

Indian Point 3
Nuclear Power Plant
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L. M. Hill
Resident Manager

May 6, 1994
IPN-94-057

U.S. Nuclear Regulatory Commission
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SUBJECT: Indian Point 3 Nuclear Power Plant
Docket No. 50-286
Licensee Event Report # 93-036-01
"Improper Seismic Mounting of Damper Actuators in the Central
Control Room Ventilation System Resulted in a Condition
Prohibited by Technical Specifications Due to Personnel Error"

Dear Sir:

The attached Licensee Event Report (LER) 93-036-01 is hereby submitted in accordance with the requirements of 10CFR50.73. This LER revision identifies the effect on the safety evaluation of the system configuration found in a subsequent inspection, the effect of no operator action on the conclusions about the safety significance of this event and the closure of a commitment. This event is of the type defined in the requirements pursuant to 10CFR50.73(a)(2)(i)(B). No new commitments are being made by the Authority in this LER revision.

Very truly yours,

A handwritten signature in cursive script, appearing to read 'L. M. Hill'.

L. M. Hill
Resident Manager
Indian Point 3 Nuclear Power Plant

LMH/vjm

cc: See Next Page

9405130167 940506
PDR ADOCK 05000286
S PDR

JEFF

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U.S. Nuclear Regulatory Commission
Resident Inspectors' Office
Indian Point 3 Nuclear Power Plant

LICENSEE EVENT REPORT (LER)

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TITLE (4) Improper Seismic Mounting of Damper Actuators in the Central Control Room Ventilation System 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
09	15	93	93	-- 036 --	01	05	06	94		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	<input type="checkbox"/> 20.402(b)	<input type="checkbox"/> 20.405(a)(1)(i)	<input type="checkbox"/> 20.405(a)(1)(ii)	<input type="checkbox"/> 20.405(a)(1)(iii)	<input checked="" type="checkbox"/> 20.405(a)(1)(iv)	<input type="checkbox"/> 20.405(a)(1)(v)	<input type="checkbox"/> 20.405(c)	<input type="checkbox"/> 50.36(c)(1)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(i)	<input type="checkbox"/> 50.73(a)(2)(iv)	<input type="checkbox"/> 50.73(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(vii)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)	<input type="checkbox"/> 50.73(a)(2)(x)	<input type="checkbox"/> 73.71(b)	<input type="checkbox"/> 73.71(c)	OTHER (Specify in Abstract below and in Text, NRC Form A)	

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
				N					

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

ABSTRACT

On September 15, 1993, at approximately 1630 hours, with the plant in a cold shutdown condition and in response to a Nuclear Regulatory Commission inspector's questions, the Heating, Ventilating and Air Conditioning (HVAC) system engineer concluded that the Central Control Room (CCR) ventilation system damper actuators were not seismically mounted. This event resulted in a condition prohibited by technical specifications which requires the CCR ventilation system to be operable when containment integrity is required. This event was caused by personnel error in that the seismic design requirements of a specification were not translated into the installation. Corrective action includes assuring the seismic qualification of the damper actuators, implementing a modification to appropriately mount actuators, counseling personnel responsible for testing the system and sampling the work performed under the specification to determine if further deficiencies exist. Prior to startup the CCR HVAC system will be restored to operable.

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DESCRIPTION OF EVENT

On September 15, 1993, at approximately 1000 hours with the plant in a cold shutdown condition (reactor power level at 15 cps, reactor coolant temperature at 110°F, reactor coolant pressure at atmospheric and pressurizer level at 26%) a Nuclear Regulatory Commission inspector posed questions regarding the stop nuts on damper (DMP) actuators in the Central Control Room (CCR) ventilation system (VI). The inspector also questioned the proper mounting of damper actuators. At approximately 1630 hours, in response to the inspector's questions, the Heating, Ventilating and Air Conditioning (HVAC) system engineer documented that the damper actuators were inadequately mounted to meet seismic qualification. The CCR HVAC system design requires that the system withstand seismic events. The system engineer has determined that the inadequate seismic mounting of the damper actuators has existed since initial criticality which took place on April 6, 1976.

