



Carolina Power & Light Company

October 30, 1981



File: NG-3514(B)

Serial No.: NO-81-1786

Office of Nuclear Reactor Regulation
ATTN: Mr. T. A. Ippolito, Chief
Operating Reactors Branch No. 2
United States Nuclear Regulatory Commission
Washington, D.C. 20555

BRUNSWICK STEAM ELECTRIC PLANT, UNIT NOS. 1 AND 2
DOCKET NOS. 50-325 AND 50-324
LICENSE NOS. DPR-71 AND DPR-62
INFORMATION REQUEST REGARDING STATION BLACKOUT,
UNRESOLVED SAFETY ISSUE A-44

Dear Mr. Ippolito:

Carolina Power & Light Company (CP&L) has received your letter of July 9, 1981 requesting information to be used in the Unresolved Safety Issue (USI) A-44, Station Blackout, effort. Pursuant to your request, the information enclosed for the Brunswick Plant should assist your efforts at determining the generic reliability of onsite standby diesel generators.

Specifically, your letter requested the completion of the following four tables: (1) Diesel Generator Operations Data, (2) Diesel Generator Scheduled Down Time Record, (3) Diesel Generator Unscheduled Down Time Record, and (4) Onsite Emergency Diesel Generator and Auxiliary Equipment Modifications Record. The information requested for the years 1976 to 1980 is provided in the completed tables. We hope that the information enclosed will assist you in incorporating as much actual experience as possible into the reliability model for emergency power systems being developed as a part of the resolution of USI A-44.

If any additional information is needed, please contact us.

Yours very truly,

E. E. Utley
Executive Vice President
Power Supply and
Engineering & Construction

WRM/lr (1013)

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Carolina Power & Light Company

10/16/81

Mr. Thomas A. Ippolito, Chief
Operating Reactors Branch #2
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, DC 20555

BRUNSWICK STEAM ELECTRIC PLANT, UNIT NOS. 1 & 2
LICENSE NOS. DPR-71 AND DPR-62
DOCKET NOS. 50-325 AND 50-324

INFORMATION REQUEST REGARDING STATION BLACKOUT, UNRESOLVED SAFETY ISSUE A-44

Dear Mr. Ippolito:

Enclosed are completed Tables 1-4 as requested in your letter of July 9, 1981.

We trust that this information satisfies your request.

Very truly yours,

Approved:

RE Morgan for CR Dietz

RMP/gvc

Enclosure

Page of 8110200615

Enclosure 1 - Page 1
Plant Name BSEP
Unit No. Common

TABLE 1

Diesel Generator Operations Data
Calendar Year 1976[illegible]

TABLE 2

Diesel Generator Operations Data
Calendar Year 1977[illegible]

III: Actual Demand Starts not for Testing

Microcollaneous Tests
(Specify Type)

Diesel Generator Operations Data
Calendar Year 1978

[illegible]

IM: Actual demand
Starts not for
Testing

Physiological Tests
(Specify Type)

TABLE 1

Miscellaneous Tests
(Specify Type)

Diesel Generator Scheduled Downtime Record
Calendar Year 1976

Plant Name BSEP

Diff. No. 2

[illegible]

Diesel Generator Scheduled Downtime Record Calendar Year 19 77

Unit No. 2

[illegible]

Diesel Generator Scheduled Downtime Record Calendar Year 1978

Plant Name BSEP

Page No. 2

Reason for Downtime	Hours of Downtime										Comments
	Reactor shutdown					Reactor not shutdown					
	DG#	DG#	DG#	DG#	DG#	DG# 1	DG# 2	DG# 3	DG# 4	DG#	
Scheduled Maintenance PM						33.5		12		12.5	Routine Maintenance PM 75-412, 78-159 work on these plant modifications were done simultaneously 78.159
Time DG is unavailable for emergency service because of required tests											

**Diesel Generator Scheduled Downtime Record
Calendar Year 1979**

Plant Name BSEP

Date No. 2

[illegible]

Diesel Generator Scheduled Downtime Record Calendar Year 1980

Plant Name BSEP

Doc. No. 2

[illegible]

