



**Consumers
Power**

**POWERING
MICHIGAN'S PROGRESS**

Palisades Nuclear Plant: 27780 Blue Star Memorial Highway, Covert, MI 49043

G B Slade
General Manager

July 30, 1993

Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

DOCKET 50-255 - LICENSE DPR-20 - PALISADES PLANT -
LICENSEE EVENT REPORT 93-004 - FUEL ROD FAILURE AND SUBSEQUENT LOSS OF SPECIAL
NUCLEAR MATERIAL DISCOVERED FOLLOWING REFUELING OPERATIONS

Licensee Event Report (LER) 93-004 is attached. This event is reportable in
accordance with 10CFR50.73(a)(2)(ii).

Gerald B Slade
General Manager

CC Administrator, Region III, USNRC
NRC Resident Inspector - Palisades

Attachment

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LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)

Palisades Plant

DOCKET NUMBER (2)

0 5 0 0 0 2 5 5

PAGE (3)

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TITLE (4) FUEL ROD FAILURE AND SUBSEQUENT LOSS OF SPECIAL NUCLEAR MATERIAL DISCOVERED
FOLLOWING REFUELING OPERATIONS

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (6)			OTHER FACILITIES INVOLVED (8)																	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAMES																	
0	6	3	0	9	3	9	3	0	0	4	0	0	0	0	0	0										
										N/A			0 5 0 0 0 0 0													
										N/A			0 5 0 0 0 0 0													
OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5: (Check one or more of the following) (11)																								
N		20.402(b)					20.405(c)					60.73(a)(2)(iv)					73.71(b)									
POWER LEVEL (10)		0					20.405(a)(1)(i)					60.38(c)(1)					60.73(a)(2)(v)					73.71(c)				
		20.405(a)(1)(ii)					60.38(c)(2)					60.73(a)(2)(vii)					OTHER (Specify in Abstract)									
		20.405(a)(1)(iii)					60.73(a)(2)(i)					60.73(a)(2)(viii)(A)					below and in Text,									
		20.405(a)(1)(iv)					X 60.73(a)(2)(ii)					60.73(a)(2)(viii)(B)					NRC Form 366A)									
		20.405(a)(1)(v)					60.73(a)(2)(iii)					60.73(a)(2)(x)														

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
	AREA CODE
Cris T. Hillman, Staff Licensing Engineer	6 1 6 7 6 4 - 8 9 1 3

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE)	NO	EXPECTED SUBMISSION DATE (16)	MONTH	DAY	YEAR			
X			0	8	3	0	9	3

ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (18)

On June 30, 1993, at approximately 2300 hours, while draining the refueling cavity in preparation for re-attaching the reactor head to the reactor vessel, an object located in the reactor cavity tilt pit exhibited contact dose rates of approximately 7000R/hr. A review of a remote camera inspection video tape led to the postulation that the object was a piece of fuel rod. Further remote camera inspection of the tilt pit resulted in the discovery of three additional pieces of what appeared to be a fuel rod. Review of the video tape revealed that one of the pieces had an end cap and the serial number was visible. Based on the serial number, it was determined that the fuel rod came from a fuel assembly (I-24) that was in the reactor core.

The root cause for the failure of the fuel rod and its dislocation from the fuel assembly has not been determined at this time.

Corrective action will be developed when a root cause for the failure is determined. A core reload plan is being developed by selecting and modifying replacement fuel assemblies. The replacement fuel assemblies are being modified to withstand one more operating cycle based on the observed wear phenomena.

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EVENT DESCRIPTION

On June 30, 1993, at approximately 2300 hours, while draining the refueling cavity in preparation for re-attaching the reactor head to the reactor vessel, radiological dose rates in the reactor cavity near the tilt pit [DF] exceeded the dose rates typically experienced during previous similar refueling cavity draining evolutions. At the time of the event the reactor head was in place over the reactor vessel resting on shims. Typical dose rates at the floor level of the refueling cavity near the tilt pit (elev. 625-feet) are 200-300 mR/hr; however, during this event the dose rate on the refueling machine bridge (elev. 649-feet) was 700 mR/hr with no water in the tilt pit. An object located on the tilt pit floor (elev. 610-feet), exhibited contact dose rates of approximately 7000R/hr. The refueling cavity was immediately evacuated and the radiological conditions assessed. Approximately two feet of water was added to the tilt pit to provide shielding. Proper radiological postings and boundaries were established, and access to the containment area was controlled. At the time of the event the reactor was in a refueling mode. There was no radiological release to the environment as a result of this event, and there were no personnel exposures that exceeded either 10 CFR Part 20 limits or CPCo administrative limits. This event had no adverse effect on the health and safety of the public.

A remote camera inspection of the tilt pit was conducted and a cylindrical object approximately five (5) feet in length and approximately four-tenths (0.4) inch in diameter was identified. It was suspected that the object was a piece of a fuel rod [AC]. On July 1, 1993 the NRC was notified of the possibility of a fuel rod in the reactor cavity tilt pit.

