

U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

REGION III

Report No. 50-315/79-09

Docket No. 50-315

License No. DPR-58

Licensee: American Electric Power
Service Corporation
Indiana and Michigan Power
Company
2 Broadway
New York, NY 10004

Facility Name: Donald C. Cook Nuclear Plant, Unit 1

Investigation At: Donald C. Cook Site, Bridgman, Michigan

Investigation Conducted: January 9-10, 1979

Investigator: *J. E. Foster*
J. E. Foster

5/10/79

Inspector: *W. L. Fisher*
M. C. Schumacher

5/11/79

Reviewed By: *C. E. Norelius*
C. E. Norelius,
Assistant to the Director

5/14/79

W. L. Fisher
W. L. Fisher, Chief
Fuel Facility Projects and
Radiation Support Section

5/11/79

Investigation Summary

Investigation on January 9-10, 1979 (Report No. 50-315/79-09)

Areas Inspected: Special, unannounced investigation of radioactive liquid release procedures and records; review of pertinent records, inspection of equipment, and interviews with personnel. The investigation involved 32 inspector-hours onsite by two NRC personnel.

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Results: No items of noncompliance with NRC regulations were identified. No evidence to corroborate or deny the allegations could be developed. However, worst-case analysis indicated that no limits would be exceeded if the allegation was confirmed.

INTRODUCTION

The Donald C. Cook Unit 1 Nuclear Power Plant, licensed to the Indiana and Michigan Electric Company, is located near Bridgman, Michigan. The plant utilizes a pressurized water reactor (PWR) designed by the Westinghouse Corporation, and began commercial operation in August, 1975. During reactor operations, quantities of radioactive liquids and gases are accumulated and processed by the plant's radioactive waste systems. Releases of radioactive liquids and gases are made at intervals.

REASON FOR INVESTIGATION

On December 12, 1978, Mr. Bruce Peek, of radio station WHFB, Benton Harbor, Michigan, contacted Mr. Ken Baker, resident NRC inspector for the Cook facility. Mr. Peek indicated that he had information from a former plant operator who was concerned about technical specification violations and records falsification at the Cook plant. On December 14, 1978, Mr. Peek provided the Resident Inspector with the name and telephone number for individual "A", the former plant operator. Individual "A" was contacted, and his concerns were discussed. An NRC investigation was initiated into these concerns.

SUMMARY OF FACTS

Individual "A" was contacted by the NRC Region III (RIII) Investigation Specialist on December 14, 1978. Individual "A" indicated that he had been an auxiliary equipment operator at the Cook 1 plant, and his concerns related to releases of radioactive liquids from the plant. He stated that he had been involved in two liquid releases from the plant during 1977, where the length of time over which the release took place was altered by five to ten minutes so that release data would not show that a maximum release rate had been exceeded. He indicated that these two releases had taken place from monitor tanks during periods when one plant recirculation pump was running. Individual "A" indicated that he did not feel that plant management was aware of these time falsifications, as only the auxiliary equipment operators involved would be knowledgeable of the occurrences. He stated that he could not recall any information as to the date of these releases or recall other individuals who participated in the releases.



Region III personnel visited the Cook Unit 1 Site, inspected equipment utilized in controlling radioactive liquid releases, interviewed auxiliary operators, reviewed release procedures, individual release data, plant condition reports related to radioactive releases, computer trend records pertaining to release data, and held discussions with plant personnel.

Radioactive liquid release data for all liquid releases, both monitor and condensate storage tanks, conducted during 1977 while only one plant recirculation pump was running were reviewed. It could not be determined which release had been referred to by individual "A". Computer trend records for all monitor tank releases were reviewed, and appeared to substantiate release time periods reflected in other records. This data was not conclusive, as radiation levels during releases were not high enough to be discernible from background levels, and the computer trend is normally stopped several minutes after a release. Reviews of the radioactive waste log indicated identical times to those recorded on various release data sheets.

