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April 5, 2001

**Douglas E. Cooper**  
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U.S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, DC 20555-0001

**DOCKET 50-255 - LICENSE DPR-20 - PALISADES PLANT**

LICENSEE EVENT REPORT - 01-001, 10CFR20.2201(b) REPORT - LOSS OF A LOW  
ACTIVITY, MIXED ISOTOPE SOURCE

Licensee Event Report (LER) 01-001 is attached. The LER describes the loss of a low activity, mixed isotope source. This loss was reported by telephone in accordance with 10 CFR 20.2201(a)(1)(ii) on March 9, 2001. LER-01-001 is the written follow-up report required in accordance with 10 CFR 20.2201(b).

SUMMARY OF COMMITMENTS

This letter contains one new commitment and no revisions to existing commitments.  
The new commitment is:

Health Physics Procedure HP-6.25, "Radioactive Source Control," will be revised to strengthen administrative controls over the disposal of radioactive sources by May 31, 2001.



Douglas E. Cooper  
Plant General Manager

CC Administrator, Region III, USNRC  
Project Manager, NRR, USNRC  
NRC Resident Inspector - Palisades

Attachment

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<b>NRC FORM 366</b> (1-2001)		<b>U.S. NUCLEAR REGULATORY COMMISSION</b>		<b>APPROVED BY OMB NO. 3150-0104</b> <small>Estimated burden per response to comply with this mandatory information collection request: 50 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records Management Branch (T-6 E6), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to bjs1@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202 (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.</small>		<b>EXPIRES 6-30-2001</b>							
<b>LICENSEE EVENT REPORT (LER)</b> <small>(See reverse for required number of digits/characters for each block)</small>													
<b>FACILITY NAME (1)</b> CONSUMERS ENERGY COMPANY PALISADES NUCLEAR PLANT				<b>DOCKET NUMBER (2)</b> 05000255		<b>PAGE (3)</b> 1 OF 4							
<b>TITLE (4)</b> 10CFR20.2201(b) REPORT - LOSS OF A LOW ACTIVITY, MIXED ISOTOPE SOURCE													
<b>EVENT DATE (5)</b>			<b>LER NUMBER (6)</b>			<b>REPORT DATE (7)</b>			<b>OTHER FACILITIES INVOLVED (8)</b>				
MO	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO	MO	DAY	YEAR	FACILITY NAME	DOCKET NUMBER			
02	08	2001	2001	- 001 -	00	04	05	2001	FACILITY NAME	DOCKET NUMBER			
										05000			
										05000			
<b>OPERATING MODE (9)</b>		1		<b>THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply) (11)</b>									
<b>POWER LEVEL (10)</b>		100		x	20.2201(b)		20.2203(a)(3)(ii)		50.73(a)(2)(ii)(B)		50.73(a)(2)(ix)(A)		
					20.2201(d)		20.2203(a)(4)		50.73(a)(2)(iii)		50.73(a)(2)(x)		
					20.2203(a)(1)		50.36(c)(1)(i)(A)		50.73(a)(2)(iv)(A)		73.71(a)(4)		
					20.2203(a)(2)(i)		50.36(c)(1)(ii)(A)		50.73(a)(2)(v)(A)		73.71(a)(5)		
					20.2203(a)(2)(ii)		50.36(c)(2)		50.73(a)(2)(v)(B)		OTHER Specify in Abstract below or in NRC Form 366A		
					20.2203(a)(2)(iii)		50.46(a)(3)(ii)		50.73(a)(2)(v)(C)				
					20.2203(a)(2)(iv)		50.73(a)(2)(i)(A)		50.73(a)(2)(v)(D)				
					20.2203(a)(2)(v)		50.73(a)(2)(i)(B)		50.73(a)(2)(vii)				
					20.2203(a)(2)(vi)		50.73(a)(2)(i)(C)		50.73(a)(2)(viii)(A)				
					20.2203(a)(3)(i)		50.73(a)(2)(ii)(A)		50.73(a)(2)(viii)(B)				
<b>LICENSEE CONTACT FOR THIS LER (12)</b>													
<b>NAME</b> Kenneth E. Marbaugh								<b>TELEPHONE NUMBER (Include Area Code)</b> 616-764-2195					
<b>COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)</b>													
CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX				
<b>SUPPLEMENTAL REPORT EXPECTED (14)</b>								<b>EXPECTED SUBMISSION DATE (15)</b>		MONTH	DAY	YEAR	
YES (If yes, complete EXPECTED SUBMISSION DATE).				X	NO								
<b>ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)</b>													
<p>On February 8, 2001, at approximately 1430 hours with the plant at 100% power, during a routine inventory of licensed radioactive sources, one low activity, mixed isotope source could not be accounted for. The source contained a total of approximately 0.992 microcurie, of which approximately 0.154 microcurie was Americium-241. (Typical home smoke detectors contain a one microcurie Americium-241 source.) Since the quantity of Americium-241 in this source was more than ten times the quantity specified in Appendix C of 10 CFR 20, a telephone report was made on March 9, 2001, in accordance with 10 CFR 20.2201(a)(1)(ii). None of the other isotopes in the source exceeded the reportable quantities as specified in Appendix C. The low activity and relatively large size of the source (2.25" dia by 1" thick) are such that it would not be a significant radiological hazard. A search of the site failed to locate the source. It is unlikely that a person could have inadvertently carried the source out of the radiologically controlled area (RCA) since the source would have caused the RCA exit monitors to alarm. It was concluded that the source was most likely discarded by mistake, inside the RCA, into a yellow trash bag with other radioactive waste. The low level radioactive waste from the time period in question was shipped off-site to a licensed vendor and final disposal has been completed.</p>													

## LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)
CONSUMERS ENERGY COMPANY PALISADES NUCLEAR PLANT	05000255	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	2 OF 4
		2001	-- 001	-- 00	

NARRATIVE (If more space is required, use additional copies of NRC Form 366A) (17)

This report provides the content required by 10 CFR 20.2201(b)(i) through (vi), as well as the pertinent information required by 10 CFR 50.73(b).

## Description of Licensed Material Involved

The missing source was a charcoal cartridge of solid form, approximately 2.25 inches in diameter and 1.0 inch thick. This "BG-300" cartridge source was used for efficiency calibration of the gamma spectroscopy system. The BG-300 charcoal cartridge had a mixture of the following nine isotopes, with the activities for each decay corrected to July 1, 2000:

Isotope	Activity (microcurie)
Am-241	0.154
Cd-109	0.693
Co-57	0.007
Ce-139	0.002
Hg-203	0.000003
Sn-113	0.0015
Cs-137	0.057
Y-88	0.002
Co-60	0.0759
<b>Total</b>	<b>0.992</b>

## Description of Circumstances Under Which Loss Occurred/Cause of the Event

On February 8, 2001, at approximately 1430 hours with the plant at 100% power, during performance of the semi-annual radioactive source inventory, radioactive source SRS 56299-66, a BG-300 charcoal cartridge, could not be found. This source was present during the last source inventory, completed in August 2000. The source was a mixed gamma source used for efficiency calibration of the gamma spectroscopy system. The source was stored inside the Radiologically Controlled Area (in the grey lab source locker) and was a licensed source because it contained greater than 0.001 microcurie of Americium-241.

NRC FORM 366A (1-2001)		U.S. NUCLEAR REGULATORY COMMISSION			
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CONSUMERS ENERGY COMPANY PALISADES NUCLEAR PLANT	05000255	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	3 OF 4
		2001	-- 001	-- 00	

**NARRATIVE** (If more space is required, use additional copies of NRC Form 366A) (17)

A search was immediately made for the missing source. Source storage areas, source use areas, and disposal release pathways were searched. Chemistry Technicians, staff, and anyone else who may have had reason to use this source, were questioned to determine if anyone knew the location of this source. The source was not found.

