

The Light company

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May 24, 1985
ST-HL-AE-1260
File No.: G9.6

Mr. George W. Knighton, Chief
Licensing Branch No. 3
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, DC 20555

South Texas Project
Units 1 & 2
Docket Nos. STN 50-498, STN 50-499
Meeting With NRC Regarding
Technical Specifications

Dear Mr. Knighton:

A meeting was held on April 19, 1985 in Bethesda, MD. with the NRC to discuss the preparation of STPEGS Technical Specifications. The two main objectives for the meeting were (1) to introduce STPEGS personnel responsible for preparing Technical Specifications to the NRC personnel responsible for the review and (2) to discuss the STPEGS program for developing Technical Specifications for the 3 train plant.

HL&P made or emphasized the following commitments.

°STPEGS Technical Specifications will be submitted in June, 1985 as a markup of Standard Technical Specifications Revision 5 with explanations for each difference and schedules for completion of any open items.

°An update to STPEGS Technical Specifications will be submitted before December, 1985 to support the NRC review.

NRC committed to review the June, 1985 submittal as soon as they receive it, concurrently with their review of the STPEGS design. Their "normal" Technical Specification review will start in December 1985, 56 weeks prior to projected issuance of the operating license. Additionally, NRC considered the Technical Specification Task Force efforts appropriate to ensure that correct Technical Specifications are developed for the STPEGS design.

NRC provided some guidance on preparing Technical Specifications and highlighted the two acceptable reasons for deviating from a Standard Technical Specification.

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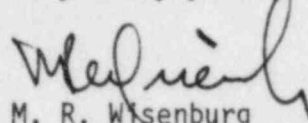
Houston Lighting & Power Company

°The Standard Technical Specification does not represent the plant design.

°The Standard Technical Specification is clearly wrong and there is an obviously better way to accomplish the same goal.

We appreciated the opportunity to discuss these issues with the NRC.

Very truly yours,



M. R. Wisenburg
Manager, Nuclear Licensing

MAM/yd

Attachment: 1) Attendance List
2) NRC Technical Specification Schedule
3) Handouts

cc:

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ATTENDANCE LIST

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B. Mann - NRC
B. Sheron - NRC
C. Moon - NRC

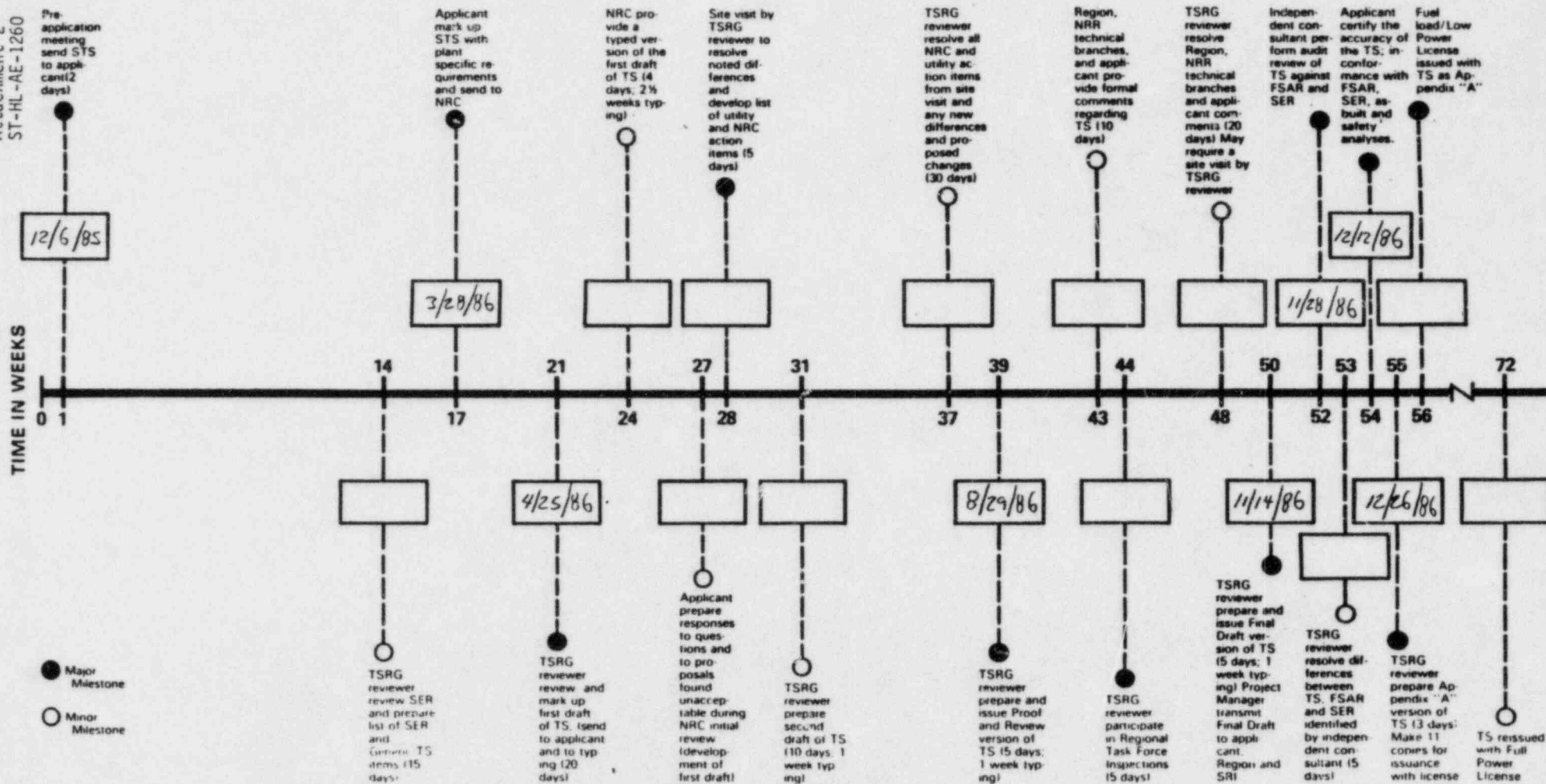
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J. N. Bailey (HL&P - Engineering)
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S. D. Phillips (HL&P - Licensing)
R. Jensen (W)
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DEVELOPMENT OF TECHNICAL SPECIFICATIONS FOR

South Texas

4/19/85

Attachment 2
ST-HL-AE-1260



SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION

TECHNICAL SPECIFICATION

STP/STS COMPARISON REVIEW

Presentation: M.A. McBurnett
STP Nuclear Licensing

INTRODUCTION

I. REASON FOR MEETING

A. UNIQUE PLANT DESIGN

B. GET ACQUAINTED

II. HISTORY

III. SCHEDULE

IV. AGENDA

A. OVERVIEW OF DIFFERENCES

B. SYSTEM - TECHNICAL SPECIFICATION REVIEW

C. FUTURE ACTIVITIES

	<u>TECHNICAL SPECIFICATION</u>	<u>DIFFERENCES</u>
3/4.1	BORATION CONTROL	SIMILAR
	BORATION SYSTEMS	CVCS NOT USED FOR ECCS
		RWST INSIDE TEMPERATURE CONTROLLED BUILDING
		RWST BORON CONCENTRATION BASED ON RAPID REFUELING
	CONTROL RODS	SIMILAR
3/4.2	POWER DISTRIBUTION LIMITS	SIMILAR
3/4.3	INSTRUMENT & CONTROLS	SIMILAR
3/4.4	REACTOR COOLANT LOOPS	SIMILAR
	SAFETY VALVES	SIMILAR
	PRESSURIZER	HEATERS ALWAYS ON ESF POWER
	STEAM GENERATOR	SIMILAR (MODEL E's)

3/4.4
Cont.

RCS LEAKAGE

CONTROLLED LEAKAGE NOT AN
ISSUE

HIGH PRESSURE TO LOW
PRESSURE ISOLATION VALVES
DO NOT INCLUDE AN RHR

RCS CHEMISTRY

SIMILAR

SPECIFIC ACTIVITY

SIMILAR

PRESSURE/TEMPERATURE LIMITS

SIMILAR

3/4.5

ACCUMULATORS

3 TRAIN

ECCS

NO CCP
NO RHR PUMP
NO THROTTLE VALVES

RWST

INSIDE BUILDING TEMPERATURE
NOT AN ISSUE

3/4.6

CONTAINMENT

SIMILAR

CSS

3 TRAIN (2 TRAINS REQUIRED)

SPRAY ADDATIVE

3 TRAIN

RCFC

3 TRAIN
6 FANS
CSS/RCFC NOT REDUNDANT

3/4.7	SAFETY VALVES	SIMILAR
	AFW	4 TRAIN "D" TURBINE DRIVEN "ABC" MOTOR DRIVEN "A" & "D" BOTH ACTUATE ON "A" TRAIN
	AFWST	SAFETY RELATED WATER SOURCE
	SPECIFIC ACTIVITY	SIMILAR
	MSIV	SIMILAR
	PRESSURE TEMPERATURE LIMITS	SIMILAR
	CCW	3 TRAIN
	ECW	3 TRAIN
	UHS	POND
	CONTROL ROOM HVAC	3 TRAINS
	ECCS PUMP ROOM EXHAUST AIR CLEANUP	FHB HVAC
	SNUBBERS	SIMILAR
	FIRE PROTECTION	UNDER DEVELOPMENT
3/4.8	ELECTRICAL POWER	3 TRAINS
3/4.9	REFUELING	RAPID REFUELING