Interviews with auxiliary operators did not indicate that liquid release times were falsified, or that other auxiliary operators knew of such occurrences. It was found that several auxiliary operators believed that a violation of the maximum release rate (Station Procedures) would automatically result in a violation of the Station Technical Specifications.

A review of station procedures, and calculations performed on selected releases indicated that Station Procedures are conservative, and releases could be performed at much higher release rates before approaching regulatory limits. "Worst case" calculations were performed on several monitor tank releases, assuming slightly higher concentrations than recorded and assuming that release time was actually ten minutes less than that recorded. In no case were technical specification limits approached.

Discussions with plant personnel indicated that actions were in progress to provide improved instrumentation for monitoring liquid releases and that consideration would be given to installation of a flow recording device. RIII personnel were advised that relocation of a pressure reading device was planned which would greatly simplify release flow regulation.

CONCLUSIONS

1. It was not possible to identify the releases mentioned by individual "A".
2. No evidence could be developed to show release time falsification.
3. "Worst-case" analysis of releases show no regulatory limits were approached, nor would they have been approached if the allegation made by individual "A" had been verified.

DETAILS

1. Personnel Contacted
Indiana and Michigan Power Company

R. S. Keith, Operations
D. V. Shaller, Plant Manager
L. K. Smith, Shift Operating Engineer
J. F. Stietzel, QA Supervisor

Individuals

Individual "A"

2. Scope

This investigation focused on radioactive releases performed at the D. C. Cook Unit 1 plant during 1977. Emphasis was placed on releases performed while one circulation pump was in operation, with particular attention to monitor tank releases.

3. Introduction

On December 12, 1978, Mr. Bruce Peek, of radio station WHFB, Benton Harbor, contacted the Resident Inspector for the Cook facility. During the conversation, Mr. Peek indicated that he had been contacted by an ex-operator from the plant who had concerns regarding falsified records at the facility and technical specification violations. The resident inspector provided Mr. Peek with information regarding known plant releases.

On December 14, 1978, Mr. Peek provided the Resident Inspector with a phone number and the name of the individual who had concerns related to radioactive liquid releases. This information was provided to the Region III office.

4. Contact with Individual "A"

Individual "A" was contacted on December 14, 1978, and again on January 6, 1979. He indicated that he had worked at the D. C. Cook Unit 1 as an auxiliary equipment operator during the period of March 1977 to August 1978. He indicated that during his employment at the Cook plant he had participated in various liquid releases to the lake. Individual "A" stated that on two occasions during 1977 when the plant was functioning

with one circulating water pump running radioactive liquid releases were performed more rapidly than allowed by the plant specifications. He indicated that this had been recognized by the auxiliary equipment operators participating in the two releases, and release data sheets had been changed to reflect longer release periods thereby lowering the release rate to within plant specifications. He indicated that this time falsification was approximately five to ten minutes, but was not able to identify either the date of the two releases, nor the other personnel who had participated in them. During the second contact, individual "A" stated that the release had taken place from a monitor tank, and that it had to be in the latter part of the year, as the weather had been cold. He indicated that he had worked on the "D" shift and the release should have taken place during the time that shift was in operation.

Individual "A" was unable to provide any other identifying information concerning the release, the tank released, date of release, or participants in the release. He indicated that it was possible his initials might be on the valve line-up sheets for these particular releases but he was not certain of this information.

5. Review of Procedures

Prior to performing a site investigation, Region III personnel reviewed D. C. Cook procedures for liquid waste releases. These procedures require a sampling of the tank to be released, calculation of concentration of radioactive material, and additional calculations to determine the maximum discharge flow rate which can be accomplished within the plant specifications. It was found that maximum flow rates for liquid waste discharges depend on the type of tank discharged at the D. C. Cook plant, with a maximum flow rate of twenty seven gallons per minute for condensate waste tank, and a 150 gallon per minute limit for a monitor waste tank release. These two flow rates are specified as maximum flow rates in the plant release procedure, although flow rate could be of a higher or lesser rate depending upon the concentrations in the liquids to be released and dilution flow at the time. Both of the two procedures were intended to provide conservative release rates for radioactive liquids, so that no regulatory limits would be approached during these releases.