TABLE 2

Diesel Generator Scheduled Downtime Record
Calendar Year 1981

Enclosure 1 - Page 2

Plant Name BSEP

Unit No. 2

Reason for Downtime	Hours of Downtime										Comments
	Reactor shutdown					Reactor not shutdown					
	DC#	DC#	DC#	DC#	DC#	DC# 1	DC# 2	DC# 3	DC# 4	DC#	
Scheduled Maintenance								1.5	7.75		Routine Maintenance
Time 16G is unavailable for emergency service because of required tests											

Diesel Generator Scheduled Downtime Record
Calendar Year 1977

Day & No. 1

[illegible]

Diesel Generator Scheduled Downtime Record
Calendar Year 1976

Plant Name BSEP

Day & No. 1

Reason for Downtime	Hours of Downtime										Comments
	Reactor shutdown					Reactor not shutdown					
	DG# 1	DG# 2	DG# 3	DG# 4	DG#	DG# 1	DG# 2	DG# 3	DG# 4	DG#	
Scheduled Maintenance											Terminations in test panel
Equipment Modification			5				1	4	29		
Time DG is unavailable for emergency service because of required tests											

Diesel Generator Scheduled Downtime Record Calendar Year 1978

Plant Name BSEP

Doc. No. 1

[illegible]

Diesel Generator Scheduled Downtime Record Calendar Year 19 79

Plant Name BSEP

Doc. No. 1

[illegible]

Diesel Generator Scheduled Downtime Record
Calendar Year 19 80

Plant Name BSEP

Date No. 1

Reason for Downtime	Hours of Downtime										Comments
	Reactor shutdown					Reactor not shutdown					
	DC# 1	DC# 2	DC# 3	DC# 4	DC# 5	DC# 1	DC# 2	DC# 3	DC# 4	DC# 5	
Scheduled Maintenance						29	28.25		8.25		Routine Maintenance
						3.9	9.5				Electrical inspection
Equipment Modification						8	11.				80-46 Installed generator spray deflectors
						5.25	9.75				79-136 and 79-147 modifies lube oil alarm and service water alarm to delay for 30 seconds upon start
Annual Inspection						65.75	49.3				
Time DC is unavailable for emergency services because of required tests											

Diesel Generator Scheduled Downtime Record
Calendar Year 19 81

Plant Name BSEP

Day & No. 1

[illegible]

TABLE 3

Diesel Generator Unscheduled Downtime Record
Calendar Year 1979

Enclosure 1 - Page 3

Plant Name BSEPUnit No. 1

LER Abstract No. (Refer to attached LER Abstract)	Downtime Hours				Comments - If any of the reported failures would not have been a failure under emergency conditions, please explain here. Refer to attached LERs or the failures listed in Table 1.
	Total Hours	Trouble-shooting	Parts, Delivered, etc.	Repair/replace	
79-74	12				None listed for 79
NO LER	8.5				Loss of control air due to ruptured diaphragm
					On start of diesel service water valves failed closed and fail to start alarm came in.

TABLE 3

Diesel Generator Unscheduled Downtime Record
Calendar Year 1980Enclosure 1 - Page 3
Plant Name BSEP
Unit No. 1

DER Abstract No. (Refer to attached LER Abstract)		Downtime Hours				Comments - If any of the reported failures would not have been a failure under emergency conditions, please explain here. Refer to attached LERs or the failures listed in Table 1.
		Total Hours	Trouble-shooting	Parts, Deliv-ery, etc.	Repair/replace	
80-043	4	8.20				
80-040	3	6				
80-070	2	1.5				
80-081	1	11.3				Diesel started in 13.9 seconds vise 10 seconds
NO LER	1	22.45				Fuel pump failed DG would carry 66% rated capacity
	2	20.5			12.5	Fuel injector tube loose. Tube could have been tightened while running if necessary.