OTHER TECHNICAL SPECIFICATION ACTIVITIES

- ° WOG

- ° AIF/INDUSTRY

- ° HL&P INHOUSE REVIEW

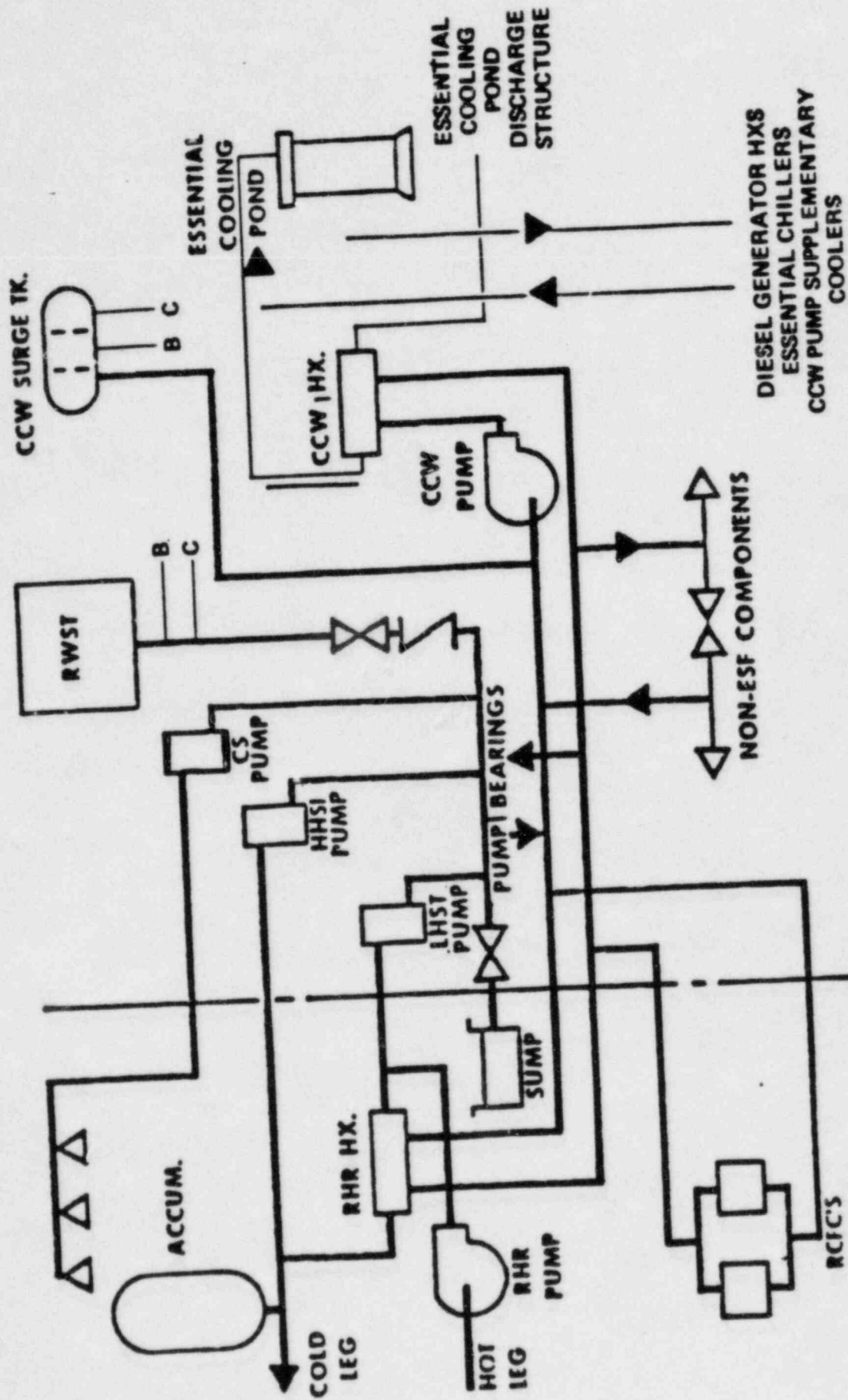
SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION
TECHNICAL SPECIFICATION REVIEW

1. ALLOW USE OF HHSI FOR CHARGING IN SHUTDOWN MODE
2. RWST BORON CONCENTRATION
3. SG TUBE PLUGGING LIMIT
4. ACCUMULATOR BORON CONCENTRATION
5. MODE 4 & 5 DG REQUIREMENTS
6. CSS/RCFC REQUIREMENTS

**SOUTH TEXAS PROJECT
3-TRAIN SYSTEMS**

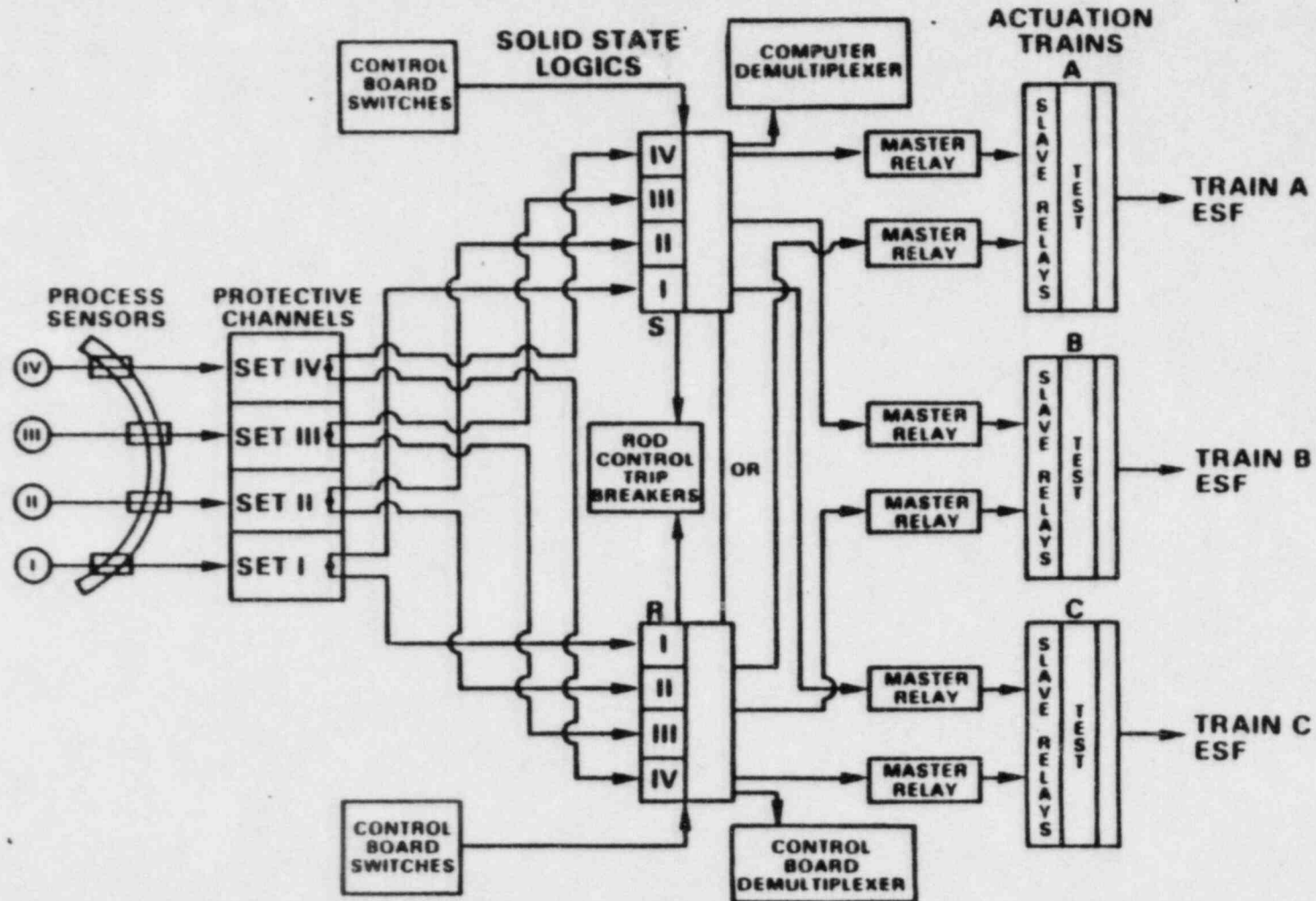
SYSTEM	TRAINS INSTALLED	NUMBER OF TRAINS WHICH OPERATE UNDER VARIOUS PLANT		
		NORMAL OPERATION	SHUTDOWN	POST DBA
DIESEL GENERATORS	3			
ESSENTIAL COOLING WATER	3			
COMPONENT COOLING WATER	3			
REACTOR CONTAINMENT FAN COOLERS	3 (2 RCFC UNITS PER TRAIN)			
RESIDUAL HEAT REMOVAL	3			
SAFETY INJECTION	3			
CONTAINMENT SPRAY	3			

*SHARE RHR HEAT EXCHANGER - RHR PUMPS NOT REQUIRED.



