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JULY 27, 1990

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

Reference: Beaver Valley Power Station, Unit No. 1 and No. 2
BV-1 Docket No. 50-334, License No. DPR-66
BV-2 Docket No. 50-412, License No. NPF-73
SBO - Alternate AC Load Management

Gentlemen:

By letter dated June 27, 1990, we provided a supplemental response to Station Blackout (SBO) relative to our Alternate AC (AAC) load management methodology. Based on our telecon of July 20, 1990, with the staff reviewers, we were requested to revise the AAC load management tables of our enclosure to demonstrate the design capability of our existing Class 1E emergency diesel generators as an AAC source for our dual unit site. For analysis purposes, the following loads have been added to Table 1:

- Turbine Bearing Oil Lift Pump
- Turbine Generator Bearing Lube Oil Pump
- Turbine Turning Gear Drive
- Residual Heat Release (RHR) Pump

The charging pump at the SBO unit, identified as a discretionary load, has been dropped from Table 1, and will be procedurally addressed. As stated in our March 30, 1990 submittal, the expected rates of reactor coolant system inventory loss of 25 gpm per pump under SBO conditions will not result in core uncovery during a SBO of 4 hours. Our concern for the potential inconsistency between the design capability documented in the tables and our operating procedures was acknowledged by the staff. The reviewers re-iterated their position that discretionary loads may be procedurally addressed to allow for operator flexibility via load management. We understand that the safety evaluation report will acknowledge the provision for procedurally addressing discretionary loads, as noted above.

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Enclosure 1 "AAC Load Management Scheme for Beaver Valley" provides the revised methodology for achieving AAC for both Beaver Valley Unit 1 and Unit 2. The proposed load management scheme ensures the non-blacked out unit is brought to and maintained in a safe shutdown condition which meets the SBO regulatory requirements. Differences in the assumptions for loss-of-offsite power loads from those currently specified in the UFSAR have been identified with justifications provided in the enclosure.

If there are any questions on this matter, please contact my office.

Very truly yours,

Nelson R Tonet for

J. D. Sieber
Vice President
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cc: Dr. T. Murley, Director of Office of NRR
Mr. J. Beall, Sr. Resident Inspector
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ALTERNATE AC LOAD MANAGEMENT SCHEME FOR BEAVER VALLEY

The revised Alternate AC (AAC) load management scheme is summarized in this enclosure. The AAC power system is adequately sized to carry the required shutdown loads for the required coping duration maintaining voltage and frequency within limits consistent with the established industry standards. Also, the loading arrangement will not degrade the performance of any shut down systems or components.

Loads Available During The First Hour

During the first hour of the event, all applicable loads identified in the FSAR table may be powered. This includes all loads that are automatically loaded onto the diesel generators as indicated in Table 8.5-1 of the FSAR.

Loads Available After One Hour and Before Four Hours

After the first hour, a degree of load management is necessary to ensure adequate Alternate AC power is available to the blacked out unit. These loads fall into three categories: (a) loads that are not generally powered within the expected duration of the station blackout, (b) loads that are not required to ensure safe shutdown capability, and (c) loads that do not have a safety function.

a. <u>Loads that are not generally powered within the expected duration of the station blackout</u>

It is important to note that some safe shutdown loads are only normally needed during the first hour of the transient, or considerably after four hours. These loads include motor operated valves, and the spent fuel pool cooling system.

Power for motor operated valves, will only be needed during the first ten minutes to realign safety systems. Since these components are not normally energized after the first hour of the event, they do not need to be powered after the first hour.

The spent fuel pool cooling pumps will not need to be powered until after the coping period for a loss of off site power. Thus, it is not necessary to consider this load during the four hour duration of a station blackout.

ALTERNATE AC LOAD MANAGEMENT SCHEME FOR BEAVER VALLEY

The Leak Collection exhaust fans, although automatically loaded on the EDG for a loss-of-offsite power event, are primarily to prevent radioactive leakage from the containment and contiguous areas following a DBA. The system provides ventilation to the Aux FW pump room which was analyzed for a loss of ventilation under SBO criteria. Therefore, this load is not needed for normal safe shutdown following a loss-of-offsite power event with no concurrent failure or DBA type events.

b. Loads that are not required to ensure safe shutdown capability

Several loads are not needed for normal safe shutdown following a loss of off site power. These include the containment air recirculation fans, and the containment instrument air compressors. The unavailability of these systems during this period will not reduce the information available to the operators to monitor the safety related conditions of the plant, nor will it impair or damage the non-blacked out (NBO) unit in any way.

b.1 Containment ventilation cooling water is not safety related at Beaver Valley. Thus, the containment recirculation fans would not serve their cooling function and would only add to the heat generation. This condition has been analyzed and verified during plant operation.[1] Containment temperatures have been shown to not increase beyond 110°F during the first four hours of the event. This temperature is considerably below the EQ operability limit of 135°F.

b.2 Similarly, cooling water for the containment instrument air compressor is not safety related, and consequently is normally unavailable during a loss of off-site power. For this reason, the compressor must be disabled since operation without cooling results in an electrical trip of the component. Existing plant procedures for coping with a LOOP event direct operators to disable the compressor for a loss of cooling water resulting from the loss of off-site power. This system is not required to ensure safe shutdown capability.