TAB. K 3

Annual Generator Unscheduled Downtime Record
Calendar Year 1978

Enclosure 1 - Page 3
Plant Name BSEP
Unit No. 1

LER Abstract No. (Refer to LER Abstract)	Downtime Hours	Comments - If any of the reported failures would not have been a failure under emergency conditions, please explain here. Refer to attached LERs or the failures listed in Table 1.			
		Total Hours	Trouble-shooting	Parts, Out (vary, etc)	Repair/replace
78-003	10	3 min			
78-062	9	N/A			Fire protection system inop not related to operation of diesels.
78-074	8	11			
78-078	7	N/A			Diesels were operational while #3 was unavailable during annual inspection. Operators failed to verify operation of others.
78-083	6				
77-90	5	N/A			Problem is on reactor recirc. pump, not diesel related.
NO LER	1	4.25			Weld cracked on jacket water elbow minute leakage.
	2	10.5			Lockout button would not reset.
	3	.8			No governor speed control.

TABLE 1

Diesel Generator Unscheduled Downtime Record
Calendar Year 1977Enclosure 1 - Page 3
Plant Name BSEP
Unit No. 1

LER Abstract No. (Refer to attached LER Abstracts)	Downtime Hours				Comments - If any of the reported failures would not have been a failure under emergency conditions, please explain here. Refer to attached LERs or the failures listed in Table 1.
	Total Hours	Trouble-shooting	Parts, Dollars, etc.	Repair/Replacement	
77-1 11	1				
LER No Abstract					
77-111	29.5				Relay burnt out
77-115	4				Slow start greater than 10 seconds
77-83	29.1				Governor leads broken
NO LER					
1	3				Fuel rack won't close

TABLE 3

Diesel Generator Unscheduled Downtime Record
Calendar Year 19 76

Enclosure 1 - Page 3

Plant Name BSEPUnit No. 1

IER Abstract No. (Refer to attached IER Abstracts)	Downtime Hours				Comments - If any of the reported failures would not have been a failure under emergency conditions, please explain here. Refer to attached IERs or the failures listed in Table 1.
	Total Hours	Trouble-shooting	Parts, Bulb, etc.	Re-air/replace	
					None reportable in 1976

TABLE 3

Diesel Generator Unscheduled Downtime Record
Calendar Year 1981Enclosure 1 - Page 3
Plant Name BSEP
Unit No. 1

LER Abstract No. (Refer to attached LER Abstract)	Downtime Hours				Comments - If any of the reported failures would not have been a failure under emergency conditions, please explain here. Refer to attached LERs or the failures listed in Table 1.
	Total Hours	Franklin-shooting	Parts, Delivered, etc.	Repair/replace	
LER No Abstract					
1-81-27	45 min.				Air compressor breaker found turned off. Diesel was started and placed on line.
1-81-39	6				

TABLE 3

Diesel Generator Unscheduled Downtime Record,
Calendar Year 1975

Enclosure 8 - Page 3,

Plant Name _____

Unit No. 2

JER Abstract ID (Number attached to JER Abstract)		Downtime Hours				Comments - If any of the reported failures would not have been a failure under emergency conditions, please explain here. Refer to attached JERs or the failures listed in Table 1.
		Total Hours	Trouble- shooting	Parts, Del- ivery, etc	Repair/ replace	
76-5	11	3				
76-69	10	11				
	9					
76-85	8	33.5				
76-156	7	9.25				
76-182	6	Records	Misplaced			

Does not pertain to the diesel generators.

TABLE 3

Diesel Generator Unscheduled Downtime Record
Calendar Year 19__

Enclosure 1 - Page 3

Plant Name BSEPUnit No. 2

LER Abstract No. (Refer to attached LER Abstracts)	Downtime Hours				Comments - If any of the reported failures would not have been a failure under normal operating conditions, please explain here. Refer to attached LERs or the failures listed in Table 1.
	Total Hours	Cranks/starting	Parts, Bulbs, etc.	Repair/replace	
77-37 5	3 min				
NO LER					
1	3 min				
2	54 min				Diesels were cold, had slow start.

