Nuclear Operating Company

South Texas Project Electric Generating Station 4000 Avenue F – Suite A Bay City, Texas 77414

June 12, 2008
ABR-AE-08000043

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
One White Flint North
11555 Rockville Pike
Rockville MD 20852-2738

South Texas Project
Units 3 and 4
Docket Nos. 52-012 and 52-013
Response to Requests for Additional Information

Attached are responses to NRC questions included in Request for Additional Information letter numbers 7, 10, 23, 25, 26, 27, 28, 29, 30, 31, 32, and 42 related to COLA Part 2, Tier 2, Sections 2.3, 2.4, 3.6, 9.1, 9.3, and 10.4. This submittal includes responses to the following Question numbers:

02.03.03-1	02.04.01-1	03.06.01-1
02.03.03-4	02.04.02-1	09.01.03-1
02.03.04-3	02.04.02-2	09.03.03-1
02.03.05-3	02.04.03-1	09.03.03-2
02.03.05-4	02.04.03-2	09.03.03-3
02.03.05-5	02.04.03-3	09.03.03-4
		10.04.07-1

When a change to the COLA is indicated by a question response, the change will be incorporated into the next routine revision of the COLA following NRC acceptance of the question response.

There are no new commitments made in this letter.

If you have any questions, please contact me at (361) 972-4626, or Bill Mookhoek at (361)-972-7274.

D079
NRO

I declare under penalty of perjury that the foregoing is true and correct.

Executed on June 12, 2008

Greg Gibson
Manager, Regulatory Affairs
South Texas Project, Units 3 & 4

jwc

Enclosures:
1. DVD for Question 02.04.01-1
2. DVD for Question 02.04.03-1
3. DVD for Question 02.04.02-2(b)

Attachments
1. Question 03.06.01-1
2. Question 02.03.03-4
3. Question 02.03.04-3
4. Question 02.03.05-3
5. Question 02.03.05-4
6. Question 02.03.05-5
7. Question 02.04.01-1
8. Question 02.04.02-1
9. Question 02.04.02-2
10. Question 02.04.03-1
11. Question 02.04.03-2
12. Question 02.04.03-3
13. Question 02.03.03-1
14. Question 10.04.07-1
15. Question 09.01.03-1
16. Question 09.03.03-1
17. Question 09.03.03-2
18. Question 09.03.03-3
19. Question 09.03.03-4

cc: w/o attachment except*
(paper copy)

Director, Office of New Reactors
U. S. Nuclear Regulatory Commission
One White Flint North
11555 Rockville Pike
Rockville, MD 20852-2738

Regional Administrator, Region IV
U. S. Nuclear Regulatory Commission
611 Ryan Plaza Drive, Suite 400
Arlington, Texas 76011-8064

Richard A. Ratliff
Bureau of Radiation Control
Texas Department of State Health Services
1100 West 49th Street
Austin, TX 78756-3189

C. M. Canady
City of Austin
Electric Utility Department
721 Barton Springs Road
Austin, TX 78704

*Steven P. Frantz, Esquire
A. H. Gutterman, Esquire
Morgan, Lewis & Bockius LLP
1111 Pennsylvania Ave. NW
Washington D.C. 20004

*George F. Wunder
Two White Flint North
11545 Rockville Pike
Rockville, MD 20852

(electronic copy)

Loren R. Plisco
U. S. Nuclear Regulatory Commission

Brad Porlier
Steve Winn
Eddy Daniels
NRG South Texas 3/4 LLC

Jon C. Wood, Esquire
Cox Smith Matthews

J. J. Nesrsta
R. K. Temple
Kevin Pollo
L. D. Blaylock
CPS Energy

Question 03.06.01-1

QUESTION:

COL (combined license) Information Item 3.16 in FSAR section 3.6.5.1 specifies that the COL applicants need to provide the details of pipe break hazards analysis results and protection methods. The applicant proposes to address the COL information item concerns in ITAAC 3.3. This ITAAC requires an evaluation of the as-built pipe break analysis, but does not address the as-designed information. The intent of the COL information item was to make available the detailed design information for staff review prior to implementation/installation. The design information should be available prior to implementation/installation. Section C.111.4.3 of Regulatory Guide (RG) 1.206 allows the applicant to propose an alternative to the COL information item.

