

**United States  
Nuclear Regulatory Commission**



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# Report of Investigation

## SUSQUEHANNA UNITS 1 AND 2:

### ALLEGED FAILURE TO PROVIDE COMPLETE AND ACCURATE INFORMATION TO THE NRC

**Office of Investigations**

Reported by OI: RI

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Title: SUSQUEHANNA UNITS 1 AND 2:

ALLEGED FAILURE TO PROVIDE COMPLETE AND ACCURATE INFORMATION TO  
THE NRC

Licensee:

Pennsylvania Power & Light Company  
2 North Ninth Street  
Allentown, Pennsylvania 18101

Docket Nos.: 50-387/388


Case Number: 1-93-054R

Report Date: August 31, 1995

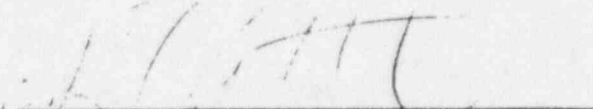
Control Office: OI:RI

Status: CLOSED

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## SYNOPSIS

This matter was initially opened by the Office of Investigation (OI), Region I (RI), on October 6, 1993. It was upgraded to a full-scale investigation on July 26, 1994, to determine if Pennsylvania Power and Light's (PP&L's) Manager of Nuclear Technology failed to provide complete and accurate information during a July 8, 1993, presentation to the NRC in Rockville, Maryland.

After a preliminary review of this matter and coordination with the RI Regional Administrator and his staff, this investigation was designated as a "normal" priority. Due to OI:RI pursuing investigations with higher priorities, this matter is being closed.

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## DETAILS OF INVESTIGATION

### Applicable Regulations

10 CFR 50.5: Deliberate misconduct (1993 Edition)  
10 CFR 50.9: Completeness and accuracy of information (1993 Edition)

### Purpose of Investigation

This matter was initially opened by the Office of Investigations (OI), Region I (RI), on October 6, 1993. It was upgraded to a full-scale investigation on July 26, 1994 (Exhibit 1), to determine if Glen D. MILLER, Pennsylvania Power and Light Company (PP&L), Manager of Nuclear Technology, failed to provide complete and accurate information during a July 8, 1993, transcribed presentation to the NRC in Rockville, Maryland

### Background

By letter dated November 27, 1992 (Exhibit 2), [REDACTED] and [REDACTED] working at PP&L's Susquehanna Steam Electric Station (SSES), submitted a 10 CFR Part 21 report documenting, what they termed, as a "substantial safety hazard" relating to the design of the SSES. In substance [REDACTED] and [REDACTED] concluded that during various SSES design basis accidents, spent fuel pool (SFP) cooling would be lost and the effects of the resultant boiling fuel pool on safety related equipment had not been analyzed by PP&L. 7C

Following a series of discussions and communications between the NRC and PP&L, the NRC, on February 18, 1993, sent PP&L a Request for Additional Information (RAI - Exhibit 3) concerning the effects of a loss of SFP cooling event, following a loss of coolant accident (LOCA). PP&L responded to the RAI by letter dated May 24, 1993 (Exhibit 4). At page 22, PP&L describes the role of the SSES Standby Gas Treatment System (SGTS) if the SFP boils. The response indicates that the SGTS would continue to operate during a LOCA/boiling SFP event.

On July 8, 1993, the NRC and PP&L met in Rockville, Maryland, in continuance of discussions regarding SFP issues. In response to NRC staff questions relating to boiling SFP conditions, MILLER stated that the SSES SGTS was designed to handle incoming air stream temperatures of 180 degrees F. at 100% humidity. Later in the meeting, MILLER was questioned specifically about the effects of condensation on the standby gas treatment duct-work. MILLER answered that PP&L "had looked at the duct-work," and believed that the point of condensation would be near "the train itself," and that the systems demisting section, heater section, and a drain at that point would be able to handle the accumulated moisture.

During an OI interview with [REDACTED] and [REDACTED] on November 23, 1993, and previously in a letter they sent to the NRC dated November 7, 1993 (Exhibit 5), they indicated that MILLER may have failed to provide complete and accurate information to the NRC during the July 8, 1993, meeting, supra.

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regarding the SSES SGTS ability to handle incoming air stream temperatures of 180 degrees F. Based on an OI review of the July 8, 1993, meeting transcript, and interviews with the NRC staff, it was further determined that MILLER may not have provided complete and accurate information regarding the ability of the SGTS duct-work to handle increased condensation resulting from a boiling SFP.

