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Vogtle Project

March 28, 1986

File: X7BC35
Log: GN-850

Director of Nuclear Reactor Regulation
Attention: Mr. B. J. Youngblood
PWR Project Directorate #4
Division of PWR Licensing A
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

REF: Youngblood to Conway, 2/20/86

NRC DOCKET NUMBERS 50-424 AND 50-425
CONSTRUCTION PERMIT NUMBERS CPPR-108 AND CPPR-109
VOGTLE ELECTRIC GENERATING PLANT - UNITS 1 AND 2
SER CONFIRMATORY ITEM 44: TMI ITEM I.C.1

Dear Mr. Denton:

Attached for your staff's review is the VEGP response to the referenced letter. The attachment contains responses to your staff's request for additional information concerning the Procedures Generation Package.

If your staff requires any additional information, please do not hesitate to contact me.

Sincerely,

J. A. Bailey

J. A. Bailey
Project Licensing Manager

JAB/sm
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CONFIRMATORY ITEM 44

(REQUEST FOR ADDITIONAL INFORMATION)

NRC POSITION

1. The justification for Emergency Operating Procedure (EOP) #19000-1 (Emergency Response Guideline (ERG) # E-0) Step 15 stated that your plant design does not include a phase B containment isolation signal. Provide a comparison table of all the systems isolated in the high pressure (HP) reference plant phases A and B and the systems isolated on phase A for your plant. Provide justification for each system that is isolated in the reference plant which is not isolated at Vogtle.

VEGP POSITION

Attached is a comparison table of containment isolation signals phase A and B components for VEGP and the high pressure (HP) reference plant (see attachment A). The HP reference plant is of typical SNUPPs design. A comparison of the VEGP and SNUPPs isolation valves identified three cases where VEGP does not provide isolation signals that is provided for by the reference plant. These cases are: (1) Containment Hydrogen Monitoring System Isolation Valves, (2) Containment Spray Emergency Sump Isolation Valves, and (3) ACCW Containment Isolation Valves.

The following is a discussion as to why VEGP does not provide an isolation signal for the above cases.

VEGP considers the Hydrogen Monitoring, the Containment Spray Emergency Sump, and the ACCW Containment penetrations to be essential systems.

The Hydrogen Monitoring System is Class 1E, Seismic Category 1 and designed to retain its integrity and to be operable under all conditions following a design basis accident. The containment spray emergency sumps isolation valves and associated piping are safety grade, Seismic Category 1, and provides for the long term removal of heat and gaseous iodine from the containment atmosphere. The ACCW System penetrations are considered essential due to the importance of maintaining cooling water to the Reactor coolant pumps. This is consistent with Regulatory Requirement Review Committee position 4.C.17.

NRC POSITION

2. Justify the elimination of sample line radiation and blowdown line radiation from the procedure identifying a ruptured steam generator. (EOP #19030-1 (ERG #E-3)Step #2).

VEGP RESPONSE

In order for the operator to be in Procedure 19030-1 (E-3), the primary to secondary leakage is substanital enough to cause SI actuation. Without SI actuation, the operator is directed to the Abnormal Operating Procedure for SG tube leakage, instead of 19030-1.

Two methods are provided in 19030-1 for determining the ruptured SG. These are: 1) an unexpected rise in the SG level, or 2) high radiation in a main steam line.

In the case of a large tube rupture, SG level provides obvious indication of the ruptured SG. A comparison of the SG level trends from the recorders show the ruptured SG. For smaller tube ruptures, the urgency is not as critical and time is available for monitoring SG level and steam line radiation for changes that indicate a ruptured SG. High main steam line radiation is available regardless of size of tube failure to identify the leaking steam generator. VEGP did not include SG sampling and blowdown radiation as methods for determining the ruptured SG because these process lines are isolated by SI actuation. The attached diagrams show the logic and circuitry which provides the isolation signal for these valves. In addition, there are certain plant conditions which prevent re-opening of the blowdown and sample isolation valves (see attachment B). Even for cases where the valves can be re-opened, the steps involved to check each SG require complicated and time consuming local operator actions which should not be included in procedure 19030-1.

NRC POSITION

3. In EOP #19251-1 step 12 (reference ERG FR-2.1 step 7), provide your plant-specific means for measurement of hydrogen concentration.

VEGP RESPONSE

VEGP's containment hydrogen monitoring system is discussed in the VEGP FSAR, subsection 6.2.5. Please refer to the attachment C.

NRC POSITION

4. Provide plant specific procedures EOP #19261-1 and 19262-1 (reference ERG #FR-1 and 1.2).

VEGP RESPONSE

Attached please find copies of Procedures EOP 19261-1 and 19262-1 (see attachment D).

NRC POSITION

5. For EOP steps corresponding to ERG steps which require establishing specific charging flow values, modify your EOPs to specify the amount of charging flow to be established.

VEGP RESPONSE

The intent of the ERG steps which require 60 gpm charging flow while placing normal charging in service is to ensure adequate charging pump cooling. Vogtle's design incorporates two charging pump miniflow paths. The normal miniflow path directs a portion of the pumps discharge through the seal water heat exchanger and back to the pump's suction header. This flow path is automatically isolated on a safety injection actuation. The alternate miniflow path directs the pumps discharge to a pressure relief valve, which is sized to ensure pump cooling and prevent cavitation, should the pump become dead headed. This flow path is normally isolated and is automatically aligned on a safety injection actuation.

The ERG steps direct the operator to place normal charging in service and isolate the safety injection flow path through the BIT. The reference plant verifies 60 gpm charging flow in lieu of verifying a miniflow path. In the corresponding Vogtle EOP steps, the operator verifies the normal miniflow isolation valves are open before securing the BIT flow path. In the event the normal miniflow path cannot be established, the operator is instructed to leave the alternate miniflow aligned to provide a relief path to the RWST.