INTERRELATIONSHIP OF SYSTEMS IN THE THREE-TRAIN CONCEPT

REACTOR PROTECTION SYSTEM LOGIC



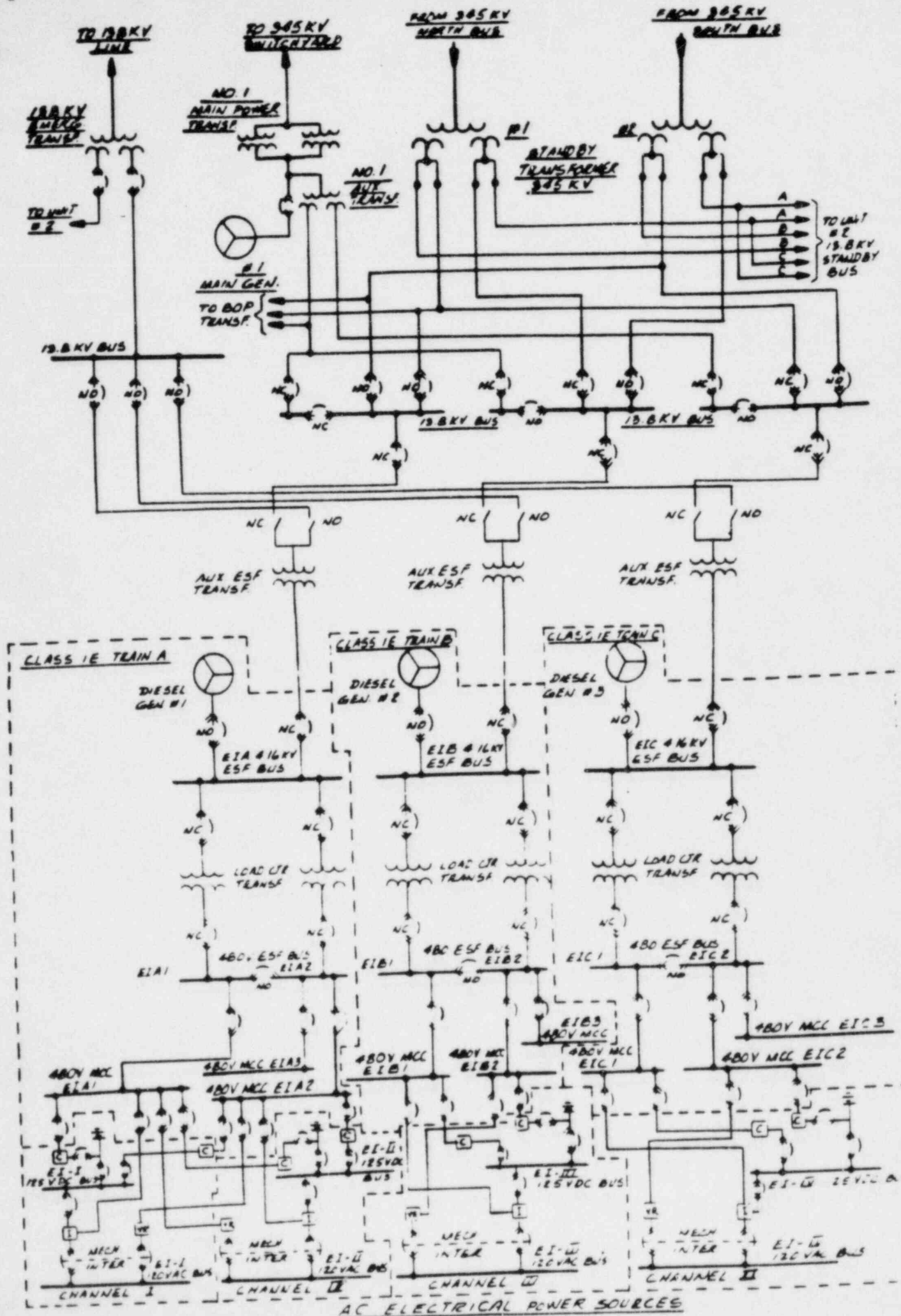
STANDBY DIESEL GENERATORS

- **THREE TRAIN SYSTEM**
- **PHYSICALLY, ELECTRICALLY SEPARATED**
- **AUTOMATICALLY STARTED**
 - **LOSS OF OFFSITE POWER (LOOP), LOCA, LOOP & LOCA**
- **AUTOMATICALLY LOADED IN SEQUENCE**

**SOUTH TEXAS PROJECT
3-TRAIN SYSTEMS**

SYSTEM	TRAINS INSTALLED	NUMBER OF TRAINS WHICH OPERATE UNDER VARIOUS PLANT		
		NORMAL OPERATION	SHUTDOWN	POST DBA
DIESEL GENERATORS	3	0	0	2
ESSENTIAL COOLING WATER	3			
COMPONENT COOLING WATER	3			
REACTOR CONTAINMENT FAN COOLERS	3 (2 RCFC UNITS PER TRAIN)			
RESIDUAL HEAT REMOVAL	3			
SAFETY INJECTION	3			
CONTAINMENT SPRAY	3			

*SHARE RHR HEAT EXCHANGER - RHR PUMPS NOT REQUIRED.



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3/4.8 ELECTRICAL POWER SYSTEMS

3/4.8.1 A.C. SOURCES

OPERATING

LIMITING CONDITION FOR OPERATION

3.8.1.1 As a minimum, the following A.C. electrical power sources shall be OPERABLE:

- Two physically independent circuits between the offsite ^{345KV} transmission network and the ~~Vonsite~~ ^{13.8KV} ~~Transformer Substation~~ ^{Transformer Substation} System, and
- ~~Two~~ ^{THREE} separate and independent diesel generators, each with

- 1) Separate ~~day and engine-mounted~~ fuel tanks containing a minimum volume of ~~_____~~ gallons of fuel,

- 2) A separate Fuel Storage System containing a minimum volume of ~~_____~~ gallons of fuel,
- 3) A separate fuel transfer pump,
- 4) Lubricating oil storage containing a minimum total volume of ~~_____~~ gallons of lubricating oil, and
- 5) Capability to transfer lubricating oil from storage to the diesel generator unit.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTION:

- With ~~either an~~ ^{ONLY ONE} offsite circuit or ^{TWO} diesel generator^s of the above required A.C. electrical power sources ~~inoperable~~, demonstrate the OPERABILITY of the remaining A.C. sources by performing Specifications 4.8.1.1.1a. and 4.8.1.1.2a.4) within 1 hour and at least once per 8 hours thereafter; restore at least two offsite circuits and ~~two~~ ^{THREE} diesel generators to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.
- With ^{ONLY} one offsite circuit and ~~one~~ ^{TWO} diesel generator^s of the above required A.C. electrical power sources ~~inoperable~~, demonstrate the OPERABILITY of the ~~remaining~~ ^{OPERABLE} A.C. sources by performing Specifications 4.8.1.1.1a. and 4.8.1.1.2a.4) within 1 hour and at least once per 8 hours thereafter; restore ~~at least one of the~~ ^{THREE} inoperable sources to OPERABLE status within 12 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. Restore at least two offsite circuits and ~~two~~ ^{THREE} diesel generators to OPERABLE status within 72 hours from the time of initial loss or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.
- With one diesel generator inoperable in addition to ACTION a. or b. above, verify that:
 1. All required systems, subsystems, trains, components, and devices that depend on the remaining OPERABLE diesel generator as a source of emergency power are also OPERABLE, and

TWO OFF POWER SO OR THREE GENERAT

ELECTRICAL POWER SYSTEMSLIMITING CONDITION FOR OPERATIONACTION (Continued)

2. When in MODE 1, 2, or 3, the steam-driven auxiliary feedwater pump is OPERABLE.

If these conditions are not satisfied within 2 hours be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

- d. With two of the above required ~~three~~ ^{THREE} offsite A.C. circuits inoperable, demonstrate the OPERABILITY of ~~two~~ diesel generators by performing the requirements of Specification 4.8.1.1.2a.4) within 1 hour and at least once per 8 hours thereafter, unless the diesel generators are already operating; restore at least one of the inoperable offsite sources to OPERABLE status within 24 hours or be in at least HOT STANDBY within the next 6 hours. With only one offsite source restored, restore at least two offsite circuits to OPERABLE status within 72 hours from time of initial loss or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.
- e. With two of the above required diesel generators inoperable, demonstrate the OPERABILITY of two offsite A.C. circuits by performing the requirements of Specification 4.8.1.1.1a. within 1 hour and at least once per 8 hours thereafter; restore at least ~~one~~ ^{TWO} of the inoperable diesel generators to OPERABLE status within 2 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the ~~following 30 hours~~ ^{THREE} following 30 hours. Restore ~~at least two~~ diesel generators to OPERABLE status within 72 hours from time of initial loss or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.8.1.1.1 Each of the above required independent circuits between the offsite transmission network and the ~~Busbar Class 1E Distribution System~~ shall be:
13.8 KV STANDBY BUSES

- a. Determined OPERABLE at least once per 7 days by verifying correct breaker alignments, indicated power availability, and
- b. Demonstrated OPERABLE at least once per 18 months during shutdown by transferring ~~manual and automatic~~ ^{THE} power supply from the normal circuit to the alternate circuit. ~~FOR THE 13.8 KV STANDBY BUSES~~

4.8.1.1.2 Each diesel generator shall be demonstrated OPERABLE:

- a. In accordance with the frequency specified in Table 4.8-1 on a STAGGERED TEST BASIS by:

- 1). Verifying the fuel level in ~~the day and engine room fuel tank~~ ^{the day and engine room fuel tank}

ELECTRICAL POWER SYSTEMS

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SURVEILLANCE REQUIREMENTS (Continued)

- 2) Verifying the fuel level in the fuel storage tank,
- 3) Verifying the fuel transfer pump starts and transfers fuel from the storage system to the day and engine-mounted tank,
- 4) Verifying the lubricating oil inventory in storage
- 5) Verifying the diesel starts from ~~ambient~~ ^{NORMAL STANDBY} condition and accelerates to at least [900] rpm in less than or equal to [10] seconds.* The generator voltage and frequency shall be [4160] \pm [420] volts and [60] \pm [1.2] Hz within [10] seconds after the start signal. The diesel generator shall be started for this test by using one of the following signals:
 - a) Manual, or
 - b) Simulated loss-of-offsite power by itself, or
 - c) Simulated loss-of-offsite power in conjunction with an ESF Actuation test signal, or
 - d) An ESF Actuation test signal by itself.
- 6) Verifying the generator is synchronized, loaded to greater than or equal to [continuous rating] kW in less than or equal to [60] seconds*, and operates with a load greater than or equal to [continuous rating] for at least 60 minutes, and
- 7) Verifying the diesel generator is aligned to provide standby power to the associated emergency busses.
 - b. At least once per 31 days and after each operation of the diesel where the period of operation was greater than or equal to 1 hour by checking for and removing accumulated water from the ~~day and engine oil~~ ^{fuel tanks} ~~ITS~~
 - c. At least once per 92 days ~~for once per 31 days for the groundwater~~ ~~shall be equal to or higher than the bottom of the fuel oil storage tanks~~ by checking for and removing accumulated water from the fuel oil storage tanks;
 - d. By sampling new fuel oil in accordance with ASTM-D4057 prior to addition to storage tanks and:
 - 1) By verifying in accordance with the tests specified in ASTM-D975-81 prior to addition to the storage tanks that the sample has:

*These diesel generator starts from ambient conditions shall be performed only once per 184 days in these surveillance tests and all other engine starts for the purpose of this surveillance testing shall be preceded by an engine pre-lube period and/or other warmup procedures recommended by the manufacturer so that the mechanical stress and wear on the diesel engine is minimized.