Please justify how ITAAC 3.3 covers the level of detail described in COL Information Item 3.6.5.1, or propose changes to include information for both as-design and as-built pipe break hazards in ITAAC Table 3.3 and provide a description pertaining the closure schedule of the as-design pipe break hazards analysis in Tier 2 (such as prior to installation), or provide a different alternative with the described justification.

RESPONSE:

ITAAC 3.3 Item 2 requires inspections of both the Pipe Break Analysis Report and the as-built high and moderate energy pipe break mitigation features (including spatial separation), but the acceptance criteria do not specify that the Pipe Break Analysis Report will be made available for staff review prior to installation. It is expected that all design-related ITAAC will be scheduled following completion of the applicable design documents and early in the construction phase. Section 3.6.5.1 of the COLA will be revised to commit to notifying the NRC staff of the availability of the Pipe Break Hazards Analysis Report(s) prior to installation of affected systems or components. The necessary details of that information will be provided in the next COLA revision occurring beyond three months after completion of the Pipe Break Analysis Report(s).

Section 3.6.5.1 will be revised to add the following paragraph at the end of the section:

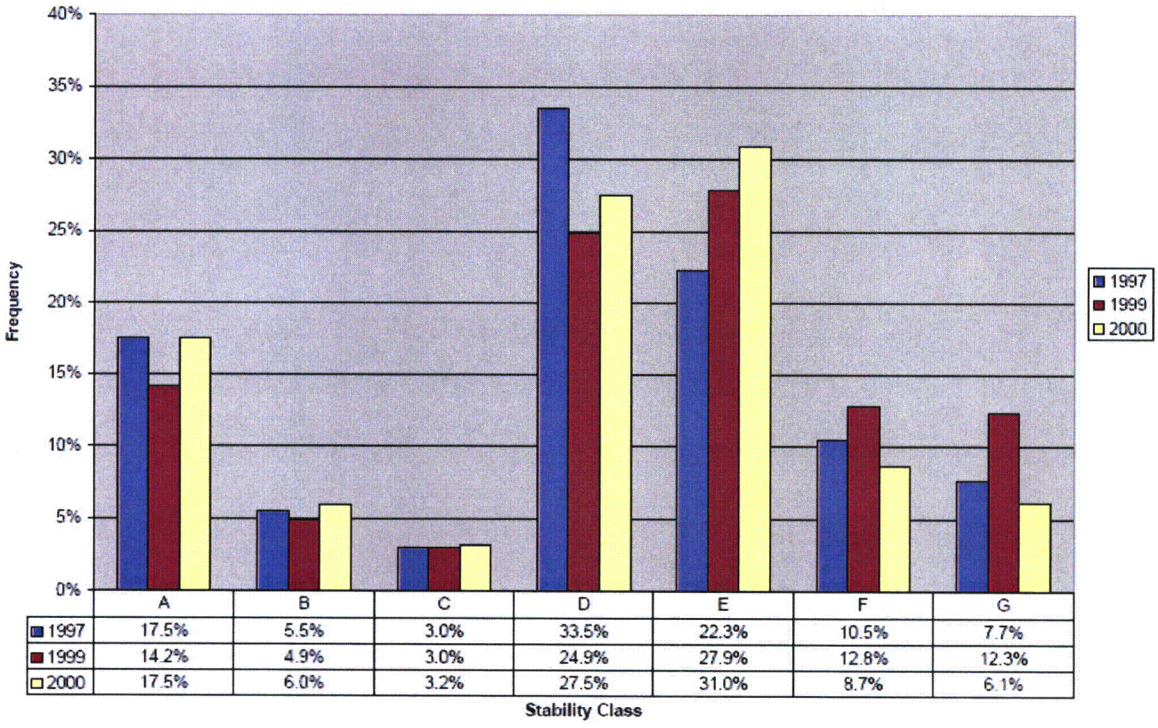
> "The NRC staff will be notified of the availability of the design Pipe Break Hazards Analysis Report(s) prior to installation of affected systems or components. The necessary details of that information will be provided in the next COLA revision occurring beyond three months after completion of the Pipe Break Analysis Report(s)."

Question 02.03.03-4

QUESTION:

Please explain the variation in onsite G stability class frequency distribution from year to year (e.g., 12.3% in 1999 versus 6.1% in 2000) as shown in Figure 1.

