

Indian Point 3
Nuclear Power Plant
P.O. Box 215
Buchanan, New York 10511
914 736.8001



John H. Garrity
Resident Manager

January 3, 1994
IPN-94-001

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Mail Stop PI-137
Washington, D.C. 20555

SUBJECT: Indian Point 3 Nuclear Power Plant
Docket No. 50-286
Licensee Event Report # 93-053-00
"Technical Specification Violation Caused By
Inoperable Diesel Generators 31, 32, And 33
Due To Personnel Error And Procedural
Deficiencies"

Dear Sir:

The attached Licensee Event Report (LER) 93-053-00 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 are the commitments made by the Authority in this LER.

Very truly yours,

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

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

JHG/vjm

101128

cc: See Next Page

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PDR ADOCK 05000286
S PDR

Handwritten initials 'JHG' in the bottom right corner of the page.

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IPN-94-001
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Mr. Thomas T. Martin
Regional Administrator
Region I
U.S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, Pennsylvania 19406

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700 Galleria Parkway
Atlanta, Georgia 30339-5957

U.S. NRC Resident Inspectors' Office
Indian Point 3

Attachment 1
List of Commitments

Number	Commitment	Due
IPN-94-001-01	The extent of condition for LER 93-053 is being determined by Technical Services during post work retesting.	January 14, 1994
IPN-94-001-02	A night order currently restricts area clearance to non-intrusive work. Operations will revise AP-10 "Clearances" to eliminate area clearances for intrusive work.	January 31, 1994
IPN-94-001-03	The Maintenance staff has been ordered to perform procedures in sequence by standing order, unless out-of-sequence work is approved using management controls, until of the need for a change to the Maintenance Directive that allowed out-of-sequence work can be evaluated. If a Maintenance Directive change is required, it will be completed by January 31, 1994.	January 31, 1994
IPN-94-001-04	Aspects of this event are being reviewed prior to startup. LER 93-053 will then be supplemented if the review identifies any substantive issue or corrective action not currently identified.	Prior to startup
IPN-94-001-05	The STAR (Stop, Think, Act, Review) policy will be reinforced by training. The Maintenance and Operations departments will receive additional training by the respective department.	Prior to startup

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNB 7714), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

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Indian Point Unit 3

DOCKET NUMBER (2)

05000286

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TITLE (4) Technical Specification Violation Caused By Inoperable Diesel Generators 31, 32, And 33 Due To Personnel Error And Procedural Deficiencies

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
12	02	93	93	-- 053 --	00	01	03	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)			
		20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)
POWER LEVEL (10)	0	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)	✓ 50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	(Specify in Abstract below and in Text, NRC Form 366A)
		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
John Murgida, Maintenance Engineer

TELEPHONE NUMBER (Include Area Code)
(914) 736-8656

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)

YES
(If yes, complete EXPECTED SUBMISSION DATE).

✓ NO

EXPECTED SUBMISSION DATE (15)

MONTH DAY YEAR

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

On December 2, 1993 at approximately 2130 hours with the plant in a cold shutdown condition, Maintenance found flow control valves SWN-FCV-1176 and SWN-FCV-1176A inoperable during a post-work test. Operations declared all three emergency diesel generators inoperable because at least one valve must be operable to allow service water to the generators. Operations made a one hour report at 2331 (one hour late due to personnel error). The condition resulted from incorrect installation of pilot solenoid valves caused by a lack of procedural adherence due to personnel error. Contributing causes were procedural inadequacies, inattention to detail and inadequate skills. At 2135 hours, Operations restored operability (four and one half hours after inoperability). Maintenance reinstalled the valves correctly and Technical Services assessed the balance of the valves for correct installation. Corrective action will require Administrative Procedure changes, new process controls (i.e., a 3 day freeze on scheduled work, monitoring of procedural conformance, night orders for Operator guidance), training on correct work practice and meetings to identify management expectations.