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ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

- a) An API Gravity of within 0.3 degrees at 60°F, or a specific gravity of within 0.0016 at 60/60°F, when compared to the supplier's certificate, or an absolute specific gravity at 60/60°F of greater than or equal to 0.83 but less than or equal to 0.89, or an API gravity of greater than or equal to 27 degrees but less than or equal to 39 degrees;
 - b) A kinematic viscosity at 40°C of greater than or equal to 1.9 centistokes, but less than or equal to 4.1 centistokes (alternatively, Saybolt viscosity, SUS at 100°F of greater than or equal to 32.6, but not less than or equal to 40.1), if gravity was not determined by comparison with the supplier's certification;
 - c) A flash point equal to or greater than 125°F; and
 - d) A clear and bright appearance with proper color when tested in accordance with ASTM-D4176-82.
- 2) By verifying within 30 days of obtaining the sample that the other properties specified in Table 1 of ASTM-D975-81 are met when tested in accordance with ASTM-D975-81 except that the analysis for sulfur may be performed in accordance with ASTM-D1552-79 or ASTM-D2622-82.
- e. At least once every 31 days by obtaining a sample of fuel oil in accordance with ASTM-D2276-78, and verifying that total particulate contamination is less than 10 mg/liter when checked in accordance with ASTM-D2276-78, Method A;
- f. At least once per 18 months, during shutdown, by:
- 1) Subjecting the diesel to an inspection in accordance with procedures prepared in conjunction with its manufacturer's recommendations for this class of standby service;
 - 2) Verifying the generator capability to reject a load of greater than or equal to [largest single emergency load] kW while maintaining voltage at $[4160] \pm [420]$ volts and frequency at $[60] \pm [1.2]$ Hz [less than or equal to 75% of the difference between nominal speed and the Overspeed Trip Setpoint, or 15% above nominal whichever is less];
 - 3) Verifying the generator capability to reject a load of [continuous rating] kW without tripping. The generator voltage shall not exceed [4784] volts during and following the load rejection;
 - 4) Simulating a loss-of-offsite power by itself, and:
 - a) Verifying deenergization of the emergency busses and load shedding from the emergency busses, and
 - b) Verifying the diesel starts on the auto-start signal ~~energizes the emergency busses with permanently connected~~

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ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

loads within [10] seconds, energizes the auto-connected shutdown loads through the load sequencer and operates for greater than or equal to 5 minutes while its generator is loaded with the shutdown loads. After energization, the steady-state voltage and frequency of the emergency busses shall be maintained at $[4160] \pm [420]$ volts and $[60] \pm [1.2]$ Hz during this test.

- 5) Verifying that on an ESF Actuation test signal, without loss-of-offsite power, the diesel generator starts on the auto-start signal and operates on standby for greater than or equal to 5 minutes. The generator voltage and frequency shall be $[4160] \pm [420]$ volts and $[60] \pm [1.2]$ Hz within [10] seconds after the auto-start signal; the steady-state generator voltage and frequency shall be maintained within these limits during this test;
- 6) Simulating a loss-of-offsite power in conjunction with an ESF Actuation test signal, and:
 - a) Verifying deenergization of the emergency busses and load shedding from the emergency busses;
 - b) Verifying the diesel starts on the auto-start signal, energizes the emergency busses with permanently connected loads within [10] seconds, energizes the auto-connected emergency (accident) loads through the load sequencer and operates for greater than or equal to 5 minutes while its generator is loaded with the emergency loads. After energization, the steady-state voltage and frequency of the emergency busses shall be maintained at $[4160] \pm [420]$ volts and $[60] \pm [1.2]$ Hz during this test; and
 - c) Verifying that all automatic diesel generator trips, except engine overspeed and generator differential, are automatically bypassed upon loss of voltage on the emergency bus concurrent with a Safety Injection Actuation signal.
- 7) Verifying the diesel generator operates for at least 24 hours. During the first 2 hours of this test, the diesel generator shall be loaded to greater than or equal to [2-hour rating] kW and during the remaining 22 hours of this test, the diesel generator shall be loaded to greater than or equal to [continuous rating] kW. The generator voltage and frequency shall be $[4160] \pm [420]$ volts and $[60] \pm [1.2]$ Hz within [10] seconds after the start signal; the steady-state generator voltage and

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ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

frequency shall be maintained within these limits during this test. Within 5 minutes after completing this 24-hour test, perform Specification 4.8.1.1.2e.6b);*

- 8) Verifying that the auto-connected loads to each diesel generator do not exceed the 2000-hour rating of ____ kW;
- 9) Verifying the diesel generator's capability to:
 - a) Synchronize with the offsite power source while the generator is loaded with its emergency loads upon a simulated restoration of offsite power,
 - b) Transfer its loads to the offsite power source, and
 - c) Be restored to its standby status.
- 10) Verifying that with the diesel generator operating in a test mode, connected to its bus, a simulated Safety Injection signal overrides the test mode by: (1) returning the diesel generator to standby operation, and (2) automatically energizing the emergency loads with offsite power;
- 11) Verifying that the fuel transfer pump transfers fuel from each fuel storage tank to the day and engine-mounted tank of each diesel via the installed cross-connection lines;
- 12) Verifying that the automatic load sequence timer is OPERABLE with the interval between each load block within $\pm 10\%$ of its design interval;
- 13) Verifying that the following diesel generator lockout features prevent diesel generator starting only when required:
 - a) [Turning gear engaged], or
 - b) [Emergency stop].
- 14) Verifying that with all diesel generator air start receivers pressurized to less than or equal to ____ psig and the compressors secured, the diesel generator starts at least [5] times from ambient conditions and accelerates to at least [900] rpm in less than or equal to [10] seconds.

*If Specification 4.8.1.1.2e.6b) is not satisfactorily completed, it is not necessary to repeat the preceding 24-hour test. Instead, the diesel generator may be operated at [continuous rating] kW for 1 hour or until operating temperature has stabilized.

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ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

- g. At least once per 10 years or after any modifications which could affect diesel generator interdependence by starting both diesel generators simultaneously, during shutdown, and verifying that both diesel generators accelerate to at least [900] rpm in less than or equal to [10] seconds; and
- h. At least once per 10 years by:
 - 1) Draining each fuel oil storage tank, removing the accumulated sediment and cleaning the tank using a sodium hypochlorite solution, and
 - 2) Performing a pressure test of those portions of the diesel fuel oil system designed to Section III, subsection ND of the ASME Code at a test pressure equal to 110% of the system design pressure.

4.8.1.1.3 Reports - All diesel generator failures, valid or nonvalid, shall be reported to the Commission in a Special Report pursuant to Specification 6.9.2 within 30 days. Reports of diesel generator failures shall include the information recommended in Regulatory Position C.3.b of Regulatory Guide 1.108, Revision 1, August 1977. If the number of failures in the last 100 valid tests (on a per nuclear unit basis) is greater than or equal to 7, the report shall be supplemented to include the additional information recommended in Regulatory Position C.3.b of Regulatory Guide 1.108, Revision 1, August 1977.

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TABLE 4.8-1
DIESEL GENERATOR TEST SCHEDULE

NUMBER OF FAILURES IN
LAST 100 VALID TESTS*

TEST FREQUENCY

≤ 1

At least once per 31 days

2

At least once per 14 days

3

At least once per 7 days

≥ 4

At least once per 3 days

*Criteria for determining number of failures and number of valid tests shall be in accordance with Regulatory Position C.2.e of Regulatory Guide 1.106, Revision 1, August 1977, where the last 100 tests are determined on a per nuclear unit basis. For the purpose of this schedule, only valid tests conducted after the completion of the preoperational test requirements of Regulatory Guide 1.108, Revision 1, August, 1977, shall be included in the computation of the "Last 100 Valid Tests."

ELECTRICAL POWER SYSTEMS

A.C. SOURCES

OPERATING - OFFSITE TO ONSITE DISTRIBUTION

LIMITING CONDITION FOR OPERATION

3.8.1.3 The circuit from each 13.8kV standby bus to its associated auxiliary ESF transformer and ESF bus shall be OPERABLE

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTION:

- a. With one circuit from a 13.8kV standby Bus to its associated ESF Bus inoperable, demonstrate the OPERABILITY of the A.C. sources identified in Specification 3.8.1.1 by performing Surveillance Requirement 4.8.1.1.1.a within 1 hour and at least once per 8 hours thereafter; and Surveillance Requirement 4.8.1.1.2.a.2 within 24 hours restore the circuit from each 13.8kV standby bus to its associated ESF bus to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in a COLD SHUTDOWN within the following 30 hours.
- b. With two or more of the above required circuits from the 13.8kV standby buses to the ESF buses inoperable, demonstrate the OPERABILITY of three diesel generators by performing Surveillance Requirement 4.8.1.1.2.a.2 within 8 hours unless the diesel generators are already operating; restore at least two of the circuits to OPERABLE status within 24 hours or be in at least HOT STANDBY within the next 6 hours. With only two of the circuits restored, to OPERABLE status restore all circuits from the 13.8kV standby buses to ESF buses to OPERABLE status within 72 hours from time of initial loss or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.8.1.3 The above required A.C. circuits shall be demonstrated operable at least once per 7 days by verifying correct breaker alignment and indicated voltage on the ESF busses.

