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MEMORANDUM FOR: Thomas E. Murley, Director
Office of Nuclear Reactor Regulation

THRU: Frank J. Miraglia, Associate Director
for Inspection and Technical Assessment

FROM: Ashok C. Thadani, Assistant Director For Systems
Division of Engineering & Systems Technology

SUBJECT: SUMMARY OF SBO RESPONSES AND STAFF REVIEW SCHEDULE
(71* SITES/111 UNITS NOT COUNTING ST. LUCIE 2) (TAC 40577)

The following status and schedule information on Station Blackout (SBO) is provided in response to your recent request.

A cursory check of the licensees' responses to the SBO Rule has been performed in order to provide an overview of the industry approach to conformance with the Rule. The information provided below is a summary of the licensee inputs; it does not represent the results of a staff review. A per plant breakdown is provided in Attachment 1.

1. A total of 22 sites (38 units) are using EDGs as the AAC source. Included in these are 4 sites (8 units) that are adding 6 new EDGs; the remaining sites use existing EDGs.
2. Ten sites (14 units) are using standby shutdown DGs (non-safety/Appendix R) as the AAC source. Included in these are two sites (2 units) that are adding a new non-safety DG as the AAC source.
3. Five sites (6 units) are using existing gas turbine generators as the AAC source. (One under construction is counted as existing).
4. One site (1 unit) is using an existing hydro unit as the AAC source.
5. Claimed SBO durations and AAC start times for the 59 units in the AAC option category (items 1 through 4).

<u># of Units</u>	<u>Claimed SBO Duration</u>	<u>AAC Start Time</u>
29	4 hours	10 minutes
19	4 hours	1 hour

*The number of sites cited in items 1-6 totals 73 because two sites with units in two categories are counted twice.

Contact:
F. Rosa/A. (Paul) Gill
X20837/ X20811

DFOL
11
Per P. Tam

<u># of Units</u>	<u>Claimed SBO Duration</u>	<u>AAC Start Time</u>
2	8 hours	10 minutes
8	8 hours	1 hour
1	16 hours	10 minutes

6. A total of 35 sites (52 units) have elected the coping option and claim a four hour SBO duration and coping capability.

Attachment 2 provides the latest SBO review schedule including identification of Mark I plants, plants identified by RES as most susceptible to SBO and plants using the AAC source approach for conformance to the SBO Rule. We expect to complete our review of all Mark I plant submittals as well as the submittals from sites believed to be most susceptible to SBO by 3/90, submittals from plants with AAC (not covered under MKI or susceptible sites) by 6/90, and the remaining submittals by 9/90.

15/

Ashok C. Thadani, Assistant Director For Systems
 Division of Engineering and Systems Technology

Attachments:
 As stated

- cc: J. Sniezek
- J. Taylor
- W. Russell, R1
- S. Ebnetter, R11
- A. Davis, R111
- R. Martin, R1V
- J. Martin, RV
- B. Boger
- G. Lainas
- G. Holahan
- M. Virgilio
- J. Richardson
- S. Varga
- P. Tam
- J. Raval
- A. Serkiz
- SAD BC's
- All SELB

7/21/89

OFF	ELB/DEST	:BC/SELB/DEST	:NRR/ADT	:AD/SAD	:	:
NAME	:PGill	:FRosa:ct	:FMiraglia	:ACThadani	:	:
DATE	:7/12/89	:7/12/89	:7/21/89	:7/20/89	:	:

T. Murley

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Distribution:

Central Files

SELB Rdg.

P. Gill

F. Rosa (PF)(2)

F. Miraglia

A. Thadani

PLANT NAME	EDG CONFIGURATION		SBO APPROACH						REMARKS SCHEDULES, ETC.		
	EXISTING LICENSING BASIS	PROPOSED EDG CHANGES	ALTERNATE AC (AAC)					COPING - NO AC PWR		HARDWARE MODIFICATIONS	
			CLAIMED COPING HRS.	EXISTING EDG'S	DG: NON-SAFETY	GAS TURBINE	HYDRO				START TIME
Arkansas 1 Arkansas 2	2/unit		4 4	X				1hr 1hr		Install across tie between unit 1 & 2 (Ties already exist between divisions A&B of each unit)	Implementation to be completed during refueling outage 1R10 (10/23/91) and 2R8 (4/11/91). Schedules based on anticipated lead times for equipment procurement.
Beaver Valley 1 Beaver Valley 2	2/unit		4 4	X				1hr 1hr		Modification of unit 1/2 1E electrical buses for installing cross-ties.	Implementation to be completed within 2 years after NRR notification.
Big Rock Point	1/unit		4						X		
Braidwood 1 Braidwood 2	2/unit		4 4	X				10mn 10mn			