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DESCRIPTION OF EVENT

On December 2, 1993 at approximately 2130 hours with the plant in cold shutdown condition (the reactor power level at 7 cps, reactor coolant temperature at 100 degrees F, reactor coolant pressure at atmospheric and the pressurizer level at 26%), flow control valves (FCV) SWN-FCV-1176 and SWN-FCV-1176A failed to open in the required time during a post-work retest following maintenance work on solenoid operated valves (SOV) (FSV) SWN-SOV-1276 and SWN-SOV-1276A (the pilot valves for the flow control valves). Operations declared all three emergency diesel generators (EDG) (EK) inoperable because at least one FCV must be operable to allow Service Water System (SWS) (BI) flow to the EDG. At 2135 hours, Operations took corrective action by manually opening valves SWN-FCV-1176 and SWN-FCV-1176A to restore EDG operability. Operations made a one hour report to the NRC at 2331 hours and documented the event in Deviation Event Report (DER) 93-793. Maintenance investigated the circumstances leading to this event for this report.

Maintenance issued a Request for Engineering Services on November 17, 1993 to correct a potential overpressure condition related to SOVs. This condition was reported in Licensee Event Report (LER) 93-050-00. Technical Services issued a Parts and Material Substitution (PMS) document to replace overpressurized SOVs. The initial PMS identified 16 SOVs for replacement. Maintenance planned the work using the PMS, Operations performed a risk assessment to identify safety issues with the work, and Planning and Scheduling issued a work schedule on November 30, 1993.

On December 1, at about 0630 hours, Operations issued an area clearance for multiple work and attached the schedule input sheets for the 16 valves to define the work scope. There is no procedural requirement for the area clearance to identify on its face the specific components that were cleared. A communications error occurred during the issuance of the area clearance. Maintenance believed the area clearance would also be applicable to replacement valves that they were planning to add to the PMS once the replacement valves had been properly scheduled. Operations believed the area clearance was restricted to the 16 valves whose schedule input sheets were originally attached to the clearance.

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On December 1, 1993, the General Manager of Maintenance and the Technical Services Manager decided to replace SWN-SOV-1276 and SWN-SOV-1276A instead of two of the original 16 valves in the PMS. The input sheet for the replacement of SWN-SOV-1276 and SWN-SOV-1276A was entered into the schedule at about 1815 hours. Prior to this, Planning and Scheduling reviewed the addition of SWN-SOV-1276 and SWN-SOV-1276A with Technical Services. Several errors occurred during this period:

- During the review, a miscommunication occurred. Planning and Scheduling asked whether work on the parallel valves should be sequenced. The Technical Services supervisor said work sequencing was not an issue for them. The Technical Services supervisor interpreted the question as a schedule prioritization issue since Technical Services is not responsible for risk assessment. Planning and Scheduling understood the comment to mean that the work could be done in any sequence.
- Planning and Scheduling did not request Operations to perform a risk assessment for SWN-SOV-1276 and SWN-SOV-1276A due to a lack of communication. The three people in Planning and Scheduling involved with this change knew that the risk assessment had not been performed but each thought that another was making sure that the risk assessment took place. An internal quality check of scheduled work, performed at about 2116 hours, did not consider SWN-SOV-1276 and SWN-SOV-1276A because SWS work was being assessed on a daily basis (Operations performed risk assessments for SWS work on a daily basis due to the dynamic nature of the logic for the SWS window). The Planning and Scheduling supervisor advised Planning and Scheduling personnel that no quality check was required for SWS work.

Because no risk assessment was performed, the above process did not identify the parallel schedule required or the necessity to keep one FCV failed open during replacement and testing to meet the single failure criteria. Maintenance was unaware of the safety significance of the SOVs due to the improper scheduling (i.e., lack of a risk assessment). The schedule for replacement of SWN-SOV-1276 and SWN-SOV-1276A was issued about 2230 hours on December 1, 1993. Operations was given the schedule to prepare clearances before work was to begin the next day. There is an Operations group that reviews work

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scheduling the day before it is due. This review would normally assure that risk assessments were done but the review was not performed because the schedule change was made so late. Maintenance assumed that the area clearance covered the substitution of SWN-SOV-1276 and SWN-SOV-1276A for two of the originally scheduled 16 valves since they believed SWN-SOV-1276 and SWN-SOV-1276A to be properly scheduled.