The physical appearance and container label on the BG-300 charcoal cartridge source, SRS-56299-66, was very similar to the labeling of radiochemistry cross check samples prepared for Palisades by Analytics, Inc. on May 20, 2000. The cross check samples were prepared in BG-300 charcoal cartridges identical to the BG-300 charcoal cartridge used for SRS-56299-66. The BG-300 charcoal cartridge cross check samples and the BG-300 source SRS-56299-66 were both stored inside the Radiologically Controlled Area (in the grey lab source locker) from the end of May until approximately the middle of August 2000. The written results for the BG-300 cross check samples were sent by Analytics to Palisades, on July 17, 2000. Sometime after July 17, 2000 the radiochemistry cross check samples in the BG-300 charcoal cartridges should have been discarded. One cross check sample was found in the source locker during the search for the missing licensed source. The presence of the BG-300 cross check sample in the source locker, when it should have been discarded, suggests that the BG-300 SRS-56299-66 source was discarded by mistake. This is likely because both the source and cross check sample were in identical containers and were similarly labeled. The source, SRS-56299-66, would have been discarded in a yellow trash bag (radioactive material for disposal). This waste has been shipped to a licensed vendor for incineration. The addition of the BG-300 charcoal source to the radioactive waste shipment did not change the shipping classification (LSA 2). The vendor was contacted and asked to look for this source in the sorting process. However, the vendor reported that the radioactive waste from the period in question had already been sorted and disposal completed.

#### Probable Disposition of Licensed Material

The source, SRS-56299-66, was most probably discarded in a yellow trash bag (radioactive material for disposal). This waste was shipped to a licensed vendor for disposal.

#### Exposure of Individuals to Radiation/Safety Consequences

There were no safety consequences with respect to plant operation. There were no known exposures to individuals associated with the loss of this source. The total curie content of the source decay, corrected to July 1, 2000, was 0.992 microcurie. The most significant risk from this source would come from ingestion. Unknowingly ingesting this source would be impossible because of its size and shape. The charcoal cartridge was approximately 2.25 inches in diameter and 1.0 inches thick. To put the risk in perspective, typical home smoke detectors contain a one microcurie Americium-241 source.

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CONSUMERS ENERGY COMPANY PALISADES NUCLEAR PLANT	05000255	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	4 OF 4
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**NARRATIVE** (If more space is required, use additional copies of NRC Form 366A) (17)

### Actions Taken to Recover Material

Upon discovery, a search was immediately made for the missing source. Source storage areas, source use areas, and disposal release pathways were searched. Chemistry Technicians, staff, and other persons who may have had reason to use this source, were questioned to determine if anyone knew the location of this source. The source was not found. The vendor to which Palisades ships radioactive waste for disposal was contacted and asked to look for this source in waste from the period in question. However, the vendor reported that the radioactive waste from the period in question had already been sorted and disposal completed.

### Measures to Ensure Against Recurrence/Corrective Actions

Investigation determined the causes for this event were (1) Inadequate program guidance for radioactive sources and cross check samples resulted in poor physical controls; and (2) The failure to use effective self-checking techniques resulted in a licensed source being mistakenly discarded.

On February 14, 2001, Chemistry and Radiological Services (C&RS) management issued a memo to C&RS Department staff stating there will be no further radioactive sources or radioactive cross checks disposed of until Health Physics Procedure, HP-6.25, "Radioactive Source Control" is revised and training on the revision completed. This was also communicated to C&RS staff personnel verbally. Health Physics procedure HP-6.25, "Radioactive Source Control" will be revised by May 31, 2001 to strengthen administrative controls over the disposal of radioactive sources. Anticipated changes include:

- a. Require that the removal of radioactive sources for disposal be done only by the Radiological Material Supervisor.
- b. Require documentation be developed recording the source identification, disposal method, and individual performing disposal, for sources that are discarded. This document will be retained.
- c. Require that radiochemistry cross check samples be included in the source inventory and be considered and handled the in the same manner as radioactive sources.

### Previous Occurrences

There are no known previous occurrences of this type of event at the Palisades Plant.