

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 (MNBB 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.

| | | | | |
|-------------------|----------------|-------------------|----------|--------------------|
| FACILITY NAME (1) | Indian Point 3 | DOCKET NUMBER (2) | 05000286 | 1 of 6 PAGE (3) |
|-------------------|----------------|-------------------|----------|--------------------|

TITLE (4) Past Operation of the Service Water Discharge Throttle Valves SWN 35-1 And SWN 35-2, May Have Placed the Plant Outside Design Basis due to Human 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 |
| 05 | 20 | 97 | 97 | -- 007 -- | 00 | 06 | 19 | 97 | 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) | | | | | | | | |
| | | 20.402(b) | | 20.405(c) | | 50.73(a)(2)(iv) | | 73.71(b) | | |
| POWER LEVEL (10) | 000 | 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 | Bob Lee, System Engineer | TELEPHONE NUMBER (Include Area Code) | (914) 736-8381 |
|------|--------------------------|--------------------------------------|----------------|

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) | | |
| YES (If yes, complete EXPECTED SUBMISSION DATE). | ✓ | NO | | MONTH | DAY | YEAR |

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

On May 20, 1997, with the plant in a cold shutdown condition, NYPA determined that the sequence of emergency operating procedure (EOP) steps to re-position the service water discharge throttle valves on the component cooling heat exchangers had potentially placed the plant outside its design basis. The EOP may not have ensured the design basis accident minimum service water flow requirements were met. During a postulated loss of coolant accident and prior to going on recirculation these manual valves needed to be repositioned open to a predetermined throttled position to provide sufficient heat removal capability. During normal operation these valves were throttled below the prescribed setting to maintain component cooling water temperature within the normal operating range due to seasonal river water temperature conditions. The cause was human error during the revision of the EOPs and non-formal implementation of design basis information. An operability determination established the minimum required throttle positions for fifty degree river water and this requirement was implemented until the current outage started. Service water and component cooling water EOP steps have been verified to comply with design. Additional review of EOPs may be required and this will be identified prior to plant startup. A procedure change will be issued to include the operational limits required to ensure the design is maintained. This event had no affect on the health and safety of the public because, based on preliminary engineering evaluation, the associated components are believed to be able to perform their function during the postulated event.

9706250450 970619
PDR ADDCK 05000286
S PDR

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

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.

| | | | | | |
|-------------------|-------------------|----------------|------------|----------|----------|
| FACILITY NAME (1) | DOCKET NUMBER (2) | LER NUMBER (6) | | | PAGE (3) |
| Indian Point 3 | 05000286 | YEAR | SEQUENTIAL | REVISION | 2 OF 6 |
| | | 97 | -- 007 -- | 00 | |

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

Note: The Energy Industry Identification System Codes are identified within the brackets { }

DESCRIPTION OF EVENT

During an NRC engineering inspection from April 7, 1997 to May 1, 1997, an inspector questioned the operation of the Service Water System (SWS){BI} including the ability to remove sufficient heat load from the Component Cooling Water (CCW){CC} heat exchanger (HX){HX} when SWS throttle valves SWN 35-1 and SWN 35-2 are throttled less than the design limits of 27.5 and 27 degrees, respectively, which were imposed to prevent pump runout. The SWS design does not have automatic provisions to accommodate changes in river water temperature relative to the effect on the component cooling operating temperature range. Thus, the adjustments to these valves are addressed administratively during plant operation. Using normal operating procedures, flow is regulated to throttle the butterfly valves {V} as the river water temperature changes due to seasonal conditions in order to maintain the component cooling temperature operating range between 72 and 110 degrees F. A plant alarm response procedure requires the operator to open the service water throttle valves when an alarm is actuated in the control room indicating the CCW temperature is exceeding its upper operating temperature band of 110 degrees F. At the time of the inspection the valves were throttled to less than 10 degrees open.