Figure 1
STP Stability Class Frequency Distributions



	A	B	C	D	E	F	G
1997	17.5%	5.5%	3.0%	33.5%	22.3%	10.5%	7.7%
1999	14.2%	4.9%	3.0%	24.9%	27.9%	12.8%	12.3%
2000	17.5%	6.0%	3.2%	27.5%	31.0%	8.7%	6.1%

RESPONSE:

The G stability Class frequency differences are attributed to year-to-year variation and are within the norm of the yearly variation. Examination of seven years of STP onsite historical stability class frequency distribution data show several year-to-year variations of greater than 6.2% (the G stability Class frequency difference between 1999 and 2000), for stabilities other than G.

No COLA revision is required as a result of this RAI response.

Question 02.03.04-3

QUESTION:

Section C.1.2 of Regulatory Guide 1.145 states that for each of the 16 direction sectors, the distances to the EAB and LPZ to be used in the χ/Q calculations should be the minimum distance from the stack or, in the case of releases through vents or building penetrations, the nearest point on the building to the EAB or LPZ within a 45 degree sector centered on the compass direction of interest. Please confirm that this was the approach used in deriving the distances to the EAB and LPZ presented in FSAR Table 2.3S-21 and 2.3S-22, or justify an alternative approach.

RESPONSE:

The distances provided in FSAR Tables 2.3S-21 and 2.3S-22 were the exact distances obtained through the use of a Geographic Information System (GIS) analysis. The shortest distance to the Exclusion Area Boundary (EAB) was in the NW direction. In this direction, the distance provided in Table 2.3S-21 is the shortest distance from the center of Unit 4 to the direction of interest (NW). Therefore, the release was assumed to be located at the center of either Unit 3 or 4, not the nearest point on the building to the EAB or Low Population Zone (LPZ).

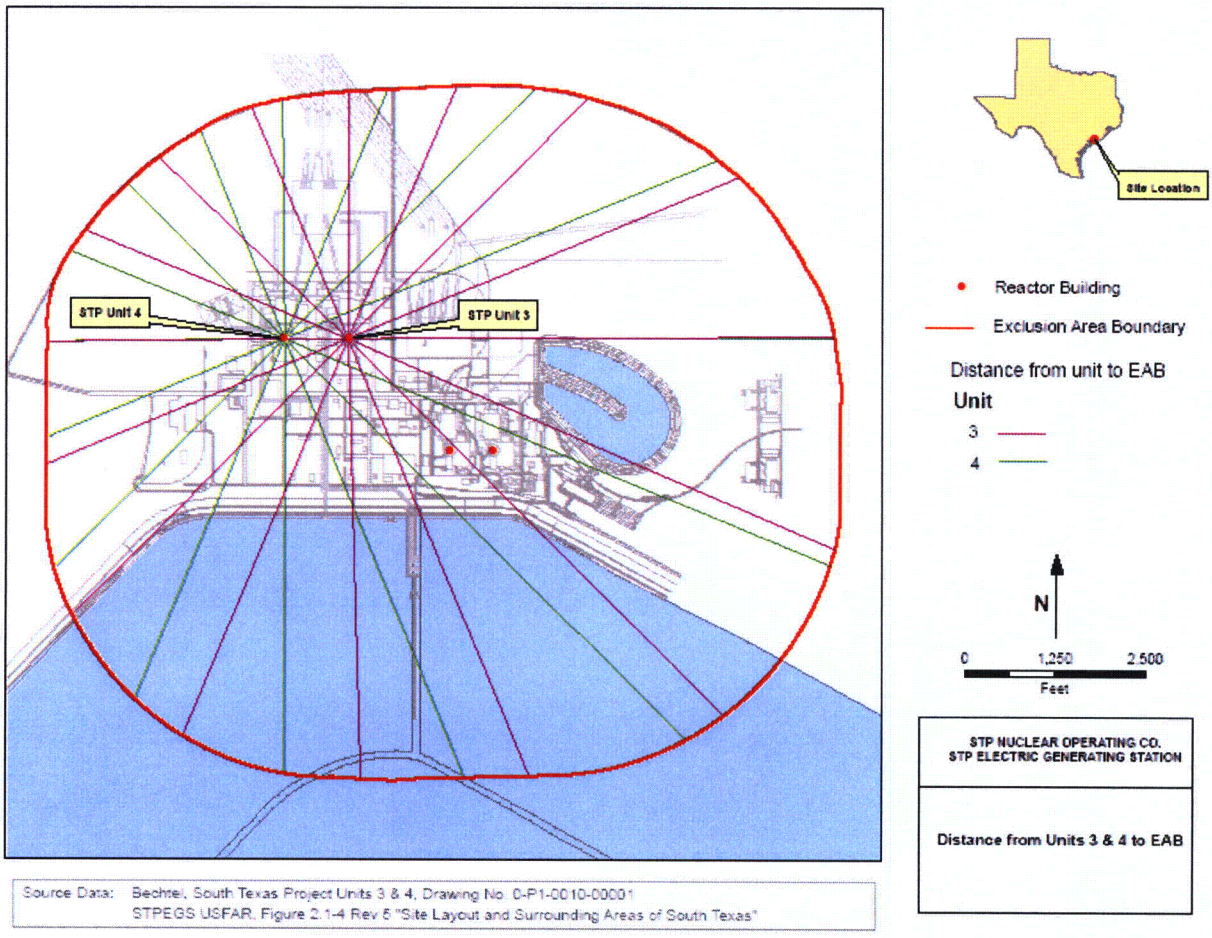
As shown on the attached figure, our alternative approach uses the distance from the center of Unit 4 in the NW direction. The shortest distance from the center of Unit 4 to any point in the 45-degree sector is similar. It is acknowledged that in the NW direction, the difference in distance from the edge of the reactor building to the EAB is about 135 feet (41 meters) shorter than if measured from the center of Unit 4. A 4.4% (41 m/930 m) difference in this distance does not significantly affect the χ/Q value predicted at the EAB.

