TABLE 2-1

ENGINEERED SAFETY FEATURES SYSTEM INITIATION INSTRUMENT SETTING LIMITS

Functional Unit	Channel	Setting Limit	
1. High Containment Pressure	a. Safety Injection b. Containment Spray (3) c. Containment Isolation d. Containment Air Cooler DBA Mode e. Steam Generator Isolation	$\leq$ 5 psig	
2. Pressurizer Low/Low Pressure	a. Safety Injection b. Containment Spray (3) c. Containment Isolation d. Containment Air Cooler DBA Mode	$\geq$ 1600 psia (1)	
3. Containment High Radiation	Containment Ventilation Isolation	In accordance with the Offsite Dose Calculation Manual	
4. Low Steam Generator Pressure	a. Steam Line Isolation b. Auxiliary Feedwater Actuation	$\geq$ 500 psia (2) $\geq$ 466.7 psia	
5. SIRW Low Level Switches	Recirculation Actuation	16 inches +0, -2 in. above tank bottom	
6. 4.16 KV Emergency Bus Low Voltage	a. Loss of Voltage	(2995.2 +104, -20.8) volts $\leq$ 5.9(4) seconds	}TRIP
	b. Degraded Voltage i) Bus 1A3 Side	$\geq$ ~~3825.52~~ 3988.8 volts (4.8 $\pm$ .5) seconds	}TRIP

TABLE 2-1 (Continued)

ENGINEERED SAFETY FEATURES SYSTEM INITIATION INSTRUMENT SETTING LIMITS

Functional Unit	Channel	Setting Limit	
6. (Continued)	b. (Continued) ii) Bus 1A4 Side	$\geq$ ~~3724.08~~ 3990.6 volts (4.8 $\pm$ .5) seconds	} TRIP
7. Low Steam Generator Water Level	Auxiliary Feedwater Actuation	$\geq$ 28.2% of wide range tap span	
8. High Steam Generator Delta Pressure	Auxiliary Feedwater Actuation	$\leq$ 119.7 psid	

(1) May be bypassed below 1700 psia and is automatically reinstated above 1700 psia.
(2) May be bypassed below 550 psia and is automatically reinstated above 550 psia.
(3) Simultaneous high containment pressure and pressurizer low/low pressure.
(4) Applicable for bus voltage $\leq$ 2995.2 - 20.8 volts only. (For voltage $\geq$ (2995.2 - 20.8) volts, time delay shall be > 5.9 seconds.)

ATTACHMENT B

DISCUSSION, JUSTIFICATION AND NO SIGNIFICANT HAZARDS CONSIDERATIONS

DISCUSSION AND JUSTIFICATION

Omaha Public Power District (OPPD) proposes to change Fort Calhoun Station Unit No. 1 Technical Specification 2.14, Table 2-1, Item No. 6.b. that specifies the setpoint limit for degraded voltage protection.

To ensure that adequate voltage from the 161 KV offsite power supply to 4.16 KV safeguards buses 1A3 and 1A4 exists during an accident, the electrical distribution system has been equipped with a degraded voltage protection system referred to as Offsite Power Low Signal (OPLS). The OPLS provides protection to safeguards equipment when a degraded voltage condition is detected on 4.16 KV bus 1A3 or 1A4, concurrent with a Safety Injection Actuation Signal (SIAS). When a degraded voltage condition exists concurrent with a SIAS, the OPLS isolates 4.16 KV buses 1A3 and 1A4 from the 161 KV offsite power supply and initiates automatic actions to load the safeguards equipment onto the emergency diesel generators. The OPLS setpoints were originally designed to ensure that the voltage supplied to the 4.16 KV and 480 V loads does not drop below 90% of the nameplate voltage rating during an accident. The motor manufacturers recommend that terminal voltage be maintained at a minimum of 90% of motor nameplate rating to protect the motors from overheating due to excessive current.

An engineering analysis revealed that during an accident in which safeguards equipment would be required to operate, the voltage supplied to some 480 V safeguards loads could degrade to approximately 87.5% of rated voltage without actuating OPLS. Therefore, in February 1991, the OPLS was determined to be outside its design basis. This situation was reported to the NRC in Licensee Event Report 50-285/91-04 dated March 21, 1991, which was subsequently revised on June 21, 1991. Interim corrective actions included placing administrative restrictions on equipment rotation and bus loading configurations. Also, the OPLS setpoints were increased to provide protection consistent with the allowable configurations. In order to remove the operational restrictions of the interim corrective actions, a modification was implemented during the 1992 refueling outage.

The 1992 modification altered the existing logic circuitry such that, upon receipt of a SIAS, the large 4.16 KV motors and equipment (i.e., feedwater, heater drain and condensate pumps) not required to mitigate the consequences of an accident are automatically load shed. The modification also raised the OPLS setpoints so that actuation occurs (assuming a concurrent SIAS) at a higher level of decreasing voltage on 4.16 KV safeguards buses 1A3 and 1A4 based on Engineering Analysis EA-FC-90-057.

Subsequent to the installation of the modification described above, it has been determined that it is possible to permit the operation of a single main feedwater/condensate pump train following a SIAS by establishing additional load shedding and modifying the OPLS setpoints. This conclusion is documented in Engineering Analysis EA-FC-92-081. Although it is not necessary to operate any main feedwater or condensate pumps to mitigate the consequences of any design basis accident, it is desirable to provide the option of operating a single main feedwater train in certain SIAS scenarios in order to provide more operational flexibility during the response to an accident. Therefore, another modification is planned for the 1993 refueling outage which will provide this flexibility. As in the case of the 1992 modification, the 1993 modification will require the OPLS setpoints to be changed. The proposed change to the technical specification limit for OPLS actuation is necessary to ensure the limit is consistent with the more restrictive limits specified in EA-FC-92-081.