The throttle valves remain in their pre-accident position following a LOCA until re-positioned to their maximum open throttled position in accordance with Emergency Operating Procedure (EOP) ES 1.3. Using the simulator, the time required to re-position these valves from a large break LOCA with RWST at 11.5 ft has been estimated to take 48 minutes from the start of the first non-essential SW pump and 44 minutes after the start of the recirculation pumps.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

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 (MNBB 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.

| FACILITY NAME (1) | DOCKET NUMBER (2) | LER NUMBER (6) | | | PAGE (3) |
|-------------------|-------------------|----------------|------------|----------|----------|
| Indian Point 3 | 05000286 | YEAR | SEQUENTIAL | REVISION | 3 OF 6 |
| | | 97 | -- 007 -- | 00 | |

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

When responding to the question, NYPA determined that the throttle positions used during normal operation had not been demonstrated as adequate to meet the minimum SWS flow rates to the CCW heat exchangers required during transfer to the recirculation phase for post LOCA recovery. On April 25, 1997, an operability determination was performed to establish the minimum required throttle values that could be used to support continued plant operation until the issue could be resolved. A flow model calculation performed based on the actual valve positions 5 and 8 degrees with a river water temperature of 50 degrees F determined that the minimum required service water flow would be provided to the CCW HXs. Continued plant operation was considered acceptable based on the projected river water temperature until the current outage, which was scheduled to begin on May 17, 1997. In addition, operations was instructed to throttle the valves open to operate at the lower end of the operating temperature range of CCW.

On May 20, 1997; at approximately 1540 hours, NYPA determined, based on a review of historical records, that during past operation the service water discharge throttle valves SWN-35-1 and SWN-35-2 had been throttled below the minimum value that would allow the amount of service water required during the transfer to the recirculation phase of a loss of coolant accident and procedures would not open the throttle valves at the time required by analysis. This may have placed the plant outside the design basis. At the time of the event discovery, the plant was at cold shutdown.

Valve Requirements

In inspection report 50-286/87-013 dated 9/8/87, "Safety System Outage Modification (Design) Inspection," the NRC identified the potential for SW pump runout during the transfer from injection to recirculation. At that time, the system operating procedure did not contain any requirements for maintaining either a minimum or maximum valve opening. Based on an analysis, isolation of some non-essential loads was incorporated into the EOP (ES-1.3) to prevent pump runout.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

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 (MNBB 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.

| FACILITY NAME (1) | DOCKET NUMBER (2) | LER NUMBER (6) | | | PAGE (3) |
|-------------------|-------------------|----------------|------------|----------|----------|
| | | YEAR | SEQUENTIAL | REVISION | |
| Indian Point 3 | 05000286 | 97 | -- 007 -- | 00 | 4 OF 6 |

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

Subsequently, an update to the SWS hydraulic analysis established, in addition to isolating some nonessential loads, a maximum open position for each valve to prevent pump run-out and ensure sufficient flow to accident required components. A throttle position of 23 degrees would preclude pump runout and satisfy cooling requirements. On August 25, 1988, based on conclusions and recommendations from the completion of testing of the SW system per ENG-281 (Rev. 1), engineering instructed that if operations chose to set these valves to another pre-determined position (other than 23 degrees open) during normal operation, that prior to entering the recirculation mode of operation, the valves are required to be adjusted to 23 degrees to accommodate all flow requirements. On August 26, 1988, EOP ES-1.3 was changed to add a sub-step to throttle SWN-35-1 and 35-2 to 23 degrees open position, however, the location of the step did not ensure that the valves would be re-positioned prior to recirculation and did not reflect that this was the requirement although the engineering memorandum was referenced. On November 8, 1988 an additional communication was provided by engineering which may have provided another opportunity to correct the EOP deficiency, but it did not correct the discrepancy. Due to pump and valve replacements, an update to the analysis required that a maximum throttle position of 18 degrees open to prevent pump runout and satisfy cooling requirements. EOP ES-1.3 was revised on June 10, 1989 to include this position. The Ultimate Heat Sink analysis was based on SW flows to CCWHXs resulting from the 18 degrees opening per ENG-281 (Rev. 2). Following the replacement of the CCWHXs the valve throttle positions were further revised to 27.5 and 27 degrees respectively. This was incorporated in a later revision to EOP ES-1.3.

