



CONNECTICUT YANKEE ATOMIC POWER COMPANY

HADDAM NECK PLANT

362 INJUN HOLLOW ROAD * EAST HAMPTON, CT 06424-3099

January 28, 1994

Re: 10CFR50.73(a)(2)(i)(B)

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

Reference: Facility Operating License No. DPR-61
Docket No. 50-213
Reportable Occurrence LER 50-213/94-001-00

Gentlemen:

This letter forwards the Licensee Event Report 94-001-00, required to be submitted, pursuant to the requirements of the Haddam Neck Plant's Technical Specifications.

Very truly yours,

John P. Stetz
Vice President

JPS/alg

Attachment: LER 50-213/94-001-00

cc: Mr. Thomas T. Martin
Regional Administrator, Region I
475 Allendale Road
King of Prussia, PA 19406

William Raymond
Sr. Resident Inspector
Haddam Neck

070023

JEZ

LICENSEE EVENT REPORT (LER)

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|---|---|---------------------------|
| FACILITY NAME (1) Haddam Neck | DOCKET NUMBER (2) 0 5 0 0 0 2 1 3 | PAGE (3) 1 OF 6 |
|---|---|---------------------------|

TITLE (4)
Containment Air Recirculation Fans Failed Flow Test

| 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 NAMES | | | DOCKET NUMBER(S) |
| 0 | 5 | 1 | 8 | 9 | 3 | 9 | 4 | | | | | 0 5 0 0 0 |
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| OPERATING MODE (9) 5 | THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5 (Check one or more of the following) (11) | | | | | | | | | |
| POWER LEVEL (10) 01010 | <input type="checkbox"/> 20.402(b) | <input type="checkbox"/> 20.406(c) | <input type="checkbox"/> 50.73(a)(2)(iv) | <input type="checkbox"/> 73.71(b) | | | | | | |
| | <input type="checkbox"/> 20.406(a)(1)(i) | <input type="checkbox"/> 50.36(c)(1) | <input type="checkbox"/> 50.73(a)(2)(v) | <input type="checkbox"/> 73.71(c) | | | | | | |
| | <input type="checkbox"/> 20.406(a)(1)(ii) | <input type="checkbox"/> 50.36(c)(2) | <input type="checkbox"/> 50.73(a)(2)(vi) | OTHER (Specify in Abstract below and in Text, NRC Form 385A) | | | | | | |
| | <input type="checkbox"/> 20.406(a)(1)(iii) | <input checked="" type="checkbox"/> 50.73(a)(2)(i) | <input type="checkbox"/> 50.73(a)(2)(vii)(A) | | | | | | | |
| | <input type="checkbox"/> 20.406(a)(1)(iv) | <input type="checkbox"/> 50.73(a)(2)(ii) | <input type="checkbox"/> 50.73(a)(2)(vii)(B) | | | | | | | |
| <input type="checkbox"/> 20.406(a)(1)(v) | <input type="checkbox"/> 50.73(a)(2)(iii) | <input type="checkbox"/> 50.73(a)(2)(ix) | | | | | | | | |

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|------------------------------------|------------|----------------------|
| LICENSEE CONTACT FOR THIS LER (12) | | TELEPHONE NUMBER |
| NAME | AREA CODE | |
| D. Carnesi, Engineer | 210 | 321671-215516 |

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

| CAUSE | SYSTEM | COMPONENT | MANUFACTURER | REPORTABLE TO NRRDS | CAUSE | SYSTEM | COMPONENT | MANUFACTURER | REPORTABLE TO NRRDS |
|-------|--------|-----------|--------------|---------------------|-------|--------|-----------|--------------|---------------------|
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|--|--|-------|-----|------|
| SUPPLEMENTAL REPORT EXPECTED (14) | EXPECTED SUBMISSION DATE (15) | MONTH | DAY | YEAR |
| <input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE) | <input checked="" type="checkbox"/> NO | | | |

ABSTRACT (Limit to 1400 spaces, i.e. approximately fifteen single space typewritten lines) (16)

ABSTRACT

On May 18, 1993, with the plant shut down in Mode 5 for the Cycle 17 Refueling Outage, three of four Containment Air Recirculation (CAR) Fans did not meet the acceptance criteria for air flow rates during surveillance testing. At that time a reportability evaluation concluded that, based on the time of discovery, this event was not reportable. On January 4, 1994 with the plant in Mode 1 at 100 percent power, a further review of the event determined that the time of discovery reporting criteria may not have been valid and that the event was reportable under 10CFR50.73(a)(2)(i)(B). The causes of the failure were instrument calibration inaccuracy and worn backdraft dampers. The four CAR Fans were adjusted and retested prior to startup from the refueling outage in June, 1993 and all air flow rates were within the Technical Specification's required range. Corrective actions included using a different approved vendor for instrument calibration and replacement of the backdraft dampers. Also, a Technical Specification change request is being considered which will widen the acceptance criteria for the CAR Fan flow requirements.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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TEXT (If more space is required, use additional NRC Form 305A's) (17)

BACKGROUND INFORMATION

Four containment air recirculation (CAR) fans (EIS Code: BK) take suction near the outer periphery of the containment building middle level and discharge to a common duct which branches to distribution outlets within containment. During normal operation (see Figure 1) air enters the units through "bypass" dampers to cooling coils and then to the fan. These dampers are so named because they bypass the accident mitigation section of the unit (chevron moisture separators, high efficiency particulate air (HEPA) filters, and charcoal adsorbent trays.) Under normal conditions the inlet to the accident section is blocked by the "face" dampers. Upon receipt of a safety injection/containment isolation signal, the "face" dampers open and the "bypass" dampers close and air flows through the accident section of the CAR fan unit to the cooling coils to the fan. Technical Specification 3.6.2 requires at least four CAR fans operable in Modes 1 through 4. Technical Specification 4.6.2 requires that each CAR unit be capable of operating with a flow rate of 52,500 +/- 2,500 cfm.

