

Indian Point 3
Nuclear Power Plant
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John H. Garrity
Resident Manager

November 20, 1993
IPN-93-147

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

SUBJECT: Indian Point 3 Nuclear Power Plant
Docket No. 50-286
Licensee Event Report # 93-045-00
"A Failure Mode Of The Central Control Room
Ventilation System Damper Actuators With The
Loss Of Instrument Air Resulted In A
Condition Prohibited By Technical
Specifications Due To Personnel Error"

Dear Sir:

The attached Licensee Event Report (LER) 93-045-00 is hereby submitted in accordance with the requirements of 10CFR50.73. This event is of the type defined in the requirements pursuant to 10CFR50.73(a)(2)(i)(B). Also attached is the commitment made by the Authority in this LER.

Very truly yours,

A handwritten signature in black ink, appearing to read 'JH Garrity', written over a horizontal line.

John H. Garrity
Resident Manager
Indian Point 3 Nuclear Power Plant

JHG/vjm

cc: See Next Page

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Attachment 1
List of Commitments

Number	Commitment	Due
IPN-93-147-01	An evaluation is being performed to define the corrective actions to the CCR HVAC system necessary to address the deficiencies that result from loss of instrument air. A supplement to LER 93-045 will be issued to identify this corrective action.	January 20, 1994

LICENSEE EVENT REPORT (LER)

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TITLE (4) A Failure Mode of The Central Control Room Ventilation System Damper Actuators With The Loss Of Instrument Air Resulted In A Condition Prohibited By Technical Specifications Due To Personnel Error

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 NAME	DOCKET NUMBER
10	23	93	93	-- 045 --	00	11	20	93	FACILITY NAME	DOCKET NUMBER 05000
									FACILITY NAME	DOCKET NUMBER 05000

OPERATING MODE (9) N	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)									
POWER LEVEL (10) 000	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
	20.405(a)(1)(iii)			<input checked="" type="checkbox"/>			50.73(a)(2)(i)			(Specify in Abstract below and in Text, NRC Form A)
	20.405(a)(1)(iv)						50.73(a)(2)(ii)			
20.405(a)(1)(v)						50.73(a)(2)(iii)				
						50.73(a)(2)(x)				

LICENSEE CONTACT FOR THIS LER (12)

NAME William Stanton, System Engineer	TELEPHONE NUMBER (Include Area Code) (914) 736-8332
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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

SUPPLEMENTAL REPORT EXPECTED (14)				EXPECTED SUBMISSION DATE (15)		
<input checked="" type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE).		NO		MONTH	DAY	YEAR
				1	20	94

ABSTRACT

On October 23, 1993 at approximately 1000 hours with the plant in a cold shutdown condition, the Heating, Ventilating and Air Conditioning system engineer initiated an investigation that identified the loss of Instrument Air as a failure mode of the Central Control Room ventilation system damper actuators that would result in loss of system function. Loss of this function is a condition prohibited by technical specifications. This event was caused by personnel error of an indeterminate origin during original design. The current Modification Control Manual provides assurance that this type of error will not occur again. Scheduled corrective actions include addressing safety significant design basis document open items and evaluating the corrective actions necessary to address the failure mode. The actions defined by the evaluation will be identified in a supplement.

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DESCRIPTION OF EVENT

On October 23, 1993 at approximately 1000 hours with the plant in a cold shutdown condition (reactor power level at 10 cps, reactor coolant temperature at 109 degrees F, reactor coolant pressure at atmospheric and pressurizer level at 31%), the Central Control Room (CCR) (NA) Heating, Ventilating and Air Conditioning (HVAC) (VI) system engineer requested the plant operator to isolate the Instrument Air (IA) (LD) system from the CCR HVAC system in order to investigate a design document open item (DDOI). The DDOI was identified from the Authority's program to develop design basis documents for safety related systems. DDOI-IP3-CCRHV-315-003, issued in draft form on October 15, 1993, identified a concern about the dampers' failure position on the loss of IA. Following isolation of the IA, the System Engineer inspected the failure positions of the damper (DMP) actuators and determined that 5 out of 7 were not in the position required following an accident. At 1330 hours on October 23, 1993, Significant Occurrence Report SOR 93-652 was written to identify this event. The system engineer determined that this condition has existed since installation of the system prior to initial startup.

Immediate corrective action was not required because the CCR HVAC system was not required to be operable. Technical Specification section 3.3.H. requires operability when containment integrity is required.

