INTERIM REPORT

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Author(s):	R.E. Hall and E.A. MacDougall
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Responsible NRC Individual and NRC Office or Division:	Mr. R.L. Ferguson Plant Systems Branch U.S. Nuclear Regulatory Commission Washington, D.C. 20555

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U.S. Department of Energy

Prepared for
U.S. Nuclear Regulatory Commission
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INTERIM REPORT

NRC Research and Technical Assistance Report

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Department of Nuclear Energy (516) 345- 2362

June 5, 1979

Division of Operating Reactors
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Attention: Mr. Robert L. Ferguson
Plant Systems Branch

Dear Bob:

Subject: Fire Protection in Operating Nuclear Power Stations
Calvert Cliffs Units 1 and 2 Safety Evaluation Report Review

The Safety Evaluation Report, as developed jointly by the NRC staff and Brookhaven National Laboratory, (BNL), adequately reflects the concerns and recommendations of the consultants. Throughout the reevaluation of Calvert Cliffs there has been general agreement between the NRC staff and the BNL consultants. Based on present data, the proposed fire protection, as set forth in the SER, will give reasonable assurance that the health and safety of the public is not endangered. The following exception represents a differing engineering point of view that should be evaluated by the NRC staff.

Valve Supervision

SER item 4.3.1.3 indicates that, subject to implementation of several modifications, post indicator valves on the underground loop main and sectional valves inside the plant will be locked open and checked monthly. The success of valve position control programs depends on ongoing administrative controls that are subject to human failure. Analysis of data from a Factory Mutual System study indicates that valves which are not electrically supervised are 5 or 6 times more likely to be found closed (when they should be open) than those valves which are electrically supervised. It is recommended that electrical supervision be extended to all sectional valves and post indicator valves in the fire protection water system.

The preceding statement is based on a detailed reevaluation of the fire protection program as implemented by the Baltimore Gas and Electric Company (BG&E) at the Calvert Cliffs Nuclear Power Station. The analysis covered a review of the fire prevention, detection and suppression capabilities of the plant as interfaced with the nuclear systems requirements. This was

accomplished by utilizing a review team concept with members from Brookhaven National Laboratory and the Nuclear Regulatory Commission Division of Operating Reactors staff.

The fire protection evaluation for this plant is based on an analysis of documents submitted by BG&E to the NRC and a site visit. The site visit was conducted by Mr. T. Lee and Mr. M. Virgillio, of the NRC, Mr. E. MacDougall of BNL, Mr. J. Klevan of Rolf Jensen and Associates under contract to BNL, and Mr. J. Townley, consultant to BNL. Mr. Townley was under contract to Brookhaven National Laboratory to review the manual fire fighting capabilities of the station along with administrative controls.

Milestone Dates

1. On March 15, 1977, Baltimore Gas & Electric Company provided their "Fire Protection Program Evaluation" in response to NRC requests of May 11 and September 30, 1976.

2. By letter of August 30, 1978, Baltimore Gas and Electric Company was provided NRC requests for additional information and staff positions pertaining to fire protection at Calvert Cliffs, Units 1 and 2 facilities.

3. On September 13, 1978, BG&E requested the Review Team's site visit for fire protection which was scheduled for September 18-22, 1978 be postponed because it coincided with the Unit 2 refueling outage. The visit was subsequently rescheduled for the week of November 27, 1978.

4. On October 4, 1978, the Review Team made a one-day visit to observe the fire protection features inside Calvert Cliffs, Unit 2 containment. The consultant member of the Review Team had not previously completed an eight-hour radiation protection course and was unable to enter the containment.

5. On October 20, 1978, BG&E provided a submittal responding to NRC requests for additional information and positions identified in NRC's letter of August 30, 1978.

6. On November 27 - December 1, 1978 the Review Team visited the Calvert Cliffs, Units 1 and 2 facilities. On December 1, 1978 a meeting was held at the Calvert Cliffs facility at which the Review Team identified the positions it was taking as a result of the site observation.

7. On December 21, 1978 a meeting was held in Bethesda, Maryland to discuss control and instrumentation cables used in the Calvert Cliffs facility.

8. By NRC interoffice memorandum of January 18, 1979, staff positions on Calvert Cliffs' fire protection, which were provided to the licensee at the meeting on December 1, 1978, were forwarded to ORPM/DOR with the request for official transmittal to Baltimore Gas and Electric Company.

9. By NRC interoffice memorandum of February 28, 1979, staff positions P-8 and P-14 were revised per ORPM's request to include detailed discussion of the Review Team's evaluation of pertinent information submitted to date.

10. By NRC letter of March 9, 1979 BG&E was provided with staff positions which had been discussed on December 1, 1978 during the site visit exit meeting and was requested to respond within 30 days.

11. On April 19, 1978 BG&E provided a submittal in response to the NRC letter of March 19, 1979.

12. On May 15, 1979 the draft Safety Evaluation Report was transmitted from the Chief, Plant Systems Branch to the Chief, Operating Reactors Branch #4.

Review Documents

1. NRC Branch Technical Position APCSB 9.5-1, Appendix A, dated August 23, 1976.

2. Calvert Cliffs Nuclear Power Plant Units 1 and 2 Fire Protection Program Evaluation dated March 15, 1977.

3. Baltimore Gas and Electric Company responses of October 20, 1978 and April 19, 1979 to NRC positions and requests for additional information.

4. Various engineering drawings and other documents provided informally by Baltimore Gas and Electric Company.

5. May 15, 1979 draft Safety Evaluation Report.

The Calvert Cliffs review has been conducted under the direction of Mr. E.A. MacDougall and myself of Reactor Engineering Analysis Group at BNL.

We have reviewed the analyses submitted by the licensee and have visited the facility to examine the relationship of safety-related components, systems and structures with both combustibles and the associated fire detection and suppression systems. Our review has been limited to the aspects of fire protection related to the protection of the public from the standpoint of radiological health and safety. We have not considered aspects of fire protection associated with life safety of onsite personnel and with property protection, unless they impact the health and safety of the public due to the release of radioactive material. The proposed modifications represent a significant increase in the level of protection against serious fire associated hazards.

Sincerely yours,

Robert E. Hall

Robert E. Hall, Group Leader
Reactor Engineering Analysis

EAM:sd

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