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February 13, 1985

United States Nuclear Regulatory Commission
Washington, DC 20555

ATTENTION: Mr. Darrell G. Eisenhut, Director
Division of Licensing
Office of Nuclear Reactor Regulation

SUBJECT: Beaver Valley Power Station - Unit No. 2
Docket No. 50-412
GNLR 84-08 Appeal Meeting Request and Position Statement on the Issue of Fire Suppression in the Cable Spreading Room

Gentlemen:

This letter is in response to the NRC letter dated January 10, 1985 (G. W. Knighton to E. J. Woolever). In that letter, the NRC staff amplified on the backfit requiring that a fixed water backup fire suppression system be added to the Beaver Valley Power Station Unit No. 2 cable spreading room. The previous staff position was provided in a November 6, 1984, letter from T. M. Novak to E. J. Woolever. The Duquesne Light Company (DLC) response to the November 6 letter was provided by DLC letter 2NRC-4-195, dated November 20, 1984.

DLC proposes that the first appeal of this issue be scheduled during the week of February 25 to March 1, 1985.

The NRR procedure for management of plant specific backfitting specifies that the appeal meeting agenda be developed from the staff and licensee positions be distributed prior to any meeting. An outline of DLC's position on this issue is attached to facilitate the Project Manager's development of such.

DUQUESNE LIGHT COMPANY

By E. J. Woolever
E. J. Woolever
Vice President

RW/wjs
Attachment

cc: Mr. S. Chesnut, Technical Assistant (w/attachment)
Mr. M. Clausen, Technical Assistant "
Mr. H. Denton, Director NRR "
Mr. T. Novak, Assistant Director "
Mr. B. K. Singh, Project Manager "
Mr. V. Stello, DEDROGER "
Mr. J. Tourtellotte, Chairman RRTF "
Mr. G. Walton, NRC Resident Inspector "

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ISSUE: Fire Suppression in the Cable Spreading Room

BACKFIT ISSUE NO.: L-84-10

DLC BACKFIT NO.: 17

05/30/84 Backfit Identified	01/10/85 NRC Rqmnts Letter	02/13/85 Appeal Filed	02/13/85 Position Statement Submitted	Meeting Agenda Issued	First Appeal Meeting	Minutes & Decision Issued	Second Appeal Requested	Meeting Agenda Issued	Second Appeal Meeting	Minutes & Decision Issued	Formal Appeal Request to Dir, NRR

	NRC POSITION	DLC POSITION	COMMENTS
PROPOSED REQUIREMENTS	I. Proposed Requirements The applicable Standard Review Plan (NUREG-0800) Section 9.5.1, paragraph II.2 identifies an acceptable level of safety for fire protection that will meet the requirements of §50.48, GDC 3 and 5. In order to meet these requirements, the following specific criteria have to be met: Branch Technical Position (BTP) CMEB 9.5-1 as it relates to the design provisions given to implement the fire protection program. The BTP CMEB 9.5-1 at paragraph C.7.c (page 9.5.1-45) states: "C. Cable Spreading Room The primary fire suppression in the cable spreading room should be an automatic water system such as closed-head sprinklers, open-head deluge system, or open directional 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." To meet the BTP CMEB 9.5-1 guidelines, a fixed water suppression system should be installed to backup the present gas suppression system. NRC Comments The purpose of fire protection in a nuclear plant is to minimize the adverse effects of fires on structures, systems, and components important to safety. The cable spreading room at Beaver Valley 2 contains such systems. The Beaver Valley 2 cable spreading room provides only partial separation between the two safety trains. The area in common contains a concentration of vertical cable trays and is located at the farthest distance from the access doors for manual fire fighting. Safety train switchgear is also located in the same fire zone but is physically located away from the vertical cable tray area. The DLC proposed fire suppression system for the cable spreading room is a gaseous CO_2 system. As a result of the Browns Ferry fire in 1975 guidelines were developed by the NRC with consultation by the industry and approved by the NRC's Regulatory Requirements Review Committee (R^{2}C) which specified that primary fire suppression should be an automatic water system or that if gaseous systems were the primary suppression that they must be backed up with an installed water spray system and hose stations and portable extinguishers immediately outside of the room." "Appendix A to BTP APCSB 9.5-1, dated August 23, 1976, as approved by R^{2}C states (page 37): "The primary fire suppression in the cable spreading room should be an automatic water system such as closed-head sprinklers, open-head deluge, or open directional spray nozzles..." "Alternately, gas systems (Halon or CO_2) may be used for primary suppression if they are backed up by an installed water spray system and hose stations and portable extinguishers immediately outside the room and if the access requirements stated above are met."	BTP CMEB 9.5-1 is guidance rather than regulation. Manual hose stations provide backup water suppression capability in the BVPS-2 cable spreading room. The guidance of Regulatory Guide 1.75, Rev. 2, and IEEE 384-1974 have been used to establish cable separation in the BV-2 cable spreading room. In the unlikely event of extensive fire damage to the cable spreading room, the Alternate Shutdown Panel provides full safe shutdown capability.	BTP CMEB 9.5-1 does address gas suppression systems, however, it does not state that fixed water backup is required. Appendix A to BTP ACSB 9.5-1 was deleted by BTP CMEB 9.5-1, Rev. 2 (July 1981). The revision states that the guidance of Appendix A had been incorporated into CMEB 9.5-1.

