



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

NOV 26 1984

NOTE FOR: T. M. Novak, AD/Licensing, DL  
FROM: L. S. Rubenstein, AD/CPS, DSI  
SUBJECT: BEAVER VALLEY UNIT 2 APPEAL ISSUES -  
POWER SYSTEMS BRANCH  
REFERENCES: 1) Applicant list of appeal issues on Beaver Valley 2,  
Applicant's letter dated 11/8/84 to D. Eisenhower  
2) Memo from L. S. Rubenstein to T. M. Novak,  
"Beaver Valley Unit 2 Appeal Issues (Revision) -  
Power Systems Branch," dated October 30, 1984

The Power Systems Branch has reviewed the following appeal issues,  
listed on Reference 1, that come under their review responsibility:

1. Application of GDC 5 to Communication Systems
2. Application of GDC 2 and GDC 4 to Communication Systems
3. Application of GDC 4 to Lighting Systems
4. Illumination Levels in Excess of SRP Criteria
5. Application of R.G. 1.26 to Areas Excluded by R.G. 1.26

The enclosure provides the requested information on the above items. Please  
note that items 1, 2, and 3 relate to communication and lighting systems and  
were previously addressed as item 2 on the enclosure to reference 2.

L. S. Rubenstein,  
AD/CPS, DSI

Enclosure:  
As stated

cc: See Page 2

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NOV 26 1984

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ENCLOSURE

BEAVER VALLEY UNIT 2 APPEAL ISSUES  
POWER SYSTEMS BRANCH

1. Application of GDC 5 to Communication Systems

Code of Federal Regulations 10 CFR Part 50, Appendix A states in part "General Design Criteria establish minimum requirements for the principal design criteria for water cooled nuclear power plants" and "the principal design criteria establish the.....requirements for structures, systems and components important to safety; that is, structures, systems and components that provide reasonable assurance that the facility can be operated without undue risk to the health and safety of the public."

The applicant has stated that the communication systems at Beaver Valley 1 and 2 are shared (interconnected). Sharing of systems important to safety is covered by GDC 5, which states "Structures, systems and components important to safety shall not be shared among nuclear power units unless it can be shown that such sharing will not significantly impair their ability to perform their safety functions, including, in the event of an accident in one unit, an orderly shutdown and cooldown of the remaining units."

Standard Review Plan (SRP) 9.5.2 "Communication Systems" requires a capability of the system to provide effective intraplant communications and effective plant-to-offsite communications during normal plant operations and during transients, fire, and accident conditions, including loss of offsite power. The SRP further states "the communication system is acceptable if the integrated design of the system will provide effective communication between plant personnel in all vital areas during normal plant operation and during the full spectrum of accident or incident conditions (including fire) under maximum potential noise level."

Adequate communications must be provided in safety related areas to assure that the operator can perform necessary safety functions in both Units 1 and 2 for postulated event stated in GDC 5.

The applicant has not provided enough information in the FSAR or its amendment so that we can conclude that in the event of a failure in the shared part of the system he will have adequate communications to perform necessary safety functions in both Units 1 and 2 for postulated event stated in GDC 5.

Without adequate communications in necessary safety related areas under postultaed event in both Units 1 and 2, it cannot be concluded that the necessary safety functions can be adequately performed.

## 2. Application of GDC 2 and GDC 4 to Communication Systems

Code of Federal Regulations 10 CFR Part 50, Appendix A states in part "General Design Criteria establish minimum requirements for the principal design criteria for water cooled nuclear power plants" and "the principal design criteria establish the....requirements for structures, systems and components important to safety; that is, structures, systems and components that provide reasonable assurance that the facility can be operated without undue risk to the health and safety of the public."

GDC 2 states in part "Structures, systems, and components important to safety shall be designed to withstand the effects of natural phenomena...without loss of capability to perform their safety functions."

GDC 4 states in part "Structures, systems and components important to safety shall be designed to accommodate the effects of and to be compatible with the environmental conditions associated with normal operation, maintenance, testing and postulated accidents including loss-of-coolant accident."

Standard Review Plan (SRP) 9.5.2 "Communication Systems" requires a capability of the system to provide effective intraplant communications and effective plant-to-offsite communications during normal plant operations and during transients, fire, and accident conditions, including loss of offsite power. The SRP further states "the communication system is acceptable if the integrated design of the system will provide effective communication between plant personnel in all vital areas during normal plant operation and during the full spectrum of accident or incident conditions (including fire) under maximum potential noise level."

Adequate communications must be provided in safety related areas to assure that the operator can perform necessary safety functions for any given Design Basis Event (DBE).

The applicant has not provided enough information in the FSAR or its amendment so that we can conclude that he will have adequate communications to perform necessary safety functions for any given DBE.

