REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

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SUBJECT: LER 86-020-01: on 861015, charcoal beds of control bldg standby filter units inadvertently sprayed w/water & rendered inoperable. Cuased by inadequate procedure. Procedure is being revised. W/870713 ltr.

DISTRIBUTION CODE: IE22D COPIES RECEIVED: LTR 1 ENCL 1 SIZE: 7
TITLE: 50.73 Licensee Event Report (LER), Incident Rpt, etc.

NOTES:

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	PD3-1 LA	1	1	PD3-1 PD	1	1
	CAPPUCCI, A	1	1			
INTERNAL:	ACRS MICHELSON	1	1	ACRS MOELLER	2	2
	AEOD/DOA	1	1	AEOD/DSP/ROAB	2	2
	AEOD/DSP/TPAB	1	1	DEDRO	1	1
	NRR/DEST/ADE	1	0	NRR/DEST/ADS	1	0
	NRR/DEST/CEB	1	1	NRR/DEST/ELB	1	1
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	NRR/DEST/MTB	1	1	NRR/DEST/PSB	1	1
	NRR/DEST/RSB	1	1	NRR/DEST/SGB	1	1
	NRR/DLPQ/HFB	1	1	NRR/DLPQ/QAB	1	1
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	NRR/DREP/RPB	2	2	NRR/PMAS/ILRB	1	1
	NRR/PMAS/PTSB	1	1	REG FILE 02	1	1
	RES DEPY GI	1	1	RES TELFORD, J	1	1
	RES/DE/EIB	1	1	RGN3 FILE 01	1	1
EXTERNAL:	EG&G GROH, M	5	5	H ST LOBBY WARD	1	1
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NRC Form 366
(9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/88

LICENSEE EVENT REPORT (LER)

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TITLE (4)
Inadvertent Deluge of Standby Filter Units Due to Inadequate Procedure

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAMES	DOCKET NUMBER(S)
									None	0 5 0 0 0
1 0	1 5	8 6	8 6	— 0 2 0	— 0 1	0 7	1 3	8 7		0 5 0 0 0

OPERATING MODE (9)	N	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
POWER LEVEL (10)	0 9 4	20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)
		20.405(a)(1)(i)	50.36(c)(1)	50.73(a)(2)(v)	73.71(c)
		20.405(a)(1)(ii)	50.36(c)(2)	50.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
		20.405(a)(1)(iii)	X 50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	
		20.405(a)(1)(iv)	50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)	
		20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
	AREA CODE
Valerie J. Crew, Technical Support Engineer	3 1 9 8 5 1 - 7 4 3 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	
D	V I	F L T		NO							

SUPPLEMENTAL REPORT EXPECTED (14)		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE)	X NO				

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

On October 15, 1986 with the reactor at 94% power, the charcoal beds of the Control Building Standby Filter Units (SFUs) were inadvertently sprayed with water and rendered inoperable after a functional test of the fire protection deluge system. The root cause was an inadequate procedure. The fire deluge system was isolated at 0900 before the test. During the functional test of both SFU deluge control units the normally closed Standby Filter Units deluge isolation valves were given a simulated high temperature signal and opened. The high temperature alarms were cleared in the control room, but the valve was sealed open. A reset button for both trains needs to be pushed to close the valves. The fire suppression system was unisolated without pushing the reset button causing the charcoal beds to be sprayed.

The root cause of the event was an inadequate procedure because pushing the reset buttons was not specified. This procedure is being revised to include this step after performing functional tests involving the Standby Filter Units control units. Also an engineering request has been initiated to consider installing an isolation valve in both trains of the SFU. This will allow isolation for tesitng and maintenance of one train while leaving the other in service. Also an engineering request has been initiated to change the control room annunciator to indicate valve position rather than charcoal bed temperature switch actuation.

In the process of reaching cold shutdown a problem was discovered with the inboard shutdown cooling isolation valve. (See text for details of the event and corrective actions)

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TEXT (If more space is required, use additional NRC Form 366A's) (17)

On October 15, 1986 the reactor was operator at 94% power. A functional test of the Standby Filter Units (SFU, EIIS System Code VI) fire protection deluge system control units was being conducted. At the conclusion of the test, the charcoal beds were inadvertently sprayed with water and rendered inoperable.