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PROPOSED REQUIREMENTS	**DLC Comment** None of the regulations pertaining to fire protection for nuclear power plants specify the suppression mediums to be used. **NRC Response** True. However, the regulations reference the documents that recommend the suppression for cable spreading rooms. §50.48 Footnote 3 states that basic guidance is contained in the aforementioned Appendix A to BTP APCSB 9.5-1. As part of the Commission's consideration of a fire protection rule for future plants (SECY 80-546/SECY 81-114), the Commission agreed that until a rule is in place, new licenses (those issued after January 1, 1979) should contain a condition requiring compliance with the commitments made by an applicant and agreed to by the staff. The Commission also agreed that deviations from our guidelines should be specifically identified and justified by the applicant and that such deviations should be specifically evaluated by the staff in the SER. In the instant case, justification for the lack of a water system in the cable spreading room has not been provided by the applicant.	DLC has provided an evaluation comparing BVPS-2 to the acceptance criteria of BTP CMEB 9.5-1, as required by 10CFR50.34(g).	
	DLC Comment Although the BTP 9.5-1 paragraph cited in the November 6, 1984, NRC letter expressed a preference for water, other parts of the same BTP address design considerations for gas suppression sytems used in cable spreading rooms. **NRC Response** The NRC guidelines for the cable spreading room do not prohibit the use of gas systems. They only recommend a backup water system if the licensee prefers to use a gas as the primary suppression medium. **DLC Comment** At least 14 operating plants along with several NTOL's use gas systems as the primary fire suppression systems in cable spreading rooms. Since these plants have not been required to obtain exemptions to Title 10, DLC must conclude that water suppression is not required by existing regulations. **NRC Response** In some operating plants constructed and licensed prior to January 1979, the existing configuration of the cable spreading room, in spite of a lack of a fixed water suppression system was deemed acceptable for a variety of reasons, e.g., cost effectiveness, adverse impact of inadvertent operation due to the presence of switchgear or other electrical equipment, application of fire retardant measures to cables. However, most of the 34 plants licensed after January 1, 1979 or to be licensed have provided a water suppression system, either primary or backup, in the cable spreading room. The plants which have not provided a water suppression system together with their acceptable deviations are: Plant — Justification Byron 1 & 2 — Improved divisional separation Catawba — Armored cable Diablo Canyon 1 & 2 — Electrical equipment present McGuire 1 & 2 — Armored cable Shoreham — Electrical equipment present	DLC's confidence in the combination of automatic fire detection, CO_2 Suppression, and manual hose application of water is consistent with NUREG-0675 supplement 23 (Diablo Canyon SER) dated June 1984. The NRC staff evaluation of an exemption request for a non-rated steel hatch states: "Nevertheless, the cable spreading room is equipped with an automatic fire detection and carbon dioxide fire suppression system. Therefore, there is reasonable assurance that if a fire should occur, it would be detected early and extinguished manually by the fire brigade or automatically by the carbon dioxide system before serious damage occurred."	More than 20 operating plants and several NTOL's use gas suppression systems without fixed water backup.