In a March 26, 1993 telephone conversation between OPPD and Mssrs. Steve Bloom and Mark Pratt of the NRC, it was requested that OPPD respond to the following 4 questions:

1. What type of engineering analysis was performed originally for OPLS? Explain in detail.

   The original OPLS analysis assumed, as its design criteria, that the Engineered Safety Features (ESF) motors would accelerate their respective loads to full speed at ≥70% of motor nameplate voltage and that the motor voltage would recover to ≥90% of terminal voltage after motor acceleration. The plant bus loading was based on loading measurements taken during power operation. These loads were then used to calculate the worst case ESF motor voltage during starting. The OPLS setpoint was based on assuring that ≥70% motor terminal voltage was maintained. Individual motor acceleration calculations were not performed. A requirement that the twelve safety injection Motor Operated Valve (MOV) contactors pickup at ≥85% of 120 V was also established. The original OPLS analysis was reviewed and approved by the NRC in Amendment No. 41 dated November 27, 1978.

2. Was there a new calculation for the new OPLS values and was this calculation down to the 120 V level?

   The calculation documented in EA-FC-92-081 was based on detailed computer modeling of the plant electrical system and loads. Worst case models were established for both ESF trains. The setpoints were established to assure ≥90% motor operating voltages following ESF motor acceleration. ESF motor acceleration calculations were performed to assure the ESF loads would accelerate with voltage at the OPLS setpoint. The acceleration calculations included ESF sequencer timer uncertainties. A calculation was also performed at the 120 V Motor Control Center (MCC) contactor level to verify automatically operated MOV contactors would pickup and hold in during the starting voltage transients.

3. What type of field verification was done to validate the data used for both initial and revised OPLS calculations?

   The field verification conducted for the original OPLS analysis involved the starting of several ESF motors and measuring the voltage transients. This data was used to verify the OPLS methodology and model adequacy. OPPD considers the present electrical distribution model which was used to derive current OPLS setpoints to be valid based on the Diesel Generator Transient Analysis. The same model (i.e., motors, pumps, fans, cable, transformer, etc.) used in the current OPLS analysis was used in the Diesel Generator Transient Analysis. This analysis was verified by comparing the diesel generator automatic operation data taken during the 1992 refueling outage to the computer generated transient load profile. The results showed acceptable agreement between the model and the actual equipment operation.

4. What controls will be used in the future to update the calculation if bus loads change? How will it be determined if increased bus loading is a concern?

   OPPD has in place procedural controls which govern modifications to the facility. Part of these controls require an Electric System Interaction Evaluation be performed. This interaction evaluation is in the form of checklists which prompt that an analysis be performed if bus loading is impacted. Bus loading is a critical input of the OPLS analysis and as such the procedural controls would address possible future changes.

Administrative Changes

Amendment number 108 is being added to the bottom of page 2-64 as the current revision to this page. Presently this amendment number is not legible on page 2-64.

BASIS FOR NO SIGNIFICANT HAZARDS CONSIDERATION

The proposed changes do not involve significant hazards considerations because operation of Fort Calhoun Station Unit No. 1 in accordance with these changes would not:

(1) Involve a significant increase in the probability or consequences of an accident previously evaluated.

OPLS actuates only when a degraded voltage condition is detected on 4.16 KV safeguards buses 1A3 or 1A4 concurrent with a SIAS. The proposed change to Technical Specification 2.14, Table 2-1, Item No. 6.b. (OPLS Setpoints) provides additional assurance that the safety related loads that are sequenced on in this situation will have adequate voltage to accelerate to rated speed. In addition, the proposed increase in OPLS setpoints will insure that voltage is maintained at a minimum of 90% of nameplate rating to protect the 480 V motors from overheating due to excessive current. The proposed change to Technical Specification 2.14, Table 2-1, Item No. 6.b. provides the level of safety for the OPLS, which is currently being maintained by plant operating procedures. Therefore, neither the probability nor consequences of an accident previously evaluated are increased.

(2) Create the possibility of a new or different kind of accident from any previously analyzed.

The proposed change will cause OPLS to actuate at a higher level of decreasing voltage (concurrent with a SIAS) on 4.16 KV buses 1A3 and 1A4. For reasons stated in the response to Item 1 above, this proposed change ensures the level of safety intended by the design basis of OPLS and provides additional protection to safeguards loads. It does not create the possibility of a new or different kind of accident.

(3) Involve a significant reduction in a margin of safety.

The proposed increase in Technical Specification 2.14, Table 2-1, Item No. 6.b. (OPLS Setpoints) revises a nonconservative limit that currently exists in Technical Specification 2.14, Table 2-1, Item No. 6.b. The proposed change provides assurance that safety related loads will have adequate voltage to accelerate to rated speed and that the voltage on 4.16 KV buses 1A3 and 1A4 does not drop below 90% of the nameplate voltage rating during an accident. Therefore, the proposed change to Technical Specification 2.14, Table 2-1, Item No. 6.b. (OPLS Setpoints) increases the margin of safety as compared with the current Technical Specification 2.14, Table 2-1, Item No. 6.b. setpoints.

Therefore, based on the above considerations, it is OPPD's position that this proposed amendment does not involve a significant hazards consideration as defined by 10 CFR 50.92 and the proposed changes will not result in a condition which significantly alters the impact of the Station on the environment. Thus, the proposed change meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(4)(9) and pursuant to 10 CFR 51.22(b) no environmental assessment need be prepared.