Maintenance commenced work on the valves about 1330 hours on December 2, 1993. Prior to and during work on SWN-SOV-1276, several errors occurred:

- The Maintenance supervisor directed the mechanics to coordinate with the Senior Reactor Operator (SRO). A miscommunication occurred when the mechanics called the SRO. The mechanics remembered being told not to work both valves at the same time and to make sure operational checks were performed and considered the planned approach, working each valve in sequence and then performing testing, acceptable under these directions. The SRO did not recognize the relationship of the SOVs to the FCVs (the SRO believed the work was on the steam generator blowdown (SGBD) valves BD-PCV-1226 and BD-PCV-1226A). The SRO therefore did not recognize the safety significance of the work.
- The mechanics and Quality Control (QC) did not identify that the manufacturer's instructions (required by a note in the work package but not included by the supervisor who considered the work within the skill of the trade) were not in the work package.
- The mechanics misinterpreted the "I" on the solenoid valve port as indicating inlet (they did not check the manufacturer's instructions) and installed the valve backwards.
- The mechanics did not complete the procedure or obtain the Maintenance supervisor's signature to close the work on SWN-SOV-1276 prior to starting work on SWN-SOV-1276A. The supervisor's signature, intended to indicate that the Supervisor had reviewed and found the procedure complete, was not required by procedure. The supervisor directed the work sequence based on a misunderstanding of safety significance resulting from the errors omitting work sequencing and risk assessment. Completion of the

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procedure would have required stroke testing of SWN-SOV-1176 and identified the installation error. Risk assessment, the critical barrier, would have identified the need for sequencing and the need to maintain the FCVs open to address single failure criteria concerns.

- The mechanics called the SRO on the next shift, at about 1515 hours, to coordinate before work on SWN-SOV-1276A. At this time, a miscommunication occurred between Operations and Maintenance that is still under evaluation. This LER will be supplemented, if necessary, to address this evaluation. The same installation error occurred as on the first valve to be replaced.

Maintenance completed work about 1700 hours and admitted instrument air to close the FCVs. The three EDGs were considered inoperable at this time. Maintenance kept both FCVs in the open (i.e., fail safe) position while working the SOVs. To provide the required safety function, at least one FCV had to be kept failed open from start of work through post-work testing to assure that an installation error and a single failure did not prevent the valves from performing their intended function.

Operations performed a post-work stroke test at about 2130 hours and both valves failed (SWN-FCV-1176 took 9.1 minutes to open and SWN-FCV-1176A did not open while the surveillance acceptance criteria was 60 seconds). Coordination of the retest between Maintenance and Operations is still being evaluated and will be reported in a supplement, if necessary. Operations took corrective action to manually open the FCVs by 2135 hours. The emergency diesel generators were inoperable for about four and one half hours. Maintenance reinstalled the SOVs correctly after the corrective action was taken.

The delay of approximately one hour in making the one hour report was due to personnel error. The Shift Supervisor was uncertain whether a four or a one hour report was required. After determining that a one hour report was required, the Shift Supervisor was uncertain when that hour started (i.e., the time inoperability was declared or when there were sufficient facts to confirm the inoperability decision.

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CAUSE OF EVENT

The event was caused by lack of procedure adherence. The barriers set in place to check errors were bypassed. The lack of procedural adherence was personnel error due to a cultural disposition to take shortcuts to procedural requirements in order to meet perceived schedule pressures. Contributing factors were procedural inadequacies (weaknesses in the management controls), miscommunications (inattention to detail in the interface between departments and within departments) and inadequate skills (a lack of understanding of performance standards).

The cause of the late reporting was personnel error, inadequate knowledge of reporting requirements.

CORRECTIVE ACTIONS

To correct this event the following corrective actions have been or will be performed:

- SWN-SOV-1276 and SWN-SOV-1276A were re-installed correctly and stroke tested to verify operability. This action is complete.
- The extent of condition for LER-93-053 is being determined by Technical Services during post-work retesting. This action is scheduled for completion by January 14, 1994.
- The following corrective actions address identified procedural inadequacies:
 1. A night order currently restricts area clearance to non-intrusive work. Operations will revise administrative procedure (AP) AP-10 "Clearances" to eliminate area clearances for intrusive work. This action is scheduled for completion by January 31, 1994.
 2. The Maintenance staff has been ordered to perform procedures in sequence by standing order, unless out-of-sequence work is approved using management controls, until of the need for a change to the Maintenance Directive that allowed out-of-sequence work can be evaluated. If a Maintenance Directive change is required, it will be completed by January 31, 1994.