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PROPOSED REQUIREMENTS	DLC Comment The SRP identifies an acceptable means for meeting the requirements which underlie the SRP. However, 10 CFR 50.34(g) states, "The SRP is not substitute for the regulations, and compliance is not a requirement." NRC Response We agree, however, 10 CFR 50.34(g) requires applicants to identify differences from the SRP acceptance criteria and evaluate how the proposed alternatives to the SRP criteria provide an acceptable method for complying with the Commission's regulations (i.e., 10 CFR 50.48): "(g) Conformance with the Standard Review Plan (SRP). (1)(i) Applications for light water cooled nuclear power plant operating licenses docketed after May 17, 1982 shall include an evaluation of the facility against the Standard Review Plan (SRP) in effect on May 17, 1982 or the SRP revision in effect six months prior to the docket date of the application, whichever is later. (ii) Applications for light water cooled nuclear power plant construction permits, manufacturing licenses, and preliminary or final design approvals for standard plants docketed after May 17, 1982 shall include an evaluation of the facility against the SRP in effect on May 17, 1982 or the SRP revision in effect six months prior to the docket date of the application, whichever is later. (2) The evaluation required by this section shall include an identification and description of 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 proposed provides an acceptable method of complying with those rules or regulations of Commission, or portions thereof, that underlie the corresponding SRP acceptance criteria. (3) The SRP was issued to establish criteria that the NRC staff intends to use in evaluating whether an applicant/licensee meets the Commission's regulations. The SRP is not a substitute for the regulations, and compliance is not a requirement. Applicants shall identify differences from the SRP accepance criteria and evaluate how the proposed alternatives to the SRP criteria provide an acceptable method of complying with the Commission's regulations."		As previously noted, DLC provided the required 10CFR50.34(g) evaluation.

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PROPOSED REQUIREMENTS	DLC Comment It appears that the NRC staff may intend to elevate the status of SRP 9.5-1 and BTP 9.5-1, which it incorporates by reference, to the level of a requirement. 10 CFR 50.34(g) states that compliance with the SRP is not a requirement. NRC Response The staff does not intend to elevate the BTP 9.5-1 to the level of a requirement. However, the Commission has stated that the "essential elements" for acceptable fire protection programs are defined, in part, in Appendix A to BTP 9.5-1: "Because of these facts, the Commission approved on April 23, 1980[14] a proposed rule concerning fire protection. This proposed rule and its Appendix R have been developed to establish the minimum acceptable fire protection requirements necessary to resolve these contested areas of concern for nuclear power plants operating prior to January 1, 1979.[15] Other fire protection criteria that have been used by the staff during its plant-specific fire protection program reviews are contained in Appendix A to BTP 9.5-1. The combination of the guidance contained in Appendix A to BTP 9.5-1 and the requirements set forth in this proposed rule define the essential elements for an acceptable fire protection program at nuclear power plants docketed for Construction Permit prior to July 1, 1976, for demonstration of compliance with General Design Criterion 3 of Appendix A to 10 CFR Part 50. Similar acceptable guidance is provided in BTP 9.5-1 for nuclear power plants docketed for Construction Permit after July 1, 1976." (Memorandum and Order CLI-80-21 In the matter of Petition for Emergency and Remedial Action, May 23, 1980)		As previously stated, Appendix A to BTP APCSB 9.5-1 was deleted by BTP CMEB 9.5-1.

[14] This rule is scheduled for publication in the Federal Register on May 29, 1980.

[15] Commissioner Kennedy and Hendrie agreed with the fire protection safety provisions of the proposed Appendix R to 10 CFR Part 50, but disagreed with the implementation schedule proposed by the Commission. A statement of Commissioners Kennedy and Hendrie separate views in this regard is attached.