6. Review of Release Data

The D. C. Cook Unit 1 Resident Inspector provided the Investigation Specialist with liquid release data sheets for those releases during calendar year 1977 where one circulating pump had been in operation. It was found that 31 such releases had taken place and were concentrated in six months of calendar year 1977. Information on the data sheets was used to calculate the gallons released, maximum release rate, actual gallons per minute released and notations were made on what type of release was accomplished. From this information it was noted that releases generally took place within the plant specifications of either 27 or 150 gallons per minute maximum depending upon on the type of waste tank released. However, it was noted that in several cases release rates had been slightly higher than these rates (2-5 gpm).

7. Visit to D. C. Cook Unit 1

During January 9-10, 1979, Region III personnel visited the D. C. Cook Unit 1 site. During this visit records related to radioactive liquid releases were reviewed, equipment was inspected, and interviews were held with auxiliary operators who had participated in liquid releases.

8. Inspection of Equipment

Region III personnel toured the area where valves and monitoring equipment utilized for radioactive releases are located. During this tour the procedures followed in performing a radioactive release were explained by auxiliary operating personnel, and various flow rates for the systems involved were described. During discussions with auxiliary operating personnel concerning the operation of equipment, Region III personnel were provided with plant flow diagrams which indicate that the maximum gallon per minute rating of the waste evaporator condensate tank pumps is twenty gallons per minute, and the maximum rating for the monitor tank pumps is 150 gallons per minute. It was noted that release rates in excess of these amounts are possible, due to the positive head pressure on these pumps. It was noted that the maximum rating for the meter formerly utilized to monitor condensate waste tanks was 27 gallons per minute. This maximum figure on the monitoring instrument apparently had been used to set the maximum release rate for the facility (site procedure). Flowrates are presently monitored by a differential pressure orifice (flowrate is calculated from a chart).



9. Review of Records

Region III personnel reviewed radioactive release data sheets for waste condensate and monitor tank releases which had taken place during 1977 while one circulation pump was running, and compared this information with data contained in the radioactive waste log. In addition, information contained on digital computer trends performed while monitor tanks were being released was reviewed in an attempt to determine if discharge times indicated on release data sheets were correct.

Information contained on the release data sheets both for condensate tank and monitor releases was found to be corroborated by notes in the radioactive liquid waste log, and information contained in the computer digital trend analysis performed while monitor tanks were being released appeared to substantiate release time information contained on the release data sheets. However, this information was not totally conclusive in that the computer digital trend showed basically background level radiation, and is normally terminated several minutes after a release has been terminated. All of the data sheets and logs reviewed were examined to see if changes had been made in the recorded times. Only one such change was noted and it appeared to be substantiated by information contained in the radioactive waste log and computer digital trend analysis. No information could be developed from the record review to indicate that any of the site records had been falsified regarding liquid waste release times.

10. Interviews of Auxiliary Equipment Operators

On January 10, 1979, Region III personnel interviewed several auxiliary equipment operators at the D. C. Cook Unit 1 plant who had participated in liquid releases. None of the individuals interviewed indicated that they had participated in nor heard of any falsification regarding liquid waste release data. The auxiliary operators interviewed indicated that they had not performed a waste condensate tank release for some time, present practice being to use the monitor tanks, which had a larger volume, and could release wastes at a higher flow rate, reducing auxiliary operator monitoring time.

Operators interviewed indicated that the monitoring equipment alarms at 10% of remaining tank volume and that shortly thereafter the pump will trip due to lack of fluid to pump. This time would then be noted on the radioactive waste log sheet. Auxiliary operators indicated that they were not aware of any

pressure on them or motivation for falsifying release times, but indicated a belief that violation of the plant maximum release rate specifications would result in a violation of the facility Technical Specifications.