Further remote camera inspection of the tilt pit resulted in the identification of three more pieces of what appeared to be a fuel rod. The total length of all four pieces was estimated to be about 12 feet. A review of the video tape from the remote camera inspection of the three additional objects revealed that one of the pieces had an end cap and the serial number was visible. Based on the serial number, it was determined that the fuel rod came from fuel assembly I-24 which was in the reactor core. The I-24 fuel assembly had been removed from the reactor during refueling, taken to the tilt pit, rotated 180 degrees and returned to its core position.

In response to these developments, CPCo formed a project team to develop an action plan for recovery of the fuel rod pieces from the tilt pit, recovery of the damaged fuel assembly from the reactor core, and analysis of the entire event.

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On July 4, 1993 the three fuel rod fragments were retrieved and relocated to storage baskets in the tilt pit. It was determined the fourth piece was not a fuel rod fragment and it was not recovered. By July 6, 1993 a plan had been developed and approved by the Plant General Manager and the NRC for the recovery of fuel assembly I-24 from the reactor core. The reactor head was removed and placed on the reactor head stand. Preparations were then made to remove the Upper Guide Structure (UGS) from the reactor vessel. During the lift of the UGS, the load cell readout indicated and the remote camera inspection of the underside of the UGS confirmed that a fuel assembly still in its core position was being lifted with the UGS. The UGS lift was halted and the containment was evacuated. An Unusual Event was declared at 2254 hours on July 6, 1993. There was no radiological release to the environment as a result of the lifting of a fuel assembly with the UGS, and there were no exposures that exceeded either 10 CFR Part 20 limits or CPCo administrative limits. The lifting of a fuel assembly with the UGS had no adverse effect on the health and safety of the public.

A closer examination of the location of the fuel assembly attached to the UGS indicated that the fuel assembly was attached to the UGS in a location where fuel assemblies had been stuck to the UGS on two previous occasions. (See LERs 88015, dated October 3, 1988 and 92017, dated March 30, 1992.) All reactor vessel work was stopped pending recovery of the fuel assembly stuck to the UGS. Containment integrity was established by closing the equipment hatch and routine work activities in the containment were suspended. Procedures were then developed for the recovery of the stuck fuel assembly.

On July 8, 1993 the fuel assembly, while still in its core position, was successfully removed from the UGS and the reactor vessel core support plate. The UGS was then lifted without further incident and was placed in its storage location in the reactor cavity. Also on July 8, 1993, an NRC Augmented Inspection Team (AIT) arrived at Palisades to investigate the broken fuel rod found in the reactor cavity tilt pit, the lifting of a fuel assembly during removal of the UGS, and other recent issues.

On July 13, 1993 fuel assembly I-24 was removed from the reactor core. Prior to removal from the reactor core, fuel assembly I-24 had been visually inspected to ensure that additional fuel rods would not be damaged during removal from the reactor core. The visual inspection of fuel assembly I-24 while it was in the reactor core was accomplished by removing an adjacent fuel assembly and an adjacent control rod. Prior to removal, it was noted that the upper end piece of the failed fuel rod was still contained within the uppermost spacer grid of the I-24 fuel assembly. During the removal of the I-24 fuel assembly from the reactor core, this piece of fuel rod dropped from the fuel assembly and landed on top of another fuel assembly tieplate in the core. The piece that had fallen from fuel assembly I-24 was retrieved from

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the core and was stored with the other three fuel rod pieces. The I-24 fuel assembly was subsequently relocated to the spent fuel pool, along with the pieces of damaged fuel rod, where inspections by CPCo personnel and the fuel vendor could be conducted.

Inspection of the I-24 fuel assembly and the broken fuel rod are ongoing. Inspection of the reactor core and lower vessel area for loose fuel pellets, other debris, and other indications of fuel damage are ongoing. The results of these inspections will be used to determine a root cause for the failure of fuel assembly I-24 and to develop corrective actions associated with this event.

This event is reportable to the NRC in accordance with 10CFR50.73(a)(2)(ii) as an event wherein a principal safety barrier (i.e., fuel cladding) was seriously degraded.

CAUSE OF THE EVENT

The root cause for the failure of the fuel rod from fuel assembly I-24 will be included in a formal root cause analysis performed by Consumers Power Company.

This event involved the failure of a principal safety barrier (fuel cladding) and is considered a failure of equipment important to safety.

ANALYSIS OF THE EVENT

The root cause analysis for the failure of the fuel rod from fuel assembly I-24 will contain a detailed analysis of the event.

CORRECTIVE ACTION

The root cause analysis for the failure of the fuel rod from fuel assembly I-24 will contain the corrective actions for this event.

ADDITIONAL INFORMATION

None