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	EXISTING LICENSING BASIS	PROPOSED EDG CHANGES	CLAIMED COPING HRS.	ALTERNATE AC (AAC)	DG: NON-SAFETY	GAS TURBINE	HYDRO	START TIME	COPING - NO AC PWR		HARDWARE MODIFICATIONS
Browns Ferry 1	4/2 units shared		4					10min	X		
Browns Ferry 2	4/2 units shared		4					10min	X		
Browns Ferry 3	4/unit		4						X		
Brunswick 1	4/2 units shared		4	X				1hr		Modify existing cross-ties controls for using AAC.	Implementation to be completed within 2 years after notification.
Brunswick 2	4/2 units shared		4	X				1hr			
Byron 1	2/unit		4					10min			
Byron 2	2/unit		4					10min			
Callaway 1	2/unit		4						X		

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	EXISTING LICENSING BASIS	PROPOSED EDG CHANGES	ALTERNATE AC (AAC)					COPING - NO AC PWR		HARDWARE MODIFICATIONS	
			CLAIMED COPING HRS.	EXISTING EDG'S	DG: NON-SAFETY	GAS TURBINE	HYDRO				START TIME
Calvert Cliff 1	1/unit plus 1 shared	Add EDG to reduce coping from 8 to 4 hrs.	4						X	Installation of an EDG; upgrade battery room ventilation system.	Implementation to be completed within 5 years after notification.
Calvert Cliff 2			4						X		
Catawba 1	2/unit		4		X			10mn			The AAC source is an existing standby shutdown diesel generator (Appendix R).
Catawba 2			4					10mn			
Clinton 1	3/unit		4	X				10mn			Existing HPCS EDG will be used as an AAC.
Cook 1	2/unit		4						X		
Cook 2			4						X		
Cooper	2/unit		4						X		
Crystal River 3	2/unit		*4						X		*Crystal River 3 should be a 8 hour coping duration category. They are taking credit for pre-hurricane shutdown but not shutting dn

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			CLAIMED COPING HRS.	EXISTING EDG'S	DG: NON-SAFETY	GAS TURBINE				HYDRO	START TIME
Davis Besse 1	2/unit		4		X			10mn		Installing a diesel generator as an AAC.	To be installed during the 7th refueling outage (7RFO) scheduled to begin Sept. 1, 1991.
Diablo Canyon 1	2/unit plus 1 shared		4						X		
Diablo Canyon 2			4						X		
Dresden 2	1/unit plus 1 shared		4						X	Modification of EDG 2/3 switchgear interlocks and logic to allow loading of both units safety buses.	Modifications will be completed two years after notification. (Dresden claims to be EAC group C when they should be EAC group D.)
Dresden 3			4						X		
Duane Arnold	2/unit		4						X		
Farley 1	1/unit plus 3 shared		4	X				10mn		Mods req'd to provide SW to the AAC; mods req'd to auto shed unnecessary loads.	No schedule given in the submittal.
Farley 2			4					10mn			

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	EXISTING LICENSING BASIS	PROPOSED EDG CHANGES	ALTERNATE AC (AAC)				COPING - NO AC PWR	HARDWARE MODIFICATIONS			
			CLAIMED COPING HRS.	EXISTING EDG'S	DG: NON-SAFETY	GAS TURBINE				HYDRO	START TIME
Fermi 2	4/unit		4			X		1hr	Inadequate battery which will be tested during this Fall and replacement based on test results.	Existing combustion turbine generator from unit 1 (used as App. R source) is being credited as AAC. No modification required.	
Fitzpatrick	4/unit (2 Div.)		4						X	Modifications are needed to provide instrumentation during SBO cond.	No details or schedule provided for the modifications.
Fort Calhoun 1	2/unit		4						X		
Ginna	2/unit		4						X		Plans to investigate the probability of adding additional instrumentation for battery-backed (DC buses) buses.
Grand Gulf 1	3/unit		4						X		
Haddam Neck	2/unit		4						X		

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			CLAIMED COPING HRS.	EXISTING EDG'S	DG: NON-SAFETY	GAS TURBINE	HYDRO				START TIME
Harris	2/unit		4						X		Additional emergency lighting required in control room and in the vicinity of mainsteam PORVs. Improve access to each mainsteam PORV. (No schedule provided.)
Hatch 1	2/unit plus 1 shared		4	X				1hr			
Hatch 2			4					1hr			
Hope Creek	4/unit		4						X		
Indian Point 2	3/unit		8			X		1hr		New DG to supply gas turbine aux loads.	The AAC source is an existing gas turbine.
Indian Point 3	3/unit		4		X			1hr			The AAC source is an existing Appendix R DG.

