



October 26, 2001

United States Nuclear Regulatory Commission  
Document Control Desk  
Washington, DC 20555

Operating License DPR-74  
Docket No. 50-316

Document Control Manager:

In accordance with the criteria established by 10 CFR 50.73 entitled Licensee Event Report System, the following report is being submitted:

LER 316/2001-002-01: "Failure of Lower Containment Airlock Door Interlock Results in Inadvertent Opening of Both Doors."

This LER supplement is being submitted to include revised information related to the completed root cause evaluation. This LER revision replaces the previous LER in its entirety.

No commitments are identified in this submittal.

Should you have any questions regarding this correspondence, please contact Mr. Ronald W. Gaston, Manager, Regulatory Affairs, at 616/697-5020.

Sincerely,

Joseph E. Pollock  
Plant Manager

INJ/pae

Attachment

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Rec'd 11/23/02

<b>NRC Form 366 (7-2001)</b> <b>U.S. NUCLEAR REGULATORY COMMISSION</b>  <div style="text-align: center; font-size: 1.2em; font-weight: bold;">LICENSEE EVENT REPORT (LER)</div> <p style="text-align: center;">(See reverse for required number of digits/characters for each block)</p>				<b>APPROVED BY OMB NO. 3150-0104 EXPIRES 7-31-2004</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>1. FACILITY NAME</b> Donald C. Cook Nuclear Plant Unit 2				<b>2. DOCKET NUMBER</b> 05000-316			<b>3. PAGE</b> 1 of 3				
<b>4. TITLE</b> Failure of Lower Containment Airlock Door Interlock Results in Inadvertent Opening of Both Doors											
<b>5. EVENT DATE</b>			<b>6. LER NUMBER</b>				<b>7. REPORT DATE</b>			<b>8. OTHER FACILITIES INVOLVED</b>	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER	
01	23	2001	2001	002	01	10	26	2001	FACILITY NAME	DOCKET NUMBER	
<b>9. OPERATING MODE</b>		3		<b>11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)</b>							
<b>10. POWER LEVEL</b>		0		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)		X 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>12. LICENSEE CONTACT FOR THIS LER</b>											
<b>NAME</b> I.N. Jackiw, Regulatory Affairs								<b>TELEPHONE NUMBER (Include Area Code)</b> 616 465-5901 x1602			
<b>13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT</b>											
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX		
B	NH	IMEC		NO							
<b>14. SUPPLEMENTAL REPORT EXPECTED</b>						<b>15. EXPECTED SUBMISSION DATE</b>			MONTH	DAY	YEAR
YES (If Yes, complete EXPECTED SUBMISSION DATE).				X	NO						
<b>16. Abstract (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)</b> This LER supplement is being submitted to include revised information related to the completed root cause evaluation. This LER revision replaces the previous LER in its entirety. On January 23, 2001, during the removal of plant equipment from the Unit 2 lower containment personnel airlock, the airlock doors' interlock failed. This allowed the inadvertent opening of both the inner and outer lower containment airlock doors at the same time for approximately 5 seconds. Technical Specification 3.6.1.3 requires both containment airlock doors to be closed; except during normal transit entry and exit through containment, then at least one airlock door shall be closed. Because both lower containment airlock doors were open at the same time, an 8-hour ENS notification was made to the NRC in accordance with 10 CFR 50.72 (b)(3)(v)(C), for a condition or event that could have prevented the fulfillment of the safety function of a system needed to control the release of radioactive material. The root cause for the containment airlock door interlock failure was the interlock mechanism slipping out of adjustment. The specific failure involved a gradual loosening of the setscrews that hold the interlock gears in place. Both the inner and outer lower containment airlock doors were immediately closed to restore containment integrity. The airlock door interlock was repaired and satisfactorily tested. Preventive maintenance (PM) activities for the airlock doors were evaluated and the root cause recommendations and vendor recommendations have been incorporated into the appropriate procedures. A detailed design analysis is presently being performed and is being tracked in accordance with the site Corrective Action Program. The appropriate procedure has been revised to include directions on the operation of the containment airlock doors and the consequences of improper airlock door configuration, including radiological and industrial safety concerns. This condition is not considered to be safety significant due to the extremely low probability of a Loss of Coolant Accident or Main Steam Line Break occurring during the 5-second time interval in which both airlock doors were open. A review of plant events during the past three years did not identify any conditions in which the containment doors were opened simultaneously. Therefore, this is considered an isolated event.											

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

**Conditions Prior to Event**

Unit 2, Mode 3, Hot Standby

**Description of Event**

On January 23, 2001, during the removal of plant equipment from the Unit 2 lower containment personnel airlock, the airlock doors' interlock failed. This allowed the inadvertent opening of both the inner and outer lower containment airlock doors at the same time. With both doors open, a rapid change in containment pressure occurred causing several ice condenser lower inlet doors to open.

Based on interviews with personnel involved in the event, the door configuration follows the timeline described below: Personnel (party 1) located in the airlock with the outer airlock door open, noticed the handwheel of the inner door beginning to turn by personnel (party 2) located in the instrument room. Party 1 immediately exited the airlock into the Auxiliary Building, pulling the door in the closed direction upon exiting. Party 1 noted that as the outer door was approaching closed, the inner door came off its closed seat. Once party 2 had entered the airlock after closing the inner door, it was noted that the outer door handwheel was turning in the closed direction. Both parties immediately concluded that the containment airlock door interlocks had failed and that containment integrity had been violated. It is estimated that the condition where both doors were off their closed seats existed for approximately 5 seconds.