The system engineer and seismic engineer inspected the mounting of the damper actuators and the setting of the stop nuts on the actuators in the CCR Ventilation System. The stop nuts on damper actuators B, C, D2, F1 and F2 (see attached figure) were found to be loose. The engineers determined that the mounting of damper actuators A, B, C, D1, D2, F1 and F2 appeared not to be seismically mounted and required detailed evaluation.

During the review of plant records the engineers were unable to locate documentation illustrating the proper seismic mounting of the damper actuators or any documentation on the seismic qualification of the actuators. The search for proof that damper actuators are seismically qualified is actively being pursued and addressed by a corrective action below.

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A detailed evaluation was performed for the A, B, C, D1, D2, F1 and F2 damper actuator mountings. This evaluation concluded that damper actuators A, B, D1 and D2 were adequately mounted so that the damper actuators would have been operable following a seismic event. This conclusion is based on the assumption that the damper actuators are seismically qualified. An ongoing search is being conducted to locate the documentation showing the seismic qualification of the actuators. If this search is unsuccessful the seismic qualification of the actuator will be evaluated through testing. If the conclusions presented here are invalidated by the results of these efforts, the Authority will provide a supplement to this LER. Although damper actuators A and D2 would have been operable following a seismic event, the mounting of the damper actuators are going to be improved. Damper actuators B and D1 are not going to be modified in any way. Damper actuators C, F1 and F2 require mounting improvements.

The fact that damper actuators A and B would have been operable following a seismic event is important in that it bounds the safety significance of this event by limiting the amount of outside air that would enter the return air stream from the CCR to 400 cubic feet per minute. The system engineer subsequently conducted a test to assess the volume of return air because the system engineer found that damper A did not properly seat.

Dampers A, B, C, F1 and F2 are required to operate automatically following a Safety Injection signal or high radiation signal. The dampers can also be operated by manually switching the system's operating mode. If the stop nuts on damper actuators B and C are not set at the correct location, the flow through the filtration unit would not be as designed, the air would not be adequately filtered and as a result the operators would not be properly protected from radiation exposure. Damper actuator F1 is required to open to create a flow path to number 31 filtration unit booster fan (FAN) in the incident condition. In the event that number 31 booster fan fails to start, number 32 booster fan will start after a predetermined time delay and the damper actuator F2 would be required to open. Improper stop nut locations can prevent the damper actuators from performing required actions. The damper actuators are manufactured by Powers Regulator (Model 331-0240).

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On September 16, 1993 technicians tested the flows controlled by the B and C dampers and determined no adjustments were necessary. The B and C damper actuator stop nuts positions were acceptable as found. The stop nuts on damper actuators B and C were tightened into place. On September 17, 1993 mechanics were sent out to adjust and tighten, as necessary, the stop nuts on damper actuators D2, F1 and F2. All dampers were capable of opening and closing fully in the as found conditions. The stop nuts were found to be in a position which would have allowed the actuator to stroke further than necessary. However, this condition would have caused the dampers to close tightly without damage to the damper. The stop nuts on damper actuators D2, F1 and F2 were adjusted and tightened into place.

CAUSE OF THE EVENT

This event was caused by personnel error due to inadequate design control during initial installation of the dampers. Specification 9321-05-45-24, "Specification for Plant Heating, Ventilating and Air Conditioning Systems" required that the dampers satisfy seismic design criteria. However, this requirement was not met in the installation. Whether this was due to a design or installation error can not be determined because installation drawings are not available.

The cause for the loose stop nuts is personnel error, inattention to detail, during the performance of surveillance test 3PT-R032C, "Control Room Filtration System Functional". The test contains steps for adjusting the dampers. Although steps for the tightening of the stop nuts used in the adjustments are not included in the procedure, personnel are expected to address a situation such as loose stop nuts.

CORRECTIVE ACTIONS

The Authority's Modification Control Manual (MCM) program procedures require the responsible engineering department to specify installation instructions. These instructions include incorporating seismic design criteria and walkdown of installations prior to system acceptance. The MCM program was not in place at the time of this event. Adherence to this MCM program assures that this event will not occur in the future.