Auxiliary operators also noted that in some cases they had to adjust valves during releases in order to prevent facility maximum flow rates from being exceeded. They again indicated they felt that exceeding of the facility procedure flow rate would result in a technical specification violation and that as such they might be criticized by plant management when such release rates were exceeded.

11. Review of Condition Reports

During the investigation Region III personnel reviewed Condition Reports, (nonconformance reports) related to liquid waste releases. It was found that two Condition Reports had been generated regarding release of radioactive liquids from condensate tanks at rates higher than the plant procedures allowed. One release had taken place on April 9, 1977 (46 gallons per minute), and the other release had taken place on January 14, 1977 (30.5 gallons per minute). No NRC limits had been exceeded during these releases. It was noted that if the time span for the January release was increased by five minutes, the release rate would have been 27 gallons per minute. No such time change had been made, however. See Exhibit I.

12. Management Discussion and Exit Interview

On January 10, 1979, Region III personnel discussed the findings of the investigation with plant management personnel, and performed an exit interview. Region III personnel indicated they had found no evidence to substantiate the allegations concerning falsified liquid release times, but indicated concern that the licensee relied wholly upon release time information supplied by auxiliary equipment operators. Concern was also expressed that the monitoring devices used to indicate flow rates for liquid releases appeared somewhat cumbersome, requiring calculations to be performed to determine actual flow rate in some cases.

Licensee personnel indicated that improvement of monitoring for liquid release flow rates had been under consideration for some time, and that equipment to improve the precision of flow rate measurement had been on order and was expected to be installed

in the near future. Licensee personnel indicated that they would take under consideration installing recording devices which would indicate the liquid release rate and time frames of liquid releases to provide documentation of flow rates.

13. Contact with Individual "A"

On January 14, 1979, Individual "A" was contacted by the Region III Investigation Specialist. The results of the investigation were discussed in detail.

Individual "A" again indicated that he believed that the liquid release which he had participated in (with the alleged adjusted time frame) was a monitor tank but he was not entirely certain, and indicated that it could have been a waste condensate tank release. Individual "A" was advised that releases for both types of tanks had been reviewed during the investigation effort.

Individual "A" stated that he had read newspaper articles which dealt with his concerns and felt that he had been misquoted on several occasions by the news media. Individual "A" stated he felt that even though Region III had not been able to substantiate his allegations, the effort had been worthwhile in directing the licensee's attention to an area which individual "A" felt required additional attention.

Attachment: Exhibit I

RELEASE OF RADIOACTIVE LIQUIDS

RELEASE NO. L77-26

1. DATE 11/14/77 TIME 0955 Hrs.

The North/South Waste Evaporator Condensate Tank contains 1321 gallons and has been recirculating for 2 1/2 hours. The tank is ready for sampling prior to release.

FORWARD TO CHEMICAL SECTION.

C.E. Murphy
SOE/OE

Recirc @ 0725

2. The North/South Waste Evaporator Condensate Tank has been sampled and may be released at a maximum flow rate of 27 gpm with 230,000 gpm minimum dilution flow.

This Release is in compliance with Environmental Technical Specifications 2.4.1 a, b and c and Table 2.4-1 and the release is approved. (RRC-285 (R-18) alarm/trip setpoint 855399 cpm. 132 cpm expected ave above 100 bkg

W. Smith RADIATION PROTECTION 11/14/77 DATE 1515 Hours TIME

The Release is not approved. Reason: _____

RADIATION PROTECTION _____ DATE _____ Hours TIME

If not approved by Radiation Protection, approval of the Plant Manager is required prior to release.

APPROVED _____ PLANT MANAGER _____ DATE _____ Hours TIME

This Release must be completed within 24 hours from time of approval.

FORWARD TO SOE.