There are three modes of operation for the CCR HVAC system:

- In the normal operation mode, approximately 1500 cfm of outside air is taken in through damper A while the filtration system is isolated.
- The 10% incident mode is automatically initiated by a safety injection or high radiation signal to maintain habitability. Between 250 and 400 cfm of outside air is drawn in through damper B and, mixed with 1500 cfm of return air, passes through the filtration system to pressurize and filter control room air. For the system engineers evaluation, the 10% incident mode is considered the fail safe mode.
- The isolation mode is manually initiated during toxic gas events to prevent outside air from being drawn into the control room.

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The CCR HVAC has 7 pneumatically operated dampers (see attached Figure 1). The function of these dampers, their position in the 10% incident mode and their failure position following loss of IA are as follows:

- Dampers A and B direct the flow of air from the outside air intake into the system. The B damper, normally closed, opens to direct outside air to the filtration unit. The A damper, normally open, closes to isolate the system fans from the outside air intake. These dampers fail closed on loss of IA.
- Damper C directs CCR return air to the filtration unit. The C damper is normally closed and opens in the 10% incident mode. It fails open.
- Dampers D1 and D2 open or close the air flow path returning to the associated HVAC unit. These dampers are normally open if the corresponding HVAC unit fan is running. Closure of a damper stops the corresponding HVAC unit fan resulting in a loss of a CCR cooling unit. These dampers both fail closed.
- The F1 or F2 dampers are each on the inlet to a filter booster fan and isolate the filtration unit. These dampers are normally closed and open in the 10% incident mode. These dampers fail closed.

The failure modes identified above isolate outdoor air from the system and result in a loss of pressurization, filtration and cooling in the CCR. This prevents the CCR HVAC system from performing its required function in any of its modes.

CAUSE OF THE EVENT

The event was caused by personnel error of an indeterminate origin during the system design. The architect engineer did not evaluate this failure mode during initial design or when upgrading the system from a non safety system to a safety system prior to initial operation.

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CORRECTIVE ACTION

The following corrective actions have been or will be performed to prevent recurrence of this event:

1. The Authority's Modification Control Manual (MCM) program procedures require the failure modes for equipment to be analyzed. The MCM program was not in place at the time of this design and installation. Adherence to this MCM program assures that this event will not occur in future modifications.
2. Priority I and II design document open items for the CCR HVAC will be evaluated prior to startup to assure they do not affect system operability. (Reference commitment number 4 in NYPA letter IPN-93-145, dated November 18, 1993)
3. An evaluation is being performed to define the corrective actions to the CCR HVAC system necessary to address the deficiencies that result from loss of instrument air. A supplement to LER 93-045 will be issued to identify this corrective action.

ANALYSIS OF THE EVENT

This event is reportable under 10 CFR 50.73.(a)(2)(i)(B). The licensee shall report any operation or condition prohibited by the plant's technical specifications. Technical Specification 3.3.H requires the CCR HVAC system to be operable when containment integrity is required. A design condition, LOCA with loss of offsite power, would have resulted in loss of the IA system until manually restored. A loss of the IA system with a loss of service air would have resulted in an inoperable CCR HVAC system. This condition has existed since initial plant startup during intermittent periods when containment integrity has been required.

Other events where personnel error in design has resulted in a reportable deficiency are reported in LER 93-39 and LER 93-26. Other events related to the CCR HVAC system are reported in LER 93-36, LER 93-08 and LER 93-44.

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SAFETY SIGNIFICANCE

This event did not affect the health and safety of the public.

A failure of the IA system could occur during any mode of operation or as a result of postulated plant events. Four scenarios were considered to evaluate the consequences. A LOCA with an earthquake was not considered since these are both very low probability events. No credit was taken for immediate operator corrective action to fix the CCR HVAC system because:

- There are no alarms in the CCR to notify the operators that there has been a loss of IA to the CCR ventilation system or that the CCR ventilation system has been lost. However there is an alarm when the system fails to completely switch to the incident mode when required.
- The dampers can be opened manually and the system properly aligned without IA. However, there are no alarms, there are no procedures for manipulating the controls and interlocks in the system and the operators have not been trained in corrective action.
- No credit is taken for the service air system backup capability.

The significance of failure in different operating modes is as follows:

- Normal Operation

The operators would become aware of the problem due to rising temperatures. Corrective action can be taken by opening control room doors and using nearby fire exhaust fans (about 5,300 cfm per fan) to alleviate the heat buildup. This will allow time to investigate the event so that corrective action could be taken.

- Toxic Gas Release

The IA failure would not prevent the control room personnel from initiating safe shutdown because the IA failure would isolate the control room.

