containment (EIS: Code NH), after completing a routine tour. At this time, the unit was defueled. At the containment control point, the individual was monitored by an automated whole body survey instrument (PCM 1B), used to detect personnel contamination. The PCM 1B alarmed, indicating contamination on the individual's right shoulder area. A subsequent whole body frisk using a hand held probe was performed to verify and isolate the location of the contamination. A hot particle was found on the right shoulder of the individual. Decontamination was accomplished using tape. The particle was analyzed for isotopic content and activity. The analysis indicated the particle was composed entirely of cobalt-60 with an activity of 1.457 microcuries. Initial dose estimates were made using the total time the individual was in the containment building (3.5 hours) as the exposure time for the particle. Based on a stay time of 3.5 hours, a skin dose of 21.061 REM was preliminarily assigned.

The investigation of this event was performed by the Health Physics Technical Support Group in conjunction with the Corporate Health Physics Section. Interviews were conducted with the individual to identify his actions while in the containment building and the relative time of each action. The individual provided a written summary of his activities and was interviewed by the Corporate Health Physicist regarding the sequence of events. The Health Physics Technical Support Group reviewed the history of hot particles originating from the Unit 3 containment during the outage. The investigation showed the following:

- 1) The individual checked his watch at 1515 hours prior to entering the area inside the bioshield. (The particle was removed at 1615 hours.) His activities prior to 1515 hours consisted of touring general areas outside of the bioshield.
- 2) Hot particle surveys are taken at least daily in general areas of containment (58' elev., 30'6" elev., 14' elev. walkway outside bioshield). No hot particles have been found during surveys of these areas or on personnel working in these areas during the Unit 3 outage (February 4, 1990, to present). A total of 67,092 man-hours have been logged on RWPs for these areas without a personnel contamination involving a hot particle as defined in health physics's station radiation procedures.
- 3) The only hot particle area designated inside containment was the 875A check valve which was enclosed within a work tent. A portion of the tour taken by the individual had him standing right outside the 875A work tent.

Based upon the investigation, the exposure time for the particle has been revised to 60 minutes (1.457 microcurie-hours) and the calculated skin exposure to 6.017 REM for the event.

The final dose will be assigned when analysis of the particle has been completed by Battelle Pacific Northwest Laboratories.

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TEXT (If more space is required, use additional NRC Form 388A-1/117)

II CAUSE OF EVENT

No specific cause for this event has been identified. The hot particle picked up inside the bioshield area by the individual probably was transferred to his right shoulder as he undressed. It was extremely small and could not be seen without magnification. The only location found inside the bioshield containing hot particles was the 875A check valve. An analysis of these particles showed none of the particles to be of the same composition as the pure Cobalt-60 particle found on the individual. A radioactive hot particle of this magnitude and composition was not expected to be present in the individual's work area. This incident appears to be an isolated event for which no specific cause can be determined.

III ANALYSIS OF EVENT

The skin dose received by the individual due to the hot particle was 6.017 REM. The dose factor for Co-60 methodology is taken directly from NUREG/CR-4418, "Dose Calculation for Contamination to the Skin Using the Computer Code VARSKIN," and is found in the Health Physics procedure 0-HPA-034.2, "Determination of Dose to the Skin from Skin Contamination." The individual's skin exposure when added to the previous skin dose of 0.364 REM is 6.381 REM for the quarter. The 6.381 REM accumulated dose is less than the 7.5 REM allowed by 10CFR 20.101.

The individual's whole body gamma exposure for the period January 1, 1990, through March 31, 1990, is 0.364 rem. This is below the FPL administrative limit of 1.25 Rem per quarter and the NRC limit of 3.0 Rem per quarter as defined in 10CFR 20.101.

The hot particle was detected by the PCM 1B at the control point. This demonstrated the effectiveness of the contamination controls by preventing the particle from leaving the radiation controlled area (RCA). Thus, the health and safety of the public was not affected by this event.

The hot particle has been sent to the Battelle Pacific Northwest Laboratories for further analysis. Results are expected within 60 days.

IV CORRECTIVE ACTIONS

Immediately following the discovery of the particle, the following additional temporary controls were implemented for Unit 3 Containment to address the apparent potential hot particle contamination.

- 1) The frequency of hot particle surveys for the 875A check valve tent (the individual was standing outside the work tent during a portion of the tour) was increased from once per shift to at least twice per shift.

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Turkey Point Unit 3

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TEXT (If more space is required, use additional NRC Form 388A's) (17)

- 2) The individual did not enter the RCA between March 16 and March 31, 1990.
- 3) The bioshield area was posted as a hot particle area pending followup surveys. No hot particles were found during the followup surveys. The posting was removed.

V ADDITIONAL INFORMATION

1. Similar LERs:

LER 250-88-27-0 was voluntarily submitted.

2. Additional Information:

A supplemental LER will be submitted if the particle analysis results in the calculated skin dose exceeding the limits of 10CFR 20.101.1.