The following discussion provides the basis for this selection. When varied direction-specific boundary distances are entered into the PAVAN code, the model cannot generate the overall 5% χ/Q values. This is a limitation of the PAVAN code. In order to obtain the maximum overall 5% χ/Q value, PAVAN was run separately for each direction-specific boundary distance for each of the 16 different directions. The ultimate maximum 0-2 hour χ/Q value was selected from the 16 sets of data using the lowest or most conservative distance (930 m). As reported in FSAR Tables 2.3S-23 and 2.3S-24, the maximum overall 0-2 hour 5% χ/Q at the EAB and LPZ, respectively, was selected by the above alternative approach.

Specifically, the 0-2 hour maximum overall 5% χ/Q at the EAB (1.96E-04) was obtained from a PAVAN run using a constant downwind distance of 930 meters for all directions. In reality, aside from only this one sector (NW direction), the downwind distances to the EAB are all greater for the rest of the directions. This approach is conservative because it assumes all downwind distances are 930 meters to the EAB.

In conclusion, the net result of the conservative approach used in the final selection of the 0-2 hour maximum χ/Q values out-weighs the use of the distance measured from the center of Unit 4, rather than from the nearest point on the building.

No COLA revision is required as a result of this RAI response.



Source Data: Bechtel, South Texas Project Units 3 & 4, Drawing No. 0-P1-0010-00001
STPEGS USFAR, Figure 2.1-4 Rev 6 "Site Layout and Surrounding Areas of South Texas"

Question 02.03.05-3

QUESTION:

FSAR Section 2.3S.5.1 states that no residential milk cows have been identified within five (5) miles of the STP site and all residents are assumed to be fattening a calf for residential consumption. However, (1) Table 2.3S-26 identifies distances to the nearest milk and not to the nearest meat animal; and, (2) Table 2.3S-27 provides X/Q and D/Q values for milk animals and not for meat animals

RESPONSE:

(1) "Milk" animal used in the table heading as shown on Table 2.3S-26 should be changed to "meat" animal.

(2) "Milk" animal as shown in "Type of Location" column on Table 2.3S-27 should be changed to "meat" animal.