#### Description of the SSES SGTS

Joseph W. SHEA, NRC project manager assigned to the evaluation of the SSES loss of SFP cooling issues for the Office of Nuclear Reactor Regulation (NRR), provided a brief description of the SSES SGTS as follows (Exhibit 6):

In part, the SGTS is an engineered safety system utilized to process secondary containment atmosphere prior to release outside the plant under accident conditions. The atmosphere passes through a duct system into the SGTS where it is filtered through a series of moisture separators, heaters, HEPA filters, charcoal filters and fans before it is released up the stack and outside the plant. The duct system contains fire dampers located at wall penetrations to prevent the spread of fire. Each damper remains open until an extreme heat condition causes the damper's fusible link to melt and close the damper. Once shut, the SGTS would be isolated and become inoperable. Both the dampers and the fusible links are considered components of the SGTS because they are part of the duct-work which feeds air to the system. The fire dampers must remain open for the SGTS to function (p. 1).

#### Interview of Allegers

[REDACTED] and [REDACTED] were interviewed at OI:RI on November 23, 1993, and provided the following substantive information:

They alleged that MILLER may not have provided complete and accurate information to the NRC during a July 8, 1993, meeting. Specifically, during the meeting, MILLER represented the SSES SGTS as being designed for 180 degree temperatures at 100% humidity. [REDACTED] and [REDACTED] related that the duct system leading to the SGTS contains fusible links rated at 165 degrees F. and would isolate the SGTS if incoming air stream temperatures, caused by a boiling SFP, reached that temperature. Accordingly, the SGTS was designed for 165 degree F. temperatures, not 180 degree F. temperatures (Exhibit 7, Excerpt, pp. 73-125).

#### Interview of Ashok THANDANI

Ashok THANDANI, NRC Associate Director for Inspection and Technical Assessment, NRR, was interviewed by the reporting investigator on July 13, 1994, at NRC Headquarters in Rockville, Maryland (Exhibit 8). In substance, he provided the following information:

A review of the PP&L modification documents by the NRR staff determined that the physical work on the fusible link modification began on July 21, 1993, and that new fusible links with the higher set points (285 degrees F. vis-a-vis 165 degrees F.) were operational on August 18, 1993 (p. 2).

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#### Additional information from SHEA

On February 7, 1994, during an NRR audit at PP&L headquarters by SHEA and Steven R. JONES, NRR Reactor Engineer, the NRC reviewed a PP&L analysis of the effects of a single boiling SFP. Up to this time, SHEA had asked Jim KENNY, PP&L Supervisor of Nuclear Licensing, a couple of times, if they had a comprehensive analysis to show exactly what the environment would be on the refueling floor affecting the SGTS during a boiling SFP event. The current analysis [which was completed in late 1993] determined that the inlet air stream temperatures in the air ducts would be about 127 degrees F., 2 degrees above the design basis temperature of 125 degrees F. The temperature discrepancy is small enough so that it would not have an effect on the system or other environmentally qualified plant components. However, the analysis determined that after approximately seven days (following boiling) the SGTS would be degraded and/or inoperable due to the passing of water from the recirculation system into the SGTS air ducts (Exhibit 6, pp. 3 and 4).

On March 7, 1994, NRR requested that PP&L provide the NRC with analyses to show the effect of actual temperatures and humidity on the SGTS during an event where the station would incur two boiling SFPs. PP&L provided the results of this analysis in a letter dated May 4, 1994. A preliminary review of this analysis determined that inlet air stream temperatures through the SGTS air ducts would be 186 degree F. and the spill over effect of water from the recirculation system into the SGTS air ducts would render the SGTS inoperable at 17 hours following boiling (Exhibit 6, p. 4).

On page 76 of the July 8, 1993, NRC/PP&L meeting transcript (Exhibit 9), John WHITE, NRC Region I Branch Chief, asked MILLER, if "the duct-work and the stand-by gas treatment and the other HVAC system, is that sufficient to handle this increased condensation [resulting from a boiling SFP]."

MILLER's response was:

Yes. We've looked at the duct-work, and we believe that the point of condensation will be near the train itself, where there is an outside air connection, and the stand-by gas treatment system has a de-misting section on the heater section and a drain that will be able to accommodate the accumulation of moisture at that point. We've looked at that.