TABLE 3

Diesel Generator Unscheduled Downtime Record
Calendar Year 1978Enclosure 1 - Page 1
Plant Name BSEP
Unit No. 2

LER Abstract No. (Refer to attached LER Abstracts)	Downtime Hours				Comments - If any of the reported failures would not have been a failure under emergency conditions, please explain here. Refer to attached LERs or the failures listed in Table 1.
	Total Hours	Trouble-shooting	Parts, Delivery, etc.	Repairs/Replacement	
78-015 4	10.5				
NO LER					
1	4.5				Weld crack on 3/4 inch line minute amount of water leaking Barring gear switch failed, function is to lock diesel out during maintenance.
2	5.5				

TABLE 1

Diesel Generator Unscheduled Downtime Record
Calendar Year 1979

Enclosure 1 - Page 1
 Plant Name BSEP
 Unit No. 2

LER Abstract No. (Refer to attached LER Abstracts)	Downtime Hours				Comments - If any of the reported failures would not have been a failure under emergency conditions, please explain here. Refer to attached LERs or the failures listed in Table 1.
	Total Hours	Trouble-shooting	Parts, Delivered, etc.	Repair/replace	
79-002 3	45 min.				Diesel was out of service for modification; failed on restart due to reset button not pushed.
79-016 2	45 min.				
79-038 1	8.5				
LER but not in Abstract 79-014	3.3				No governor speed response

TABLE 3

Diesel Generator Unscheduled Downtime Record
Calendar Year 1980

Enclosure 1 - Page 3

Plant Name BSEPUnit No. 2

IER Abstract No. (Refer to attached IER Abstract)	Downtime Hours				Comments - If any of the reported failures would not have been a failure under emergency conditions, please explain here. Refer to attached IERs or the failures listed in Table 1.
	Total Hours	Trouble-shooting	Parts, Del-ivary, etc	Repair/replace	
NO IER					
1	16				Fuel oil leak on injector
2	4				DC Ground
3	2.2				Replacement of grounded component.
4	9.2				With #2DG out of service for maintenance #3 DC started in 16.61 sec. instead of required 10 sec.

TABLE 3

Diesel Generator Unscheduled Downtime Record
Calendar Year 1981Enclosure 1 - Page 3
Plant Name BSEP
Unit No. 2

DER Abstract No. (Refer to attached DER Abstracts)	Downtime Hours				Comments - If any of the reported failures would not have been a failure under emergency conditions, please explain here. Refer to attached DERs or the failures listed in Table 1.
	Total Hours	Trouble-shooting	Parts, Deliv-ery, etc	Repair/replace	
81-12	3				#4 DG governor erratic under load
81-32	.20				# During inspection #3 failed to start in less than 10 seconds
81-33	.3				#4 Hi jacket water temperature
81-44	26.5				#4 Hi jacket water temp low pressure
81-51	11				#4 Slow up to speed
81-55	34				#1 Output bkr tripped open found burnt resistor
81-61	24				#4 Field did not flash
81-66	8				#2 Hi jacket water temp trip

ON-SITE EMERGENCY DIESEL GENERATOR AND AUXILIARY EQUIPMENT MODIFICATION RECORD

TABLE 4

 Plant Name BSEP
 Unit No. 1 & 2

Equipment or Procedure Modified	Date of Mod.	Reason for Modification and Declared Improvement	Description of Modification
D/G Fuel Oil	1/12/75		This modification places fuel oil alarms on Unit No. 2 RTGB until Unit No. 1 annunciator panel 4A-S is placed in service. Consists of 4 conductor cables from XU-34 to XU-43 to XU-36.
D/G	2/7/75	Dampers do not function properly.	Remove dampers, modify and reinstall to permit dampers to function properly.
D/G	2/20/75	Exhaust fumes enter building through the air exhaust silencer drain line.	FECP #1044 corrects this
D/G Ventilation	2/25/75	Cable separation (ECP #0117)	To correct improperly identified cables.
D/G Starting Air	11/25/75		D/G starting air comp. relief valve.
D/G Control Logic	12/2/75	There is a loss of power to the emergency bus before the D/G comes to full power.	After loss of normal supply each emergency bus is energized from the associated D/G. This modification provides for restoring the normal source of power without a momentary loss of power to the emergency bus.
D/G	2/22/79	With a loss of the voltage regulator potential transformer, the AC will not transfer to DC (this would result from a blown fuse).	This modification adds an automatic transfer circuit to transfer excitation from the AC to DC regulator.
D/G	6/17/75	FSAR requirement	Install flapper covers over start isolated (emergency start) buttons at local diesel panels. (FECP #1224 installs)