FSAR Tables 2.3S-26 and 27 will have "milk" animal changed to "meat" animal. Markups of the draft tables are as follows:

TABLE 2.3S-26

DISTANCES FROM THE RELEASE POINTS TO SENSITIVE RECEPTORS

	Distance to Vegetable Garden, ~~Milk~~Meat Animal, EAB, and Resident (meters) from				Closer of two (meters)
Direction	Center of STP 1 & 2	Center of STP 3 & 4	STP 3	STP 4	STP 3 or 4
N	5600	5174	5158	5193	5158
NNE	8000	7858	7794	7924	7794
NE	8000	8000	8066	8278	8000
ENE	8000	8000	8324	8585	8000
E	8000	8000	8531	8805	8000
ESE	5600	6387	6262	6513	6262
SE	5600	6396	6297	6495	6297
SSE	8000	8000	8658	8794	8000
S	0	0	0	0	0
SSW	8000	8000	8260	8180	8000
SW	7200	7112	7198	7027	7027
WSW	4000	3632	3748	3517	3517
W	7200	6561	6698	6425	6425
WNW	6400	5619	5747	5490	5490
NW	7200	6407	6503	6313	6313
NNW	5600	4936	4979	4896	4896

Note: If the distance is greater than 8000 meters, then the distance is taken as 8000 meters. If a pathway is not applicable, the receptor distance is 0 meters.

TABLE 2.3S-27 XOQDOQ-Predicted Maximum X/Q and (D/Q) Values at Receptors of Interest

	Type of Location	Direction from Site	Distance (miles)	X/Q (sec/m^3)
No Decay	EAB	NW	0.58	1.30E-05
	Resident	WSW	2.19	6.20E-07
	~~Milk~~Meat Animal	WSW	2.19	6.20E-07
	Vegetable Garden	WSW	2.19	6.20E-07
	Unit 4 Reactor	WNW	0.17	8.30E-05

2.26 Day Decay	EAB	NW	0.58	1.30E-05
	Resident	WSW	2.19	6.20E-07
	~~Milk~~Meat Animal	WSW	2.19	6.20E-07
	Vegetable Garden	WSW	2.19	6.20E-07
	Unit 4 Reactor	WNW	0.17	8.30E-05

8 Day Decay	EAB	NW	0.58	1.20E-05
	Resident	WSW	2.19	5.10E-07
	~~Milk~~Meat Animal	WSW	2.19	5.10E-07
	Vegetable Garden	WSW	2.19	5.10E-07
	Unit 4 Reactor	WNW	0.17	8.00E-05

	Type of Location	Direction from Site	Distance (miles)	(D/Q) (1/m^2)
	EAB	NW	0.58	8.50E-08
	Resident	NNW	3.04	1.80E-09
	~~Milk~~Meat Animal	NNW	3.04	1.80E-09
	Vegetable Garden	NNW	3.04	1.80E-09
	Unit 4 Reactor	WNW	0.17	3.40E-07

Question 02.03.05-4

QUESTION:

FSAR Section 2.3S.5 provides estimates of annual average atmospheric dispersion factors (X/Q values) and relative dry deposition factors (D/Q values) for use in demonstrating compliance with 10 CFR Part 20, Subpart D dose limits for individual members of the public and 10 CFR Part 50, Appendix I numerical guides for design objectives and limiting conditions for operation to meet the requirement that radioactive material in effluents released to unrestricted areas be kept as low as is reasonably achievable. Regulatory Guide (RG) 1.111 provides guidance for estimating atmospheric transport and dispersion of gaseous effluents in routine releases from land-based light-water-cooled reactors. RG 1.111 states that appropriate time periods for meteorological data utilization should be based on the constancy of the source term or release rate. Annual data summaries should be used if emissions are continuous. If releases are intermittent, consideration should be given to frequency and duration of the releases; e.g., if emissions are infrequent and of short duration, atmospheric dispersion models and meteorological data applicable to the time of release should be considered. Consequently, please describe the expected frequency and duration of routine releases and justify the use of annual average dispersion conditions.

RESPONSE:

Releases are continuous. Table 11.3-1 of the DCD (Rev. 0) presents both the short-term (MBq/s) and the annual (MBq/year) gas release rates. As stated in DCD Section 11.3.2, the release rates are based on a design value of 3700 MBq/sec following a 30-minute decay. The release rate per second presented in that table when converted by multiplying (3600 sec/hr and 8760 hr/yr) is equivalent to the annual release rate presented in the same table. This indicates that the release rate presented in the DCD is continuous. As a result, the annual X/Q and D/Q values presented in 2.3S.5 are representative and reasonable.

No COLA revision is required as a result of this RAI response.