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	EXISTING LICENSING BASIS	PROPOSED EDG CHANGES	ALTERNATE AC (AAC)					COPING - NO AC PWR		HARDWARE MODIFICATIONS	
			CLAIMED COPING HRS.	EXISTING EDG'S	DG: NON-SAFETY	GAS TURBINE	HYDRO				START TIME
Kewaunee	2/unit		4		X			10mn		Installing a Diesel Generator as an AAC.	Modifications to be completed at the end of refueling outage in 1992 or 2 years after notification.
LaSalle 1	2/unit plus 1 shared		4						X	Existing batteries inadequate. Installing new batteries.	Modification for Unit 1 to be completed during fourth refueling outage (5/91) and modifications for Unit 2 during fourth refueling outage (12/91). (Should be EAC Group D & note)
LaSalle 2			4						X		
Limerick 1	8/2 units uniquely shared		4		X			1hr			
Limerick 2			4					1hr			
Maine Yankee	2/unit		4		X			1hr			Using Appendix R DG as an AAC.
McGuire 1	2/unit		4					10mn			Using standby shutdown facility (Appendix R) diesel generator as AAC.
McGuire 2			4		X			10mn			

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	EXISTING LICENSING BASIS	PROPOSED EDG CHANGES	ALTERNATE AC (AAC)					START TIME	COPING - NO AC PWR		HARDWARE MODIFICATIONS	
			CLAIMED COPING HRS.	EXISTING EDG'S	DG: NON-SAFETY	GAS TURBINE	HYDRO					
Millstone 1	1 EDG plus 1 Gas Turb. 2/unit		8	X				1hr		Install cross-ties of Unit 1 and 2 to Unit 3.	Modifications to be completed within 2 years after notification.	
Millstone 2			8					1hr		Install cross-ties between Unit 2 and 3.		Modification of cross-ties to be completed within 2 years after notification.
Millstone 3			8					1hr				
Monticello	2/unit		4					X				
Nine Mile Point 1	2/unit		4					X		Unit Class 1E batteries not adequate for 4 hours. Evaluating if additional batteries needed or can get by with load stripping Analysis to be completed by 6/1989.		
Nine Mile Point 2	3/unit		4					X				
North Anna 1 North Anna 2	2/unit		8	X				1hr		Installing cross-tie between safety buses of Unit 1.	Modifications to be completed within 2 years after notifications.	

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			CLAIMED COPING HRS.	EXISTING EDG'S	DG: NON-SAFETY	GAS TURBINE	HYDRO				START TIME
Oconee 1	2 Hydro for 3 Units		4	X				10min		The AAC source is the existing standby shutdown facility (Appendix R DG).	
Oconee 2			4					10min			
Oconee 3			4					10min			
Oyster Creek	2/unit		4			X		1hr	Combustion Turb. peaking units already under construction to be used as AAC.	To be completed by the end of refueling outage 14R scheduled for Fall of 1992.	
Palisades	2/unit								X	Provide an additional source of offsite power	Modifications will be completed by the end of next refueling outage.
Palo Verde 1	2/unit		4						X	A cross connect between Class 1E batteries will be installed and capacity increased.	No schedule provided.
Palo Verde 2			4						X		
Palo Verde 3			4						X		

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	EXISTING LICENSING BASIS	PROPOSED EDG CHANGES	ALTERNATE AC (AAC)				START TIME	COPING - NO AC PWR		HARDWARE MODIFICATIONS
			CLAIMED COPING HRS.	EXISTING EDG'S	DG: NON-SAFETY	GAS TURBINE				
Peach Bottom 2	4/unit shared		4	X			1hr			
Peach Bottom 3			4							1hr
Perry 1	3/unit		4	X			10mn		The AAC source is the division III HPCS EDG.	
Pilgrim	2/unit		16		X		10mn	Modification of some controls to alert the operator to line up the AAC within 10 min.	The AAC power source is an existing diesel generator installed during RF07.	
Point Beach 1	2/2 units shared		8			X	1hr		Evaluating installation of a third EDG as a backup or as an AAC. However this should not be considered as a commitment.	
Point Beach 2			8							X