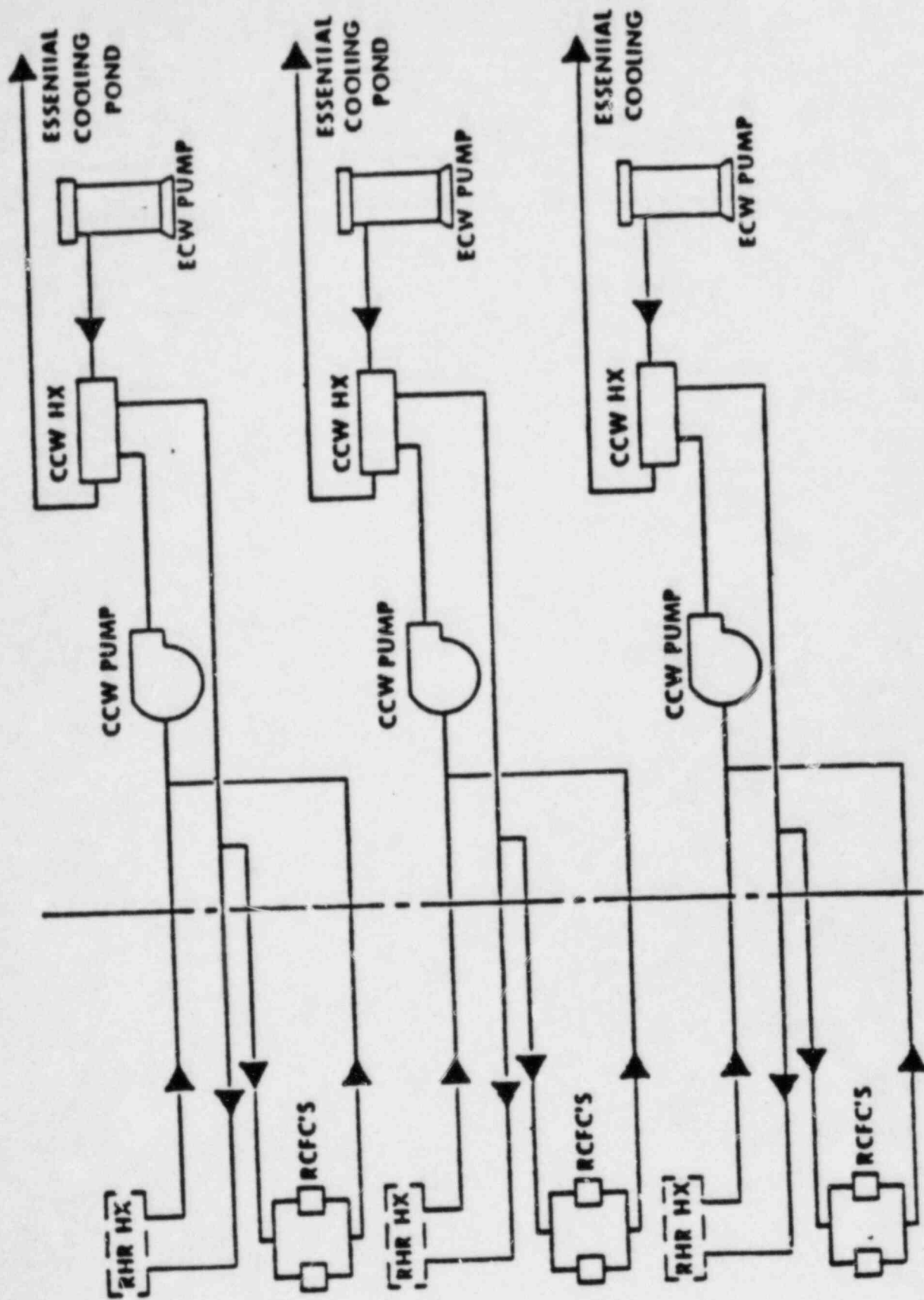
ESSENTIAL COOLING WATER SYSTEM

- **SUPPLIES COOLING WATER TO VARIOUS SAFETY-RELATED SYSTEMS FOR NORMAL PLANT OPERATION AS WELL AS NORMAL SHUTDOWN AND DURING AND AFTER POSTULATED DBA'S**

**SOUTH TEXAS PROJECT
3-TRAIN SYSTEMS**

SYSTEM	TRAINS INSTALLED	NUMBER OF TRAINS WHICH OPERATE UNDER VARIOUS PLANT		
		NORMAL OPERATION	SHUTDOWN	POST DBA
DIESEL GENERATORS	3			
ESSENTIAL COOLING WATER	3	1	2	2
COMPONENT COOLING WATER	3			
REACTOR CONTAINMENT FAN COOLERS	3 (2 RCFC UNITS PER TRAIN)			
RESIDUAL HEAT REMOVAL	3			
SAFETY INJECTION	3			
CONTAINMENT SPRAY	3			

•SHARE RHR HEAT EXCHANGER – RHR PUMPS NOT REQUIRED.



COMPONENT COOLING WATER SYSTEM -- ESF LOADS

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PLANT SYSTEMS

3/4.7.4 ^{ESSENTIAL COOLING}
~~SERVICE~~ WATER SYSTEM

LIMITING CONDITION FOR OPERATION

3.7.4 At least ^{THREE} ~~two~~ independent ^{ESSENTIAL COOLING} ~~service~~ water loops shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTION:

1. With only ^{TWO ESSENTIAL COOLING} ~~one service~~ water loop OPERABLE, restore at least ^{THREE} ~~two~~ loops to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.
2. WITH ONLY ONE ESSENTIAL COOLING WATER, 24 HOURS

SURVEILLANCE REQUIREMENTS

4.7.4 At least two service water loops shall be demonstrated OPERABLE:

- a. At least once per 31 days by verifying that each valve (manual, power-operated, or automatic) servicing safety-related equipment that is not locked, sealed, or otherwise secured in position is in its correct position; and
- b. At least once per 18 months during shutdown, by verifying that:
 - 1) Each automatic valve servicing safety-related equipment actuates to its correct position on a _____ test signal, and
 - 2) Each Service Water System pump starts automatically on a _____ test signal.

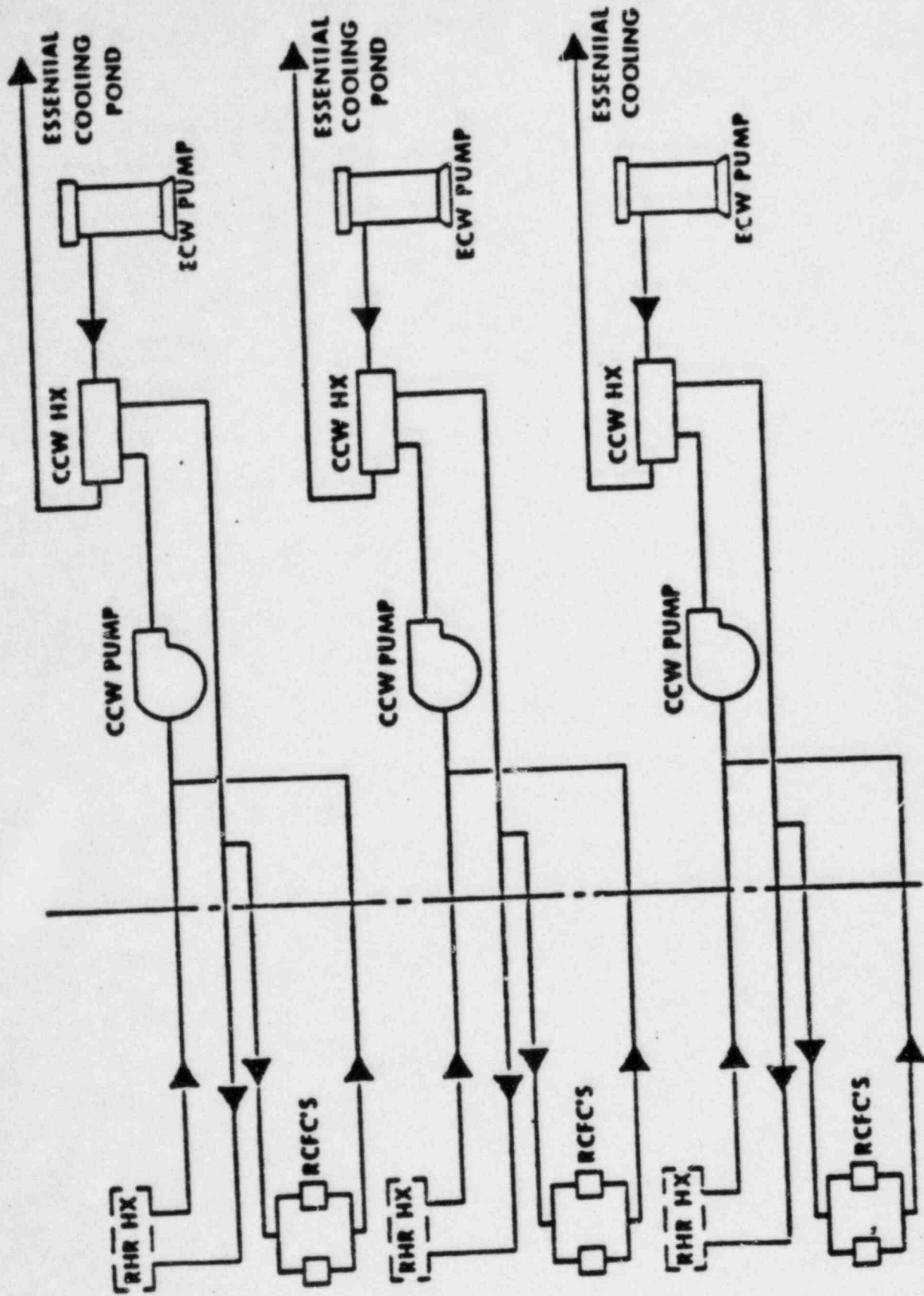
COMPONENT COOLING WATER SYSTEM

- **PROVIDE COOLING WATER TO VARIOUS NUCLEAR PLANT COMPONENTS DURING ALL MODES OF PLANT OPERATION**
- **PROVIDE COOLING WATER TO COMPONENTS REQUIRED FOR NORMAL OPERATION**
- **PROVIDE AN INTERMEDIATE FLUID BARRIER BETWEEN POTENTIALLY RADIOACTIVE COMPONENTS AND THE ESSENTIAL COOLING WATER SYSTEM TO REDUCE THE POSSIBILITY OF RADIOACTIVE CONTAMINATION TO OUTSIDE ENVIRONMENT**
- **PERFORM ITS COOLING FUNCTION FOLLOWING A DESIGN BASIS ACCIDENT WITH OFFSITE OR STANDBY POWER SOURCES**

**SOUTH TEXAS PROJECT
3-TRAIN SYSTEMS**

SYSTEM	TRAINS INSTALLED	NUMBER OF TRAINS WHICH OPERATE UNDER VARIOUS PLANT		
		NORMAL OPERATION	SHUTDOWN	POST DBA
DIESEL GENERATORS	3			
ESSENTIAL COOLING WATER	3			
COMPONENT COOLING WATER	3	1	2	2
REACTOR CONTAINMENT FAN COOLERS	3 (2 RCFC UNITS PER TRAIN)			
RESIDUAL HEAT REMOVAL	3			
SAFETY INJECTION	3			
CONTAINMENT SPRAY	3			

*SHARE RHR HEAT EXCHANGER - RHR PUMPS NOT REQUIRED.



COMPONENT COOLING WATER SYSTEM - ESF LOADS

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PLANT SYSTEMS

3/4.7.3 COMPONENT COOLING WATER SYSTEM

LIMITING CONDITION FOR OPERATION

3.7.3 ~~At least two independent~~^{THREE} component cooling water loops shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTION:

1. With only ~~one~~^{TWO} component cooling water loop OPERABLE, restore at least two loops to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.
2. WITH ONLY ONE COMPONENT 24 HOURS

SURVEILLANCE REQUIREMENTS

4.7.3 At least two component cooling water loops shall be demonstrated OPERABLE:

- a. At least once per 31 days by verifying that each valve (manual, power-operated, or automatic) servicing safety-related equipment that is not locked, sealed, or otherwise secured in position is in its correct position; and
- b. At least once per 18 months during shutdown, by verifying that:
 - 1) Each automatic valve servicing safety-related equipment actuates to its correct position on a _____ test signal, and
 - 2) Each Component Cooling Water System pump starts automatically on a _____ test signal.