Without adequate communications in safety related areas under any given DBE, it cannot be concluded that the necessary safety functions be adequately performed.

### 3. Application of GDC 4 to Lighting Systems

Code of Federal Regulations 10 CFR Part 50, Appendix A states in part "General Design Criteria establish minimum requirements for the principal design criteria for water cooled nuclear power plants" and "the principal design criteria establish the....requirements for structures, systems and components important to safety; that is, structures, systems and components that provide reasonable assurance that the facility can be operated without undue risk to the health and safety of the public."

GDC 4 states in part "Structures, systems and components important to safety shall be designed to accommodate the effects of an be compatible with the environmental conditions associated with normal operation, maintenance, testing and postulated accidents including loss-of-coolant accidents."

SRP 9.5.3 "Lighting Systems" requires the lighting systems to meet the following: "(1) a capability of the normal lighting system(s) to provide adequate lighting during all plant operating conditions, and (2) a capability of the emergency lighting system to provide adequate lighting during all plant operating conditions, including fire, transients and accident conditions, and the effect of loss-of-offsite power on the emergency lighting system."

Adequate lighting must be provided in safety related areas and access and egress areas to assure that the operator can perform necessary safety functions for any given Design Basis Event (DBE).

The applicant has not provided enough information in the FSAR or its amendment so that we can conclude that he will have adequate lighting to perform necessary safety functions for any given DBE.

Without adequate lighting in safety related areas under any given DBE, it cannot be concluded that the necessary safety functions can be adequately performed.

#### 4. Illumination Levels in Excess of SRP Criteria

SRP 9.5.3 "Lighting Systems" requires the lighting systems to meet the following: "(1) a capability of the normal lighting system(s) to provide adequate lighting during all plant operating conditions, and (2) a capability of the emergency lighting system to provide adequate lighting during all plant operating conditions, including fire, transients and accident conditions, and the effect of loss-of-offsite power on the emergency lighting system."

SRP 9.5.3 also states "the lighting systems designs will be acceptable if they conform to the Illuminating Engineering Society (IES) Lighting Handbook as related to systems design and illumination levels recommended for industrial facilities."

The applicant has applied the Emergency Lighting Section of the IES Handbook dealing only with escape routes, while the staff's concern is adequate illumination for operation in safety related areas and adequate illumination for safe access and egress routes to those areas.

Activity levels in safety related, access and egress areas defined by the applicant and appropriate illumination levels for these areas should be provided to conform with the IES Handbook.

Minimum illumination level for emergency operation of controls or equipment is given in Figure 2-2, of IES Handbook and minimum illumination levels for safety lighting is given in Figure 2-6 of the IES Handbook.

Adequate illumination levels must be provided in safety related areas and access and egress to these areas to enable operator to perform necessary safety functions for any given Design Basis Event (DBE).

The applicant has not provided enough information in the FSAR or its amendment so that we can conclude that he will have adequate illumination levels to perform necessary safety functions for any given DBE.

Without adequate illumination levels in necessary safety related areas under any given DBE, it cannot be concluded that the necessary safety functions can be adequately performed.



5. Application of R.G. 1.26 to Areas Excluded by R.G. 1.26

GDC 17 "Electric Power Systems" states in part "an onsite electric power system....shall be provided to permit functioning of structures, systems and components important to safety. The safety function.....shall be to provide sufficient capacity and capability to assure that (1) specified acceptable fuel design limits and design conditions of the reactor coolant pressure boundary are not exceeded as a result of anticipated operational occurrences, and (2) the core is cooled and containment integrity and other vital functions are maintained in the event of postulated accidents."

Regulatory Guide 1.26 "Quality Group Classifications and Standards for Water, Steam and Radioactive Waste-Containing Components of Nuclear Power Plants" excludes, among others, such systems as the diesel engines and generators, and auxiliary support systems, i.e., diesel fuel, starting air, lube oil, and air intake and exhaust systems. However, the diesel engine cooling water system is covered by this guide. These auxiliary systems excluded from the R.G 1.26 and their components mounted on and furnished with the diesel engine perform safety related functions in support of safety related onsite electric power system functions stipulated in GDC 17. To assure that the diesel engine will perform its safety function it is necessary that these support systems and their engine mounted counterparts be designed to seismic Category I, and ASME Section III, Quality Group C requirements or equivalent.

The engine mounted piping and components should be designed to assure diesel engine performance under any given Design Basis Event (DBE).

The applicant has not provided assurance that the engine mounted piping will enable the diesel engine to perform its safety function under any given DBE.

Without adequately designed engine mounted piping and components, the engine cannot perform its safety function under any given DBE.