

WOLF CREEK

NUCLEAR OPERATING CORPORATION

Bart D. Withers
President and
Chief Executive Officer

January 6, 1989

WM 89-0004

DD

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Mail Station P1-137
Washington, D. C. 20555

Subject: Docket No. 50-482: Licensee Event Report 88-028-00

Gentlemen:

The attached Licensee Event Report (LER) is submitted pursuant to 10 CFR 20.405(a)(1)(i) concerning an exposure of an individual in excess of the applicable limits in 10 CFR 20.101.

Very truly yours,

Information in this record was deleted
in accordance with the Freedom of Information
Act, exemptions 6
FOIA- 96-411

B. D. Withers

Bart D. Withers
President and
Chief Executive Officer

BDW/jed

Attachment

cc: B. L. Bartlett (NRC), w/a
D. D. Chamberlain (NRC), w/a
R. D. Martin (NRC), w/a
D. V. Pickett (NRC), w/a

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LER
485-88028
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P.O. Box 411 / Burlington, KS 66838 / Phone (913) 264-8831
Employer MFC/VET

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PDR FOIA
O'MEAL196-411 PDR

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LER
485-88118
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LICENSEE EVENT REPORT (LER)

PLANT NAME NO. **Wolf Creek Generating Station** REGISTRATION NO. **010101014121** OF **014**

EVENT TITLE **Individual Receives Skin Dose in Excess Of Limits As A Result Of Unexpected Hot Particle Contamination**

EVENT DATE (MM/DD/YY)				LIC. NUMBER (MM/DD/YY)				REPORT DATE (MM/DD/YY)				OTHER FACILITY INVOLVED (MM/DD/YY)			
MONTH	DAY	YEAR		MONTH	DAY	YEAR		MONTH	DAY	YEAR		MONTH	DAY	YEAR	
12	09	88		02	01	89		01	06	89					

EVENT TYPE (MM/DD/YY)		LIC. NUMBER (MM/DD/YY)		REPORT DATE (MM/DD/YY)		OTHER FACILITY INVOLVED (MM/DD/YY)	
MONTH	DAY	YEAR		MONTH	DAY	YEAR	
12	09	88		02	01	89	

LICENSEE CONTACT FOR THIS LER IS: **Merlin G. Williams - Manager Plant Support** TELEPHONE NUMBER: **311631641-1818111**

CAUSE	SYSTEM	COMPONENT	MAINT. AC. TAKEN	REPORTABLE TO NRC	CAUSE	SYSTEM	COMPONENT	MAINT. AC. TAKEN	REPORTABLE TO NRC

SUPPLEMENTAL REPORT EXPECTED DATE (MM/DD/YY): **01/06/89**

YES or NO REPORT EXPECTED SUBMISSION DATE (MM/DD/YY): **NO**

On December 9, 1988, at 1750 CST, an individual in the Radiologically Controlled Area (RCA) was discovered to have a localized area of facial contamination. Health Physics personnel subsequently removed a 0.7093 microCurie (uCi) Cobalt-60 particle from his chin. The individual had been working in the area of the polar crane inside the containment building. Work in the area was suspended while hot particle surveys were performed. These surveys identified no unusual conditions and work was resumed. The maximum possible time the individual could have been exposed to this particle was determined to be four hours and sixteen minutes. Using this exposure time, it was conservatively determined that the individual may have received an occupational dose of 12.5 Rem to the skin of the whole body. The individual was precluded from further RCA entries during the quarter.