By verifying a pump miniflow path exists prior to isolating the BIT flow path, the operator ensures charging pump cooling is established. This allows the operator to control charging flow as required to maintain pressurizer level while providing pump protection. In most cases, the pressurizer level is high when the operator attempts to establish charging and secure safety injection. During these times it is desired to have minimum charging flow.

PHASE A CONTAINMENT ISOLATION

VOGTLE ISO. VALVE NUMBER	SNUPPS ISO. VALVE NUMBER	DESCRIPTION	COMMENT
HV-8047	BB HV-8026	PRT Nitrogen Iso. Valve	
HV-8033	BB HV-8027	PRT Nitrogen Iso. Valve	
HV-8100	BG HV-8100	Seal Water Return CTMT Iso. Valve	
HV-8112	BG-HV-8112	Seal Water Return CTMT Iso. Valve	
HV-8152	BG HV-8152	Letdown System CTMT Iso. Valve	
HV-8160	BG HV-8160	Letdown System CTMT Iso. Valve	
HV-8028	BL HV-8047	Reactor Makeup Water CTMT Iso. Valve	
HV-8825	EJ HCV-8825	RHR to SI Test Line Iso. Valve	
HV-8890A	EJ HCV-8890A	RHR A to SI Pumps Test Line Iso. Valve	
HV-8890B	EJ HCV-8890B	RHR B to SI Pumps Test Line Iso. Valve	
HV-8823	EM HV-8823	SI/Accumulator Injection Test Line Iso. Valve	
HV-8824	EM HV-8824	Safety Injection Pump B Test Line Iso. Valve	
HV-8843	EM HV-8843	Boron Injection Upstream Test Line Iso.	
HV-8871	EM HV-8871	SI Test Line to RWST Iso. Valve	
HV-8881	EM HV-8881	Safety Injection Pump Test Line Iso. Valve	
HV-8964	EM HV-8964	SI Test Line System Outside CTMT Iso.	

VOGTLE ISO. VALVE NUMBER	SNUPPS ISO. VALVE NUMBER	DESCRIPTION	COMMENT
----------	GS HV-3	Hydrogen Analyzer B Inlet Iso.	Vogtle considers the H_2 monitor essential
----------	GS HV-4	Hydrogen Analyzer B Inlet Iso.	Vogtle considers the H_2 monitor essential
----------	GS HV-5	Hydrogen Analyzer B Inlet Iso.	Vogtle considers the H_2 monitor essential
----------	GS HV-8	Hydrogen Analyzer B Disch. Iso.	Vogtle considers the H_2 monitor essential
----------	GS HV-9	Hydrogen Analyzer B Disch. Iso.	Vogtle considers the H_2 monitor essential
----------	GS HV-12	Hydrogen Analyzer A Inlet Iso.	Vogtle considers the H_2 monitor essential
----------	GS HV-13	Hydrogen Analyzer A Inlet Iso.	Vogtle considers the H_2 monitor essential
----------	GS HV-14	Hydrogen Analyzer A Inlet Iso.	Vogtle considers the H_2 monitor essential
----------	GS HV-17	Hydrogen Analyzer A Disch. Iso.	Vogtle considers the H_2 monitor essential
----------	GS HV-18	Hydrogen Analyzer A Disch. Iso.	Vogtle considers the H_2 monitor essential
----------	GS HV-31	Sample Line to CTMT Atmos Monitor	Vogtle utilizes one CNMT. atmos. rad. monitor. See HV-12975, 6, 7, & 8 below. Vogtle design provides isolation with fewer valves. See HV-12975, 6, 7, & 8 for similar valves arrangement.
----------	GS HV-32	Sample Line to CTMT Atmos Monitor	Same as GS-HV-31
HV-8212	GS HV-33	Hydrogen Sample Return From PASS	
HV-8211	GS HV-34	Hydrogen Sample Return From PASS	
HV-12975	GS HV-36	Sample Line to CTMT Atmos Monitor	
HV-12976	GS HV-37	Sample Line to CTMT Atmos Monitor	
HV-12977	GS HV-38	Sample Return CTMT Atmos Monitor	

VOGTLE ISO. VALVE NUMBER	SNUPPS ISO. VALVE NUMBER	DESCRIPTION	COMMENT
----------	GS HV-3	Hydrogen Analyzer B Inlet Iso.	Vogtle considers the H_2 monitor essential
----------	GS HV-4	Hydrogen Analyzer B Inlet Iso.	Vogtle considers the H_2 monitor essential
----------	GS HV-5	Hydrogen Analyzer B Inlet Iso.	Vogtle considers the H_2 monitor essential
----------	GS HV-8	Hydrogen Analyzer B Disch Iso.	Vogtle considers the H_2 monitor essential
----------	GS HV-9	Hydrogen Analyzer B Disch. Iso.	Vogtle considers the H_2 monitor essential
----------	GS HV-12	Hydrogen Analyzer A Inlet Iso.	Vogtle considers the H_2 monitor essential
----------	GS HV-13	Hydrogen Analyzer A Inlet Iso.	Vogtle considers the H_2 monitor essential
----------	GS HV-14	Hydrogen Analyzer A Inlet Iso.	Vogtle considers the H_2 monitor essential
----------	GS HV-17	Hydrogen Analyzer A Disch. Iso.	Vogtle considers the H_2 monitor essential
----------	GS HV-18	Hydrogen Analyzer A Disch. Iso.	Vogtle considers the H_2 monitor essential
----------	GS HV-31	Sample Line to CTMT Atmos Monitor	Vogtle utilizes one CNMT. atmos. rad. monitor. See HV-12975, 6, 7, & 8 below. Vogtle design provides isolation with fewer valves. See HV-12975, 6, 7, & 8 for Similiar valves arrangement.
----------	GS HV-3~~1~~ 2	Sample Line to CTMT Atmos Monitor	Same as GS-HV-31
HV-8212	GS HV-33	Hydrogen Sample Return From PASS	
HV-8211	GS HV-34	Hydrogen Sample Return From PASS	
HV-12975	GS HV-36	Sample Line to CTMT Atmos Monitor	
HV-12976	GS HV-37	Sample Line to CTMT Atmos Monitor	
HV-12977	GS HV-38	Sample Return CTMT Atmos Monitor	