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- The following corrective actions address procedural adherence and strengthen communications:
 1. An all-hands meeting was held December 6 to discuss management expectations with respect to the performance standards for procedural adherence and controls. Compliance with AP-4 "Procedure Adherence" was stressed with particular attention to responsibilities for adherence to procedures and for revising procedures when inadequacies are identified. Discipline policies for failure to follow procedure were identified. Followup all hands meetings will be conducted as necessary. This action has been completed.
 2. Plant management has directed that a 3 day freeze be imposed on scheduled work and that only "R" (ready) status work be scheduled, unless other means to control schedule pressure can be defined and implemented. This action has been completed.
 3. Management has increased the monitoring of procedural adherence in the field and will continue this practice until no longer necessary to help assure procedural compliance and adequate communications. This action has been implemented and is therefore complete.
 4. The STAR (Stop, Think, Act, Review) policy will be reinforced by training. The Maintenance and Operations departments will receive additional training by their respective department. This action is scheduled for completion prior to startup.
 5. Operations issued a night order on requests for work that requires that the SRO request the name of the valve, check the work against the schedule and verify the request with the Shift Supervisor. This action has been completed.
- Corrective actions to address procedural adherence (i.e., the all-hands meeting to address management expectations, STAR training and increased monitoring of procedural adherence) are also intended to effect cultural changes.

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- Operations issued a night order to identify the specific steps to be considered in determining whether an event is reportable in one hour or four hours and the time an event becomes reportable. This action has been completed.

Aspects of this event are still being reviewed. LER 93-053 will be supplemented prior to startup if the review identifies any substantive issue or corrective action not currently identified. The evaluation is to be complete prior to startup.

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 (TS). TS section 3.7.F requires a minimum of 2 EDGs operable under all plant conditions. Specification 1.0 defines "operable" and considers the availability of necessary cooling water to be required for operability. Without service water available, the EDG were inoperable and the plant was in violation of specification 3.7.F on December 2, 1993 from 1700 hours until 2135 hours.

Similar events have been reported in recent LERs. Inoperable diesel generators have been reported in LERs 93-042, 93-027, 93-024, 93-020, 93-019, 92-011, 92-010 and 92-007. A failure to follow procedures resulting in inoperable equipment has been reported in LERs 93-042, 93-039, 93-032, 93-024, 93-007 and 93-006.

SAFETY SIGNIFICANCE

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

At least 2 EDGs are required to be operable to provide emergency onsite power for the loss of offsite power or earthquake during a shutdown condition. There was no actual requirement for emergency onsite power in the four hours and thirty five minutes that the EDG were inoperable. If there had been a demand for the EDG and a failure occurred due to loss of cooling, there would have been no significant risk due to the following:

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- The FCVs are normally modulated by a valve positioner supplied with instrument air through SWN-SOV-1275 (for SWN-FCV-1176) and SWN-SOV-1274 (for SWN-FCV-1176A). Although these components are not safety grade, the SOVs would be expected to deenergize and the air supply to operate the positioner and provide cooling water to the EDG.
- Alternate power sources (e.g., gas turbines and the 10 CFR 50, Appendix R diesel generator) could be used to reestablish residual heat removal. The low residual heat in the core would have allowed the operators substantial time to restore core cooling with these power supplies.
- There is reason to believe that the EDG would not have been lost if the normal service water controller had not operated. The EDGs can operate for 5.23 minutes at full load without service water. Since SWN-FCV-1276 was able to stroke fully open within 9.1 minutes, service water flow would have started as the valve began to open and partial cooling would have been available. No engineering evaluation was performed to confirm operability because alternate power was available.

No evaluation has been conducted for the event at power. It is not reasonable to postulate a demand for the EDG considering the brief period of inoperability and that the circumstances leading to the event are not probable during power operation.

The extent of condition for this event is evaluated by Technical Services during post-work retesting to verify that the valve work was properly completed.