



PSE&G Public Service
Electric and Gas
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Robert L. Mittl General Manager
Nuclear Assurance and Regulation

November 20, 1985

Director of Nuclear Reactor Regulation
United States Nuclear Regulatory Commission
7920 Norfolk Avenue
Bethesda, Maryland 20814

Attention: Mr. Walter Butler, Chief
Licensing Branch 2
Division of Licensing

Gentlemen:

SEPARATION OF AUTOMATIC AND MANUAL
INITIATION CIRCUITS
HOPE CREEK GENERATING STATION
DOCKET NO. 50-354

As a result of the telecon held on November 18, and November 20, 1985 between representatives of Public Service Electric & Gas Company (PSE&G) and the NRC the following documents (attached) are submitted for your review.

- Bailey 862 Solid State Logic Module Analysis
- Summary Report of Bailey 862 Logic Module

In the event you require additional information pertaining to this subject, do not hesitate to contact us.

Very truly yours,

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Attachment

The Energy People

Boo!
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Director of Nuclear
Reactor Regulation

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11/20/85

C D.H. Wagner
USNRC Licensing Project Manager

A.R. Blough
USNRC Senior Resident Inspector

BAILEY 862 SOLID STATE LOGIC MODULE ANALYSIS

In response to a request for additional information regarding the separation of automatic and manual initiation circuits within the Bailey 862 solid state logic system, we provide the following:

NSSS

Each individual Emergency Core Cooling System has automatic and manual initiation control circuits which are completely independent from the Bailey 862 logic system. All NSSS initiation control circuits use the standard GE relay design.

NSSS ESF Systems include the following:

- a. Emergency Core Cooling Systems (ECCS) (HPCI, ADS, LPCI, and Core Spray)
- b. Primary Containment and Reactor Vessel Isolation Control System (PCRVICES)
- c. Residual Heat Removal (RHR)/Containment Spray Cooling Mode (CCSCM)
- d. RHR/Suppression Pool Cooling Mode (SPCM)

Non-NSSS

Each Non-NSSS Engineered Safety Features (ESF) System and Essential Auxiliary Supporting (EAS) System is designed with automatic and manual initiation control circuits in redundant channels.

Non-NSSS ESF Systems include the following:

- a. Primary Containment Isolation System (PCIS)
- b. Containment Atmosphere Control System (CACs)
- c. Main Control Room Habitability and Isolation System (MCRHIS)
- d. Main Steam Isolation Valve Sealing System (MSIVSS)
- e. Filtration, Recirculation and Ventilation System (FRVS)
- f. Reactor Building Ventilation Isolation System (RBVIS)
- g. EAS Systems
 1. Station Service Water System (SSWS)
 2. Safety Auxiliaries Cooling System (SACS)
 3. Class 1E Power Systems
 4. Primary Containment Instrument Gas System (PCIGS)
 5. Control Area Chilled Water Systems (CACWS)
 6. ESF Equipment Area Cooling Systems (EACS)

System level initiation is not provided for EAS systems.

These systems are usually in service during plant operation.

The attached table identifies, by system, the equipment control circuits that share the auto/manual function in the same 862 Logic Module. The table also identifies the redundant equipment and channel(s). Each 862 logic equipment control circuit operates independently and its module performing auto/manual initiation is not shared by any other equipment control circuit. Therefore, for all cases a failure of a single 862 Logic Module will not prevent the actuation (manual or automatic) of any redundant equipment or redundant system. The RSP does not use Bailey 862 Logic Modules. Controls for NSSS and BOP located on the RSP are hardwired.

As requested, a copy of the qualification summary report of the 862 Logic Module has been attached for your information.

CH.A	CH.B	CH.C	CH.D	COMMENTS
PRIMARY CONTAINMENT ISOLATION SYSTEM				
PCIS A	PCIS B	PCIS C	PCIS D	PCIS is designed as a four (4) channel system with manual and auto initiation at the channel level.
HV-4952			HV-4951 HV-4950	HV-4952 is the INBD.ISOL.VLV.
HV-4956			HV-4978 HV-4979 HV-4980	HV-4956 is the INBD.ISOL.VLV.
HV-4958			HV-4978 HV-4979 HV-4980	HV-4958 is the INBD ISOL.VLV.
HV-4964			HV-4962 HV-4963	HV-4964 is the INBD.ISOL.VLV.
HV-4955A HV-5019A HV-4959A HV-4966A		HV-4983A HV-4984A HV-4965A HV-5022A		
	HV-5019B HV-4955B HV-4959B		HV-4984B HV-4983B HV-4965B	
	HV-4966B		HV-5022B HV-4974	HV-4966B is the INBD.ISOL.VLV.
HV-5054A		HV-5053A		
	HV-5054B		HV-5053B	
HV-5050A		HV-5052A		
	HV-5050B		HV-5052B	
HV-5152A		HV-5126A		
	HV-5126B		HV-5152B	
			HV-5161	Inboard check valve SE-V006 meets NRC General Design Criterion 55 as tabulated in PSAR Table 6.2-16 pg. 5 of 33.
HV-5148		HV-5147	HV-5162	HV-5148 is the INBD.ISOL.VLV.
HV-5155			HV-5154	
	HV-F004		HV-F003	