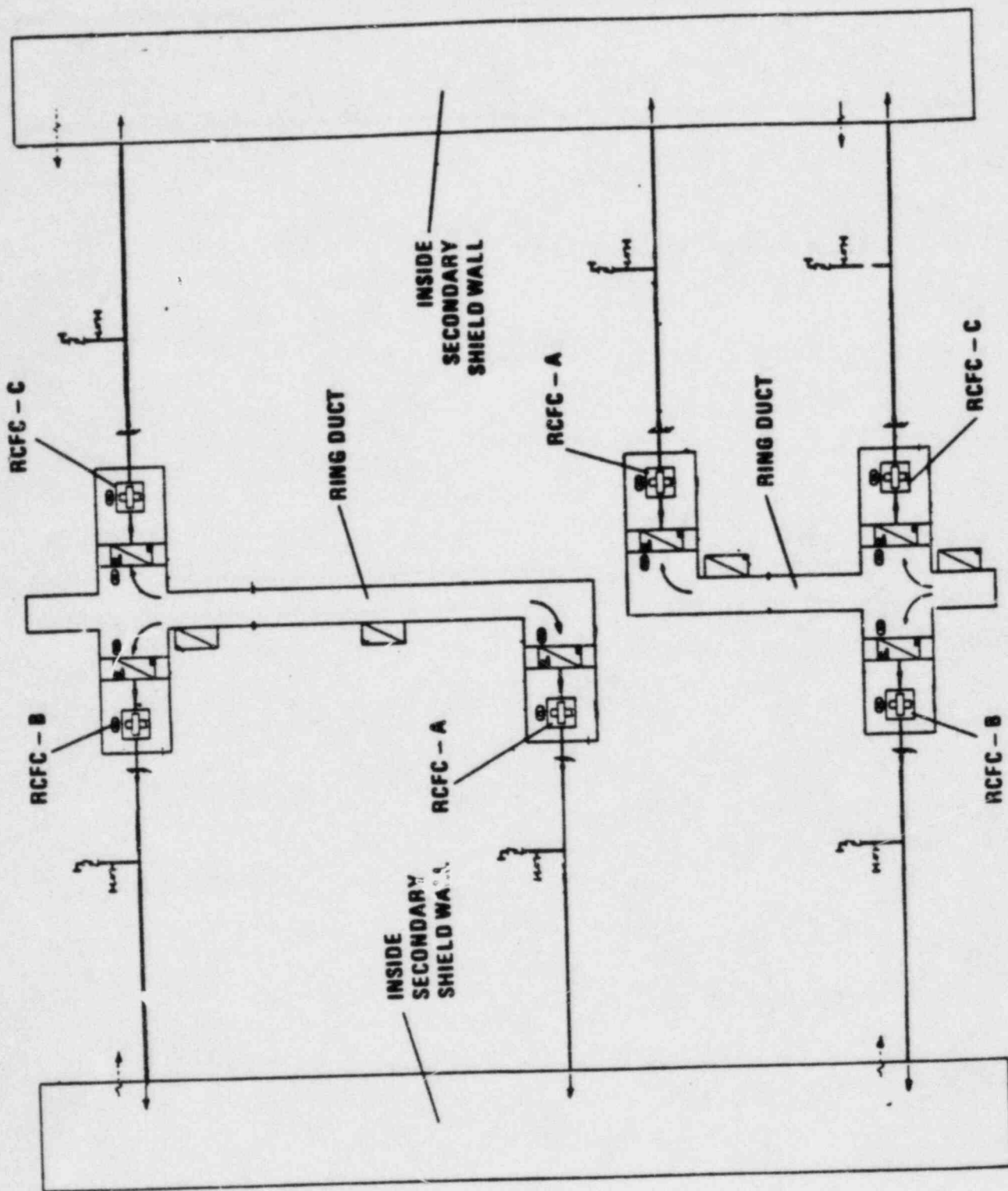
REACTOR CONTAINMENT FAN COOLERS

- **THREE TRAINS WITH TWO FAN COOLERS PER TRAIN**
- **OPERATES DURING ALL MODES OF PLANT OPERATION**
 - **NORMAL – NON ESSENTIAL CHILLED WATER**
 - **LOCA – CCW**
- **FOR LOCA THREE RCFC COOLERS MUST OPERATE**
- **REMOVES HEAT AND LOWERS CONTAINMENT PRESSURE
(IN CONJUNCTION WITH CS) AND REJECTS TO CCW**

**SOUTH TEXAS PROJECT
3-TRAIN SYSTEMS**

SYSTEM	TRAINS INSTALLED	NUMBER OF TRAINS WHICH OPERATE UNDER VARIOUS PLANT		
		NORMAL OPERATION	SHUTDOWN	POST DBA
DIESEL GENERATORS	3			
ESSENTIAL COOLING WATER	3			
COMPONENT COOLING WATER	3			
REACTOR CONTAINMENT FAN COOLERS	3 (2 RCFC UNITS PER TRAIN)	2 (4 RCFC UNITS)	2 (4 RCFC UNITS)	2 (3 RCFC UNITS)
RESIDUAL HEAT REMOVAL	3			
SAFETY INJECTION	3			
CONTAINMENT SPRAY	3			

*SHARE RHR HEAT EXCHANGER - RHR PUMPS NOT REQUIRED.



REACTOR CONTAINMENT
FAN COOLERS

CONTAINMENT SYSTEMS

CONTAINMENT COOLING SYSTEM [OPTIONAL] [Credit taken for iodine removal by spray systems]

LIMITING CONDITION FOR OPERATION

3.6.2.3 ~~Two~~ ^{FIVE} independent groups of ~~containment~~ ^{REACTOR} cooling fans shall be OPERABLE, with ~~two~~ fan systems to each group. ~~[Equivalent to 100% cooling capacity.]~~

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTION:

- a. With ~~one group of the above required~~ ^{TWO} ~~containment~~ ^{REACTOR} cooling fans inoperable, and both Containment Spray Systems OPERABLE, restore the inoperable group of cooling fans to OPERABLE status within 7 days or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.
- b. WITH THREE REACTOR CONTAINMENT COOLING FANS INOPERABLE, RESTORE TWO OF . . . 72 Hrs
- b. With two groups of the above required containment cooling fans inoperable and both Containment Spray Systems OPERABLE, restore at least one group of cooling fans to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. Restore both above required groups of cooling fans to OPERABLE status within 7 days of initial loss or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.
- c. WITH FOUR REACTOR CONTAINMENT COOLING FANS INOPERABLE, RESTORE THREE OF . . . 24 Hrs
- c. With one group of the above required containment cooling fans inoperable and one Containment Spray System inoperable, restore the inoperable Spray System to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. Restore the inoperable group of containment cooling fans to OPERABLE status within 7 days of initial loss or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.6.2.3 Each group of containment cooling fans shall be demonstrated OPERABLE:

- a. At least once per 31 days by:
- 1) Starting each fan group from the control room, and verifying that each fan group operates for at least 15 minutes, and
 - 2) Verifying a cooling water flow rate of greater than or equal to ___ gpm to each cooler.
- b. At least once per 18 months by verifying that each fan group starts automatically on a ___ test signal.