The function of the charcoal beds in the Standby Filter Units (a two train system) is to absorb radioactive gases from the Control Building atmosphere air supply in the event of a radioactive release. A fire suppression deluge system is provided due to the falmmability of the charcoal beds.

A functional test of the deluge system control units was performed for the first time using a Preventive Maintenance Instruction on October 15, 1986 beginning at 0859. This test was performed as a result of increased emphasis on preventive maintenance and function calibration on safety systems. The fire deluge system (EIIS System Code KP) was isolated with manual valve V-33-111 (EIIS Component Code KP-ISV-33-111) to perform this functional test.

Each control unit monitors the temperature in the SFU charcoal bed. If the temperature reaches 255° F an alarm is sounded and a permissive signal is sent to the normally closed deluge isolation valve control that will allow manual opening. These valves for the A and B trains respectively are CV-7328A and CV-7328B (EIIS Code VI-TCV-7328A and VI-TCV-7328B). If the temperature reaches 310° F an alarm is annunciated in the Control Room and the deluge isolation valve automatically opens (see figure 1).

The Preventive Maintenance Instruction required jumpering out the signal contacts across the control units to generate high temperature signals, then checking for the 255° permissive alarm and the 310° automatic initiation alarm in the Control Room. The alarms came in as expected and were cleared. The Instructions next called for verifying that the SFU fire system is returned to its normal alignment, so the manual isolation valve (V-33-111) to the fire system was opened.

However, during the functional testing the 310° automatic initiation alarm sealed open the normally closed SFU isolation valve. Clearing the Control Room alarms did not break the seal-in logic and close the valve. To close this valve and break the seal-in logic, reset button (PB7328A and PB7328B) must be pressed. Since the instructions did not require pushing the reset button, the carbon beds of the Standby Filter Units were sprayed with water when the deluge system was unisolated.

The deluge system to both SFU trains are isolated by one manual valve (V-33-111). This renders the deluge system to both trains inoperable, so a fire watch was posted and the functional test of the deluge system control units was performed on both trains while they were isolated. Both units were declared inoperable after the carbon beds were sprayed with water and an unusual event was declared at 1100 on October 15, 1986. The Nuclear Regulatory Commission notifications were made at 1122. At least one train

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of the SFUs must be operable per Technical Specification 3.10.A.3. The plant commenced reactor shutdown at 1113 hours in accordance with Technical Specification 3.10.A.4 which requires commencing shutdown and being in cold shutdown within 24 hours. This event is being reported pursuant to 10CFR50.73(a)(2)(i)(A), as the completion of any nuclear plant shutdown required by plant Technical Specifications, and 50.73(a)(2)(iii)(D) as an event that alone could have prevented the fulfillment of the safety function of systems needed to mitigate the consequences of an accident.

The cause of the event was an inadequate procedures. The maintenance instructions should have included a step to push the reset buttons (PB7328A and PB7328B) (EIIS Code VI-IS-7328A and VI-IS-7328B) to reset the valves. The Control Room annunciators are actuated by the temperature switches. So no control room indication was present that showed the deluge valves were open after the test signals were removed and the annunciators reset.

The charcoal filters of the Standby Filter Units were replaced. The preventive maintenance procedures will be revised before it is next scheduled to be worked to include pushing the reset button when the test is completed. As a further corrective action, an engineering review has been initiated to consider installing 2 deluge isolation valves, one for each train of the SFU's. This will allow isolation for testing and maintenance of one deluge train while leaving the other in service. Also an engineering request has been initiated to change the control room annunciator to indicate valve position rather than temperature switch acutation.

A review of plant systems found the same logic existed on the Standby Gas Treatment System (SGBT, EIIS System Code BH). Therefore the procedural revision and the engineering requests initiated as corrective actions on the SFU system were also initiated on the SBGT system.

The function of the charcoal beds in the Standby Filter Units is to adsorb radioactive gases from the Control Building atmosphere air supply in the event of a radioactive release. In the event of a large radioactive release contaminating the control building air supply after the SFUs were inoperable, the Control Room could have been evacuated and the plant shut down by using the Remote Shutdown Panel. The plant was in cold shutdown within 24 hours and operated according the Technical Specifications throughout the period.