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The following corrective actions will be performed in order to address the deficiencies identified during the investigation of this event:

1. An ongoing search is being conducted by the Technical Services department to locate the documentation showing the seismic qualification of the actuators. If this search is unsuccessful the seismic qualification of the actuator will be evaluated through testing prior to startup. If the conclusions presented in this LER are invalidated by the results of these efforts, the Authority will provide a supplement to this LER 30 days after the results are received.
2. The Site Engineering department has completed a modification to seismically mount the appropriate CCR HVAC damper actuators. This closes commitment IPN-93-123-02.
3. The Performance department has counseled the technicians who perform surveillance test 3PT-R032C in order to assure that they address deficiencies such as the loose stop nuts.
4. Prior to startup, the Nuclear Engineering and Design (NED) department will perform a random sampling of the work performed under specification 9321-05-45-24 to determine if further field installation deficiencies exist.

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ANALYSIS OF THE EVENT

Damper actuators C, F1 and F2, were in a state of degraded operability during a period of intermittent plant operation above cold shutdown from initial criticality through March 7, 1993 when the plant was brought to cold shutdown. This event is reportable pursuant to 10 CFR 50.73(a)(2)(i)(B). The licensee shall report any operation or condition prohibited by the plant's Technical Specifications. This condition is prohibited by Technical Specifications 3.3.H which requires the CCR ventilation system to be operable when containment integrity is required. During this period, while the plant was operating, there was the possibility that these damper actuators may have failed to perform their required function during or following a seismic event.

Licensee Event Report LER 93-035-00 reported a similar event in that the original engineering design was inadequate.

SAFETY SIGNIFICANCE

This event did not affect the health and safety of the public. However, in the scenario which postulates a radiological accident concurrent with a seismic event the thyroid exposure limits for the control room operators would have been exceeded.

- The postulated worse case event is a seismic event with a loss of coolant accident (LOCA). Following this event the CCR HVAC system would automatically switch to the ten percent incident mode. Damper actuators A, B, D1 and D2 would have been operable following a seismic event. The A damper would close and the B, C, F1 and F2 would open. Assuming the C, F1 and F2 damper actuators fail and the dampers do not open, the filtration unit would not be operable.
- LER 93-036-00 reported that, under the worse case event, 400 cubic feet per minute (CFM) of outside air that would normally be drawn through the open B damper and filtration unit by the booster fans would back-flow through the C damper into the return air stream from the CCR. This flow rate would continue for up to 20 minutes until an operator investigating a failure to complete the switch to 10 percent incident mode would close the manual outside air damper as instructed in Emergency Operating Procedure EOP E-0, "Reactor Trip or Safety Injection." The credit for 20

