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

OCT 30 1984

NOTE FOR: T. M. Novak, AD/Licensing, DL

FROM: L. S. Rubenstein, AD/CPS, DSI

SUBJECT: BEAVER VALLEY UNIT 2 APPEAL ISSUES (REVISION) - POWER SYSTEMS BRANCH

Items 1 and 4 of the enclosure to my memo of October 17, 1984, on the above subject, have been revised in accordance with discussion between G. Knighton and A. Ungaro on October 25, 1984.

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Enclosure:
As stated

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ENCLOSURE

BEAVER VALLEY UNIT APPEAL ISSUES
POWER SYSTEMS BRANCH

1. Alarm for Rocker Arm Lube Oil Reservoir (430.119)

Standard Review Plan (SRP) 9.5.7 "Emergency Diesel Engine Lubrication System" states in part that "the diesel engine is provided with a dedicated lube oil system design which includes measures to provide lubrication to the diesel engine wearing parts during standby conditions and/or normal and emergency starts."

The staff's original concern was about the loss of lubrication to the rocker arm assembly in the event of loss of lube oil level in the reservoir of the rocker arm lube oil system during diesel engine operation or standby condition. Loss of lube oil level in the reservoir tank would subject the rocker arm assembly to severe wear and/or to possible engine failure while operating under load or to a dry start when starting from a standby mode. The staff requires monitoring of lube oil level in the reservoir tank to assure the presence of a sufficient supply of lube oil. The FSAR does not contain an adequate lube oil system description to determine that this feature is included in the design.

In telephone discussion of October 16, 1984 between A. Ungaro (PSB), Gary Beatty (Dusquesne Light) and Marilyn Ley (LPM) regarding the above concern it was established that adequate protection measures are included in the diesel generator control system to preclude the above from occurring during engine operation. With regard to the similar concern during engine standby, the staff was advised that the reservoir tank is equipped with a sight gage glass which can be observed to verify oil level. The applicant has committed to update the response to question 430.119 to reflect a more indepth description of the lube oil system controls that will address the staff concerns. With confirmation of the above additional information, the need for the low level alarm is eliminated and the staff considers this issue resolved.

The above will be reflected in a subsequent supplement to the SER.

2. Class 1E Power for Lighting and Communication System (430.97 & 100

Standard Review Plan (SRP) 9.5.2 "Communication Systems" states in part that the "capability of the system to provide effective intra-plant 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."

SRP 9.5.3 "Lighting Systems" states in part the lighting systems are reviewed with the following considerations: "(1) the capability of the normal lighting system(s) to provide adequate lighting during all plant operating conditions, and (2) the 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." All lighting and communication systems in the applicant's present design are powered from non-Class 1E sources. The applicant has not provided adequate assurance on how he can safely shut down the plant under seismic conditions.

The staff requires that under a design basis seismic event, the applicant's design should provide adequate communications between the control room and necessary plant safety related areas and adequate lighting in these areas to enable operator to perform the necessary safety functions.

3. Air Dryers for Emergency Diesel Generator (430.97 & 100)

The applicant's air starting system provided for the diesel generators relies on periodic blowdown of the air receivers for the removal of entrained oil and excess water from the starting air. The applicant states that this action will preclude any air start system contamination and hence the need for air dryers.

The staff does not agree with the above rationale for the following reasons:

(1) Manual blowdown of air receivers will only eliminate accumulated condensed moisture. The air in the air receivers (and system piping) will still be saturated at the operating pressure and temperature. A reduction in pressure, temperature or both will cause condensation.

(2) Blowdown of system piping will only eliminate possible condensed moisture and some removal of corrosion products. The system is still exposed to moist air.

(3) Continuous system exposure to moist air will eventually result in internal corrosion and corrosion products buildup causing clogging of filters and/or malfunction of air start control valves with resultant unavailability of the diesel generator.

Over a period of time the air start system as designed for Beaver Valley 2 cannot preclude corrosion and buildup of corrosion products within the system, thus subjecting the air start system to potential contamination and failure to perform its safety function. Operating experience and staff study NUREG/CR-0660 (SRP Section 9.5.6) has identified moisture in air start systems as the single greatest cause of diesel generator unreliability. This problem can occur in diesel engines with air start motors as well as air-over-piston started engines.

In addition, staff discussion with the various diesel generator manufacturers relative to air start systems for their diesel generators have resulted in the following uniform recommendations:

1. use of dry and clean "instrument quality" air, or

2. If the engine is to be provided with its own starting air system they strongly recommend the use of air dryers.

For reasons cited above, the staff requires the installation of air dryers in the standby diesel generator air start systems at Beaver Valley 2, as has been done in similar designs recently approved by the staff.

4. Motor Operated Accumulator Isolation Valve (Open Item #67)

In an ideal system design, a single failure of an electrical component, e.g., spurious operation, should not result in loss of capability of the system to perform its safety function. In a number of designs, the staff has determined that failure of an electrical system component can cause undesirable mechanical motion of a valve or other fluid system component and that such a spurious motion can result in loss of the system safety function. In these instances, to satisfy single failure criterion, in lieu of mechanical system design changes, the staff had been allowing disconnection of power to such electrical components to preclude their undesired spurious operation. PSB BTP 18 in SRP 8.1 (Appendix 8A) discusses the requirements for such power lockout features. Though the BTP does not specifically state how the power lockout should be implemented, majority of the O/L applicants elected to lockout the control circuit power for the motor operators. The staff found this approach acceptable for these earlier designs.

However, operating experience in the last couple of years strongly substantiate that spurious valve motion without an automatic or manual signal is a reality. In all such abnormal occurrences the applicants could not establish the reason for a particular valve changing its status spuriously. The only conclusion that could be derived from such occurrences is that motive power for the valve was available and somehow was applied to the operator thus resulting in the spurious valve motion. To alleviate this concern, the staff has required that

in such designs the motive power for the valves should be locked out with the lockout design meeting the single failure criterion.

The staff's concern is how power will be removed from the above valve motor to meet the single failure criterion and what procedures will be in place to verify that power is removed.

The applicant has provided the necessary design details and other information to resolve the staff concern. The resolution of this issue will be reported in a subsequent supplement to the SER.