



Consolidated Edison Company of New York, Inc.
Indian Point Station
Broadway & Bleakley Avenue
Buchanan, New York 10511-1099

January 13, 1988

Re: Indian Point Unit No. 2
Docket No. 50-247

Mr. William Russell
Regional Administrator - Region I
U.S. Nuclear Regulatory Commission
631 Park Avenue
King of Prussia, PA 19406

Subject: Steam Generator Dryout

This letter is to inform you of the status of our investigation of the event referenced in your January 7, 1988 Confirmatory Action Letter 88-01, together with those corrective actions which we have identified. Our analysis of the operability of the affected components is complete and concludes that there were no safety impacts resulting from this evolution which are adverse to plant startup. The analysis of the circumstances surrounding this incident has proceeded to the point where short term actions have been developed and implemented to enhance performance that should prevent recurrence of such an event. Certain long term corrective actions have also been identified. Our examination and consideration of appropriate responses and corrective actions is continuing. A comprehensive report on our analysis and corrective actions will be submitted to the Regional Administrator as provided in paragraph 3, page 1 of your January 7 letter.

The circumstances of this event are basically as set forth in your letter and as confirmed by your Augmented Inspection Team ("AIT"). On January 3, 1988, the wide range instrumentation for Steam Generator No. 23 indicated that the level had dropped to zero. A gradual loss of level had occurred over about a twenty-four hour period, while conditions appropriate for a Reactor Coolant System hydrostatic test were being established. Steam Generators #23 and #24 were isolated during the hydrostatic test due to the unavailability of the #23 auxiliary boiler feed pump, which normally provides make-up to these steam generators. Leakage through the #23 Main Steam Isolation Valve allowed the steam generator to gradually boil dry during this time.

Immediately upon learning of the incident, management embarked on an investigation and analysis of the event. The circumstances as they were then known were reported to the Senior Resident Inspector. The NRC startup inspection team was already on site and we also kept them fully apprised. The analysis focused on technical and operations performance issues. The technical issues have been evaluated and discussed with Mr. Paul Swetland, of the NRC staff, who was on site. At this time, there are no outstanding information requests regarding the technical issues. Issues relating to the performance of operations are discussed herein.

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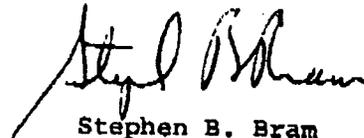
Attachment I to this letter provides findings relative to operations performance in this incident as well as our conclusions.

Attachment II contains the short and long term corrective actions to prevent similar occurrences in the future. The schedule for implementation of the long term actions is also provided.

Our corrective actions are intended, in part, to enhance the interface between watch personnel, including the STA, and to stress the need to anticipate and evaluate the potential consequences of off normal evolutions as well as to review ongoing operations and plant status. The corrective actions are also intended to ensure the timely communication of problems to management. Additionally, the Operations Manager and General Manager, NPG will meet on a routine basis in the Control Room at the start of the day shift to discuss with operations personnel the conduct of plant operations for the upcoming day and night shifts and to assess our corrective actions until we are satisfied that they are effective. As described in Attachment II, surveillance will also be performed by Quality Assurance. The Vice President, Nuclear Power will participate, as required, in shift turnovers and plant evolutions to independently assess program effectiveness.

Should you or your staff have any questions, please contact us.

Very truly yours,



Stephen B. Bram
Vice President
Nuclear Power

cc: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Senior Resident Inspector
U.S. Nuclear Regulatory Commission
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Ms. Marylee Slosson
U.S. Nuclear Regulatory Commission
Washington, DC 20555

ATTACHMENT I

FINDINGS AND CONCLUSIONS RELATING TO OPERATIONS PERFORMANCE

Several areas have been reviewed to determine the pertinent facts related to the incident and to reach conclusions resulting from that review. These areas include:

- (a) Communications/Contingency Planning
- (b) Administrative/Management
- (c) Training

I. FACTS

A. COMMUNICATIONS/CONTINGENCY PLANNING

1. Control Room operators were aware of decreasing level in steam generator #23, however, some Senior Watch Supervisors and the Shift Technical Advisors (STAs) on duty during this time period were not.
2. The STA was not required to attend the start of shift meetings
3. Contingency plans dealing with the planned hydrostatic test and the equipment known to be out of service during the evolution were not specifically relayed to the operators on shift.
4. Alternative contingency plans were not made by watch standing personnel.

