

# ACCELERATED DISTRIBUTION DEMONSTRATION SYSTEM

## REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR:9111010200 DOC.DATE: 91/10/25 NOTARIZED: NO DOCKET #  
 FACIL:50-315 Donald C. Cook Nuclear Power Plant, Unit 1, Indiana M 05000315  
 AUTH.NAME AUTHOR AFFILIATION  
 CARTEAUX,P.F. Indiana Michigan Power Co. (formerly Indiana & Michigan Ele  
 BLIND,A.A. Indiana Michigan Power Co. (formerly Indiana & Michigan Ele  
 RECIP.NAME RECIPIENT AFFILIATION

SUBJECT: LER 91-009-00:on 910927,discovered that CO2 pop-off chain  
 for fire damper not wired to CO2 piping,rendering fire  
 damper inoperable.Caused by personnel error.Wire removed &  
 approved clip reattached to chain.W/911025 ltr.

DISTRIBUTION CODE: IE22T COPIES RECEIVED:LTR 1 ENCL 1 SIZE: 6  
 TITLE: 50.73/50.9 Licensee Event Report (LER), Incident Rpt, etc.

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AEOD/DSP/TPAB	1 1	AEOD/ROAB/DSP	2 2
NRR/DET/ECMB 9H	1 1	NRR/DET/EMEB 7E	1 1
NRR/DLPQ/LHFB10	1 1	NRR/DLPQ/LPEB10	1 1
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NRR/DST/SELB 8D	1 1	NRR/DST/SICB8H3	1 1
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REC FILE 02	1 1	RES/DSIR/EIB	1 1
RGN3 FILE 01	1 1		
EXTERNAL: EG&G BRYCE,J.H	3 3	L ST LOBBY WARD	1 1
NRC PDR	1 1	NSIC MURPHY,G.A	1 1
NSIC POORE,W.	1 1	NUDOCS FULL TXT	1 1

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Indiana Michigan  
Power Company  
Cook Nuclear Plant  
One Cook Place  
Bridgman, MI 49106  
616 465 5901



October 25, 1991

United States Nuclear Regulatory Commission  
Document Control Desk  
Rockville, Maryland 20852

Operating Licenses DPR-58  
Docket No. 50-315

Document Control Manager:

In accordance with the criteria established by  
10 CFR 50.59 entitled Licensee Event Report System, the  
following report is being submitted:

91-009-00

Sincerely,

A handwritten signature in cursive script that reads 'A. A. Blind'.

A. A. Blind  
Plant Manager

AAB:sb

Attachment

c: D. H. Williams, Jr.  
A. B. Davis, Region III  
E. E. Fitzpatrick  
P. A. Barrett  
B. F. Henderson  
R. F. Kroeger  
B. Walters - Ft. Wayne  
NRC Resident Inspector  
T. Colburn - NRC  
J. G. Keppler  
M. R. Padgett  
G. Charnoff, Esq.  
D. Hahn  
INPO  
S. J. Brewer/B. P. Lauzau  
B. A. Svensson

Handwritten initials 'JEJ' with a vertical line to the right.

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

**ABSTRACT** (Limit to 1400 spaces, i.e. approximately fifteen single-space typewritten lines) (16)

The wiring open of the fire damper was determined to be an isolated incident. The pop-off was immediately installed correctly. The fire damper was then tested and declared operable. Based on a Plant survey, retraining will be conducted to applicable personnel on appropriate response to inoperable fire dampers.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

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TEXT (If more space is required, use additional NRC Form 365A's) (17)

Conditions Prior to Occurrence

Unit in Mode One (Power Operation) at 99 percent of rated thermal power.

Description of Event

On September 27, 1991, while conducting testing of the Unit One Reactor Cable Tunnel (RCT) CO<sub>2</sub> System, a Performance Technician discovered that the CO<sub>2</sub> pop-off chain for damper 1-HV-ET-FD-4 (EIIS/LW-DMP) had been wired to the CO<sub>2</sub> piping, thus rendering the fire damper inoperable. It appeared that at some time the clip that holds the chain or wire to the pop-off clip had broken off. The clip was found in the damper track. After the clip broke off, someone wired the clip's chain to the CO<sub>2</sub> pop-off piping.