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			CLAIMED COPING HRS.	EXISTING EDG'S	DG: NON-SAFETY	GAS TURBINE	HYDRO				START TIME
Prairie Island 1	2/2 units shared	Adding 2 EDGs to change to 2/unit dedicated	4	X				10mn		Adding 2 EDGs and modifying 4160V SWGR buses.	Modifications to be completed by early 1992 (start up cycle 15 for Unit 2)
Prairie Island 2			4								
Quad Cities 1	1/unit plus 1 shared		4						X	Modifications of EDG 2/3 interlocks/logic to permit loading of safety buses of both units.	Modifications to be completed within 2 years after notifications. (The EAC group should be D and not C as claimed i.e., EDG reliability target should be .975 & not 95.)
Quad Cities 2			4						X		
Rancho Seco	4/unit		4	X				10mn		Installing CBs in secondary side of startup transformers to permit loading of the AAC to either buses.	No schedule provided.
River Bend	3/unit		4						X		
Robinson 2	2/unit		4		X			1hr		Minor modifications to the conduit supports and switchgear room.	The AAC source is an existing Appendix R diesel generator. (No schedule given.)

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			CLAIMED COPING HRS.	EXISTING EDG'S	DG: NON-SAFETY	GAS TURBINE	HYDRO				START TIME
Salem 1	3/unit		4						X		
Salem 2			4							X	
San Onofre 1	2/unit		4		X			1hr			The AAC power source is an existing Appendix R DG.
San Onofre 2	2/unit		4						X	Install cable and conduit between DC buses A&C and B&D. Make connections after 3 hrs in SBO to obtain add capacity.	Modifications to be completed within 2 yrs. after notification.
San Onofre 3			4						X		
Seabrook 1	2/unit		4						X		
Sequoyah 1	4/2 units plus 1 spare		4						X	Provide additional air for air-operated valves.	Modifications to be completed within 2 yrs. after notification.
Sequoyah 2			4						X		

PLANT NAME	EDG CONFIGURATION		SEO APPROACH						REMARKS SCHEDULES, ETC.		
	EXISTING LICENSING BASIS	PROPOSED EDG CHANGES	ALTERNATE AC (AAC)					COPING - NO AC PWR		HARDWARE MODIFICATIONS	
			CLAIMED COPING HRS.	EXISTING EDG'S	DG: NON-SAFETY	GAS TURBINE	HYDRO				START TIME
Shoreham	3/unit		8			X		10mn		Modifications include supporting system for gas turbine, bypass switches and updating documentation for the gas turbine.	The AAC power source is an existing gas turbine. Modifications to be completed by March, 1990.
South Texas 1	3/unit		4					10mn			
South Texas 2			4	X				10mn			
St. Lucie 1	3/unit		4	X				10mn		Modifications to include cross-tie between safety buses of Unit 1&2.	Modification to be completed by Dec. 31, 1991. Unit 2 exempt by the SBO Rule.
St. Lucie 2			-					-			
Summer 1	2/unit		4						X	Addition of a dedicated power source for the Class 1E battery charger.	Existing battery not adequate. Modifications to be completed 2 years after notification.

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			CLAIMED COPING HRS.	EXISTING EDG'S	DG: NON-SAFETY	GAS TURBINE	HYDRO				START TIME
Surry 1	1/unit plus 1 shared	Proposing to install an EDG to change EAC config. group.	4						X	Install a fourth EDG dedicated to a unit.	Modifications to be completed 2 years after notification.
Surry 2			4						X		
Susquehanna 1	4/2 units shared		4						X		
Susquehanna 2			4						X		
Three Mile Island 1	2/unit		4	X				10min		The AAC power source is an existing TMI-2 EDG.	
Trojan	2/unit		4						X		

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	EXISTING LICENSING BASIS	PROPOSED EDG CHANGES	ALTERNATE AC (AAC)					COPING - NO AC PWR		HARDWARE MODIFICATIONS	
			CLAIMED COPING HRS.	EXISTING EDG'S	DG: NON-SAFETY	GAS TURBINE	HYDRO				START TIME
Turkey Point 3	2/2 units shared	Installing 2 EDGs	4	X				10mn	Installing 2 EDGs and interconnect via a new swing bus.	Modifications to be completed by the end of 1990.	
Turkey Point 4			4					10mn			
Vermont Yankee	2/unit		8				X	10mn	Modifications need for the tie line from Hydro unit to the Vermont Yankee and upgrading of the Hydro units.	Modifications to be completed within the next 3 years.	
Vogtle 1	2/unit		4						X	Replacing 5 circuit breakers. Add additional lighting in control room.	Modifications to be completed within 1 year after notification.
Vogtle 2			4						X		
Waterford 3	2/unit		4						X		
WNP 2	3/unit		4	X				10mn		The AAC power source is an existing div. III HPCS EDG.	
Wolf Creek	2/unit		4						X		