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[1]LER 84-07 Loss of Containment Cooling

ALTERNATE AC LOAD MANAGEMENT SCHEME FOR BEAVER VALLEY

Loads Available After Four Hours

The station blackout rule only requires Alternate AC power to be provided for the station's required coping duration. Thus, after four hours, Unit 1 no longer needs to supply AAC power to Unit 2. However, as discussed above, the proposed loading arrangement is sufficient to maintain the station in a safe condition for an extended duration beyond four hours.

EOP Development and Methodology

Procedures (EOP's) will be developed to allow for discretionary loads for operator flexibility of load management dependent on sufficient EDG capacity. The addition of a high-head charging pump to the blacked-out unit would be one such example.

Both Beaver Valley units are equipped with 100% capacity turbine driven AFW pumps. Irrespective of the turbine driven AFW pump, sufficient design capability is available to power the motor-driven AFW pump at the NBO unit during this event. (See Table 1)

Summary and Conclusion

The load management scheme discussed above ensures the NBO unit is brought to and maintained in a safe shutdown condition for an extended period well beyond four hours. No component is permanently disabled or in any way degraded. In fact, load management is needed to ensure long term operability of equipment. On this basis, we find that this arrangement meets the current SBO requirements.

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TABLE 1

Alternate AC Load Management Scheme For Beaver Valley

(Total Loads on Unit 1 EDG)

COMPONENT	UNIT 1 LOADS (kW) NBO Unit			UNIT 2 LOADS (kW) BO Unit	Remarks
	0 to 1 hour	1 hour to 4 hours	After 4 hours	1 hour to 4 hours	
Charging-Hi Head Safety Injection Pump	442.0	442.0	442.0		
River Water Pump	338.0	338.0	338.0	(+)	+ Cross-tie RWS
Steam Generator AFW Pump	302.0	302.0	302.0		
RHR Pump *	0	218.0	218.0		* 4 hour delay
Primary Plant Component Cooling Water Pump	221.0	221.0	221.0		
Turbine Bearing Oil Lift Pump	13.0	13.0	13.0		
Motor Operated Valves	53.0	0.0	0.0		See Section a
Emergency Diesel Auxiliaries	28.0	28.0	28.0		
Turbine Generator Bearing Lube Oil Pump	39.0	39.0	39.0		
Turbine Turning Gear Drive	39.0	39.0	39.0		
Pressurizer Heaters **	0.0	270.0	270.0		** 1 hour delay
Boric Acid Transfer Pump	13.0	13.0	13.0		
Boric Acid Tank Heaters	15.0	15.0	15.0		
Battery Chargers	38.0	38.0	38.0	14.6	
Emergency Lighting Supplemental	5.0	5.0	5.0		
Emergency Lighting Supplemental	28.0	28.0	28.0		
Containment Air Recirculation Fans	283.0	0.0	0.0		See Section b.1
Control Room Air Supply Fans	48.0	48.0	48.0		
Control Room Air Return Fans	25.0	25.0	25.0		
Control Room AC Compressors	61.0	61.0	61.0		
Control Room AC Condenser Circulating Pumps	4.0	4.0	4.0		
Leak Collection Exhaust Fans	115.0	0	0		See Section a
Safeguards Area Sump Pump	4.0	4.0	4.0		
Emergency Swgr & Battery Room Exhaust Fan	8.0	8.0	8.0		
Emergency Swgr & Battery Room Supply Fan	13.0	13.0	13.0		
Fuel Pool Cooling Pump	17.0	0.0	17.0		See Section a

**Intermittent Load; Pressurizer heaters to be de-energized when starting discretionary load (charging pump) at BV-2. To be procedurally addressed.

TABLE 1 (Cont.)