The purpose of the pop-off clip is to allow the fire damper to be kept in the open position and at the time of a CO<sub>2</sub> actuation be forced off the CO<sub>2</sub> piping by the CO<sub>2</sub> discharge and allow the damper to close. With the pop-off clip wired to the CO<sub>2</sub> piping, the damper would not have closed until the fusible link in the hold-open chain melted and allowed the damper to close. This would have happened after the CO<sub>2</sub> System had actuated, which is not per design.

In discussing this incident with personnel who would have had reason to be working around the fire damper, no one had any knowledge of how the pop-off clip became wired to the CO<sub>2</sub> piping. A review of Job Order and Condition Report computer data bases failed to find that this incident had been previously documented.

The last documented time that the pop-off clip was known to be properly installed was in June 1990 when the Plant Quality Control Section performed the required 18-month inspection of fire dampers as required by Technical Specification 4.7.10. The pop-off was installed correctly after the wire was removed. The fire damper was then tested and subsequently declared operable.

Cause of Event

The cause of the Event was personnel error. Based on the fact that the pop-off clip's chain was found in an unnatural state, i.e., wired to the pop-off piping, indicates personnel involvement. Because it could not be determined which personnel were involved, it was assumed that the personnel involved did not understand the approved process for responding to damaged/inoperable fire dampers. To determine if this was a generic Plant problem 120 Plant personnel were surveyed to determine the effectiveness of training in this area. Of the personnel interviewed, a majority indicated that refresher training would be beneficial to ensure accurate and consistent responses per the approved process.

Analysis of Event

This Event is considered reportable pursuant to 10 CFR 50.73(a)(2)(i)(B) as operation prohibited by the Plant's Technical Specifications. Plant Technical

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Analysis of Event (Continued)

Specifications 3.7.9.3, Low Pressure CO<sub>2</sub> Systems, and 3.7.10, fire rated assemblies, requires the establishment of a fire watch within one hour from the discovery of an inoperable fire damper. Due to a personnel error in not following approved Plant Procedures, a fire watch was not posted and the equipment was left in an inoperable state for longer than one hour.

The inoperable fire damper (1-HV-ET-FD-4) was found in the 3-hour rated wall separating the Unit 1 Quadrant 4 Cable Tunnel [Fire Zone (FZ 8)] from the Unit 1 Quadrant 3N Cable Tunnel (FZ 9). The deficiency was described as an incorrectly installed CO<sub>2</sub> pop-off valve. The CO<sub>2</sub> pop-off valve would have prevented the damper from fully closing. For the purpose of this evaluation, the damper is considered to be fully open (worst case scenario). The damper is 28" by 34.5" and located approximately 8.5' off the floor.

Fire Zone 8 has a fixed combustible loading of 30,842 BTU/sq. ft. for an equivalent fire severity of less than 1/2 hour. Primary fire suppression in the Unit 1 Quadrant 4 Cable Tunnel is a manually actuated total flooding CO<sub>2</sub> System. Ionization and infrared type fire detectors are available to provide early warning of fire to the Unit 2 Control Room. Manual fire suppression is provided by portable extinguishers as well as water hose reels.

Fire Zone 9 has a fixed combustible loading of 72,857 BTU/sq. ft. for an equivalent fire severity of less than 1 hour. Primary fire suppression in the Unit 1 Quadrant 3N Cable Tunnel is a manually actuated total flooding CO<sub>2</sub> System. Ionization and infrared type fire detectors are available to provide early warning of fire to the Unit 1 Control Room. Manual fire suppression is provided by portable extinguishers as well as water and CO<sub>2</sub> hose reels.