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HOW PROPOSED REQUIREMENT WOULD IMPROVE SAFETY	II. How the Proposed Requirements would Improve Safety The design scenario for a CO_2 system consists of prompt detection and extinguishment of a fire. However, the "actual" scenario may be considerably different. For example, (1) CO_2 systems are subject to impairment when workers are in the room for prolonged periods, and failure of personnel to reactivate the automatic portions of the system can lead to the CO_2 system being impaired for a considerable time, (2) if considerable heat is produced before the CO_2 system discharges, this heat may cause additional short circuits during the soak time. That may result in unreviewed transients, (3) if fire doors are not properly latched, pressure buildup due in the room due to the CO_2 discharge in the room may open the doors and dissipate the supply of CO_2, (4) if fire dampers fail to close the CO_2 concentration may not be maintained, CO_2 and combustion products may be transported to other areas. In the event the CO_2 system does not promptly extinguish the fire, water would be applied by the fire brigade using fire hoses. Because of the large fire loading and congestion, we deem this task to be difficult and uncertain. There are several vertical cable trays near the floor level which lead to rapid fire propagation and the production of considerable smoke. The smoke and congested configuration of cable trays would make manual fire fighting difficult. Therefore, a fixed water backup suppression system should be provided to reduce this uncertainty and provide reasonable assurance that the fire will be suppressed promptly even if the CO_2 design "scenario" is not achieved. DLC Comment DLC does not consider the selection of CO_2 to be a weak link in the defense-in-depth chain. Both water and CO_2 have design requirements which must be considered in the suppression system design. The staff has chosen to label their design requirements as limitations. Water suppression systems have their own set of design requirements which can also be labeled as limitations. BVPS-2 uses covered cable trays and has electrical switchgear located in the fire area in which the cable spreading room is located. NRC Response Fire in the cable spreading room may damage cable from both safety trains which are normally used to shutdown the reactor and maintain it in a safe shutdown condition. A significant fire may generate large amounts of heat and smoke that may, in addition, damage building structures, affect adjacent areas, and produce unreviewed transient conditions. The alternate shutdown capability provided for the cable spreading room is a minimum capability. Thus, the operating staff is challenged to cope with fire induced spurious signals and their resulting plant transients while achieving and maintaing stable hot shutdown conditions. As the fire progresses, transients that cannot be controlled by the operator., may occur. Therefore, because the alternate shutdown capability for the cable spreading room has limited capability, it is essential that there is reasonable assurance that a cable spreading room fire can be extinguished promptly. The ability of CO_2 to accomplish this action depends on maintaining a certain concentration of CO_2 in the cable spreading room for a period of time necessary to terminate the fire and prevent reignition using a limited supply of CO_2. DLC has not provided justification that: (1) there is no benefit to the backup water system or (2) there is an adverse impact to a backup water system. DLC has not yet submitted information on the extent to which cable trays will be covered but has indicated informally that not all cable trays will be covered. They presently plan to use manual hose streams to fight a fire in the room if the CO_2 system is inadequate to control the fire. Therefore, protection of the switchgear from this less discriminate use of water must be considered. The staff believes that a fixed backup water suppression system installed in the largest area of the cable spreading room away from the electrical switchgear will provide better protection to the switchgear than manually applied water.	DLC is committed to a spurious signals analysis which will identify the potential for safety degradation due to short circuits as a result of fire. Potential problems identified by this analysis will be rectified. The spring loaded door design ensures adequate sealing. The fire dampers fail shut on completion of CO_2 discharge. The 3 hr. structure, together with a combustible loading of less than 3 hrs., provided assurance that adjacent areas will not be adversely affected. Even assuming extensive fire damage to the cable spreading room, the alternate shutdown panel provides all capability required to safely shut down BV-2. A second application of CO_2 is available with a capacity equal to the first application. Although a percent coverage figure is not currently available, BV-2 has developed, and is refining as required, design criteria for the selection/placement of cable tray covers as required for separation. Even partial coverage of trays, greatly reduces the effectiveness of a fixed water system when compared to CO_2. A smaller volume of water, applied only to the area of the fire, is less threatening to switchgear than a much larger volume applied through the fire area.	The BV-2 fire protection plan includes: administrative control of CO_2 lockout, posting of a fire watch responsible for lockout and restoration of CO_2, and control room indication of lockout of CO_2. Training will be conducted in the cable spreading room to ensure that fire brigade members are familiar with layout and methods of approach to fires in various areas of the room. The ability to maintain the required concentration/time will be demonstrated by test. Procedurally, the burden of proof is not on DLC to demonstrate that no possible benefit could result from installation of a fixed water system. Rather, the staff is required to justify the proposed requirement.

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RELATION OF NEW REQUIREMENT TO EXISTING REGULATORY POSITIONS	III. Relation of New Requirements to Existing Regulatory Positions The staff position is unchanged from regulatory positions which have existed since 1976. This application by the staff is consistent with the practices of the SRP and staff positions previously approved. Therefore, this is an exception from Chapter 0.14 per Section 046.	No specific comments, however, DLC does not concede that the staff position is established.	
SUGGESTED TIME FOR IMPLEMENTATION	IV. Suggested Time for Implementation DLC Comment DLC is unable to establish a position since no time has been proposed. NRC Response Section C.1.e of BTP CMEB 9.5-1 provides guidance on the implementation of the fire protection program: "(1) The fire protection program (plans, personnel, and equipment) for buildings storing new reactor fuel and for adjacent fire areas that could affect the fuel storage area should be fully operational before fuel is received at the site. Such adjacent areas include those whose flames, hot gases, and fire-generated toxic and corrosive products may jeopardize safety and surveillance of the stored fuel. (2) The fire protection progam for an entire reactor unit should be fully operational prior to initial fuel loading in that reactor unit. (3) On reactor sites where there is an operating reactor and construction or modification of other units is under way, the fire protection program should provide for continuing evaluation of fire hazards. Additional fire barriers, fire protection capability, and administrative controls should be provided as necessary to protect the operating unit "rom construction fire hazards." Where good cause has been shown that certain modifications could not be implemented by fuel loading, licensing may proceed on the basis of compensatory measures acceptable to the staff for the time period between fuel load and the completion of the modification.	No comment.	