Alternate AC Load Management Scheme For Beaver Valley
(Total Loads on Unit 1 EDG)

COMPONENT	UNIT 1 LOADS (kW) NBO Unit			UNIT 2 LOADS (kW) BO Unit	Remarks
	0 to 1 hour	1 hour to 4 hours	After 4 hours	1 hour to 4 hours	
Control Rod Cooling Fan	81.0	81.0	81.0	56.0	See [1]
Miscellaneous Fans, Dampers, and Pumps	13.0	13.0	13.0		
Miscellaneous Fans, Dampers, and Pumps	10.0	10.0	10.0		
Pipe Heat Tracing	60.0	60.0	60.0		
Pipe Heat Tracing	60.0	60.0	60.0		
Vital Bus Loads	50.0	50.0	50.0		
Miscellaneous Heaters	62.0	62.0	62.0		
Miscellaneous Heaters	12.0	12.0	12.0		
Emergency AC Distribution Panels	11.0	11.0	11.0		
Emergency AC Distribution Panels	22.0	22.0	22.0		
Containment Instr. Air Compressor	17.0	0.0	0.0		See Section b.2
Computer Inverter	17.0	17.0	17.0		
48 Volt Battery Charger	5.0	5.0	5.0		
Additional SBO loads for BO Unit					
Control Room HVAC Unit (BV-2)				27.4	Fan only
Load & Cooling System Losses AC Dist. Transf.				49.0	
AC Dist. Transf.				0.3	
AC Dist. Transf.				3.1	
AC Dist. Transf.				0.3	
AC Dist. Transf.				5.1	
Vital Bus Rect. 2-3				8.8	
Vital Bus Rect. 2-1				14.0	
Battery Room Exhaust Fan				6.2	
AC Distr. xmfr				2.9	
AC Distr. xmfr				2.1	
TOTAL LOADS	2572.0	2575.0	2592	189.8	
TOTAL LOADS ON UNIT 1 EDG	2572.0	2764.8	2592		

NOTE: Diesel generator 168 hour rating = 2950 kw.(Ref. UFSAR-1, Fig. 8.1-1).

[1] A single CRDM shroud fan is sufficient during the first four hours for upper head cooling per EOPs and engineering evaluation. Reference EM No. 22241.

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TABLE 2

Alternate AC Load Management Scheme For Beaver Valley
(Total Loads on Unit 2 EDG)

COMPONENT	UNIT 2 LOADS (kW) NBO Unit			UNIT 1 LOADS (kW) BO Unit	Remarks
	0 to 1 hour	1 hour to 4 hours	After 4 hours	1 hour to 4 hours	
Charging-Hi Head Safety Injection Pump	477.0	477.0	477.0	442	
Service Water Pump	696.0	696.0	696.0		
Steam Generator AFW Pump	320.0	320.0	320.0		
RHR Pump *	0	241.0	241.0		* 4 hour delay
Primary Plant Component Cooling Water Pump	316.0	316.0	316.0		
Leak Coloi. Filter Exch. Fans	150.0	150.0	150.0		
Emerg. Swgr. Supply Fans	50.4	50.4	50.4		
Emerg. Swgr. Exch. Fans	44.9	44.9	44.9		
Main Steam Fans	62.0	62.0	62.0		
Cont. Air Recirc. Fans	154.0	0	0		See Section b.1
Leak Sys. Elec. Htr.	211.0	211.0	211.0		
Press. Heaters **	0.0	270.0	270.0		** 1 Hour Delay
CRDM Shroud Fan	56.0	56.0	56.0	81.0	See Note 1
Load & Clg. Sys. Losses (XFMR)	49.0	49.0	49.0		
AC Dist. Transf. (E-5)	0.3	0.3	0.3		
SWP Lube Water Strainer	0.5	0.5	0.5		
Intake Supply Fan	4.1	4.1	4.1		
AC Dist. TRansf. (E.3)	3.1	3.1	3.1		
Control Rm. AC Unit	27.4	27.4	27.4	61.0	
Refrig. Cond. Unit	50.0	50.0	50.0		
AC Dist. Transf. (E-9)	0.3	0.3	0.3		
Elec. Heat Xfer.	2.1	2.1	2.1		
Motor Operated Valves (total)	110.6	0	0		See Section a
Fuel Pool Cooling Pump	14.4	0	14.4		See Section a
Cont. Bldg. Air Exch and Supply Fan	25.0	25.0	25.0		
Chg. Pump Cub. Exch. Fan	18.0	18.0	18.0		
AC Dist. Transf. (E-1)	5.1	5.1	5.1		
MCC Cub. Exch. Fan	2.8	2.8	2.8		
DG Fuel Oil Xfr. Pumps	0.7	0.7	0.7		
DG Bldg. Supply Fan (270A)	33.0	33.0	33.0		
DG Crank Case Vacuum Pump	1.1	1.1	1.1		

** Intermittent Load