



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

JUL 3 1985

Docket No.: 50-412

APPLICANT: Duquesne Light Company
FACILITY: Beaver Valley Power Station, Unit 2
SUBJECT: DIRECTOR, DIVISION OF LICENSING, DECISION ON THE APPEAL OF
THE REQUIREMENTS ON FIRE SUPPRESSION IN THE CABLE SPREADING ROOM

I. Introduction

a. Background on this Backfit Appeal Issue

In the draft Safety Evaluation Report (SER) for Beaver Valley Power Station 2 (BVPS-2) dated February 23, 1984, the staff had informed Duquesne Light Company (DLC) that the automatic, total flooding, carbon dioxide (CO₂) primary fire suppression system in the cable spreading room with backup permanent hose stations did not conform to the Standard Review Plan (SRP). After reviewing the draft SER, the applicant, in their letter to the NRC dated May 30, 1984, identified the staff's requirements on fire suppression in the cable spreading room as a backfit referencing NRC Manual Chapter 0514 (0514) issued as Generic Letter 84-08 dated April 4, 1984. DLC requested that the staff requirements be submitted to NRC management for review.

On June 18, 1984, the Assistant Director of Licensing (ADL) met with DLC to discuss the status of significant licensing issues, and on September 19, 1984, the NRC sent a letter to DLC to establish an appeal meeting on fire suppression in the BVPS-2 cable spreading room. An appeal meeting was established for September 26, 1984, but due to misunderstanding of the approach to be used at the meeting, the parties were unsuccessful in holding an appeal meeting. By telephone on October 1, 1984, the ADL discussed with DLC the procedure for future appeal meetings in order to closely follow the procedures of 0514, and a follow-up meeting was held with DLC on October 5, 1984 to further discuss backfit and appeal procedures.

By letter dated November 6, 1984, the ADL provided information to the applicant on requirements and safety significance for nine backfit items including fire suppression in the cable spreading room. By letter dated November 20, 1984, DLC requested further clarification of the ADL information. Clarification was provided by the ADL on January 10, 1985. On February 13, 1985, the applicant documented their final position on fire suppression in the BVPS-2

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cable spreading room and requested that a backfit appeal meeting be held in accordance with 0514. The first stage backfit appeal meeting was held on February 28, 1985.* As a result of this appeal meeting, the Director, Division of Licensing decided a site visit was necessary to obtain first hand information to complement the information provided in the appeal meeting. The site visit was made on March 13, 1985.

II. Decision

a. Procedural Requirements

On March 10, 1982, the Commission approved the final rule, 10 CFR Part 50.34(g), "Conformance with the Standard Review Plan (SRP)". This rule requires applicants, whose applications were docketed after May 17, 1982, to identify and describe "all differences in design features, analytical techniques and procedural measures proposed for a facility and those corresponding features, techniques and measures given in the SRP acceptance criteria. Where such a difference exists, the evaluation shall discuss how the alternative proposal provides an acceptable method of complying with those rules or regulations of Commission, or portion thereof, that underlie the corresponding SRP acceptance criteria." Since BVPS-2 was docketed May 18, 1983, the rule applies to BVPS-2. The applicant and staff at the February 28, 1984 backfit appeal meeting agreed that this requirement applied to BVPS-2.

In the case of this fire suppression in the cable spreading room issue, the staff expected DLC to address the procedural requirements of the rule by providing the justification for their deviation from the SRP. DLC's position as stated in their May 30, 1984 letter to the NRC, was that the fire suppression system in BVPS-2's cable spreading room conforms to the SRP therefore, there is no deviation, hence, no justification is required.

The lack of understanding of what was required was due to the difference in interpretation of the SRP. The staff stated that automatic water system should be utilized (also the use of foam is acceptable) as the primary suppression and anything but water (or foam) required a justification for the deviation. DLC position was that gas systems were included in the SRP because the SRP mentions the need to compensate for losses through drains when gas systems were installed and that gas systems had been accepted by the staff at numerous operating reactors.

* According to 0514, the first stage of appeal would be held by the Division of Licensing at the Assistant Director's level, followed by Director, Division of Licensing, for a second stage of appeal if needed. The Director, Office of Nuclear Reactor Regulation, directed that the first stage of the BVPS-2 backfit appeal shall be held at the Division Director's level so that the appeal process would be moved immediately to a higher NRR management level and would eliminate one level of NRR appeal.

A decision is required on which is the better interpretation in order to decide whether or not a deviation from the SRP exists.

Based on the staff presentation in the February 28, 1985 appeal meeting, the past practices in staff reviews and considering the fact that the SRP is a staff document developed to ensure uniformity of staff safety reviews, I am persuaded that the better interpretation of the SRP is that utilization of only a gas system a deviation from the SRP. Therefore, a justification for the deviation must be provided. For BVPS-2 those items that required justification are as follows:

1. In the BVPS-2 cable spreading room, deviation from the SRP by using automatic gaseous fire suppression as the primary system versus automatic water suppression.
2. In the BVPS-2 cable spreading room, the deviation from the SRP 3 foot by 8 foot access criteria in certain locations. For example, there are areas where movement in passageways is partially blocked by horizontal girders, where low overhead areas require an individual to stoop in order to continue forward and where aisles between cable trays require care to avoid snagging fire fighting equipment on structural protusions.