VOGTLE ISO. VALVE NUMBER	SNUPPS ISO. VALVE NUMBER	DESCRIPTION	COMMENT
HV-12978	GS HV-39	Sample Return CTMT Atmos Monitor	
HV-7126	HB HV-7126	RCDT Vent Inside CTMT	
HV-7136	HB HV-7136	RCDT Pumps Disch. Hdr. Outside CTMT Iso.	
HV-7150	HB HV-7150	RCDT Vent Outside CTMT	
HV-7699	HB HV-7176	RCDT Pumps Disch. Hrd. Inside CTMT Iso.	
HV-9378	KA FV-29	Reactor Bldg. Instr. Air Supply Outside CTMT Iso.	
HV-780	LF FV-95	CTMT normal Sumps to Floor Drain Tank Inside CTMT Iso.	
HV-781	LF FV-96	CTMT Normal Sumps to Floor Drain Tank Outside CTMT Iso.	
HV-3507	SJ HV-5	PZR/RCS Liquid Sample Inner CTMT Iso.	
HV-3508	SJ HV-6	PZR/RCS Liquid Sample Outer CTMT Iso.	
HV-3513	SJ HV-12	PZR Vapor Sample Outer CTMT Iso.	
HV-3514	SJ HV-13	PZR Vapor Sample Inner CTMT Iso.	
HV-10950 HV-10951 HV-10952	SJ HV-18	Accumulator Sample Inner CTMT Iso.	
HV-10953	SJ HV-19	Accumulator Sample Outer CTMT Iso.	
HV-3502	SJ HV-127	PZR/RCS Liquid Sample Outer CTMT Iso.	
HV-3548	SJ HV-128	PZR/RCS Liquid Sample Inner CTMT Iso.	
HV-8220	SJ HV-129	PZR/RCS Liquid Sample Outer CTMT Iso.	

VOGTLE ISO. VALVE NUMBER	SNUPPS ISO. VALVE NUMBER	DESCRIPTION	COMMENT
--------	SJ HV-130	PZR/RCS Liquid Sample Outer CTMT Iso. Valve	Vogtle design provides isolation with fewer valves
HV-8208	SJ HV-131	PASS Discharge to RCDT	
HV-8209	SJ HV-132	PASS Discharge to RCDT	
HV-8888	EM HV-8888	Accumulator Tank Fill Line Iso. Valve	
--------	EN HV-01	CTMT Recirc. Sump to CTMT Spray Pump A Iso.	Vogtle considers CNMT Spray Emergency Sump Iso. valves essential
--------	EN HV-07	CTMT Recirc. Sump to CTMT Spray Pump B Iso.	Same as EN HV-01
HV-8880	EP HV-8880	CTMT Nitrogen Supply Iso. Valve	
HV-9385	GS HV-20	Hydrogen Purge Inner CTMT Iso.	
--------	GS HV-21	Hydrogen Purge Outer CTMT Iso.	Vogtle design provides a check valve iso. inside CNMT.
HV-27091	KC HV-253	Fire Protection System Hdr Outer CTMT Iso.	

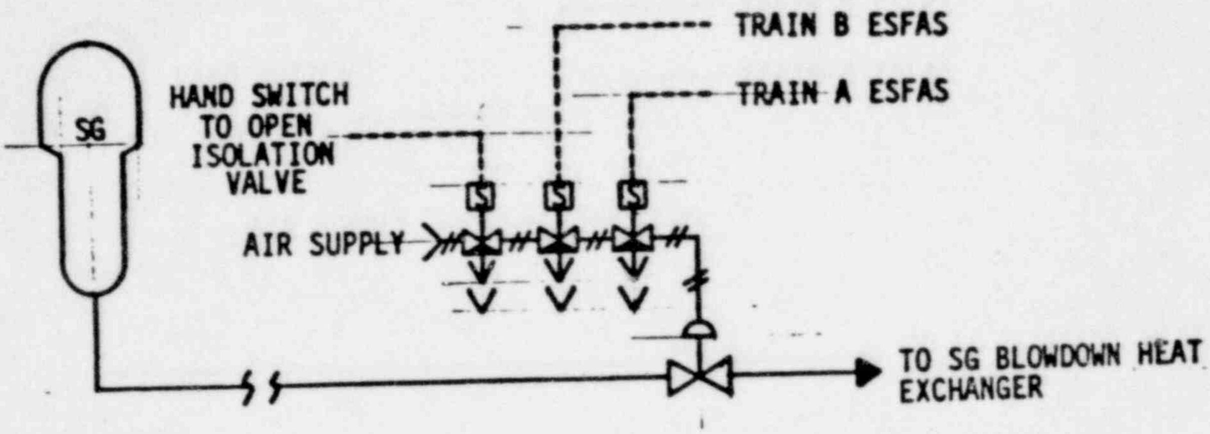
PHASE B CONTAINMENT ISOLATION

--------	EG HV-58	CCW to RCS Iso.	Vogtle maintains ACCW to CNMT. To provide continued RCP operation; which is considered essential.
--------	EG HV-59	CCW Return From RCS Iso.	Same as EG HV-58
--------	EG HV-60	CCW Return From RCS Iso.	Same as EG HV-58
--------	EG HV-61	CCW Return From RCS Iso.	Same as EG HV-58
--------	EG HV-62	CCW Return From RCS Iso.	Same as EG HV-58