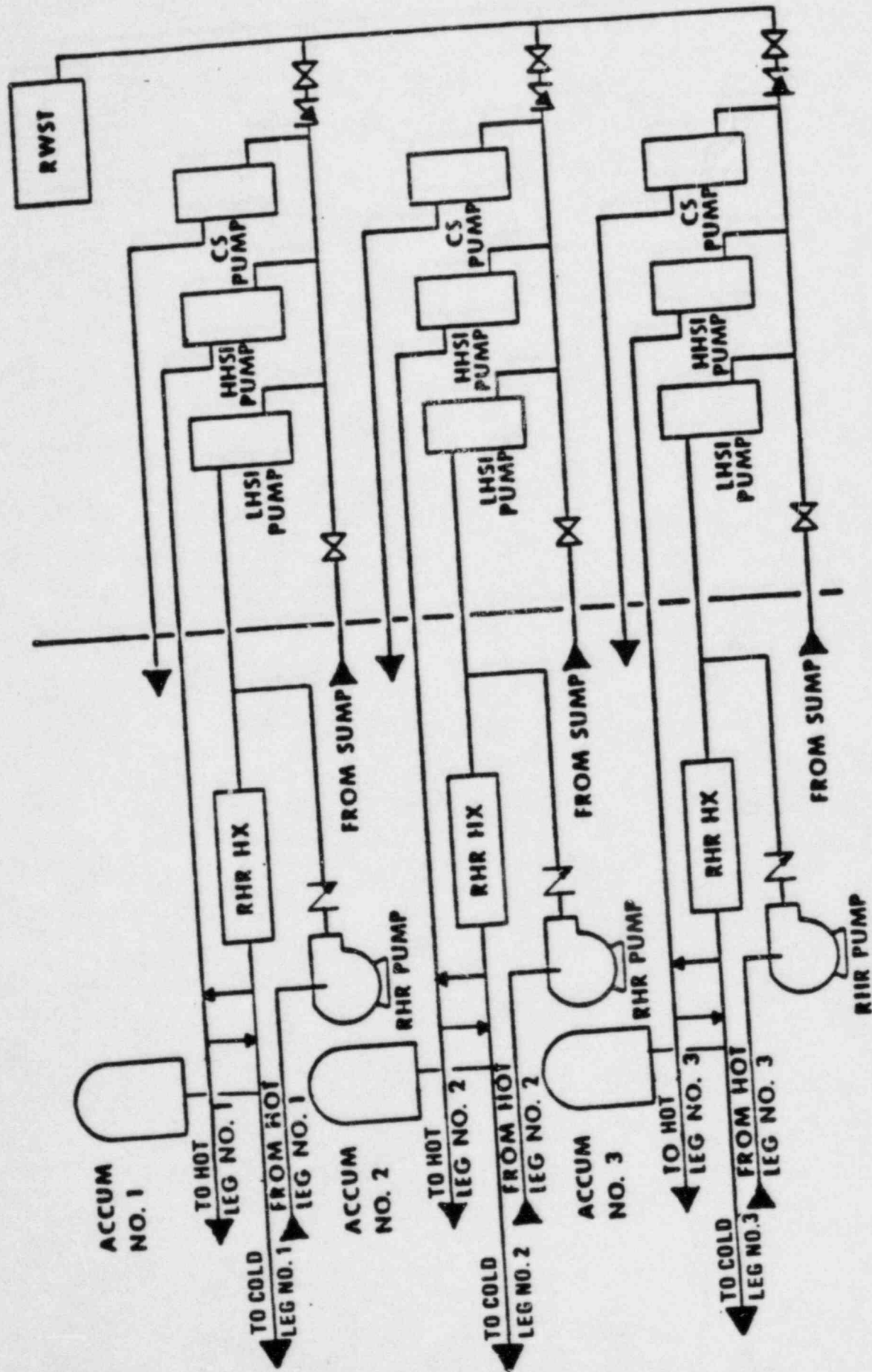
RESIDUAL HEAT REMOVAL SYSTEM

- **REMOVE HEAT ENERGY FROM THE CORE AND REACTOR COOLANT SYSTEM DURING PLANT COOLDOWN, AND REFUELING OPERATIONS**
- **TRANSFER REFUELING WATER FROM THE REFUELING CAVITY TO THE REFUELING WATER STORAGE TANK FOLLOWING REFUELING**
- **RHR HX'S ACT IN CONJUNCTION WITH THE LHSI PUMPS FOR EMERGENCY CORE COOLING AND LONG TERM RECOVERY FOLLOWING A DBA**

**SOUTH TEXAS PROJECT
3-TRAIN SYSTEMS**

SYSTEM	TRAINS INSTALLED	NUMBER OF TRAINS WHICH OPERATE UNDER VARIOUS PLANT		
		NORMAL OPERATION	SHUTDOWN	POST DBA
DIESEL GENERATORS	3			
ESSENTIAL COOLING WATER	3			
COMPONENT COOLING WATER	3			
REACTOR CONTAINMENT FAN COOLERS	3 (2 RCFC UNITS PER TRAIN)			
RESIDUAL HEAT REMOVAL	3	0	1	0
SAFETY INJECTION	3			
CONTAINMENT SPRAY	3			

*SHARE RHR HEAT EXCHANGER - RHR PUMPS NOT REQUIRED.



THREE-TRAIN CONCEPT -- SAFETY INJECTION SYSTEM/RESIDUAL HEAT REMOVAL SYSTEM

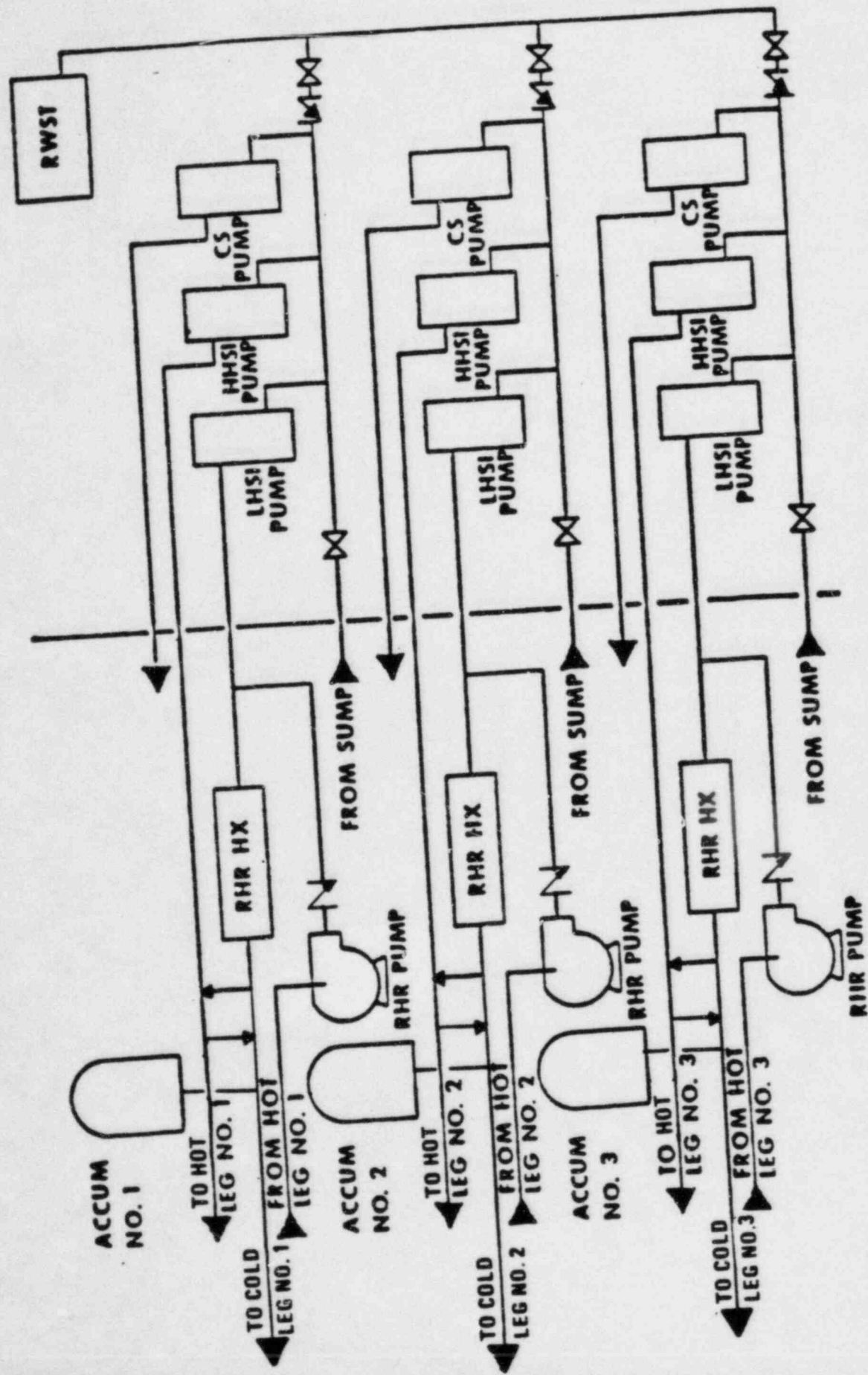
SAFETY INJECTION SYSTEM

- **PROVIDES EMERGENCY CORE COOLING AND INVENTORY MAKEUP
FOLLOWING A DBA**
- **LHSI PUMPS TRANSFER WATER FROM THE RWST TO THE REFUELING
CAVITY PRIOR TO REFUELING OPERATIONS**

**SOUTH TEXAS PROJECT
3-TRAIN SYSTEMS**

SYSTEM	TRAINS INSTALLED	NUMBER OF TRAINS WHICH OPERATE UNDER VARIOUS PLANT		
		NORMAL OPERATION	SHUTDOWN	POST DBA
DIESEL GENERATORS	3			
ESSENTIAL COOLING WATER	3			
COMPONENT COOLING WATER	3			
REACTOR CONTAINMENT FAN COOLERS	3 (2 RCFC UNITS PER TRAIN)			
RESIDUAL HEAT REMOVAL	3			
SAFETY INJECTION	3	0	0	2° (1 SPILLS)
CONTAINMENT SPRAY	3			

*SHARE RHR HEAT EXCHANGER - RHR PUMPS NOT REQUIRED.



THREE-TRAIN CONCEPT - SAFETY INJECTION SYSTEM/RESIDUAL HEAT REMOVAL SYSTEM

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EMERGENCY CORE COOLING SYSTEMS

3/4.5.2 ECCS SUBSYSTEMS - T_{avg} GREATER THAN OR EQUAL TO 350°F

LIMITING CONDITION FOR OPERATION

3.5.2 ~~Two~~ ^{THREE} Independent Emergency Core Cooling System (ECCS) subsystems shall be OPERABLE with each subsystem comprised of:

- a. One OPERABLE ^{HIGH HEAD SAFETY INJECTION} ~~centrifugal~~ ^{charging} pump.
- b. One OPERABLE ^{LOW HEAD} ~~Safety~~ Injection pump ~~(SWP - 100% - 100% - 100%)~~.
- c. One OPERABLE RHR heat exchanger,
- ~~One OPERABLE RHR pump, and~~

d. An OPERABLE flow path capable of taking suction from the refueling water storage tank on a Safety Injection signal and automatically transferring suction to the containment sump during the recirculation phase of operation.

APPLICABILITY: MODES 1, 2, and 3.

ACTION:

- a. With one ECCS subsystem inoperable, restore the inoperable subsystem to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.
- b.* *c.* WITH TWO ECCS 24 HOURS
In the event the ECCS is actuated and injects water into the Reactor Coolant System, a Special Report shall be prepared and submitted to the Commission pursuant to Specification 6.9.2 within 90 days describing the circumstances of the actuation and the total accumulated actuation cycles to date. The current value of the usage factor for each affected Safety Injection nozzle shall be provided in this Special Report whenever its value exceeds 0.70.

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EMERGENCY CORE COOLING SYSTEMS

SURVEILLANCE REQUIREMENTS

4.5.2 Each ECCS subsystem shall be demonstrated OPERABLE:

- a. At least once per 12 hours by verifying that the following valves are in the indicated positions with power to the valve operators removed:

<u>Valve Number</u>	<u>Valve Function</u>	<u>Valve Position</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____

- b. At least once per 31 days by:

- 1) Verifying that the ECCS piping is full of water by venting the ECCS pump casings and accessible discharge piping high points, and
- 2) Verifying that each valve (manual, power-operated, or automatic) in the flow path that is not locked, sealed, or otherwise secured in position, is in its correct position.

- c. By a visual inspection which verifies that no loose debris (rags, trash, clothing, etc.) is present in the containment which could be transported to the containment sump and cause restriction of the pump suction during LOCA conditions. This visual inspection shall be performed:

- 1) For all accessible areas of the containment prior to establishing CONTAINMENT INTEGRITY, and
- 2) Of the areas affected within containment at the completion of each containment entry when CONTAINMENT INTEGRITY is established.