CH.A	CH.B	CH.C	CH.D	COMMENTS
	HV-F020	HV-F019	HV-5834A ↓ 5A ↓ 6A V 7A	HV-F022A (MSIV) is the INBD.ISOL.VLV. ↓ B ↓ C ↓ D ↓
HV-5018 HV-4957 HV-4652 HV-4680	HV-4679 HV-4681	HV-9531B1 ↓ B2 ↓ B3 V B4	HV-9531A1 ↓ A2 ↓ A3 V A4	
			HV-4953 HV-4981	
			HV-3800A HV-3800B	Inboard check valves BB-V043 and BB-V047 meet NRC General Design Criterion 56 as tabulated in FSAR Table 6.2-16 pg. 3 of 33.
	HV-2553 HV-2555		HV-2554 HV-2556	
HV-2598 HV-2599				These valves are not part of ESF protection system.
CONTAINMENT ATMOSPHERE CONTROL SYSTEM				
HV-5055A HD-9372A HD-9372C	HV-5055B	HV-5057A	HV-5057B HV-5035	H ₂ recombination system. These items are not part of ESF Protection System. ↓
MAIN CONTROL ROOM HABITABILITY & ISOLATION SYSTEM				
		AVH-403 AV-400 AV-415 HD-9598A HD-9588AA HD-9588BA	BVH-403 BV-400 BV-415 HD-9598B HD-9588AB HD-9588BB	MCRHIS is designed as a two (2) loop system. ↓ MCR Isolation Dampers ↓
MAIN STEAM ISOLATION VALVE SEALING SYSTEM				
		HV-6055B HV-6057	HV-6055A	MSIVSS Test loop ISOL.VLVS. These items are not part of ESF protection system.

CH.A	CH.B	CH.C	CH.D	COMMENTS
FILTRATION, RECIRCULATION, AND VENTILATION SYSTEM				
HD-9395A	HD-9395B			
AV-213 EV-213	BV-213 FV-213	CV-213	DV-213	E&F start as back-up on failure of A, B, C, or D.
AV-206	BV-206			
REACTOR BUILDING VENTILATION ISOLATION SYSTEM				
		HD-9370A HD-9414A	HD-9370B HD-9414B	
STATION SERVICE WATER SYSTEM				
AP-502 HV-2198A	BP-502 HV-2198B	CP-502 HV-2198C	DP-502 HV-2198D	SSWS is designed as a two (2) loop system A & C, B & D.
HV-2203	HV-2204	HV-2207		RACS ISOL. HV-2207 is redundant for HV-2203 & HV-2204.
HV-2371A	HV-2371B	HV-2346		Not part of ESF Protection sys.
		HV-2355A	HV-2355B	
SAFETY AUXILIARIES COOLING SYSTEM				
AP-210 HV-2491A	BP-210 HV-2491B	CP-210 HV-2494A	DP-210 HV-2494B	SACS is designed as a two (2) loop system A & C, B & D.
HV-2522A HV-2496A		HV-2522C HV-2496C		Loop A SACS/TACS isolation valves.
	HV-2522B HV-2496B		HV-2522D HV-2496D	Loop B SACS/TACS isolation valves.
HV-7922A HV-2317A	HV-7922B HV-2317B			Fuel pool Heat Exchanger cross-connect.
		HV-2453A HV-2321A	HV-2453B HV-2321B	PCIGS Heat Exchanger cross-connect.
CLASS 1E POWER SYSTEMS				
52-40107	52-40207	52-40307	52-40407	SDG circuit breakers.

CH.A	CH.B	CH.C	CH.D	COMMENTS
52-41014 52-45011 52-41011	52-42011 52-42014 52-46011	52-43014 52-47011 52-47031	52-44014 52-48011	Feeder circuit breaker for non-class 1E loads. Safety function is to trip on LOCA.
PRIMARY CONTAINMENT INSTRUMENT GAS SYSTEM				
HV-5172A	HV-5172B	HV-5156A HV-5124A	HV-5156B HV-5124B	PCIGS is designed as a two (2) loop system.
CONTROL AREA CHILLED WATER SYSTEM				
AK-403 AP-414	BK-403 BP-414	AK-400 AP-400	BK-400 BP-400	CACWS is designed as a two (2) loop system.
ESF EQUIPMENT AREA COOLING SYSTEM				
		AVH-407	BVH-407	Auxiliary building control area HVAC is designed as a two (2) loop system.