

The Light company

Houston Lighting & Power P.O. Box 1700 Houston, Texas 77001 (713) 228-9211

October 30, 1985
ST-HL-AE-1467
File No.: G9.17

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 and 2
Docket Nos. STN 50-498, STN 50-499
Information Concerning the Supplementary
Containment Purge Subsystem

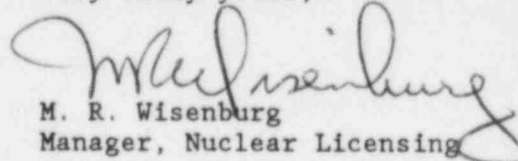
Dear Mr. Knighton:

The attachment enclosed provides information to support the NRC review of the Containment Supplementary Purge Subsystem. This information was discussed with the staff in a telephone conversation on October 21, 1985.

The attachments include mark-ups of FSAR pages which will be incorporated in a future FSAR amendment unless otherwise noted below. Also included is a proposed change to be incorporated as part of the STP Technical Specifications which will be submitted later this year.

If you should have any questions concerning this matter, please contact Mr. Powell at (713) 993-1328.

Very truly yours,


M. R. Wisenburg
Manager, Nuclear Licensing

MEP/bl

Attachments: Annotated FSAR pages regarding the Supplementary Containment
Purge Subsystem

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PDR ADOCK 05000498
A PDR

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cc:

Hugh L. Thompson, Jr., Director
Division of Licensing
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Robert D. Martin
Regional Administrator, Region IV
Nuclear Regulatory Commission
611 Ryan Plaza Drive, Suite 1000
Arlington, TX 76011

N. Prasad Kadambi, Project Manager
U.S. Nuclear Regulatory Commission
7920 Norfolk Avenue
Bethesda, MD 20814

Claude E. Johnson
Senior Resident Inspector/STP
c/o U.S. Nuclear Regulatory
Commission
P.O. Box 910
Bay City, TX 77414

M.D. Schwarz, Jr., Esquire
Baker & Botts
One Shell Plaza
Houston, TX 77002

J.R. Newman, Esquire
Newman & Holtzinger, P.C.
1615 L Street, N.W.
Washington, DC 20036

Director, Office of Inspection
and Enforcement
U.S. Nuclear Regulatory Commission
Washington, DC 20555

E.R. Brooks/R.L. Range
Central Power & Light Company
P.O. Box 2121
Corpus Christi, TX 78403

H.L. Peterson/G. Pokorny
City of Austin
P.O. Box 1088
Austin, TX 78767

J.B. Poston/A. vonRosenberg
City Public Service Board
P.O. Box 1771
San Antonio, TX 78296

Brian E. Berwick, Esquire
Assistant Attorney General for
the State of Texas
P.O. Box 12548, Capitol Station
Austin, TX 78711

Lanny A. Sinkin
3022 Porter Street, N.W. #304
Washington, DC 20008

Oreste R. Pirfo, Esquire
Hearing Attorney
Office of the Executive Legal Director
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Charles Bechhoefer, Esquire
Chairman, Atomic Safety &
Licensing Board
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Dr. James C. Lamb, III
313 Woodhaven Road
Chapel Hill, NC 27514

Judge Frederick J. Shon
Atomic Safety and Licensing Board
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Mr. Ray Goldstein, Esquire
1001 Vaughn Building
807 Brazos
Austin, TX 78701

Citizens for Equitable Utilities, Inc.
c/o Ms. Peggy Buchorn
Route 1, Box 1684
Brazoria, TX 77422

Docketing & Service Section
Office of the Secretary
U.S. Nuclear Regulatory Commission
Washington, DC 20555
(3 Copies)

Advisory Committee on Reactor Safeguards
U.S. Nuclear Regulatory Commission
1717 H Street
Washington, DC 20555