The information in DLC's February 13, 1985 submittal, the information provided in the transcribed backfit appeal meeting of February 28, 1985 along with the first hand information I obtained from the March 13, 1985 site visit have provided the information needed to satisfy the 10 CFR 50.34(g) procedural requirement. The acceptability of the DLC justification is addressed in the next section.

b. Technical Requirements

The staff's position is that, in accordance with Section 9.5.1 of the SRP, primary fire suppression in the cable spreading room should be an automatic water system. The staff noted that there are reasons why and how water became the agent for primary fire suppression.

These reasons have developed from lesssons learned from experiences on other fires, for example, the Browns Ferry fire. These experiences have identified CO₂ asphyxiation and toxicity concerns, reduced CO₂ availability concerns (system may need to be shut off while people are working in areas where a CO₂ system has been installed) and that CO₂ maybe somewhat less reliable than sprinklers because it does not remove too much heat.

DLC's position, as documented in the transcribed minutes of the February 28, 1985 appeal meeting, is:

"that the primary fire suppression for the cable spreading room is an automatic total flooding CO₂ system with hose stations and fire brigade as the backup to the CO₂ system.

* SRP Section C.7.c. states "the primary fire suppression in the cable spreading room should be an automatic water system,... When gas systems are installed, drains should have adequate seals or the gas extinguishing systems should be sized to compensate for losses through the drains."

DLC believes that the CO₂ system with the hose stations as backup provides an equivalent level of safety for the specific conditions of the Beaver Valley 2 cable spreading room.

The level of safety is achieved by the defense-in-depth approach. More specifically, DLC has an alternate shutdown capability totally separated and electrically independent from the cable spreading room, and this alternate shutdown system can bring the plant to a safe shutdown condition. The CO₂ system and its backup hose stations are all designed to meet NFPA codes.

And, finally, Duquesne Light contends that it has adequate access and fire fighting conditions in the cable spreading room to extinguish any fire hazard in that room."

Based on my review of the applicant's February 13, 1984 letter, from information presented in the February 28, 1985 backfit appeal meeting on fire suppression in the cable spreading room, from first hand information I gathered in the March 13, 1985 site visit and from information available to me in technical reports, I note the following factors which formed the basis for my decision.

1. The National Fire Protection Association Code-12 (NFPA-12) recognizes and recommends the use of total flooding CO₂ systems, similar to the type being used in BVPS-2, for suppressing cable insulation fires. It should be noted that the National Fire Protection Association Code is a nationally recognized standard accepted by the NRC. Members of the Association are from industry, government and testing laboratories.
2. BVPS-2 has a backup manual fire fighting capability with hose stations and a trained fire brigade.
3. Cable fire tests run by Sandia and reported in NUREG CR/3656 showed that CO₂ was an adequate suppression agent in extinguishing cable fires.
4. The BVPS-2 cable spreading room area is separated by fire rated barriers from the rest of the plant and will contain a total burnout of insitu combustibles (FSAR, Amendment 2, Table 1).
5. For any fire in the cable spreading area, safe shutdown should not be affected because alternative shutdown capability is available independent of the cable spreading area (FSAR).
6. Early warning detection is provided to alert the fire brigade (FSAR).

7. The northwest corner of the cable spreading room has a very dense concentration of cable trays and direct access to this area by the fire brigade is limited.
8. On my site visit of March 13, 1985, I observed two exercises in which fire fighters managed to go through the most difficult passageways in the cable spreading room. The fire fighters were fully equipped in their appropriate gear and on one of the two exercises their face masks were darkened simulate a blackout due to heavy smoke. With face masks darkened, the fire fighters relied extensively on the human factor considerations for accessibility under these more demanding conditions.

III. Conclusion

Upon reviewing the information presented by the staff and DLC, I have concluded that the automatic total flooding CO₂ system with hose stations and fire brigade as the backup to the CO₂ system is adequate except as listed below. Furthermore, the fire protection program in the BVPS-2 cable spreading room has in general, adequate defense-in-depth.

Also, I conclude that personnel accessibility in the BVPS-2 cable spreading room, although clearly not close to being ideal, was demonstrated for the existing passageways. However, in order to provide for reasonable assurance that adequate accessibility exists for passageways during periods of limited visibility, DLC should implement the recommendations provided by DLC's Human Factors expert in their letter to the NRC dated April 25, 1985. Furthermore, the temporary ramps and platforms needed to facilitate passage should be replaced with permanent installations that are of sufficient size and design to allow safe passage of the fire fighter. Training of the fire brigade should include walkthroughs in full equipment with anticipated conditions of limited visibility, impaired communications and high temperature. Simulation of these conditions either in the cable spreading room or at a fire training facility would be acceptable.

Based upon first hand information from the March 13, 1985 site visit and the information provided by the NRR and DLC staff, I do not conclude there is reasonable assurance of hose stream access into the dense concentration of cable trays in the northwest corner of the cable spreading room. Therefore, I consider this a deviation from the SRP and a justification acceptable to the staff is required.

IV. Appeals

Decisions made herein may be appealed to the Director, Office of Nuclear
*Reactor Regulation.

Distribution

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