SNUPPS
Standardized Nuclear Unit
Power Plant System

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Nicholas A. Petrick
Executive Director

September 20, 1983

SLNRC 83-0053 FILE: 0278
SUBJ: Power Systems Branch Review

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Docket Nos. STN 50-482 and STN 50-483

Reference: SLNRC 83-0044, dated August 10, 1983; Same Subject

Dear Mr. Denton:

The reference letter transmitted information concerning the SNUPPS Load Shedder and Emergency Load Sequencer (LSELS) for use in the Power Systems Branch review. On page three of the enclosure to that letter, in the first paragraph, it is incorrectly stated that, given a safety injection signal (SIS) without a loss of offsite power, the LSELS will shed non-essential loads from the Class 1E busses and transmit start signals to the emergency diesel generators. For these plant conditions, the LSELS will shed selected loads, both essential and non-essential, from the safety busses. Also, the diesel generator start signal originates from an SIS or a safety bus undervoltage condition. The undervoltage condition diesel start signal is processed through the LSELS; whereas, the SIS diesel start signal is not. The enclosed page from the enclosure to the reference letter has been modified to incorporate these corrections. In addition, FSAR Section 8.3.1.1.2 will be updated in the next revision to incorporate these corrections.

Very truly yours,

N A Petrick

Nicholas A. Petrick

MHF/nld5b4
Enclosure

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For a Loss of Offsite Power (LOOSP), whether with or without a Safety Injection Signal (SIS), the LSELS will shed selected loads from the 4.16 kV Class 1E busses, trip the incoming offsite breakers and transmit start signals to the associated DG control circuits. For an SIS without LOOSP, the LSELS will shed selected loads from the Class 1E busses and automatically sequence Class 1E electrical distribution system loads onto the offsite power source. The design of each LSELS is such that it cannot cause either the diesel generator breaker or the incoming offsite breaker to close. It can only initiate load shedding, breaker tripping, and sequential loading of the Class 1E busses. The alignment of the onsite and offsite power sources is determined by design features and operator actions outside the control of the LSELS.

The LSELS panels and circuitry consist of hardwired, solid state logic modules which allow the design to be relatively simple and direct. The design of the SNUPPS LSELS meets all applicable General Design Criteria, Regulatory Guides and IEEE Standards (i.e., 308-74, 279-71, 323-74, and 344-75).

The SNUPPS design uses one LSELS per Class 1E bus to sequence Class 1E loads, whether the power is being supplied from the offsite power source or the onsite power source. This arrangement is preferred to the arrangement where there are two sequencers per Class 1E bus, one for sequencing Class 1E loads when the offsite power source is supplying power and one for sequencing Class 1E loads when the onsite power source is supplying power. With the SNUPPS arrangement, under emergency conditions, the single LSELS is made aware of the power being supplied from either the offsite or onsite power sources and properly sequences Class 1E loads. By combining the control logic and initiating circuitry for both the offsite and onsite power condition in one LSELS assembly, an improvement is made in the system reliability when compared to the case of the second arrangement. This is due to the fact that, for arrangements with two sequencers per Class 1E bus, it would be necessary to provide interlocks between the two sequencers such that combinations of LOOSP and SI conditions could not cause a conflict in load sequencing. These additional interlocks would, in essence, add another potential source of unreliability. In addition, for arrangements with two sequencers, reliability is reduced in that one sequencer is required to operate properly and the other sequencer is required not to fail adversely. A failure of one of the sequencers could result in the issuance of incorrect instructions to the Class 1E distribution system and related loads that could negate the ability of the controlled equipment to respond to the commands of the remaining unfaulted sequencer. It is common practice in the nuclear industry for large, SNUPPS-vintage plants to favor the arrangement of one sequencer for both onsite and offsite power sources.

A reliability evaluation of the SNUPPS LSELS has been performed by the LSELS vendor, Consolidated Controls Corporation (CCC). The results are reported in CCC's engineering report (J-104-0221-05). The CCC report is conservative in that although the reliability analysis uses standard reliability techniques and data, the success criteria used in the analysis overstates the reliability needed of the system. That is, the LSELS is determined to be successful only