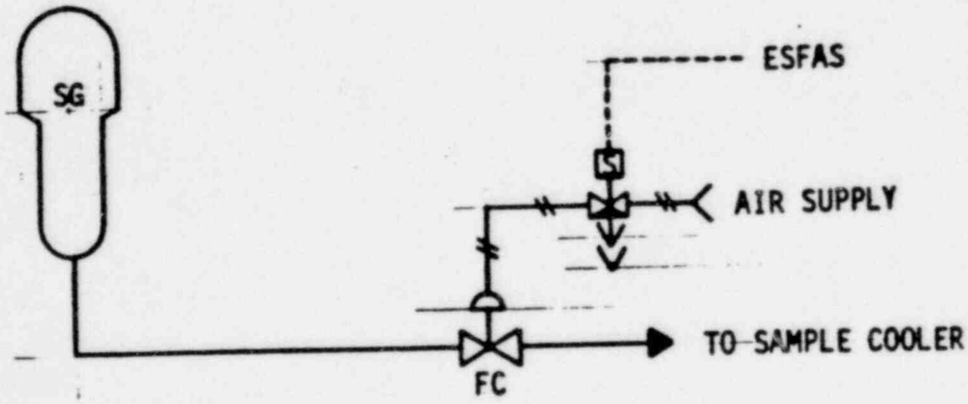
ATTACHMENT B

1 of 3

STEAM GENERATOR BLOWDOWN ISOLATION VALVES

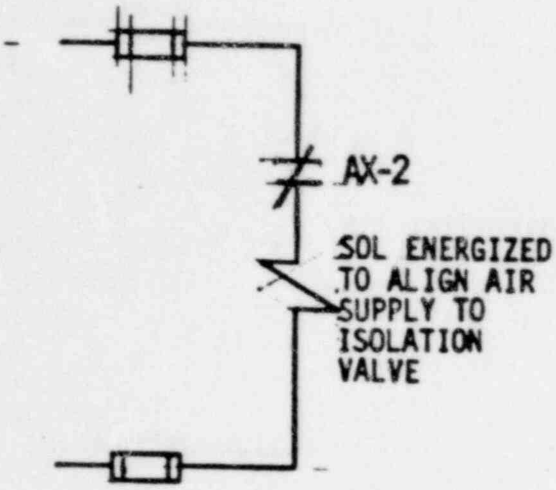


STEAM GENERATOR SAMPLE ISOLATION

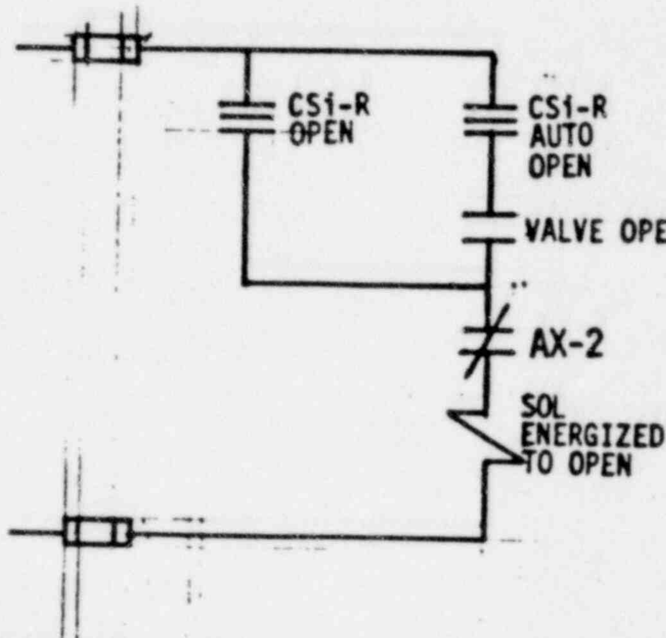


REFERENCE: P & IDs: 1X4D159-1 & 3

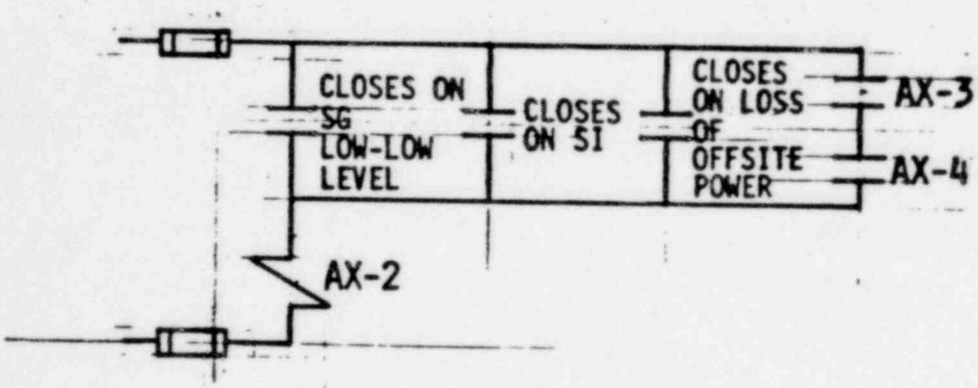
SG BLOWDOWN ISOLATION AX-2 VALVE ELECTRICAL CIRCUIT

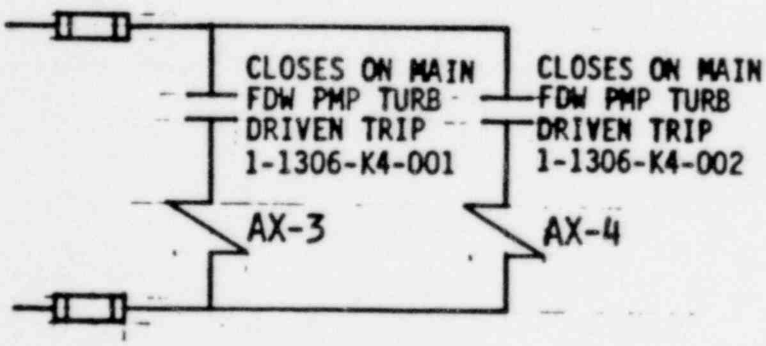


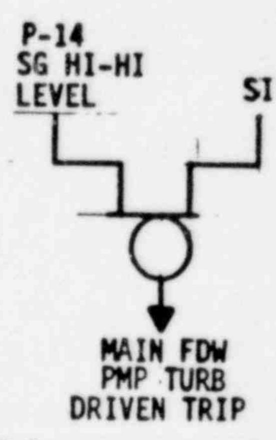
SG SAMPLE ISOLATION VALVE ELECTRICAL CIRCUIT



ESF INTERLOCK CIRCUIT

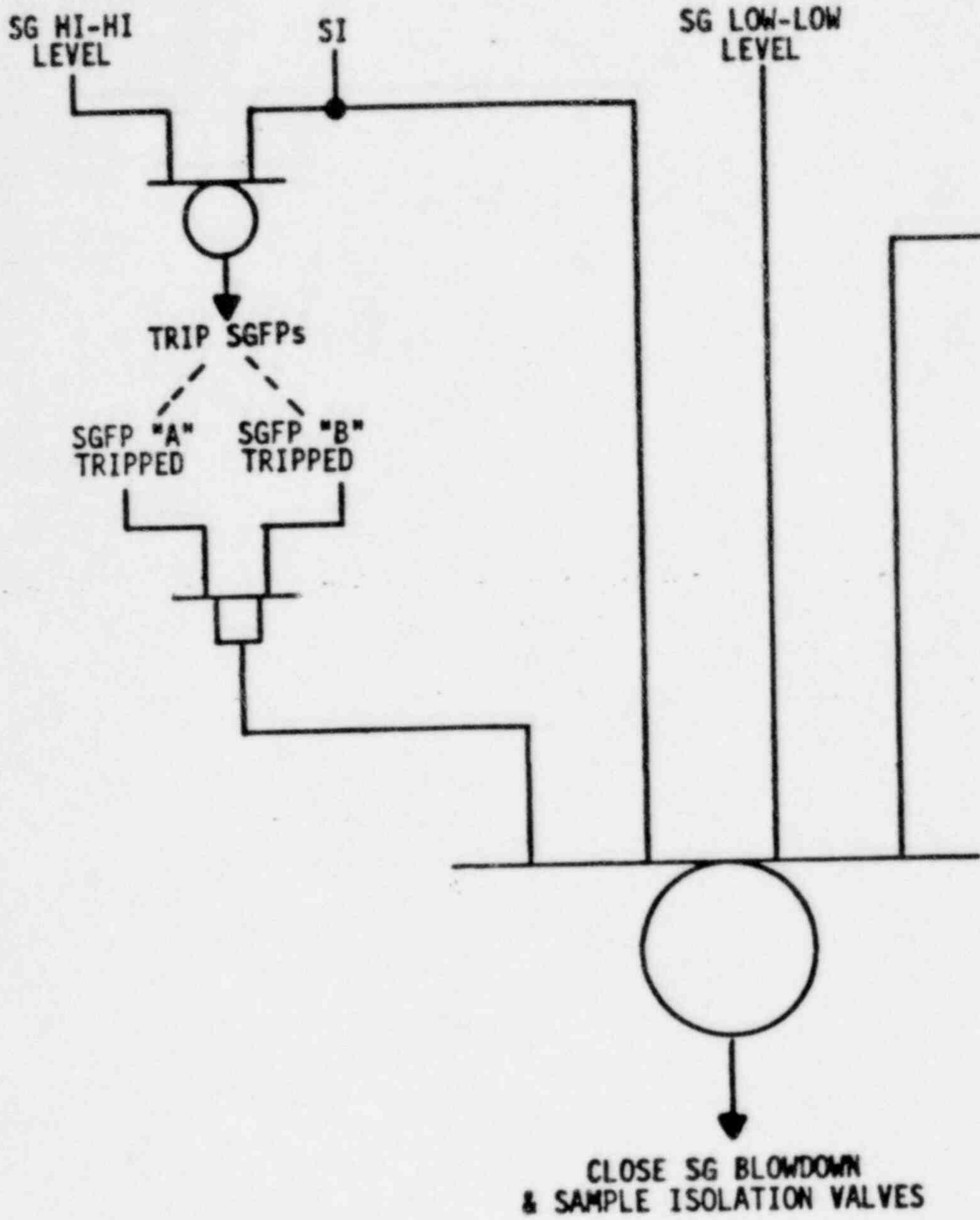






REFERENCE: ELEMENTARIES: 1X3d-BC-Q01A,B,C,D,Q04B,C,Q07E,F

SG BLOWDOWN & SAMPLE ISOLATION VALVE LOGIC



REFERENCE: LOGIC DIAGRAM: 1X5DN117-1

3. Hydrogen Monitoring

ATTACHMENT C

6.2.5.1.4 Containment Hydrogen Monitoring System

A. The hydrogen monitoring system is designed as a Class 1E, Seismic Category 1 system. It is designed to retain its integrity and operability under all conditions following a design basis accident (DBA).

B. All materials and equipment required by this system are selected to be compatible with the environmental conditions anticipated during accident operation and are suitable for a lifetime consistent with that of the plant.

C. The system samples containment air, providing the means to measure the containment hydrogen concentration and to alert the operator in the event that a high hydrogen concentration is detected, in accordance with the requirements of Regulatory Guide 1.7.

D. The hydrogen monitoring system consists of two identical units that are completely independent of each other and are powered from independent Class 1E power sources. Therefore, assuming a single failure, capability is available to monitor the hydrogen concentration in the containment.

E. Proper shielding and other provisions are incorporated into the design to ensure that personnel exposure does not exceed the limits of General Design Criterion 19 and that the required radiological analysis can be performed on the containment air sample.

6.2.5.2.4 Containment Hydrogen Monitoring System

Each redundant hydrogen monitoring train in the hydrogen monitoring system consists of a hydrogen analyzer and two associated sample lines with solenoid-operated isolation valves inside and outside the containment. These sampling lines are designed to be free of water traps (runs where liquid could accumulate) and are equipped with sufficient heat tracing to prevent condensation from the sample being supplied to the analyzers.