EVENT DESCRIPTION

On May 18, 1993, with the plant shut down in Mode 5 for the Cycle 17 Refueling Outage, three of four Containment Air Recirculation (CAR) Fans did not meet the acceptance criteria for air flow rates during surveillance testing. The air flow for the three CAR Fans were below the criteria of 52,500 +/- 2,500 cfm and the results were as follows:

- #1 CAR fan = 48,480 cfm
- #2 CAR fan = 48,888 cfm
- #3 CAR fan = 41,856 cfm

At that time a reportability evaluation concluded that, based on the time of discovery, this event was not reportable. On January 4, 1994 with the plant in Mode 1 at 100 percent power, a further review of the event determined that the time of discovery reporting criteria may not have been valid and the event was reportable under 10CFR50.73(a)(2)(i)(B).

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

CAUSE OF THE EVENT

The initial reportability determination was based on an interpretation of question/answer 2.3 from U.S. Nuclear Regulatory Commission NUREG 1024, Supplement No. 1, "Licensee Event Report System - Description of System and Guidelines for Reporting." It was concluded that an equipment failure occurring at the time of a surveillance test is assumed to have occurred at the time of discovery and, therefore, is not reportable unless there exists "firm evidence" that the failed component had been inoperable for a period of time in excess of its allowed outage time. Supporting evidence to the not reportable position was the following:

1. The surveillance was successfully completed during prior testing (previous outage.)
2. There was no "firm evidence" as to the cause of the surveillance failure being attributed to a fabrication, installation, or maintenance error.
3. There is no firm evidence that the system had been inoperable during the past operating cycle.

Upon further review of this event it was determined that a failure of three of four CAR Fans may be indicative of a systematic problem, that the "time of discovery" reporting criteria may not have been valid and, therefore, the event was reportable under 10CFR50.73(a)(2)(i)(B).

Two factors were identified during the initial investigation which contributed to the surveillance failure. First, the same instrument was used to measure the air flow from Cycle 16 to Cycle 17. Prior to the Cycle 17 Refueling Outage, a Quality Assurance audit questioned the vendor's calibration program. The instrument was sent to a different vendor and found to be reading approximately 7 percent too high. This instrument had been used to set the CAR Fans' flow during the Cycle 16 Outage and, thus, it is possible that the CAR fans were adjusted improperly because of the instrument calibration. The Cycle 17 surveillance failure occurred after the instrument calibration error was corrected. Second, the CAR Fans' backdraft dampers were identified as showing signs of worn bearings during the Cycle 16 Outage. Their condition is believed to have degraded to a point which may have affected air flow. The worn bearings could cause an increase in the fans' discharge pressure by imposing more resistance to the damper's motion. This would cause the fan to be less efficient and, therefore, pull less air (decreased flow.)

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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TEXT (If more space is required, use additional NRC Form 385A's) (17)

SAFETY ASSESSMENT

The measured flow for three (3) of the four (4) CAR fans was below the Technical Specification limit of 52,500 +/- 2500 cfm. As a result, this event is reportable under 10CFR50.73 since it resulted in a condition prohibited by the plant's Technical Specifications. However, a Technical Specification change is being planned to specify a limit of 51,500 +/- 3500 cfm. The evaluations for a lower limit of 48,000 cfm show acceptable CAR fan performance.

It has been determined that reducing the air flow rate to 48,000 cfm has a negligible impact on the heat removal rate of the CAR fans and the design basis assumption on CAR fan heat removal rate remains valid. This is because CAR fan performance is not very sensitive to the air flow rate. With the same assumed CAR fan heat removal rate, the post-LOCA and post-steam line break containment response is unaffected. Similarly, an evaluation of CAR fan filtration with the lower air flow rate has shown no significant impact on post-LOCA off site doses.

With the proposed limit, only one of the four CAR fans would have been declared inoperable. The current design basis analysis shows acceptable containment response crediting only three CAR fans. Thus, if the one inoperable CAR fan were counted as the single failure, the CAR fans would still perform their safety function. In addition, since the CAR fan performance is not very sensitive to air flow rate, it is likely that the CAR fan for which the flow rate was measured at 41,856 cfm would not have prevented the system from accomplishing its safety function. Thus, it is judged the CAR fan performance was not seriously degraded and the CAR fan system would have accomplished its safety function. Based upon this evaluation it is concluded that the safety significance of this event was low.

CORRECTIVE ACTION

The immediate corrective action consisted of adjusting the fans' flow vanes in order to achieve the required air flow.

Testing instruments are now being sent to a different, approved calibration vendor in order to ensure instrument calibration remains constant. The backdraft damper assembly for each of the CAR Fans was replaced during the Cycle 17 Outage. In addition, the backdraft dampers have been included in the CAR Fan preventive maintenance program.

The four CAR Fans were retested prior to startup from the Cycle 17 Refueling Outage and all air flow rates were within the Technical Specification's required range.

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TEXT (If more space is required, use additional NRC Form 385A's) (17)

A Technical Specifications change request is being considered which will widen the acceptance criteria for the CAR Fan flow requirements. With the proposed limit, only one of the four CAR Fans would have failed the surveillance.

ADDITIONAL INFORMATION

None.

PREVIOUS SIMILAR EVENTS

- LER 85-002-00
- LER 91-004-01

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TEXT (If more space is required, use additional NRC Form 386A's) (17)

FIGURE 1