Followup surveys conducted on December 10, 1988, identified an additional 0.03288 uCi Cobalt particle. Reviews were conducted of previous surveys of the area and of records of previous contamination incidents during the current refueling outage to identify any similarities to this event. The reviews concluded that this incident is an isolated case. It was also determined based on relative isotopic abundance that these two particles had originated several years ago. A review of the Hot Particle Contamination Control program did not identify any necessary programmatic changes.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED FOR RELEASE 2000-01-01
EXPIRES 07/01/00

FACILITY NAME	EVENT NUMBER	LER NUMBER			PAGE	
		YEAR	MONTH	DAY	OF	PAGES
Wolf Creek Generating Station	000000048288	88	02	08	00	02 OF 04

NOTE: If more space is required use additional LER pages 2204 or 2205

INTRODUCTION

On December 9, 1988, an individual in the Radiologically Controlled Area (RCA) was discovered to have a localized area of contamination on his chin. Subsequent evaluation indicated that the resultant exposure may have exceeded the 10CFR20.101 skin of the whole body quarterly dose limit. This report is being submitted in accordance with 10CFR20.405(a)(1)(i). The information required by 10CFR20.405(a)(2)(b) is provided separately as an attachment to this report.

DESCRIPTION OF EVENT

On December 9, 1988, at 1304 CST, several workers entered the containment building (NB) in order to perform work on snubber thrust washers on the polar crane. At the time of this event, the unit was in Mode 6, Refueling. Approximately 30 minutes later, the workers actually began the work. At 1745 CST the workers placed their tools in a temporary storage location and proceeded to exit the RCA for shift turnover.

One individual, a contractor, detected skin contamination while performing a manual frik at the friking station located exterior to the Containment personnel access hatch on the 2847' elevation of the Auxiliary Building (NB). In accordance with station procedures, the individual promptly notified Health Physics personnel of the situation. Health Physics personnel verified that the contamination was located on the individual's chin, then escorted the individual to the decontamination area of the RCA.

A hot particle of 60,000 net counts per minute was lifted from the individual's chin using duct tape at 1750 CST. After the removal of the hot particle, no further contamination was detected on the individual. It was subsequently verified through nasal smears and whole-body counting that the individual had no detectable internally deposited radionuclides. Gamma spectroscopy analysis was performed on the particle. The particle was determined to be composed of 0.7093 microCuries (uCi) of Cobalt-60.

Following discovery of the hot particle, work was suspended in the area of the polar crane. Health Physics personnel performed surveys for hot particles in the area in which the individual had been working and on tools and equipment that had been used. These surveys were completed at approximately 2200 CST and identified no additional hot particles or unexpected gross contamination. Following completion of these surveys, the work activities were resumed, with Health Physics personnel performing more frequent monitoring. The work has since been completed without further significant incidents.

The individual and his co-workers were interviewed in an attempt to identify the most likely time and location at which the hot particle had been picked up. Based on the information obtained, it was determined that the work had involved some crawling around due to tight work space and some repositioning

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED FOR US NRC-200
DATE 8/21/88

Facility Name (N)

Event Number (N)

LER Number (N)

Page (N)

Wolf Creek Generating Station

0 0 0 0 0 4 8 2 8 8 - 0 2 8 - 0 0 0 3 OF 0 4

TEXT OF THIS REPORT IS REQUIRED AND ADDITIONAL TEXT FROM 2000 TO 2171

of tools. Further hot particle surveys, with particular emphasis on the areas in which the individual had most likely picked up the hot particle, were conducted on the morning of December 18, 1988. During these surveys one additional hot particle was found in the area in which the workers temporarily stored their tools. This second hot particle was composed of 0.00128 uCi of Cobalt-58 and 0.0316 uCi of Cobalt 60.

The investigation concluded that it was likely that the individual had become contaminated when he deposited his tools just prior to exiting containment. However, because this conclusion could not be positively verified, it was conservatively assumed that the contamination had occurred at approximately 1334 CST, upon initiation of the work activities. Therefore, in determining the skin dose to the individual using the computer code VARSKIN, the maximum exposure time was 4 hours and 16 minutes. With this exposure time, the official dose assigned to this individual due to this incident is 12.5 Rem to the skin of the whole body. This dose exceeds the 10CFR20.101 permissible occupational dose of 7.5 Rem per quarter to the skin of the whole body.

This dose assignment and its ramifications have been discussed with the individual. In addition, the individual has been excluded from further entries into the RCA for the remainder of the calendar quarter.