On October 16, 1986 at 0831 with the reactor pressure at 65 psig, the inboard shutdown cooling isolation valve MO-1908 (EIIS Code JM-ISV-1908) would not open on a signal from the Control Room. The thermal overload was found tripped. The overload was reset, but tripped again when another attempt was made to open the valve from the circuit breaker. Workers were sent to investigate this problem and the valve was discovered fully closed on its seat. It was opened manually at 0900. The valve still could not be cycled from the Control Room after being opened manually but the thermal overloads were no longer tripped. The valve could then be cycled from the

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breaker. Valve MO-1908 was declared inoperable and left open. The shutdown cooling outboard isolation valve-1909 (EIIS Code JM-ISV-1909) was also opened to complete the shutdown cooling valve lineup.

The inboard and outboard shutdown cooling isolation valves are listed in Technical Specification Table 3.7-3 "Primary Containment Power Operated Isolation Valve". Technical Specification Section 3.7.D.2 states, "reactor power operation may continue provided at least one valve in each line having an inoperable valve shall be in the mode corresponding to the isolated condition". Section 3.7.D.3 states that if this specification cannot be met, "an orderly shutdown shall be initiated and the reactor be in Cold Shutdown condition within 24 hours.". A Technical Specification revision is being submitted to permit isolation valves to be closed to satisfy these requirements to be reopened on an intermittent basis under administrative control. This mode of operation allowed by BWR 4 Standard Technical Specifications will provide the operational flexibility needed for this situation.

The plant was already in an unusual event and in the process of reaching cold shutdown because of the inoperability of the SFU's. The Shutdown Cooling Supply Isolation Valve would be opened in normal operation to reach a cold shutdown condition. The Nuclear Regulatory Commission notifications were made at 0928 on October 16, 1986 to provide an update of the valve problem. The plant was in cold shutdown at 1047 of the same day. This event is also being reported pursuant of 10CFR50.73(a)(2)(i)(A), as the completion of any nuclear plant shutdown required by plant Technical Specifications.

After reaching cold shutdown, MO-1908 was examined. All electrical signals between the valve and the Control Room were measured and no deficiencies were found. The valve limit switches, torque switches and other motor operator components were then visually inspected for degradation of electrical connections and tested. No problems were discoverd. The valve was then cycled successfully from the Control Room 3 times. The problem with the valve could not be repeated and it continued to operate normally. The valve's safety function is to close. DAEC would normally consider increased frequency valve stroke testing for such unresolved problems. But it is not possible in this case since this valve can only operate at pressures less than 135 psig and is positioned in the isolated close position during plant operation.

On December 10, 1986 at 1550 hours, the inboard shutdown cooling isolation valve MO-1908 would not open on a signal from the Control Room (LER 86-25). The valve was opened manually after several attempts from the Control Room. The shutdown cooling outboard isolation valve MO-1909 was also opened to complete the shutdown cooling valve lineup.

After reaching cold shutdown, examinations showed that the motor was grounded. Further efforts at a root cause determination of the failure were not possible due to the degree of damage to the motor.

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The root cause of this event is unknown. However, a contributary factor in both failures is the differance in torque requirements from a hot to a cold environment.

As corrective actions, the original 5 HP motor was replaced with a larger 7.5 HP motor in December. The inboard shutdown cooling isolation valve MO-1908 functioned properly during shutdown for the recent refuel outage. During this outage MO-1908 was examined using the Motor Operated Valve Analytic Testing (MOVAT) system. The results of the test verified that the motor and valve will operate properly.