Technical Specification (TS) 3.6.1.3 requires both containment airlock doors to be closed; except during normal transit entry and exit through containment, then at least one airlock door shall be closed. Because both lower containment airlock doors were open at the same time, an 8-hour ENS notification (Event No. 37681) was made to the NRC in accordance with 10 CFR 50.72 (b)(3)(v)(C), for a condition or event that could have prevented the fulfillment of the safety function of a system needed to control the release of radioactive material. In addition, since both containment airlock doors were inoperable, the action statement for TS 3.6.1.3 was not met and TS 3.0.3 was entered. However, this condition is not reportable since both airlock doors were closed within one hour.

This LER supplement is being submitted to include revised information related to the completed root cause evaluation and replaces the previous LER in its entirety.

**Cause of Event**

The root cause for the containment airlock door interlock failure was the interlock mechanism slipping out of adjustment. The specific failure involved a gradual loosening of the setscrews that hold the interlock gears in place. The preventive maintenance scope and frequency was not sufficient to maintain the interlocks in adjustment.

A contributing cause for this event was inattention to detail. Although the sign posted on the outer airlock door security gate provides instruction for proper operation of the containment airlock, personnel exiting lower containment are expected to verify the readiness of the containment airlock door for opening by using the door position indicator lights. In this event, plant personnel failed to verify that the door position indication lights were illuminated prior to opening the inner containment airlock door.

**Analysis of Event**

The containment system is a steel-lined, reinforced concrete structure, including foundations, access hatches, and penetrations. This system is designed and constructed to maintain full containment integrity when subject to accident temperatures and pressures, and postulated earthquake conditions. The structure is designed for no loss of function under various tornado or accident conditions. The containment system is provided with two personnel access airlocks. Each personnel access airlock is a welded steel assembly with a door at each end that is equipped with a double compressible seal to ensure leak tightness of the airlock. Both airlock doors are designed to open in towards containment so in the event of an accident, the higher pressures expected inside containment during the accident would force the doors closed if the doors were in a near-closed position. The doors of the personnel locks are interlocked so that one

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

door cannot be opened unless the other is sealed. Indicating lights have been provided outside each airlock door to indicate whether the opposite door is being operated.

With both lower containment airlock doors off their closed seats, concurrently, for approximately 5 seconds, several of containment's accident and mitigation functions supported by the airlock could have been impacted. Specifically,

- The function of the containment system to limit the release of radioactive fission products following an accident to limit the dose to the public and control room operators in accordance with 10 CFR 100 and GDC 19.
- The function of the airlock to provide protection for the reactor vessel and other safety related systems, structures, and components from internal and external missiles and natural phenomena.
- The function of accumulating and directing water to support the emergency core cooling system and containment spray system during the recirculation phase of an accident.

Because the lower containment personnel airlock doors are configured to open into containment, the pressures experienced inside containment during the initial moments of a Loss of Coolant Accident (LOCA) or a Main Steam Line Break (MSLB) would assist in closing the doors and holding them closed. This postulated LOCA or MSLB would have resulted in a release of the containment atmosphere until the outer airlock door was fully closed. Any release would have been of short duration as the pressure wave of the event would have assisted in closing both doors, since the doors were in the near-closed position. As such, this condition would not have prevented the containment system from fulfilling its accident and mitigation functions as described above. It should be noted that the probability of a LOCA or MSLB occurring during the 5-second time interval in which both airlock doors were open is extremely low. Due to the extremely short duration of time that the doors were open and the likelihood of an accident occurring, this condition is not considered to be safety significant. A review of plant events during the past three years did not identify any conditions in which the containment doors were opened simultaneously. Therefore, this is considered an isolated event.

**Corrective Actions**

Both the inner and outer lower containment airlock doors were immediately closed to restore containment integrity. The airlock door interlock was repaired and satisfactorily tested. Recently performed Unit 1 and 2 TS surveillances of the containment airlock door interlocks were reviewed and were found to be successfully completed. The ice condenser lower inlet doors were also closed.

A preliminary review of the current interlock design has been completed to identify potential enhancements necessary to improve reliability of the containment airlock door interlock. A detailed design analysis is presently being performed and is being tracked in accordance with the site Corrective Action Program.

Preventive maintenance (PM) activities for the airlock doors were evaluated and the root cause recommendations and vendor recommendations have been incorporated into the appropriate procedures. Specifically, recommendations have been implemented to not reuse the interlock gear setscrews and the PM schedule frequency has been revised.

Containment entry procedure PMP-4010-CAC-001, Rev. 1, "Containment Access Control," has been revised to include directions on the operation of the containment airlock doors and the consequences of improper airlock door configuration, including radiological and industrial safety concerns. The procedure requires that prior to initial entry into containment, radiation workers review a required reading training package and sign the containment entry log indicating that they are familiar with the expectations and requirements associated with the containment airlock doors.

**Previous Similar Events**

None