ROOT CAUSE AND CORRECTIVE ACTIONS

Following this incident, previously performed radiological surveys of the area involved were reviewed for indications of abnormal contamination. This review verified that there had been no previously identified hot particles, in the area. No unusual radiation levels or evidence of abnormal contamination had been detected in the polar crane area. In conjunction with this effort, records of previous incidences of personnel contamination during the current refueling outage were reviewed for similarities to the incident discussed in this report. No similarities to this event were identified.

In an effort to identify the source of the hot particles detected in the polar crane area, the relative abundance of Cobalt 58 and Cobalt 60 of the particles was compared to the relative abundance of these isotopes detected in recent sample analyses. From data comparisons, it was determined that these particular particles had not originated from current refueling activities, but had most likely been created several years prior.

Based on these evaluations, it has been concluded that this is an isolated incident. An internal review of the Hot Particle Contamination Control program has been performed, and the program was determined to adequately address Hot Particle concerns. Consequently, no changes to this program are considered necessary at this time.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED AND FORWARDED: NRC-200-0101
ISSUED: 8/1/68

PLANT/UNIT NAME	EVENT NUMBER	LER NUMBER				PAGE	
		YEAR	MO	DAY	NO.	OF	PAGES
Wolf Creek Generating Station	0 8 0 0 0 4 8 2	8 8	-	0 2 8	-	0 0	0 4 OF 0 4

NOTE: If more space is required, use additional form NRC-200-0101 (1/78)

ADDITIONAL INFORMATION

Although there have been previous cases of contamination incidents involving hot particles, there have been no previous incidents at Wolf Creek Generating Station which resulted in exposures beyond 10CFR26.181 limits.

Hot particles, usually microscopic in nature, come primarily from two major sources: degraded fuel and neutron activated corrosion and wear products. A hot particle on the skin gives a high beta dose to a small area. The area used to calculate a beta dose is 1 square centimeter at a depth of 7 milligram per square centimeter per the VARSKIN computer code. There is scientific evidence indicating that highly localized irradiation of the skin by hot particles is less biologically damaging than more uniform irradiation by the same quantity of radioactive material.

NRC Form 439 10 CFR 29.408	U.S. Nuclear Regulatory Commission	1. DATE OF REPORT
REPORT OF TERMINATING INDIVIDUAL'S OCCUPATIONAL EXPOSURE		2. NRC LICENSE NUMBER NPF-42 (HRC)

PART I. LICENSEE AND INDIVIDUAL IDENTIFICATION DATA

3. Name & address of reporting licensee WOLF CREEK NUCLEAR OPERATING CORP. WOLF CREEK GENERATING STATION PO BOX 411 BURLINGTON KS, 66839	4. Name of individual & address [REDACTED]			
5. Name & address of employer MAINTENANCE MECHANICAL DANTEL INTERNATIONAL	6. SSN [REDACTED]	7. DOB [REDACTED]	8. DO [REDACTED]	9. YY [REDACTED]

EX 6

EX 6

PART II. EXTERNAL DOSE DATA

Yes	10. Monitoring for external exposure to radiation was provided.				
9. PERIODS OF EXPOSURE	10. WHOLE BODY DOSE (rems)				11. EXTREMITY DOSE (rems)
	DEEP		SHALLOW (skin)		
	a TOTAL	b NEUTRON	c TOTAL	d BETA	SHALLOW (skin)
10/15/88 - 12/09/88	.512	.000	13.012	12.500	.512

PART III. INTERNAL EXPOSURES TO RADIOACTIVE MATERIAL

Yes	12. Monitoring for exposure to radioactive material provided.	
13. Periods of exposure (dates whole body counting performed)		
10/03/88 12/09/88		
14. Other bioassay results		
15. THIS REPORT IS FURNISHED TO YOU UNDER THE PROVISION OF THE NUCLEAR REGULATORY COMMISSION'S REGULATION 10 CFR PART 19. YOU SHOULD PRESERVE THIS REPORT FOR FUTURE REFERENCE.		
INTERIM LETTER XX FINAL REPORT	AUTHORIZING SIGNATURE <i>L. F. Breshears</i> L. F. Breshears Health Physics Supervisor	