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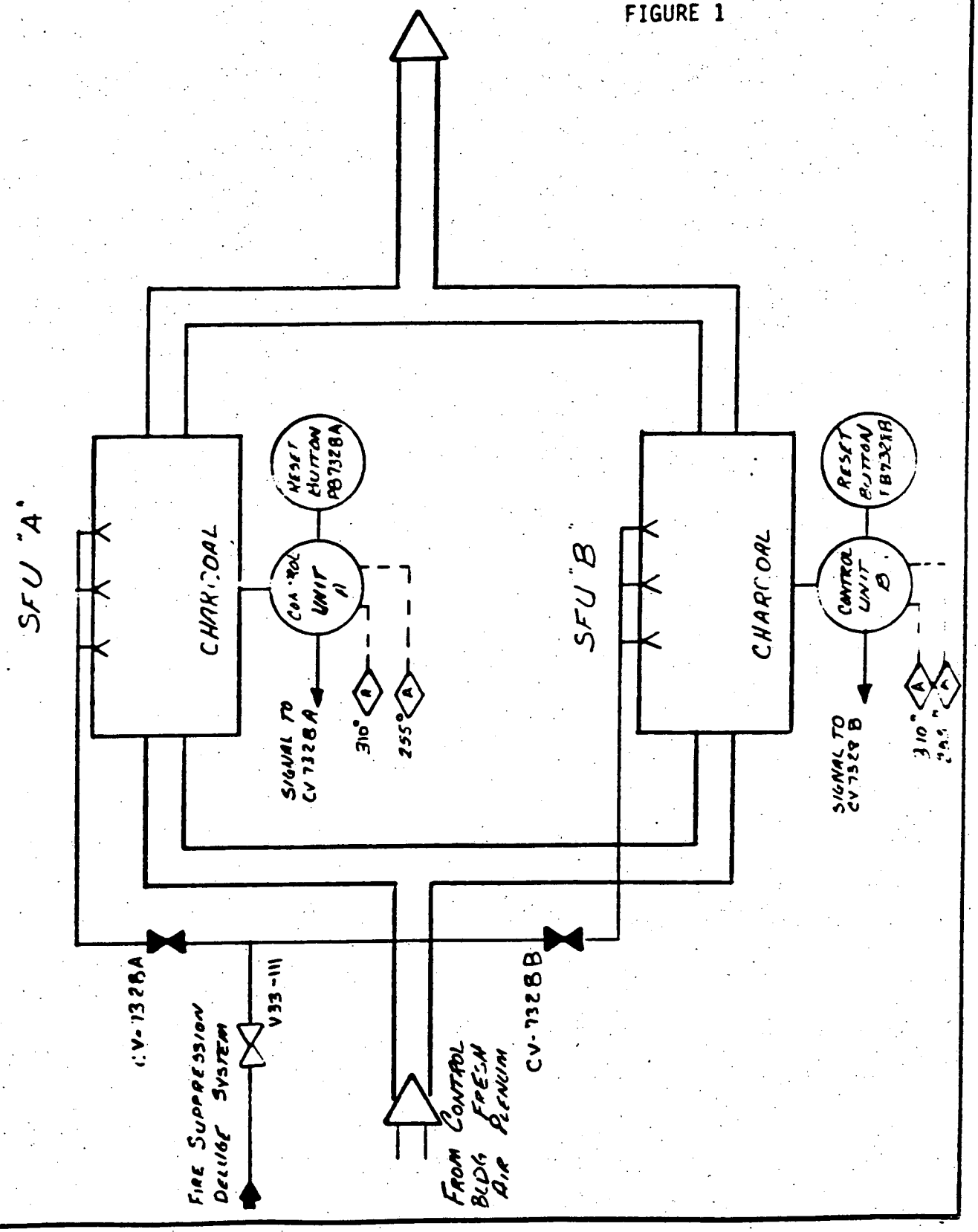
FIGURE 1



Iowa Electric Light and Power Company

July 13, 1987
DAEC-87- 0768

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D. C. 20555

Subject: Duane Arnold Energy Center
Docket No. 50-331
Op. License DPR-49
Licensee Event Report No. 86-020 Revision 1

Gentlemen:

In accordance with 10 CFR 50.73 please find attached a copy of the subject revised Licensee Event Report.

Very truly yours,

7/1/87

Rick L. Hannen
Plant Superintendent - Nuclear

RLH/VJC/go

Attachment - LER 86-020 Rev 1

cc: Mr. A. Bert Davis
Regional Administrator
Region III
U. S. Nuclear Regulatory Commission
799 Roosevelt Road
Glen Ellyn, IL 60137

NRC Resident Inspector - DAEC

File A-118a

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