3. DATE 11/14/77 TIME 1625 Hours

Permission is hereby granted to release the contents of the North/South Waste Evaporator Condensate Tank at or below the flow rate specified below. An independent verification of the valve lineup for this release has been made. DF₁ = Dilution Flow from Section 2

CHF = Operating Circulating Water Pumps X 230,000 GPM
FR₁ = Release Flow Rate from Section 2

*NOTE-Subtract 1/2 pump if one half of a condenser is valve out.

FR_{max} = Maximum Release Flow Rate
CHF X FR₁ = FR_{max} 230000 X 27 = 27 GPM
DF₁ 230000

A. W. Smith
SOE/OE

4. The North/South Waste Evaporator Condensate Tank was discharged from 1642 hours on 11/14/77 to 1713 hours on 11/14/77. Number of Circulating Water Pumps in operation during this release was 1.

Dilution Flow Rate 230000 gpm Release Flow Rate 30.5 gpm
Total Dilution 7130000 gal Final Tank Volume 374 gal*
Initial Tank Volume 1321 gal* Total Release 947 gal

Discharge Path to 'B' condens. unit #1 to discharge tunnel

ORIGINAL TO MASTER FILE
COPY TO RADIATION PROTECTION

A. W. Smith
OPERATIONS DEPARTMENT

*From approved tank volume curve.



RELEASE OF RADIOACTIVE LIQUIDS

RELEASE NO. L77-26

5. SAMPLE NO. 34236π DATE 1/14/77 TIME 1016 Hrs. TANK North / South

Appendix B, Technical Specification 2.4.2.b requires actual analysis prior to release. 3 |

ISOTOPE	CONCENTRATION μCi/ml	MCP	%MCP	ISOTOPE	CONCENTRATION μCi/ml	MCP	%MCP
I ¹³¹	2.41 E-7	3x10 ⁻⁷		NO ⁹⁵	2.73 E-7		
Cs ¹³⁷	2.25 E-6	2x10 ⁻⁵		H ³	3.51 E-5	3x10 ⁻³	
Cs ¹³⁴	2.06 E-6	9x10 ⁻⁶					
Co ⁶⁰	2.54 E-6	3x10 ⁻⁵					
Co ⁵⁸	4.93 E-6	9x10 ⁻⁵					
Cr ⁵¹	2.542 E-7	2x10 ⁻³					
In ⁵⁴	6.59 E-7	1x10 ⁻⁴		Gross α	2.25 E-7	—	—
Zn ⁶⁵	2.30 E-7	1x10 ⁻⁴		Gross β	8.12 E-6	—	—

Boron Concentration 5 ppm. All significant gamma peaks have been identified and quantified. 3 |

Submitted By W Scott (Analyst) Date 1/14/77 Time 1350 Hrs.

This release is in compliance with Section 2.2 and 2.4.2.b & c of the Environmental Technical Specifications and 3

may be released at a maximum flow rate of .25 gpm with 230000 gpm minimum dilution flow.

APPROVED BY J. A. Ewald (w.s.) (Chemical Section) DATE 1/14/77 TIME 1355 Hrs.

NOT APPROVED BY _____ (Chemical Section) DATE 1/1 TIME _____ Hrs

6. Total Concentration * .1295 x 10⁻⁴ μCi/ml. Total %MCP 130.51

Maximum Release Flow 27. gpm

Minimum Dilution Flow = 0.01 x % MPX x Release Flow = 230,000 gpm.

Estimated volume release = 3.78 x 10³ x gallons in tank = .5000 x 10⁷ ml.

Estimated release activity * = .6477 x 10⁻⁴ Ci

Activity release last quarter * = .6683 Ci. Last year * .1814 x 10¹ Ci

RELEASE APPROVED WJ Mettler (RADIATION PROTECTION) DATE 1/14/77 TIME 1515 Hrs

RELEASE NOT APPROVED. REASON: _____

RADIATION PROTECTION DATE 1/1 TIME _____ Hrs

* Excluding tritium and dissolved gasses.

Exhibit I
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