After the sample has been analyzed, it is returned to the containment. The analyzers are located in accessible areas outside the containment. The hydrogen monitoring subsystem piping is in accordance with the criteria of Regulatory Guide 1.26, Quality Group B. Solenoid-operated isolation valves are arranged to obtain samples from two locations within the containment for each train. The operator may select either of these sampling points from the main control room. 9 14

The operation of the hydrogen gas analyzer is based on the measurement of thermal conductivity of the gaseous containment atmosphere sample. The thermal conductivity of the gas mixture changes in proportion to the changes in the concentration of the individual gas constituents of the mixture. The thermal conductivity of hydrogen is far greater (approximately seven times the thermal conductivity of air) than any other gases or vapors expected to be present. This operation of the hydrogen monitoring system is not limited due to radiation, moisture, or temperature expected at the equipment location. The monitors are designed to function under design pressure conditions of -2 to 60 psig.

Indication of hydrogen concentration is available within 30 min of initiating flow through the monitors. This is accomplished by operating the monitors in standby during normal plant operation.

The range of the monitors is 0 to 10 volume percent with an accuracy of ±5.0 percent of scale.

The output signal of the hydrogen monitors is indicated locally and recorded and alarmed in the control room. In addition to the high hydrogen alarm, a common malfunction alarm is located in the control room to indicate loss of power, low or high pressure, or low or high temperature.

Design data for principal system components are presented in table 6.2.5-5. The system is schematically shown in figure 9.4.6-2.

The hydrogen monitoring system meets the requirements of TMI Action Plan Task II.F.1 regarding hydrogen monitoring.

6.2.5.5.4 Containment Hydrogen Monitoring System

The control switches for the sample selector valves and containment isolation valves are located on the process control panel in the control room. Operation of the hydrogen analyzers is controlled remotely from the main control board. Hydrogen concentration is both indicated and recorded on the main control board.

TABLE 6.2.5-5

DESIGN DATA FOR PRINCIPAL COMPONENTS OF THE CONTAINMENT HYDROGEN MONITORING SYSTEM

Hydrogen Analyzer	
Quantity	2 per unit
Type	Thermal conductivity
Range	0 to 1 and 0 to 10 volume percent
Accuracy	±5 percent of full scale
Valves (isolation)	
Quantity	10
Type	8 solenoid-operated gate valves and 2 check valves
Tubing Material	Stainless steel (Class 2)

4. ATTACHMENT D

Approval	Vogtle Electric Generating Plant NUCLEAR OPERATIONS	Georgia Power	Procedure No. 19261-1
			Revision No. 0
Date	Unit 1		Page No. 1 of 12

EMERGENCY OPERATING PROCEDURE

FR-I.1 RESPONSE TO HIGH PRESSURIZER LEVEL

PURPOSE

This procedure provides actions to respond to a high pressurizer level.

ENTRY CONDITIONS

- 19200-1, F-0.6 INVENTORY CSFST on a YELLOW Condition.

CONTINUED

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1. Check if ECCS Has Been Terminated: • SI pumps - ALL STOPPED. • BIT - ISOLATED.	1. Return to procedure and step in effect.

CONTINUED

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

The PRZR may be water solid. Charging and letdown flows should be carefully controlled to avoid sudden RCS pressure changes.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
2. Establish Excess Letdown By Initiating 13008-1, CVCS EXCESS LETDOWN.	2. Establish Safety Grade Letdown: a. Open reactor vessel head vent isolation valves: • HV-8095A • HV-8096A • HV-8095B • HV-8096B b. Open reactor vessel head vent throttle valves as required to obtain 90 gpm letdown flow: • HV-442A • HV-442B c. Continue safety grade letdown until ANY of the following occurs: • PRZR level - LESS THAN 92%. -OR- • PRT pressure - GREATER THAN 80 PSIG. -OR- • PRT level - GREATER THAN 90%. d. Isolate safety grade letdown.

CONTINUED

ACTION/EXPECTED RESPONSE | RESPONSE NOT OBTAINED

NOTE

- If all sources of RCP seal cooling flow have been lost, then the RCP seal is assumed to be hot. Recovery of No. 1 seal cooling is performed by Step 5.
- Without instrument air available charging should be established using Attachment A.

3. Check If Charging Flow Has Been Established:

   a. The following conditions are satisfied:

      - CCP - AT LEAST ONE RUNNING.
      - RCP seal injection - AT LEAST 8 GPM.

   RESPONSE NOT OBTAINED:

   a. Perform the following:

      1) IF ACCW flow to RCP thermal barrier is zero, THEN isolate seal injection to the affected RCP before starting a charging pump.

      2) Start one CCP.

   b. Instrument air to containment - ESTABLISHED.

   RESPONSE NOT OBTAINED:

   b. Establish instrument air to containment:

      1) Verify instrument air pressure is normal.

         IF instrument air pressure is NOT normal, THEN start one air compressor by initiating 13710-1, SERVICE AIR SYSTEM.

      2) Open instrument air to containment isolation valve HV-9378 if necessary.

CONTINUED

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
c. Charging flow - ESTABLISHED.	c. Establish charging flow. IF charging can NOT be established, THEN establish excess letdown using Procedure 13008-1, CVCS EXCESS LETDOWN. Go to Step 6.
4. Check Letdown - IN SERVICE.	4. Establish letdown by initiating 13006-1, CVCS STARTUP AND NORMAL OPERATION.