If a fire were to occur in either FZ 8 or FZ 9, it would most likely be a Class "A" type fire involving ordinary combustibles such as cable jacketing or plastics. A fire of this type can go through a prolonged pre-burning (incipient) stage in which visible smoke is produced before flaming combustion begins. The hot gases and smoke produced during the incipient stage would set off the ionization detectors in the area while the fire is small. This early warning detection system would alert the Control Room to initiate manual fire fighting activities. If the fire should continue to grow before the fire brigade could cool and extinguish the fire using portable fire fighting equipment, the CO<sub>2</sub> System would be manually discharged. The initial discharge of CO<sub>2</sub> would quickly "knock down" an incipient stage fire. However, enough CO<sub>2</sub> would leak through the HVAC opening to render the concentration level of CO<sub>2</sub> ineffective for extinguishing deep-seated fires.

Our calculations show that we can expect 175 lbs. CO<sub>2</sub>/min. to escape through the damper opening. The CO<sub>2</sub> System protecting this room has not been designed to allow for this much leakage. The CO<sub>2</sub> Suppression System will be unable to effectively "smother" a deep-seated fire that may be located above the opening. However, some benefit will be afforded by the CO<sub>2</sub> discharge; that is, the inherent quality of CO<sub>2</sub> to cool a fire. The liquid discharge of CO<sub>2</sub> into the room will deliver a total cooling effect of approximately 120 BTU/lb. While this is not enough cooling to completely extinguish a deep-seated fire located above the opening, it will help in controlling a fire until the fire brigade is ready

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Analysis of Event (Continued)

to reenter the area and assist the Suppression System. Because CO<sub>2</sub> is heavier than air, fires located beneath the opening will be controlled, if not completely extinguished. In accordance with Plant Procedure, the fire brigade would don self-contained breathing apparatus and assist in extinguishing a fire within these areas. It is assumed their response would be to manually close the damper, which would preserve the remaining CO<sub>2</sub> concentration. In addition, multiple discharges of CO<sub>2</sub> would be available from the 17-ton low pressure CO<sub>2</sub> System if the fire brigade deemed it necessary.

The combustible loading on either side of the opening consists of plastics and/or cable jacketing. Fires involving these materials tend to propagate vertically rather than horizontally since the hot gases and other products of combustion rise to the ceiling. The low propagating characteristics of the cables and the fact that no cables penetrate this opening would also tend to retard fire propagation in the horizontal direction. Based on the location of the HVAC opening in relation to the combustibles on each side of the wall, the combustibles would not be directly exposed to fire. Therefore, propagation of fire through the opening from FZ 8 to FZ 9 (or vice versa) is not likely.

A fire would not propagate out of FZ 8 or FZ9 because: 1) the combustible loading in FZ's 8 and 9 is low; 2) any fire in these areas would be detected by available ionization type detectors while the fire is in an incipient stage; 3) manual fire fighting equipment is readily available for use by the fire brigade; 4) the subject fire damper would perform as designed provided the CO<sub>2</sub> pop-off was removed, which could have been done either manually by the fire brigade, if conditions permitted, or by the melting of a fusible link in the chain; 5) the low pressure CO<sub>2</sub> Systems protection FZ's 8 and 9 have the capability of providing multiple dumps of CO<sub>2</sub> if the fire brigade deemed it necessary; 6) the low combustible loadings in FZ's 8 and 9 coupled with the location of all combustibles would make ignition of combustibles located in the adjacent fire zone by heat convection and/or radiation unlikely.

Based on the above, it is concluded that this Event did not constitute an unreviewed safety question as defined in 10 CFR 50.59(a)(2), nor did it create a significant hazard to the health and safety of the public.

Corrective Actions

Upon finding the damper wired open, the wire was removed, the approved clip was reattached to the hold-open chain, and the pop-off was installed correctly. The damper was then tested and declared operable.

The wiring open of the fire damper was determined to be an isolated incident. Directions as to what actions are required if site personnel find an inoperable fire damper are found in a Plant Manager's Procedure. Because a Plant survey indicated that training in this area may not be fully effective, retraining will be conducted to applicable personnel with a scheduled completion date of 12-31-91.

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Failed Component Identification

None.

Previous Similar Events

None.