4. The CRDM Ventilation Subsystem is not required to operate after LOCA, however, when normal power supply is interrupted and the reactor is maintained at hot standby, the CRDM Ventilation Subsystem is operable from the ESF power train. This arrangement prevents damage to the CRDM components. 32 41
 5. The Reactor Cavity and Support Ventilation Subsystem is provided with two 100 percent capacity trains and is powered from the ESF buses to assure maintenance of design flow during normal operation and to prevent excessive heat buildup during LOOP. 32 41
 6. The Normal Containment Purge Subsystem isolation valves at the Containment wall are designed to fail as is, in the event of LOOP. Interlocks are provided to automatically close the valves on Containment ventilation isolation signal. These valves normally remain closed. 32 41
 7. The Containment isolation valves ^{located inside containment} for the lines serving the Supplementary Containment Purge Subsystem are designed to fail as is, in the event of LOOP. Interlocks are provided to automatically close the valves on Containment ventilation isolation signal. 41 32 41
 8. The RCFC Subsystem assures adequate mixing of the RCB atmosphere to prevent formation of pockets with high concentration of hydrogen during post-LOCA operation.
- The basis for the layout of the RCFC supply and return air ducts is to assure complete mixing of the Containment atmosphere.
9. To achieve fast closure of Containment purge isolation valves, Containment purging is divided into two subsystems: one for shutdown only (Normal Containment Purge Subsystem) and one for normal plant operation (Supplementary Containment Purge Subsystem). The Supplementary Subsystem is designed with low flowrate, thus requiring smaller isolation valves and enabling faster closure time. 32
 10. The expected activity inside Containment during normal operation can be found in Section 12.2 and annual releases are tabulated in Section 11.3. 41

9.4.5.4 Inspection and Testing Requirements. To assure and demonstrate the capability of the RCB HVAC System to perform the assigned function, tests are performed to verify proper wiring and control hook-up, proper functioning of system components and control devices, and to establish design air flowrates. A final, integrated preoperational test is conducted with equipment and controls operational to verify that the system performance and operation meet design requirements. 3 41

9.4.6 Diesel-Generator Building Heating and Ventilating System

9.4.6.1 Design Bases. The Diesel Generator Building (DCB) Heating and Ventilating (H&V) System is designed to perform the following functions during normal and accident conditions: 31

The other isolation valves located outside the containment are quick closure fail closed valves.
pneumatic

TABLE 3.9-1.2 (Continued)

ACTIVE VALVES (BOP SYSTEMS)

<u>SYSTEM</u>	<u>VALVE NUMBER</u>	<u>SIZE</u>	<u>TYPE</u>	<u>ACTUATED BY</u>	
Instrument Air	FV8565	2"	Ball	air	5
Steam	FV4150, FV4151, FV4152,	3"	Globe	air	10
Generator Blowdown	FV4153				5
	FV4186, FV4187, FV4188, FV4189	1"	Y-Pattern	solenoid	
Containment Purge	HA001, HA002, HA003, HA004, HA005, HA006	18"	Butterfly	motor	41
	HA0007, HA0008, HA0009, HA00010	48"	Butterfly	motor	22.11
Radiation Monitoring	RP001, RP002, RP003, RP004, RP005, RP006	1"	Ball	motor	5
Essential Chilled Water	TV9476, TV9486, TV9496	4"	Three-Way control	air	10.5
	TV9477, TV9487, TV9497	6"	Three-Way control	air	
	CH0254, CH0268, CH0269	4"	Butterfly	air	
	FV9776, FV9777	18"	Butterfly	air	
	HC0003, HC0005	18"	Butterfly	motor	

ISOLATION VALVE NO.	VALVE SIZE (IN.)	INSIDE/ OUTSIDE CONT.	NORMAL FLOW DIRECTION	VALVE TYPE	VALVE OPERATOR	POWER SOURCE	PRIMARY MODE	SECONDARY MODE	CLOSURE TIME (SECS)	VALVE POSITION			TRIP	ISOLATION SIGNAL
										NORMAL	SHUTDOWN	POST ACCIDENT	FAIL	
HA-0003	18	INSIDE	IN	BUTTERFLY	MOTOR	ELECTRIC	AUTO	RM	10"	CLOSED	CLOSED	CLOSED	AS IS	B
HA-0001	18	OUTSIDE	IN	BUTTERFLY	MANUAL	ELECTRIC	AUTO	RM	10"	CLOSED	CLOSED	CLOSED	AS IS	A
HA-0013	1	OUTSIDE	N/A	PMD	MANUAL	N/A	MANUAL	N/A	N/A	CLOSED	CLOSED	CLOSED	N/A	N/A
											F.L.C.			