B. ADMINISTRATIVE/MANAGEMENT

1. The plant was taken out of cold shutdown with a permissible but less than normal complement of safety equipment available.
2. The Plant Operating Procedure requires steam generator levels to be maintained between 35% and 65% prior to primary temperature exceeding 250°F. Although not specified in the procedure, the intent is to utilize the narrow range steam generator level. There is no requirement for level when temperature is below 200°F or going above 200°F.
3. Procedure also requires that if steam generator levels cannot be maintained between 20% and 70%, the SWS is to be immediately notified. Again, the intent is to use the narrow range steam generator level.

4. Minimum steam generator narrow range level requirements were not met when the plant was brought out of cold shutdown on January 1, 1988.
5. Steam generator #23 levels were recorded as being out of specification from January 1 to January 4, 1988, and the log sheets reflecting this fact were signed by watch supervisors. However, watch supervisors were either not notified or not fully cognizant of the steam generator levels during this time period.

C. TRAINING

1. An Emergency Operating Procedure (EOP) background document allows the filling of a steam generator from levels below 8% so long as the tube temperature is less than 550°F.
2. EOP's are not intended to be applied when RCS temperature is less than 350°F.

II CONCLUSIONS

A. COMMUNICATIONS/CONTINGENCY PLANNING

1. Plans and contingencies covering the heatup of the primary system with certain equipment (e.g. auxiliary feedwater pump #23) out of service were not adequately transmitted.
2. Not all Senior Watch Supervisors on duty during this event were fully cognizant of steam generator level conditions for one or more of the following reasons: inadequate watch turn-over, inadequate transfer of information from the control room, or inadequate monitoring of information.
3. Certain judgements made by operations personnel were not adequately challenged or checked by one another.

B. ADMINISTRATIVE/MANAGEMENT

1. The STA was not sufficiently involved in the on-going operations.
2. Consideration and contingencies for on-going plant activities and available plant equipment were not adequately passed along to watch standing personnel once developed, nor were they independently developed by watch personnel during initial shift discussions.
3. Watch personnel accepted the possibility of not being able to satisfy the requirements of supplying data for inclusion on the log sheets (and, therefore, not fulfilling the

requirements of Plant Operating Procedures), due to entering an evolution with key equipment (such as the narrow range steam generator level instrumentation and an auxiliary feedwater pump) not initially available.

4. Turnover signoff areas of the log sheets were inadequate for the purpose of conveying all the necessary information to the watch supervisor.
5. The potential exists for depending on the EOP's and background documentation as justification for allowing equipment to be operated in a manner which is not intended.

C. TRAINING

1. Not all watch personnel were fully aware of the design cycles, consequences and importance of boiling a steam generator dry.
2. Operator training programs may emphasize post-critical and power operations to such an extent that cold shutdown and hot shutdown evolutions, and the special considerations and problems particular to each, may not receive the desired level of emphasis.

ATTACHMENT II

CORRECTIVE ACTIONS REGARDING STEAM GENERATOR DRYOUT
RELATIVE TO OPERATIONS PERFORMANCEShort Term Corrective Action:

1. In order to improve Control Room communications, the SWS, the SRO, and the STA shall be required to review the status of the Central Control Room (CCR) panels at the beginning, middle, and end of each watch. This applies to the STA when the RCS temperature is at 200°F or above.
2. Each will make a visual inspection of charts, indicators, controls, etc. Each walkdown shall include a discussion of operable equipment, plant status, planned evolutions and procedures and methods for performing these evolutions and contingencies for possible problems.

The beginning and end of shift walkdowns will be conducted by existing shift and oncoming shift personnel; this applies to the SWS, the SRO, and the STA.

3. An STA will be assigned to each shift to cover each watch and he will be required to attend the start of each watch meeting.
4. Except in cold shutdown, the STA shall be assigned to the CCR and provided with adequate room and provisions. The STA will conduct a minimum of two tours (per shift) of vital areas. Observations will be recorded in an STA log. He will indicate actions based upon observed conditions requiring a corrective action.