ON-SITE EMERGENCY DIESEL GENERATOR AND AUXILIARY EQUIPMENT MODIFICATION RECORD

TABLE 4

 Plant Name BSEP
 Unit No. 1 & 2

Equipment or Procedure Modified	Date of Mod.	Reason for Modification and Declared Improvement	Description of Modification
D/G Service Water			Implement FECP #1310. Install all new jacket water cooling system heat exchanger water boxes. Also add corrosion protection.
D/G Fuel Oil	4/20/76	Require meters to determine fuel oil consumption by each diesel.	Install fuel oil meters.
D/G HVAC	5/24/76	The req'd setpoint of the temperature switches is not compatible with the output range.	Provides individual temperature switches for high temperature alarm in the 4 D/G cells.
D/G	12/16/76	NRC requires a PT on the D/G pressure switches.	This modification installs four new racks, each furnished with five calibration and five isolation valves.
D/G Fuel Oil	2/19/76	Cancellation of temporary Plant Modification 75-029.	Modification 75-029 placed the fuel oil alarms for D/G 1 and 2 four day tank alarms on the D/G 1 and D/G 2 annunciators because the proper annunciator panel 4A-S was not ready. This modification removes the temporary wiring and places the alarms in permanent service.
D/G Drain System	4/13/76	To keep flood waters from backing into the D/G Building from the oil collector sump pit.	Work performed by FECP #1461.
D/G	6/8/76	Relief valve setpoint change.	

ON-SITE EMERGENCY DIESEL GENERATOR AND AUXILIARY EQUIPMENT MODIFICATION RECORD

TABLE 4

Plant Name BSEP
Unit No. 1 & 2

Equipment or Procedure Modified	Date of Mod.	Reason for Modification and Declared Improvement	Description of Modification
D/G Fuel Oil	12/17/76	PNSC Action Item 76.107.6.1.a for sampling of the bottom of the saddle tanks.	This modification adds sample lines to the diesel saddle tanks.
D/G System	5/6/77	1. Cold weather and ventilation system affects performance of D/G System. 2. Increase setpoints.	The setpoints of lube oil prefilter heater, jacket water heater and lube oil pressure trip are being increased.
D/G System	7/21/77	NRC requested that D/G instruments be tested.	Tees with valves are being added to various instrument sensing lines to allow instrument calibration.
D/G System Fuel Oil	11/29/78	Technical Specification 38.1.1.B.?	This modification adds separate high and low level annunciators for the D/G fuel oil storage tanks instead of a common high or low level annunciator.
D/G System	2/23/79	NRC commitment by letter NG-77-583 dated 5/16/77	This modification will add a separate Control Room alarm for low starting air pressure and will tie the barring gear engaged contact into the D.G. Tripped/Not Available annunciator.
Fire Protection	8/4/80	Modify ventilation system so that the system can adequately remove fuel oil fumes from the area. Also, NRC requirement as per NRC 79-17 Item 5.C.14.	This modification swaps mounting positions of exhaust fans and gravity supply ventilators to improve air flow in each of the four fuel oil underground tank rooms.