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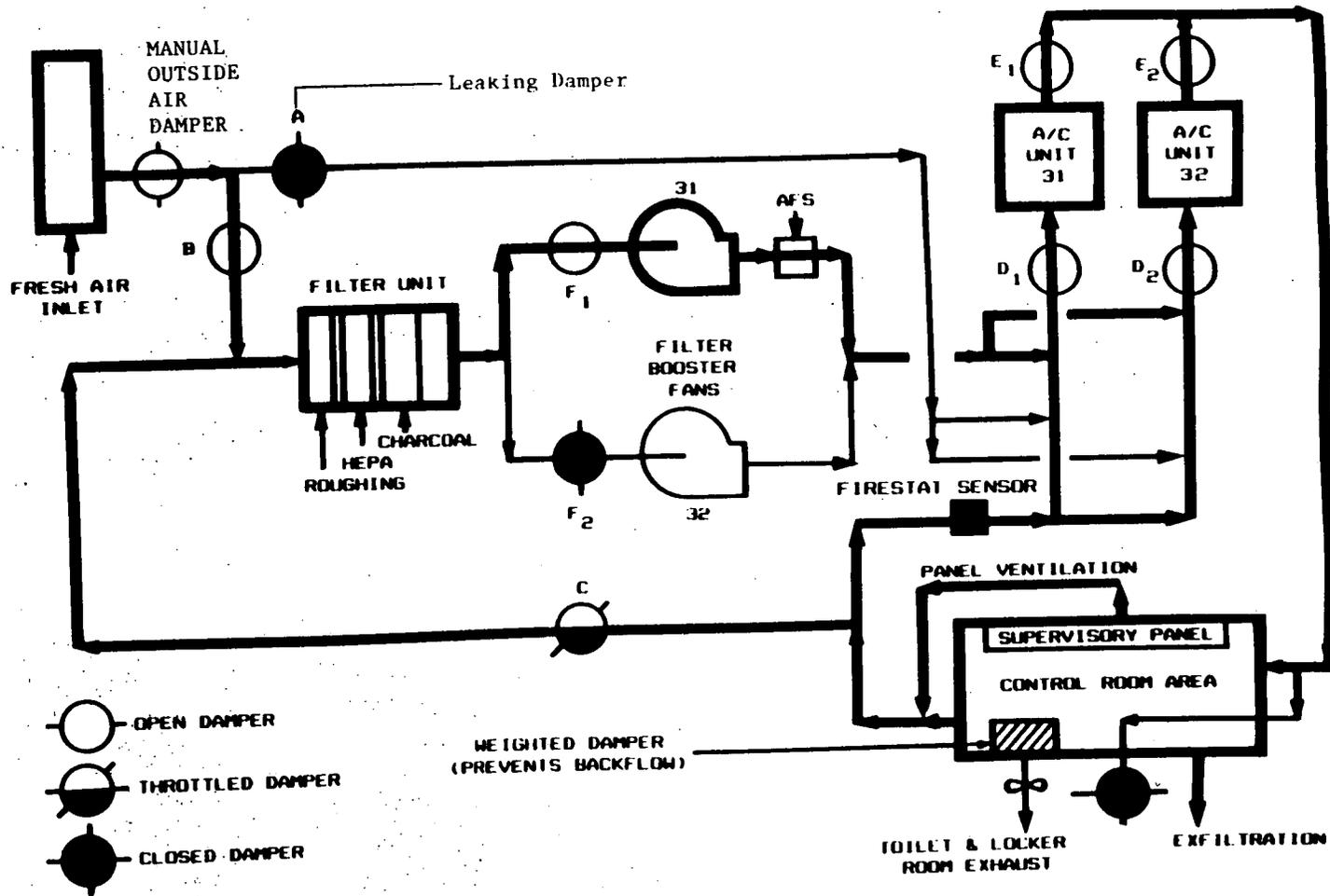
minute operator action and assumption of 400 cfm have been revised. EOP E-0 requires the operator to verify the incident mode but there would be no direct alarm to assure that the operator would recognize the damper failures and take appropriate corrective action. The 400 cfm assumption was changed because, after the LER was reported, the system engineer identified leakage past the "A" damper when it was closed. The correct assumption for unfiltered air was determined by a test, performed in the accident mode with booster fans off, that identified unfiltered air leakage into the control room of 625 cfm (311 cfm and 314 cfm through the "A" and "C" dampers, respectively). Dose calculations were performed assuming operator action to isolate the outside air intake at a time which would maximize the dose (53 minutes) and assuming no operator action. Inleakage of 130 cfm of unfiltered air was assumed when the control room was isolated. The dose calculations identified a higher dose but confirmed the safety significance conclusions, discussed below, in LER 93-036-00.

- The effects would not have had any increase on the exposure to the general public but the 10 CFR 50, General Design Criteria 19 exposure limit, as interpreted by Standard Review Plan 6.4, Rev. 2, for the control room operators would have been exceeded. Of concern is that the thyroid exposure to CCR personnel would have been exceeded. Had such an event occurred, actions would have been taken to reduce the thyroid exposure to CCR personnel. These actions include limiting CCR occupancy, using respiratory equipment, administering potassium iodide tablets and purging the CCR atmosphere. The radiation doses indicated for the evaluated failure mode are in excess of the design criteria for thyroid dose but would not prohibit the operators from performing safety related functions.

For all other events or accidents which do not involve a seismic event, the CCR HVAC system (including the damper actuators) would have been capable of performing its design functions.

The extent of condition of this event is being addressed by the corrective action which serves to sample the work performed under specification 9321-05-45-24. This corrective action serves to determine if further seismic deficiencies exist.

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



-  OPEN DAMPER
-  THROTTLED DAMPER
-  CLOSED DAMPER

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