#### Interview of John R. WHITE

WHITE was interviewed by the reporting investigator on June 6, 1994 (Exhibit 10), and provided the following substantive information:

During the July 8, 1994, meeting, WHITE asked MILLER if the duct-work for the SGTS and the other heating, ventilating, and air conditioning (HVAC) systems could handle the increased condensation caused by a boiling SFP. WHITE's question was in the context of a boiling SFP/LOCA. MILLER's answer [as stated above] indicated to WHITE that PP&L had analyzed the condition presented by WHITE and condensation was not a problem (p. 1).



In 1994, WHITE learned from SHEA that NRR had reviewed PP&L analyses, supra., that concluded that the SSES SGTS would be degraded or fail due to the passing of water from the recirculation system to the SGTS air ducts (p. 2).

#### Interview of MILLER

MILLER was interviewed by the reporting investigator and RI Project Engineer Scott BARBER on September 22, 1994, at NRC RI in King of Prussia, Pennsylvania (Exhibit 11). In substance, he provided the following information:

MILLER was aware that in 1992 SSES Engineering had recommended replacing the 160-65 degree F. fusible links, located in the SGTS's duct-work, with links rated for higher temperatures (pp. 23, 31, and 32). He also noted that SSES did not take any credit for the SGTS in their Final Safety Analysis Report (FSAR) because, even without stand-by gas treatment, off-site doses would be acceptably low (p. 35). On July 8, 1993 (during the PP&L presentation to the NRC), MILLER did not know whether or not the fusible links had been replaced (p. 43). At some point subsequent to the recommendation to replace the fusible links in 1992, it's MILLER's belief that PP&L informed the NRC of PP&L's intention to replace the links (pp. 40 and 41). In any event, his response to the NRC regarding the 180 degree F. design capability of the SGTS was in reference to the SGTS train (separators, heaters, filters, fans, etc.), not the duct-work (p. 40), which MILLER termed as a "supporting system" (p. 44) that was discussed separately during the July 8th meeting (p. 42). (Also, see July 8, 1993, meeting transcript, Exhibit 9, pp. 69-71.)

MILLER's statement concerning the effects of condensation on the SGTS duct-work was based on documented engineering judgement contained in PP&L's evaluation of [REDACTED] and [REDACTED] Engineering Deficiency Report (EDR G20020). In July 1993, he did not have benefit of the comprehensive evaluations that were completed by PP&L in late 1993 and 1994 (referred to by WHITE, supra.) which concluded that the SGTS duct-work would fail due to water passing from the recirculation system into the duct-work. In July 1993, PP&L believed that the build-up of water would be near the SGTS train, not the duct-work. They did not have a sophisticated computer model or analysis completed at that point in time (Exhibit 11, pp. 73-93). 7C

#### Coordination with NRC Staff

On January 19, 1995, Barry R. Letts, Field Office Director, OI:RI, met with William KANE, Deputy Regional Administrator, NRC:RI, to discuss OI case inventory. During a discussion of case priorities, this investigation was changed from a "high" to a "normal" priority. This priority was confirmed in a conversation between Letts, KANE, and Thomas T. MARTIN, RI Regional Administrator, on January 31, 1995.

On August 18, 1995, during the monthly prioritization meeting, Letts met with MARTIN, RI Regional Administrator, to discuss case priorities. MARTIN again categorized this matter as a "normal" case priority, based on the technical staff's assessment of the safety significance of the underlying technical issue.

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Based on determinations that this investigation is of "normal" priority, higher priority cases take precedence and this case is being closed. If, at a future date, information is developed which raises the priority of this case, OI:RI will re-evaluate the matter.

LIST OF EXHIBITS

<u>Exhibit No.</u>	<u>Description</u>
1	Notification of Investigation, dated July 26, 1994.
2	Letter, (b)(7)(C) and (b)(7)(D) to RI Regional Administrator, dated November 27, 1992.
3	NRC Request for Additional Information (RAI) to PP&L, dated February 18, 1993.
4	PP&L's response to RAI, dated May 24, 1993.
5	Letter, (b)(7)(C) and (b)(7)(D) to NRR, dated November 7, 1993.
6	Report of Interview (SHEA), dated May 18, 1984.
7	Excerpt (pp. 73-125) from interview with (b)(7)(C) and (b)(7)(D) dated November 23, 1993.
8	Report of Interview with THADANI, dated July 13, 1994.
9	Transcript of meeting (NRC and PP&L), dated July 8, 1993.
10	Report of Interview with WHITE, dated June 6, 1994.
11	Interview Transcript of MILLER, dated September 22, 1994.

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