-

CONTINUED

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
5. Check If RCP Seal Return Flow Should Be Established:	
a. Seal injection flow - GREATER THAN 8 GPM.	a. Restore seal injection flow using Attachment B.
b. Verify RCP seal parameters: • Seal injection supply temperature - LESS THAN 135°F. • RCP No. 1 seal temperature - LESS THAN 220°F. • ACCW supply temperature - LESS THAN 105°F.	b. Secure the affected RCP. Go to Step 6.
c. Establish flow: 1) Open RCP seal return header isolation valves: • HV-8100 • HV-8112	
2) Verify seal return flow from each RCP - NORMAL FOR RCP NUMBER 1 SEAL DIFFERENTIAL PRESSURE.	2) Open RCP seal leakoff valves as necessary: • HV-8141A (RCP 1) • HV-8141B (RCP 2) • HV-8141C (RCP 3) • HV-8141D (RCP 4)

CONTINUED

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6. Check PRZR Pressure:	
a. Pressure - LESS THAN 2335 PSIG.	a. Verify at least one PRZR PORV and block valve open. IF NOT, THEN open one PORV and block valve as necessary until pressure is less than 2315 psig.
b. Pressure - LESS THAN 2260 PSIG.	b. Control charging and letdown flow as necessary to lower PRZR pressure to less than 2260 psig.
7. Verify PRZR PORVs - SHUT	7. Manually shut PORVs. IF any valve can NOT be shut THEN manually shut its block valve.
8. Energize PRZR Heaters.	
9. Check PRZR Spray Valves:	
a. Normal spray valves - SHUT.	a. Manually shut spray valves. IF any valve can NOT be shut, THEN stop the RCP supplying the failed spray valve.
b. Auxiliary spray valve - SHUT.	b. Manually shut auxiliary spray valve.

CONTINUED

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
10. Control Charging And Letdown Flow As Necessary To Maintain RCS Pressure Stable.	
11. Check PRZR Level - LESS THAN 92%.	11. Return to Step 10.
12. Return To Procedure And Step In Effect.	

END OF PROCEDURE TEXT

ATTACHMENT A

ESTABLISHING CHARGING WITHOUT INSTRUMENT AIR

A. Establish Charging With Both Train A And Train B Emergency Buses Energized:

1. Verify alternate miniflow isolation valves - OPEN:

   - HV-8508A
   - HV-8508B

2. Verify one CCP - RUNNING.

3. Verify charging isolation valves - OPEN:

   - HV-8105
   - HV-8106

4. Verify BIT isolation valves - SHUT:

   - HV-8801A
   - HV-8801B
   - HV-8803A
   - HV-8803B

5. Dispatch local operators to do the following:

   a. Open 1208-U4-136 CVCS SEALS FLOW CONTROL HV-181 BYPASS

   b. Shut 1208-U4-134 CVCS SEALS FLOW CONTROL HV-181 INLET ISO

   c. Shut 1208-U4-135 CVCS SEALS FLOW CONTROL HV-181 OUTLET ISO

   d. Adjust to obtain 8 to 13 gpm RCP SEAL INJ NEEDLE VLVS TO #1 SEAL:

      - 1208-U4-414(RCP #1)
      - 1208-U4-415(RCP #2)
      - 1208-U4-416(RCP #3)
      - 1208-U4-417(RCP #4)

   e. Adjust to obtain desired charging flow 1208-U4-136 CVCS SEALS FLOW CONTROL HV-181 BYPASS.

ATTACHMENT A (Cont'd.)

B. Establish Charging With Train A Emergency Bus Energized:

1. Verify Train A alternate miniflow isolation valve HV-8508A - OPEN.
2. Verify Train A CCP - RUNNING.
3. Verify Train A charging isolation valve HV-8106 - OPEN.
4. Dispatch local operators to do the following:
   a. Shut CCP discharge crosstie isolation valve HV-8438
   b. Verify Train B charging isolation valve HV-8105 - OPEN
   c. Open 1208-U4-136 CVCS SEALS FLOW CONTROL HV-181 BYPASS
   d. Shut 1208-U4-134 CVCS SEALS FLOW CONTROL HV-181 INLET ISO
   e. Shut 1208-U4-135 CVCS SEALS FLOW CONTROL HV-181 OUTLET ISO
   f. Adjust to obtain 8 to 13 gpm RCP SEAL INJ NEEDLE VLVS TO #1 SEAL:
      - 1208-U4-414(RCP #1)
      - 1208-U4-415(RCP #2)
      - 1208-U4-416(RCP #3)
      - 1208-U4-417(RCP #4)
   g. Adjust to obtain desired charging flow 1208-U4-136 CVCS SEALS FLOW CONTROL HV-181 BYPASS.

ATTACHMENT A (Cont'd.)

C. Establish Charging With Train B Emergency Bus Energized:

1. Verify Train B alternate miniflow isolation valve HV-8508B - OPEN.

2. Verify Train B CCP - RUNNING.

3. Verify Train B charging isolation valve HV-8105 - OPEN.

4. Verify Train B BIT isolation valves - SHUT:

- HV-8801B
- HV-8803B

5. Dispatch local operators to do the following:

a. Verify Train A BIT isolation valves - SHUT

- HV-8801A
- HV-8803A

b. Verify Train A charging isolation valve HV-8106 - SHUT

c. Open 1208-U4-136 CVCS SEALS FLOW CONTROL HV-181 BYPASS

d. Shut 1208-U4-134 CVCS SEALS FLOW CONTROL HV-181 INLET ISO

e. Shut 1208-U4-135 CVCS SEALS FLOW CONTROL HV-181 OUTLET ISO

f. Adjust to obtain 8 to 13 gpm RCP SEAL INJ NEEDLE VLVS TO #1 SEAL:

- 1208-U4-414(RCP #1)
- 1208-U4-415(RCP #2)
- 1208-U4-416(RCP #3)
- 1208-U4-417(RCP #4)

g. Adjust to obtain desired charging flow 1208-U4-136 CVCS SEALS FLOW CONTROL HV-181 BYPASS.

END OF ATTACHMENT A

ATTACHMENT B

RECOVERY OF RCP SEAL INJECTION

1. Check RCP No. 1 seal temperature.

   IF less than 220°F,
   THEN open CVCS SEALS RCP SEAL INJ SUPPLY CNMT ISO valve and ACCW supply to the affected RCP. Return to Step 5b.

   IF greater than 220°F,
   THEN proceed to Step 2 of this Attachment.