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- LOCA With Loss of Offsite Power

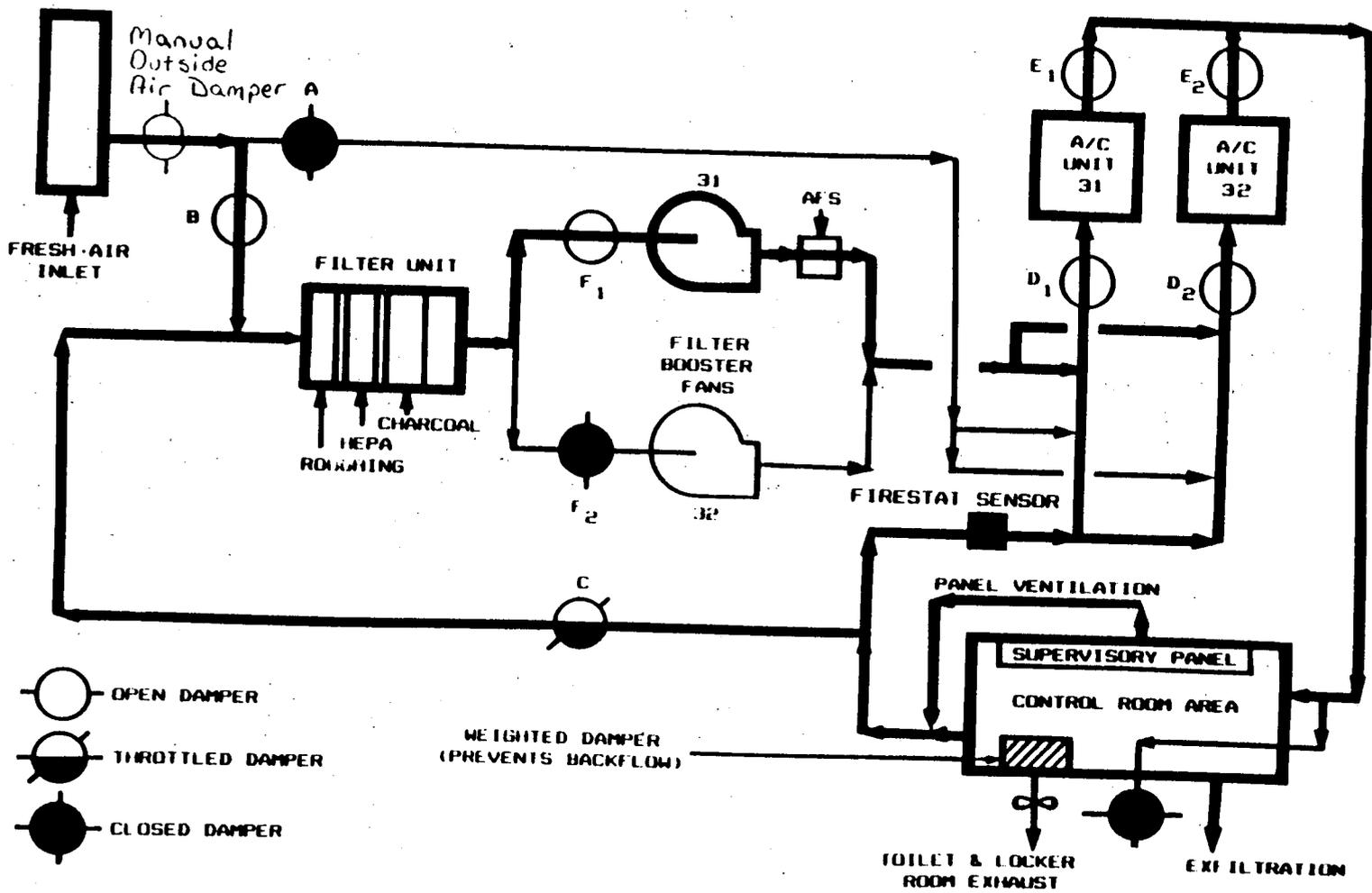
This event was evaluated in LER 93-44 and would not prevent the operators from mitigating the consequences of a LOCA.

- Earthquake

There would be no radioactive releases to prevent the operators from taking corrective action similar to loss of IA during normal operation. A loss of offsite power with the earthquake would not affect this conclusion although it would cause loss of the service air system as well as the IA system. LER 93-36 identified damper failures that could occur due to an earthquake and the safety significance of a bounding event.

The extent of condition will be determined by the current program to close DDOIs. DDOIs have been prioritized in order of their safety significance with priority I being the most significant. All priority I and II DDOIs for the CCR HVAC will be addressed prior to startup to ensure that they do not affect system operability. Priority III and IV DDOIs address the design bases of systems and components but are not considered significant for operability.

FIGURE 1
**CONTROL ROOM VENTILATION SYSTEM
 PARTIAL RECIRCULATION
 (CONTROL ROOM PRESSURIZED)**



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