An STA log will be maintained to record pertinent operational observations, and will include:

- major equipment out of service
 - major planned evolutions for the watch
 - appropriate procedures to be used for these evolutions
 - evaluation of the applicability of these procedures with existing plant conditions
 - documentation of the three (3) daily board checks.
5. Operations management will conduct periodic tours of the CCR to ensure personal awareness of plant status and implementation of appropriate responses.
 6. The sign-off sheet of CCR log sheets shall be revised to allow sufficient room on the sheet to discuss and note equipment status information.
 7. The importance of the steam generator levels, dryout, and life cycle considerations are to be reviewed with all watch sections. The improper use of EOP's for normal plant evolutions will also be discussed.

8. The importance of following procedures in all cases shall be emphasized, and operators shall be encouraged to challenge procedure absence or ambiguity.

Long Term Corrective Actions:

Following are Con Edison's proposed long term corrective actions and implementation schedule, which may be subject to revision pending completion of incident review and analysis.

1. Following the incorporation of these recommendations into the appropriate procedures, Administrative Directives, and position guides, Quality Assurance shall perform periodic surveillances of these activities. (Scheduled to be completed by February 29, 1988)
2. In order to improve technical review of CCR operations, the Watch Engineering program will be implemented, which will replace the STA program. This program has already been developed on our own initiative and is intended to represent a significant upgrade to the STA program. (Scheduled to be completed by December 31, 1989)
3. Fuller coverage of the importance of the steam generator levels, dryout, and life cycle considerations is to be incorporated in licensed operator training programs. (Scheduled to be completed by March 31, 1989)
4. The EOPs shall be reviewed to identify additional areas where it is necessary to clarify the limits and applicability of the EOP parameters to normal plant evolution. Training programs will incorporate this information. (Scheduled to be completed by March 31, 1989)
5. Quality Assurance will review the report of our investigation of the incident, the conclusions of this report, and the Corrective Action Plan to assure it addresses the conclusions. Quality Assurance may make recommendations for consideration. (Scheduled to be completed by February 29, 1988)
6. Additional training shall be provided for all control room operators covering Cold Shutdown and Hot Shutdown operations, considerations, and precautions. (Scheduled to be completed by March 31, 1989)
7. "Key" control room charts and instruments shall be reviewed to determine which should be stamped or recorded by the SWS and STA as part of their regular review of CCR panel status. (Scheduled to be completed by June 30, 1988)
8. Present startup procedures shall be reviewed and revised as necessary to incorporate detail of contingency equipment required to be operable if key equipment is not available. (Scheduled to be completed by December 31, 1988)

9. Quality Assurance shall perform a special audit to verify compliance with the Corrective Action Plan; this audit will be conducted after implementation of the long term corrective actions. (Scheduled to be completed in phases through December 31, 1989)

10. Quality Assurance will review planned plant evolutions and select evolutions which will be surveilled for compliance with procedures and plans. Results of these surveillances will be reported directly to the Vice President, Nuclear Power. (Ongoing through December 31, 1988)

ATTACHMENT F

LIST OF ATTENDEES

AIT EXIT

<u>Name</u>	<u>Title</u>
P. Swetland	NRC Team Leader
L. Rossbach	SR. Resident Inspector
R. Temps	Operations Engineer, RI
P. Kelley	NRC Resident Inspector
T. Talbot	Con. Ed. Engineering
R. Sutton	Con. Ed. Tech. Support
H. Sager	Con. Ed. Tech. Support
L. Liberatori	Con. Ed. Tech. Support
S. Brozski	Con. Ed. Q.A.
H. Morrison	Con. Ed. Ups.
V. Ellwanger	Con. Ed. Reg. Affairs
Min I. Lee	Con. Ed. Gen. Mgr. Tech. Supp.
R. Ridding	Con. Ed. Generation Support
S. Bram	Con. Ed. V. P. Nuclear Power
Jude DelPercio	Con. Ed. Mgr. Regulatory Affairs
John McCann	Con Ed. Mgr. Nuclear Info.
K. Bahr	Con Ed. Tech. Support
J. Banli	Con. Ed. GM-NPG
J. Curny	Con. Ed. Chief Plant Eng.