ENGINEERED SAFETY
FEATURES YES ☐ NO ☒

FLUID
CONTAINED: AIR

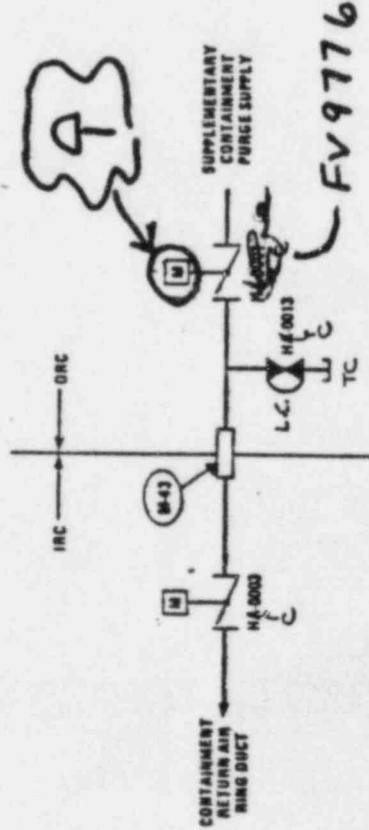
LENGTH OF PIPING
OUTSIDE CONT: 1.0 FT.

APPLICABLE GDC NO.: 13

REFERENCE PAID:

GENERAL COMMENTS:

THIS VALVE COULD BE OPENED DURING NORMAL OPERATION AS NEEDED



18 CFR 26.1 A. PENDIX / REQUIREMENT

TYPE	A	B	C	None
	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

CONTAINMENT PENETRATION NO. M-43

DESCRIPTION: SUPPLEMENTARY CONTAINMENT PURGE
SUPPLY
SYSTEM: RCB SUPPLEMENTARY PURGE SUBSYSTEM

**SOUTH TEXAS PROJECT
UNITS 1 & 2**

CONTAINMENT PENETRATIONS
Sheet 44 of 93

Figure 6.2.4-1

Amendment 89-6

FV 9777

AIR

Spring

CLOSED

ISOLATION VALVE NO.	VALVE SIZE (IN.)	INSIDE/ OUTSIDE CONT.	NORMAL FLOW DIRECTION	VALVE TYPE	VALVE OPERATOR	POWER SOURCE	PRIMARY MODE	SECONDARY MODE	CLOSURE TIME (SEC.)	VALVE POSITION				ACTUATION TRAIN	ISOLATION SIGNAL
										NORMAL	SHUTDOWN	POST ACCIDENT	FAIL		
HA-0005	18	INSIDE	OUT	BUTTERFLY	MOTOR	ELEC (SP)	AUTO	RM	10	CLOSED*	CLOSED	CLOSED	AS IS	B	CVI
HA-0006	18	OUTSIDE	OUT	BUTTERFLY	MOTOR	ELEC (SP)	AUTO	RM	10	CLOSED*	CLOSED	CLOSED	AS IS	A	CVI
HA-0014	1	OUTSIDE	N/A	PMO	MANUAL	N/A	MANUAL	N/A	N/A	CLOSED	CLOSED	CLOSED	N/A	N/A	N/A
										C.L.C.	C.L.C.	C.L.C.			

ENGINEERED SAFETY FEATURES SY. YES ☐ NO ☒

FLUID CONTAINED: ~JR

LENGTH OF PIPING OUTSIDE CONT.: 1.0 FT.

APPLICABLE SDC NO.: 58

REFERENCE PID: SV00019

GENERAL COMMENTS:

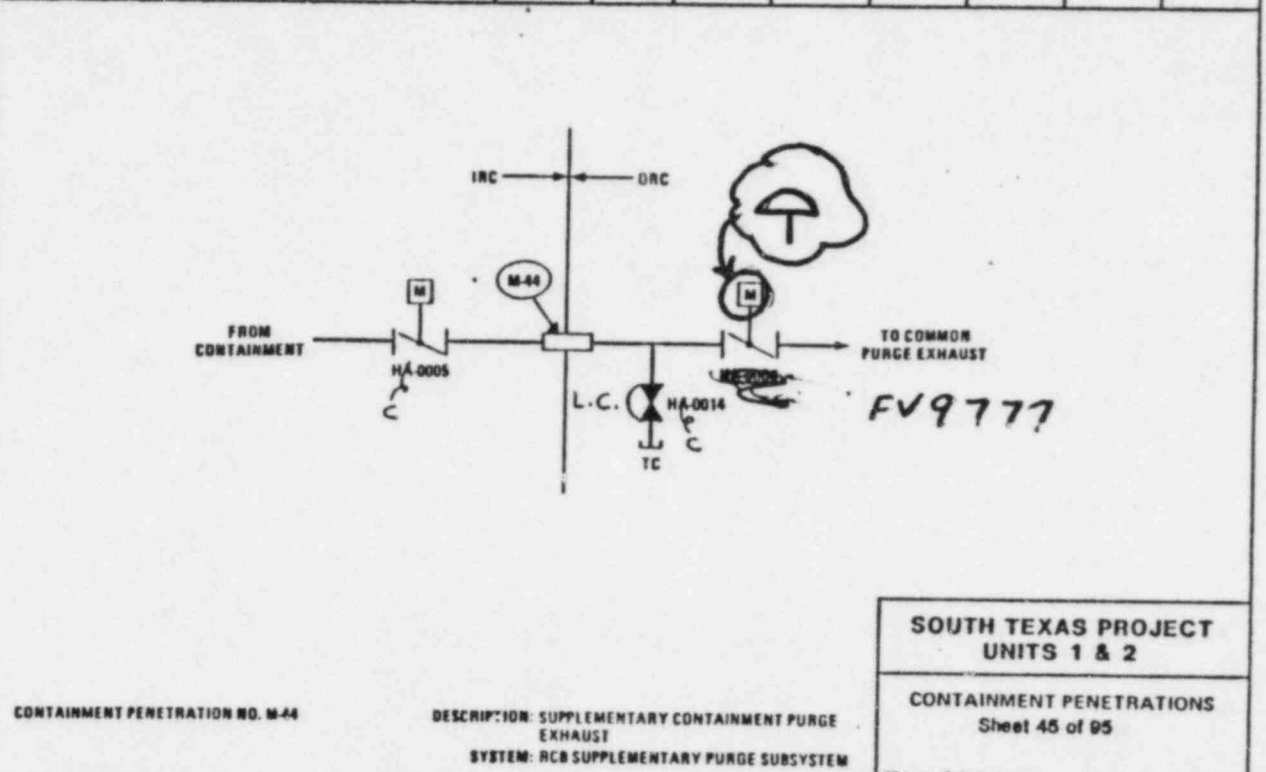
IS CFR 10 APPENDIX J REQUIREMENT

TYPE A ☐

B ☐

C ☒

NONE ☐



CONTAINMENT PENETRATION NO. M-44

DESCRIPTION: SUPPLEMENTARY CONTAINMENT PURGE EXHAUST

SYSTEM: RCB SUPPLEMENTARY PURGE SUBSYSTEM

SOUTH TEXAS PROJECT

UNITS 1 & 2

CONTAINMENT PENETRATIONS

Sheet 45 of 95

Figure 6.24-1

Amendment 00

ATTACHMENT 1

ST-HL-AE-1461

PAGE 4 OF 7

Question 022.11

The response to Request No. 022.5 assumes a maximum closure time for the supplementary containment purge subsystem (18-inch) isolation valves of 25 seconds. It is our position that the closure time for the valves should not exceed 5 seconds (see BTP CSB 6-4, Item B.1.f). Revise your FSAR accordingly.

Response

As part of the response to Request No. 022.5, two analyses were presented in order to demonstrate the adequacy of the Supplementary Containment Purge Subsystem. These analyses were calculations of the radiological consequences of a postulated Loss-of-Coolant-Accident (LOCA) concurrent with operation of the Supplementary Purge Subsystem and analysis of the reduction in containment pressure resulting from the partial loss of containment atmosphere during the accident for ECCS backpressure determination. For both of these analyses, a total isolation time of 25 seconds was assumed. This assumed isolation time conservatively bounds the time required for valve closure, instrument delay, and diesel generator start (assuming loss of offsite power).

The ~~actual~~ Supplementary Containment Purge Subsystem ^{motor operated} isolation valve closure time, ~~as delineated in Table 6.2.4-1~~, is 10 seconds or less. The results of the analyses performed in response to Request No. 022.5 have demonstrated the adequacy of the present Supplementary Containment Purge Subsystem isolation valves design.

while the pneumatic valves have a closure time of 5 seconds or less.