CAUSE OF EVENT

Based on investigation to date, the following has been identified. A supplemental LER will be forwarded to the NRC if additional investigations find a significant difference from those determined by the preliminary assessment. The cause is attributed to the following two human errors. The first human error occurred during the implementation of administrative controls by placing the procedural step at a location in EOP ES-1.3 which did not re-position the outlet throttle valves prior to the transfer to recirculation.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

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 (MNBB 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.

| FACILITY NAME (1) | DOCKET NUMBER (2) | LER NUMBER (6) | | | PAGE (3) |
|-------------------|-------------------|----------------|------------|----------|----------|
| | | YEAR | SEQUENTIAL | REVISION | |
| Indian Point 3 | 05000286 | 97 | -- 007 -- | 00 | 5 OF 6 |

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

The second human error was an inadequate review of the EOP change to ensure that the design information was appropriately implemented. A contributing factor is the non-formal method used by engineering which did not track the proper implementation of the required activity. The design basis information was provided by memorandum and did not verify proper incorporation. Consequently, the EOP was inadequate to ensure the design basis accident minimum service water flow requirements.

CORRECTIVE ACTIONS

The following corrective actions have been or will be performed to address the causes of this event:

- A shift order based on the operability determination was issued on April 30, 1997 to maintain the service water valves SWN-35-1 and 35-2 throttled opened to maximize service water flow to the CCW heat exchangers in order to operate at the low end of the CCW outlet temperature range of 72-110 degrees F.
- A review was conducted on Emergency Operating Procedure steps involving CCW and Service Water operation to establish if these steps were in accordance with design basis documents. No discrepancies were found other than those already identified during the April 1997 NRC inspection.
- Procedures will be revised prior to start-up to ensure the minimum closure limits based on river water temperature and minimum flow requirements to support CCW during recirculation.
- Upon conclusion of the cause determination, the appropriate extent of condition review of EOPs will be determined prior to plant start-up.
- Subsequent to 1988 when the errors were made that caused this event, a formalized engineering program (modification and design control programs) was implemented in 1989. An administrative directive will be issued to emphasize that engineers are required to ensure formal tracking of actions to implement design basis requirements. This directive will be issued by July 15, 1997.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

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.

| FACILITY NAME (1) | DOCKET NUMBER (2) | LER NUMBER (6) | | | PAGE (3) |
|-------------------|-------------------|----------------|------------|----------|----------|
| Indian Point 3 | 05000286 | YEAR | SEQUENTIAL | REVISION | 6 OF 6 |
| | | 97 | -- 007 -- | 00 | |

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

ANALYSIS OF EVENT

The condition is being reported under 10 CFR 50.73 (a)(2)(ii)(B). The licensee shall report any event or condition that results in placing the facility outside its design basis. The condition is being reported because the plant may have been outside its design basis, pending final analysis, due to the EOPs not ensuring the minimum design basis service water flow to the component cooling heat exchangers prior to post LOCA switchover to recirculation phase.

A review of Licensee Event Reports (LERs) identified no other LERs over the last two years for similar events where design requirements were not properly implemented into procedures.

SAFETY SIGNIFICANCE

This event did not have a significant effect on the health and safety of the public. Given a postulated LOCA, the throttled valves would provide less flow to cool CCW, than what was evaluated in the limiting Ultimate Heat Sink (UHS) analysis. The UHS analysis had justified a CCW heat exchanger outlet temperature of 140.5 degrees F. Preliminary analysis indicates that the CCW temperature at the outlet of the CCW heat exchanger under the most limiting historically documented operating conditions would have reached 158 degrees F at 8 minutes after switchover to recirculation assuming a SW flow of 2137 gpm to CCW HX 32 and no flow to CCW HX 31. This temperature was calculated using design basis assumptions for fan cooler and heat exchanger fouling as well as minimum flows for CCW and maximum flows for recirculation. These are the same conservative design basis assumptions used in the Ultimate Heat Sink Analysis. The calculated CCW temperature exceeds the previous maximum in the Ultimate Heat Sink Analysis. Based on previous evaluations, input from vendors and engineering judgment, the higher CCW temperature for one hour time period is acceptable.

We believe that required equipment would have been able to perform their function; therefore, this event had no affect on the health and safety of the public if the postulated LOCA event occurred when the plant was in the limiting condition.