2. Verify seal injection supply temperature - LESS THAN 135°F.
   Verify ACCW supply temperature - LESS THAN 105°F.

3. Dispatch operator to shut CVCS SEALS RCP SEAL INJ NEEDLE VLVS TO #1 SEAL for affected RCP.

   - 1208-U4-414(RCP 1)
   - 1208-U4-415(RCP 2)
   - 1208-U4-416(RCP 3)
   - 1208-U4-417(RCP 4)

4. Verify CVCS SEALS RCP SEAL INJ NEEDLE VLVS of Step 3 of this Attachment is shut.

5. Open CVCS SEALS RCP SEAL INJ SUPPLY CNMT ISO valve for affected RCP.

6. Slowly open CVCS SEALS RCP SEAL INJ NEEDLE VLVS TO #1 SEAL to establish a 1°F per minute cooldown rate.

7. WHEN RCP No. 1 seal temperature is less than 220°F,
   THEN restore ACCW supply to the affected RCP.

8. Verify RCP seal parameters:

   - Seal injection supply temperature - LESS THAN 135°F.
   - RCP No. 1 seal temperature - LESS THAN 220°F.
   - ACCW supply temperature - LESS THAN 105°F.

   IF RCP seal parameters can NOT be verified,
   THEN secure the affected RCP.

9. Return to Step 5b of procedure.

END OF ATTACHMENT B

EMERGENCY OPERATING PROCEDURE

FR-I.2 RESPONSE TO LOW PRESSURIZER LEVEL

PURPOSE

This procedure provides actions to respond to a low pressurizer level.

ENTRY CONDITIONS

- 19200-1, F-0.6 INVENTORY CSFST on a YELLOW condition.

CONTINUED

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1. Check If ECCS Has Been Terminated: • SI pumps - ALL STOPPED. • BIT - ISOLATED.	1. Return to procedure and step in effect.
2. Verify Letdown - ISOLATED.	2. Manually isolate letdown.

NOTE

If all RCP seal cooling flows have been isolated, then the RCPs seal is assumed to be hot.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
3. Check If Charging Flow Has Been Established:	
a. The following conditions are satisfied: • CCPs - AT LEAST ONE RUNNING. • RCP seal injection - AT LEAST 8 GPM.	a. Perform the following: 1) IF ACCW flow to RCP thermal barrier is zero, THEN isolate seal injection to the affected RCP before starting CCP. 2) Start one CCP.

CONTINUED

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
b. Instrument air to containment - ESTABLISHED.	b. Establish instrument air to containment: 1) Verify instrument air pressure normal. IF instrument air pressure NOT normal, THEN start one air compressor by initiating 13710-1, SERVICE AIR SYSTEM. 2) Open instrument air to containment isolation valve HV-9378.
c. Charging flow - ESTABLISHED.	c. Establish charging flow.
4. Raise Charging Flow To Restore PRZR Level.	4. IF charging flow at maximum, THEN manually operate ECCS pumps as necessary. IF PRZR level can NOT be restored, THEN go to 19010-1, E-1 LOSS OF REACTOR OR SECONDARY COOLANT.
5. Check PRZR Level:	
a. Level - RISING.	a. Return to Step 4.
b. Level - GREATER THAN 17%.	b. Return to Step 5a.

CONTINUED

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6. Check If RCP Seal Return Flow Should Be Established:	
a. Seal injection flow- AT LEAST 8 GPM.	a. Restore seal injection flow using Attachment A.
b. Verify RCP seal parameters: • Seal injection supply temperature - LESS THAN 135°F. • RCP seal number one seal temperature - LESS THAN 220°F. • ACCW supply temperature - LESS THAN 105°F.	b. Stop the affected RCP. Go to Step 7.
c. Establish flow: 1) Open RCP seal return header isolation valves: • HV-8100 • HV-8112	
2) Verify seal return flow from each RCP - NORMAL FOR RCP SEAL NUMBER 1 DIFFERENTIAL PRESSURE.	2) Open RCP seal leakoff valves as necessary: • HV-8141A (RCP 1) • HV-8141B (RCP 2) • HV-8141C (RCP 3) • HV-8141D (RCP 4)

CONTINUED

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
7. Energize PRZR Heaters As Necessary.	
8. Return To Procedure And Step In Effect.	

END OF PROCEDURE TEXT

ATTACHMENT A

RECOVERY OF RCP SEAL INJECTION

1. Check RCP No. 1 seal temperature.

   IF less than 220°F,
   THEN open CVCS SEALS RCP SEAL INJ SUPPLY CNMT ISO valve and ACCW supply to the affected RCP. Return to Step 6b.

   IF greater than 220°F,
   THEN proceed to Step 2 of this Attachment.

2. Verify seal injection supply temperature - LESS THAN 135°F.
   Verify ACCW supply temperature - LESS THAN 105°F.

3. Dispatch operator to shut CVCS SEALS RCP SEAL INJ NEEDLE VLVS TO #1 SEAL for affected RCP.

   - 1208-U4-414(RCP 1)
   - 1208-U4-415(RCP 2)
   - 1208-U4-416(RCP 3)
   - 1208-U4-417(RCP 4)

4. Verify CVCS SEALS RCP SEAL INJ NEEDLE VLVS of Step 3 of this Attachment is shut.

5. Open CVCS SEALS RCP SEAL INJ SUPPLY CNMT ISO valve for affected RCP.

6. Slowly open CVCS SEALS RCP SEAL INJ NEEDLE VLVS TO #1 SEAL to establish a 1°F per minute cooldown rate.

7. WHEN RCP No. 1 seal temperature is less than 220°F,
   THEN restore ACCW supply to the affected RCP.

8. Verify RCP seal parameters:

   - Seal injection supply temperature - LESS THAN 135°F.
   - RCP No. 1 seal temperature - LESS THAN 220°F.
   - ACCW supply temperature - LESS THAN 105°F.

   IF RCP seal parameters can NOT be verified,
   THEN secure the affected RCP.

9. Return to Step 6b of procedure.

END OF ATTACHMENT A