Question 022.16

The containment isolation valves for the supplemental containment purge subsystem are motor operated valves, which by design fail in the "as is" position upon loss of power. It is our position that valves, which close upon loss of actuating power, be used for containment purge systems. Discuss your position for complying with this position.

Response

The Supplementary Containment Purge Subsystem isolation valves are quarter-turn valves with full travel in a maximum time of 10 seconds.

These valves are provided with electric power from ESF buses so that on a loss of normal power the valve operators receive power from the diesel generator and the valves are closed. The inside and outside isolation valves are train segregated so no single active failure can prevent the isolation function. Analyses performed in response to Question 022.5 assumed a conservative isolation time of 25 seconds with results showing no fission products reaching the environment. The subject analyses demonstrate that STP meets 10CFR50.46 requirements and the dose guidelines of 10CFR100, even if the containment is being purged at the time of a postulated LOCA.

The supplementary Containment Purge Subsystem has been revised to incorporate a pneumatic quick closure, fail closed, valve on the outboard^{side} of both the intake and exhaust penetrations. These^{valves} will provide the requested isolation upon loss of actuating power. It should be noted that the dose consequences ~~data~~ found in Section 15.6.5 and requested in 022.05 are acceptable and ~~have~~ have assumed, conservatively, the failure of these quick closure valves.

CONTAINMENT SYSTEMS

CONTAINMENT VENTILATION SYSTEM

LIMITING CONDITION FOR OPERATION

ATTACHMENT
ST-HL-AE-1461
PAGE 7 OF 7

3.6.1.7 Each containment purge supply and exhaust isolation valve shall be OPERABLE and:

- a. Each ~~42~~⁴⁸-inch containment purge supply and exhaust isolation valve shall be sealed closed.
- b. The ~~42~~^{18 inch Supplemental}-inch containment purge supply and exhaust isolation valves shall be sealed closed to the maximum extent practicable but may be open for ~~purge~~^{supplemental} system operation for pressure control, for ALARA and respirable air quality considerations for personnel entry and for surveillance tests that require the valve to be open.

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

ACTION:

- a. With a ~~42~~⁴⁸-inch containment purge supply and/or exhaust isolation valve(s) open or not sealed closed, close and/or seal close the open valve(s) or isolate the penetration within 4 hours, otherwise be in at least ~~within the next 6 hours~~ within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.
- b. With an ~~42~~^{18 inch Supplemental}-inch containment purge supply and/or exhaust isolation valve(s) open for reasons other than given in 3.6.1.7.b above, close the open ~~42~~¹⁸-inch valve(s) or isolate the penetration(s) within 4 hours, otherwise be in at least ~~within the next 6 hours~~ within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.
- c. With a containment purge supply and/or exhaust isolation valve(s) having a measured leakage rate exceeding the limits of Specifications 4.6.1.7.2 and/or 4.6.1.7.3, restore the inoperable valve(s) to OPERABLE status or isolate the penetrations such that the measured leakage rate does not exceed the limits of Specifications 4.6.1.7.2 and/or 4.6.1.7.3 within 24 hours, otherwise be in at least ~~within the next 6 hours~~ within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

~~check at least once per 24 hrs and~~

4.6.1.7.1 The 48 inch containment purge supply and exhaust isolation valves shall be verified to be:

- a. Closed at least once per 24 hours.
- b. Sealed closed at least once per 31 days.

4.6.1.7.2 At least once per twenty-four (24) months, each 18-inch containment purge supply and exhaust isolation valve shall be demonstrated operable pursuant to 10CFR50, Appendix J. Verification of operability is made by determining that the combined leakage rate (the measured leakage rate for these valves plus the leakage rate measured pursuant to specification 4.6.1.2.d, for all other type B & C penetrations) is less than 0.60La.

4.6.1.7.3 At least once per twenty-four (24) months, each sealed closed 48-inch containment purge supply and exhaust isolation valve shall be demonstrated operable pursuant to 10CFR50, Appendix J. Verification of operability is made by determining that the combined leakage rate (the measured leakage rate for these valves plus the leakage rate measured pursuant to specification 4.6.1.2.d, for all other type B & C penetrations) is less than 0.60La.