

SAFETY EVALUATION REPORT  
DEGRADED VOLTAGE FROM OFFSITE POWER SYSTEM  
ARKANSAS NUCLEAR ONE #1

BACKGROUND

In telephone conversations with Arkansas Power & Light Company, the staff became aware of a potentially serious degradation of the offsite power system at Arkansas Nuclear One Unit 1. In the event of a LOCA and the simultaneous starting of all ESF loads onto the offsite power system, the voltage at the onsite Class IE 480-volt buses could dip to as low as 72%. According to an analysis performed by the licensee, such a low voltage could jeopardize the control circuit fuses in the 480V motor control centers which are required for the ECCS valves to function, i.e. could result in blown fuses.

DISCUSSION

In its letter of October 25, 1978, the licensee proposed to modify the starting circuits of six (6) large Engineered Safety Features (ESF) loads on each 4160-volt Class IE system bus. The reason for this modification as stated in the licensee's letter would be to assure adequate power without the need to transfer to the diesel generators. However, in a telecon on October 26, 1978, he stated that there could be unacceptable under voltage conditions that could result in a loss of safety feature functions, i.e. some safety loads could not be relieved to function.

The modification would change these loads from being block started to being sequential started on offsite power. This proposed change is identical to the existing design for the ESF start loads when offsite power is not available and power is derived from the onsite diesel generator system. Without the change the licensee's analysis indicates that an unacceptable under voltage condition would exist which could cause 480-volt control circuit fuses to fail. This in turn could result in a loss of the safety system functions.

Enclosed with the licensee's letter were six schematic diagrams which depict the intended modification. The modification consists of changing some wiring so that the automatic start circuits for both offsite power and onsite power will include the sequencer contacts for that load.

The staff has reviewed these diagrams and has discussed them with the licensee, and we conclude that the modification is acceptable. In addition, the licensee has proposed tests which will confirm the functional integrity of the modification and which we find acceptable.

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The licensee has stated that the sequential loading of these selected loads is sufficient to maintain the bus voltage at a level above that which could jeopardize safety-related fuses. The staff intends to confirm the licensee's detailed analysis as part of the on-going generic review of "degraded grid voltage."

CONCLUSION

Based on the information supplied by the licensee and our review thereof, we conclude that the proposed modification will reduce the potential jeopardization of the performance of the ECCS required and is acceptable.