ON-SITE EMERGENCY DIESEL GENERATOR AND AUXILIARY EQUIPMENT MODIFICATION RECORD

TABLE 4

Plant Name BSFP
Unit No. 1 & 2

Equipment or Procedure Modified	Date of Mod.	Reason for Modification and Declared Improvement	Description of Modification
Fire Protection Ventilation D/G Building	11/24/80	NRC 79-17 Item 5.C.8 - fire curtains in El. 50' D/G Building are inadequate.	Add an additional fusible link on other side of each of four D/G Building fire curtains.
D/G	10/29/80	Adding a time delay to the lube oil pressure pre-trip annunciator will prevent jacket water and lube temperature alarms from being masked due to the lube oil pressure alarm being initiated.	This modification will add a 30 second delay to the low lube oil pressure pre-trip annunciator to allow the D/G to come up to speed before the alarm is allowed to initiate.
D/G	8/29/79	Changing the setpoints will prevent the loss of cooling water to the diesels during initial startup and speed regulation. This is essential for the dependability of the diesel generators.	This modification will change the setpoints of the D/G speed switches (tack pack) from 510 to 500 rpm.
D/G	10/29/80	When the D/Gs are not operating, there is a continuous low service water alarm on the local D/G control annunciator panel.	This modification will wire the low service water annunciator in series with a contact of the timed S.C. relay which will eliminate an annunciator light on the local D/G panels when the D/Gs are not running.
D/G Fire Protection		Fire Protection Program Review APCSB 4.5-1, and NRC letter 9/19/79	This modification provides relays and resistors to supervise the deluge valve solenoid and its associated actuation circuitry for open circuits, short circuits, loss of power supply and ground faults.

ON-SITE EMERGENCY DIESEL GENERATOR AND AUXILIARY EQUIPMENT MODIFICATION RECORD

TABLE 4

 Plant Name BSEP
 Unit No. 1 & 2

Equipment or Procedure Modified	Date of Mod.	Reason for Modification and Declared Improvement	Description of Modification
D/G Fire Protection	1/8/81	This modification brings the D/G Building El. 23' Sprinkler System into compliance with NFPA 13.	This modification relocates sprinkler heads, adds flush connections and heat collectors to applicable sprinkler heads (D/G Building El. 23').
D/G Fire Protection	11/16/79	1. This improves the response time of detection and action of the AFFF System. 2. This prevents spurious trips of the AFFF deluge valves by blocking areas outside air intake filter from the detector.	This modification adds: 1. Heat collectors to sprinkler heads and heat detectors 2. Shields to flame detectors.
D/G Fire Protection	9/10/80	This modification complies with Fire Protection Program Review and Safety Evaluation Report and NFPA 13.	This modification relocates sprinklers, adds flush connections and heat collector uprights (D/G Building El. 2' - basement).
D/G Fire Protection	11/17/80	NFPA 13. This modification complies with Fire Protection Program Review and Safety Evaluation Report.	This modification relocates sprinklers, adds flush connections and heat collector uprights (D/G Building El. 2' - basement).
D/G Fire Protection	10/29/80	NFPA 13. This modification complies with Fire Protection Program Review and Safety Evaluation Report.	This modification relocates sprinklers, adds flush connections and heat collector uprights (D/G Building El. 2' - basement).
D/G Fire Protection	12/1/80	NFPA 13. This modification complies with Fire Protection Program Review and Safety Evaluation Report.	This modification relocates sprinklers, adds flush connections and heat collector uprights (D/G Building El. 2' - basement).

ON-SITE EMERGENCY DIESEL GENERATOR AND AUXILIARY EQUIPMENT MODIFICATION RECORD

Plant Name BSEP
 Unit No. 1 & 2

TABLE 4

Equipment or Procedure Modified	Date of Mod.	Reason for Modification and Declared Improvement	Description of Modification
D/G Fire Protection	10/30/80	NFPA 13. This modification complies with Fire Protection Program Review and Safety Evaluation Report.	Add drain, flush connections and pipe supports to the D/G air intake filter AFFF Sprinkler System. (D/G El. 50')

*There are no completed modifications for 1980 concerning diesel generators.

ON-SITE EMERGENCY DIESEL GENERATOR AND AUXILIARY EQUIPMENT MODIFICATION RECORD

TABLE 4

Plant Name BSEP
Unit No. 2

Equipment or Procedure Modified	Date of Mod.	Reason for Modification and Declared Improvement	Description of Modification
D/G PA System	12/5/77	Need PA System	Install PA telephones in each of the four D/G day tank rooms.
D/G Fire Protection	8/12/80	This modification is req'd to complete barrier separation between the D/G cells and the D/B Building upper level. Also NFPA-13 req'd NRC commitment.	This modification will install three hour fire rated barriers around diesel intake and exhaust pipes where they pass through El. 50' floor.