~~d. At least once per 18 months by:~~

- ~~1) Verifying automatic isolation and interlock action of the RHR system from the Reactor Coolant System by ensuring that:~~

~~a) With a simulated or actual Reactor Coolant System pressure signal greater than or equal to 425 psig the interlocks prevent the valves from being opened, and~~

~~b) With a simulated or actual Reactor Coolant System pressure signal less than or equal to [750] psig the interlocks will cause the valves to automatically close.~~

d. AT LEAST ONCE PER 18 MONTHS BY

- 2) A visual inspection of the containment sump and verifying that the subsystem suction inlets are not restricted by debris and that the sump components (trash racks, screens, etc.) show no evidence of structural distress or abnormal corrosion.

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EMERGENCY CORE COOLING SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

e. At least once per 18 months, during shutdown, by:

- 1) Verifying that each automatic valve in the flow path actuates to its correct position on (Safety Injection actuation and Automatic Switchover to Containment Sump) test signals, and
- 2) Verifying that each of the following pumps start automatically upon receipt of a Safety Injection actuation test signal:

HIGH HEAD SAFETY INJECTION

a) ~~Centrifugal charging pump,~~

b) ^{LOW HEAD} ~~^~~ Safety Injection pump, and

~~c) RHR pump~~

f. By verifying that each of the following pumps develops the indicated differential pressure on recirculation flow when tested pursuant to Specification 4.0.5:

HIGH HEAD SAFETY INJECTION
1) ~~^ Centrifugal charging pump~~

≥ _____ psid,

2) ^{LOW HEAD} ~~^~~ Safety Injection pump

≥ _____ psid, and

~~3) RHR pump~~

~~≥ _____ psid~~

~~g. By verifying the correct position of each electrical and/or mechanical position stop for the following ECCS throttle valves:~~

~~1) Within 4 hours following completion of each valve stroking operation or maintenance on the valve when the ECCS subsystems are required to be OPERABLE, and~~

~~2) At least once per 18 months~~

~~HPSI System
Valve Number~~

~~|||||
|||||
|||||
|||||~~

~~LPSI System
Valve Number~~

~~|||||
|||||
|||||
|||||~~

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EMERGENCY CORE COOLING SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

b. By performing a flow balance test, during shutdown, following completion of modifications to the ECCS subsystems that alter the subsystem flow characteristics and verifying that:

- 1) For centrifugal charging pump lines, with a single pump running:
 - a) The sum of the injection line flow rates, excluding the highest flow rate, is greater than or equal to ___ gpm, and
 - b) The total pump flow rate is less than or equal to ___ gpm.
- 2) For Safety Injection pump lines, with a single pump running:
 - a) The sum of the injection line flow rates, excluding the highest flow rate, is greater than or equal to ___ gpm, and
 - b) The total pump flow rate is less than or equal to ___ gpm.
- 3) For RHR pump lines, with a single pump running, the sum of the injection line flow rates is greater than or equal to ___ gpm.

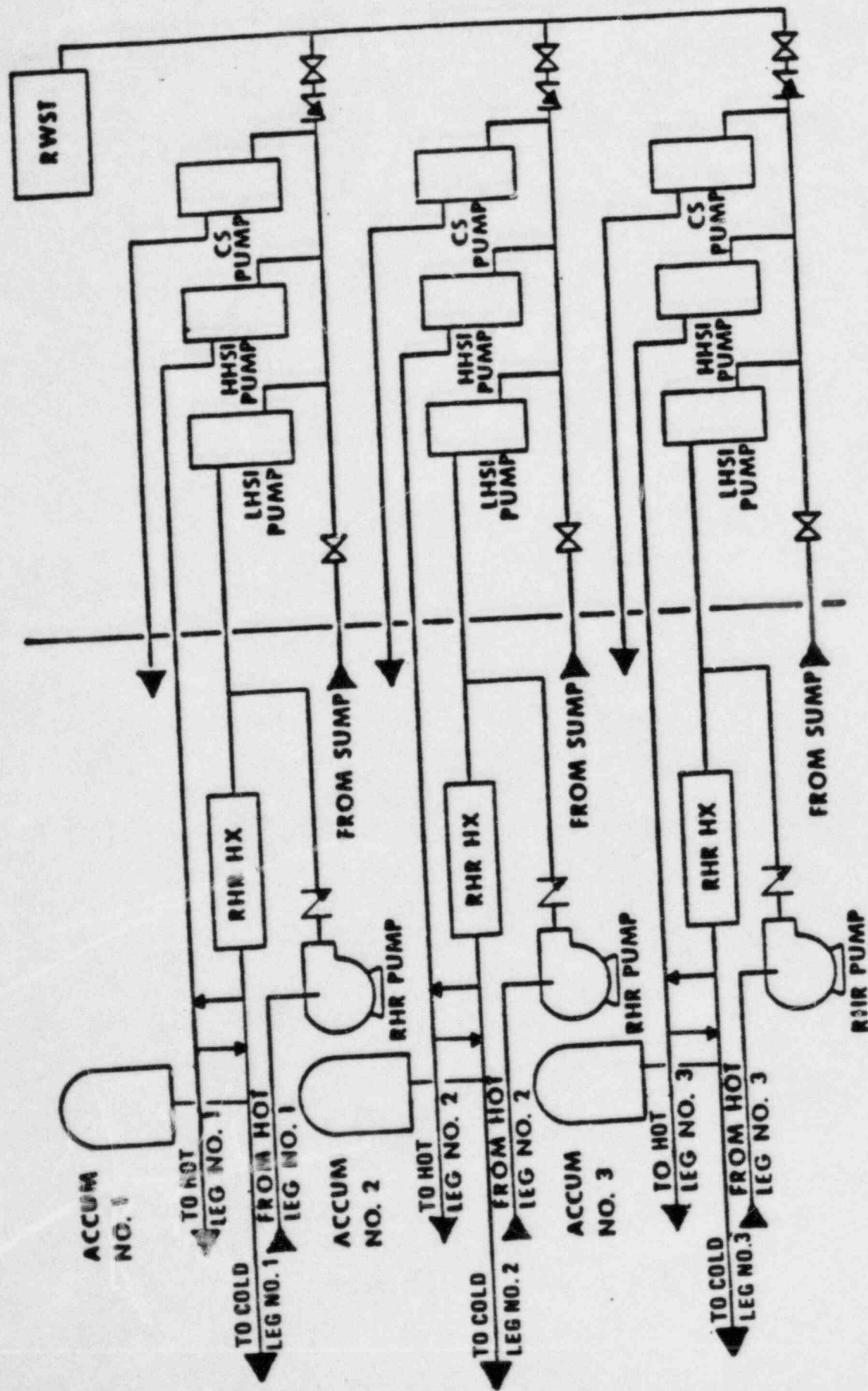
CONTAINMENT SPRAY SYSTEM

- **SPRAY CONTAINMENT BUILDING TO REDUCE PRESSURE**
- **SPRAY CONTAINMENT BUILDING AND CONTROL pH TO ABSORBE I₂ IN ATMOSPHERE**

**SOUTH TEXAS PROJECT
3-TRAIN SYSTEMS**

SYSTEM	TRAINS INSTALLED	NUMBER OF TRAINS WHICH OPERATE UNDER VARIOUS PLANT		
		NORMAL OPERATION	SHUTDOWN	POST DBA
DIESEL GENERATORS	3			
ESSENTIAL COOLING WATER	3			
COMPONENT COOLING WATER	3			
REACTOR CONTAINMENT FAN COOLERS	3 (2 RCFC UNITS PER TRAIN)			
RESIDUAL HEAT REMOVAL	3			
SAFETY INJECTION	3			
CONTAINMENT SPRAY	3	0	0	2

*SHARE RHR HEAT EXCHANGER - RHR PUMPS NOT REQUIRED.



THREE-TRAIN CONCEPT - SAFETY INJECTION SYSTEM/RESIDUAL HEAT REMOVAL SYSTEM

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CONTAINMENT SYSTEMS

3/4.6.2 DEPRESSURIZATION AND COOLING SYSTEMS

CONTAINMENT SPRAY SYSTEM [Credit taken for iodine removal]

LIMITING CONDITION FOR OPERATION

3.6.2.1 ^{THREE} ~~Two~~ independent Containment Spray Systems shall be OPERABLE with each Spray System capable of taking suction from the RWST and transferring suction to the containment sump.

APPLICABILITY: MODES 1, 2, 3

ACTION:

1. With one Containment Spray System inoperable, restore the inoperable Spray System to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours; restore the inoperable Spray System to OPERABLE status within the next 48 hours or be in COLD SHUTDOWN within the following 30 hours.
2. WITH TWO CONTAINMENT SPRAY SYSTEMS 24 HOURS

4.6.2.1 Each Containment Spray System shall be demonstrated OPERABLE:

- a. At least once per 31 days by verifying that each valve (manual, power-operated, or automatic) in the flow path that is not locked, sealed, or otherwise secured in position, is in its correct position;
- b. By verifying, that on recirculation flow, each pump develops a discharge pressure of greater than or equal to _____ psig when tested pursuant to Specification 4.0.5;
- c. At least once per 18 months during shutdown, by:
 - 1) Verifying that each automatic valve in the flow path actuates to its correct position on a _____ test signal, and
 - 2) Verifying that each spray pump starts automatically on a _____ test signal.
- d. At least once per 5 years by performing an air or smoke flow test through each spray header and verifying each spray nozzle is unobstructed.

**SOUTH TEXAS PROJECT
3-TRAIN SYSTEMS**

SYSTEM	TRAINS INSTALLED	NUMBER OF TRAINS WHICH OPERATE UNDER VARIOUS PLANT		
		NORMAL OPERATION	SHUTDOWN	POST DBA
DIESEL GENERATORS	3	0	0	2
ESSENTIAL COOLING WATER	3	1	2	2
COMPONENT COOLING WATER	3	1	2	2
REACTOR CONTAINMENT FAN COOLERS	3 (2 RCFC UNITS PER TRAIN)	2 (4 RCFC UNITS)	2 (4 RCFC UNITS)	2 (3 RCFC UNITS)
RESIDUAL HEAT REMOVAL	3	0	1	0*
SAFETY INJECTION	3	0	0	2* (1 SPILLS)
CONTAINMENT SPRAY	3	0	0	2

*SHARE RHR HEAT EXCHANGER - RHR PUMPS NOT REQUIRED.