Question 02.03.05-5

QUESTION:

Please clarify whether the no decay and 2.26 day decay χ/Q values presented in FSAR Table 2.3S-27 assume no dry deposition and the eight (8) day decay χ/Q values presented in FSAR Table 2.3S-27 assume dry deposition.

RESPONSE:

The no decay and 2.26 day decay χ/Q values presented in Table 2.3S-27 assume no dry deposition, and the 8 day decay χ/Q values presented in the same table assume dry deposition.

No COLA revision is required as a result of this RAI response.

Question 02.04.01-1

QUESTION:

(a) Provide a geographical information system (GIS) coverage for existing topography data obtained from aerial survey that was used to create FSAR Figure 2.4S.1-3. (b) Provide a GIS coverage for the layout of major structures of all four STP units.

RESPONSE:

(a) The GIS coverage for existing topography data obtained from the aerial survey used to create FSAR Figure 2.4S.1-3 is provided in the enclosed DVD in a subfolder named: "STP_FSAR_Figure_2.4S.1-3."

(b) The GIS coverage for the layout of major structures of all four STP units is provided in the enclosed DVD in a subfolder named: "STP_FSAR_Figure_2.4S.1-3."

No COLA Revision is required as a result of this response.

Question 02.04.02-1

QUESTION:

Final Safety Analysis Report (FSAR) Table 2.0-2 shows that the precipitation site characteristic at the STP site is defined by the local PMP rate of 19.8 in/hr, which exceeds the ABWR DCD envelope value of 19.4 in/hr. Provide a discussion of the additional load on safety-related SSCs as a result of this exceedance to demonstrate that sufficient safety margins exist in the design of these SSCs.

RESPONSE:

The Reactor Building, the Control Building and two Reactor Service Water (RSW) Pump Houses are the only buildings classified as safety-related SSCs. (The Radwaste Building will be classified as non-safety related in the next revision to the COLA.) The slight increase in maximum precipitation rate at the STP site only impacts the roof loading of these SSCs.

Per FSAR Tier 2 Sections 3H.1.4.2 and 3H.2.4.2.5, roof parapets are furnished with scuppers to supplement roof drains, or the roofs are designed without parapets, so that excessive ponding of water cannot occur. The roof design satisfies the provisions of ASCE 7, Section 8.

Per FSAR Tier 2 Sections 3H.6.4.2.5, the roof of each RSW pump house is designed without parapets so that excessive ponding of water cannot occur. Such roof design meets the provisions of RG 1.102.

Therefore, the increased local precipitation rate results in no additional load on safety-related SSCs and safety margins are not impacted.

No COLA revision is required as a result of this RAI response.

Question 02.04.02-2

QUESTION:

(a) Provide input and output files used in the HEC-HMS computations that form the basis of peak discharges from site drainages during the local PMP event. (b) Provide input and output files used in the HEC-RAS simulations used to determine peak flood elevations in the power block area.

RESPONSE:

(a) The HEC-HMS input files used for local PMP computations and computation outputs are provided in the enclosed DVD in a subfolder named: "Audit Question 51 - HEC-HMS Input_Output."

(b) The HEC-RAS input files used for water level computations in the power block area and output report are provided in the enclosed DVD in a subfolder named: "Audit Question 52 - HEC-RAS Input_Output."

No COLA Revision is required as a result of this response.

Question 02.04.03-1

QUESTION:

Provide a map, preferably a GIS coverage, of the Colorado River Basin including both the upper and lower basins' boundaries with annotations for the six highland lakes and their impounding dams.

RESPONSE:

The GIS coverage of the Colorado River Basin, including both the upper and lower basins' boundaries with annotations for the six highland lakes and their impounding dams, is provided in the enclosed DVD in subfolders named: "STP_FSAR_Figure_2.4S.1-4", "STP_FSAR_Figure_2.4S.1-5" and "STP_FSAR_Figure_2.4S.1-6."

No COLA Revision is required as a result of this response.

Question 02.04.03-2

QUESTION:

What are the spillway discharge capacities of the dam impounding Lake O.H. Ivie and the Mansfield dam?

RESPONSE:

The table below provides the spillway discharge capacities of the dam impounding Lake O.H. Ivie and the Mansfield Dam.

Lake/ Reservoir Name	Spillway Discharge Capacity	Reference
Lake O.H Ivie (once called Stacy Reservoir)	228,000 cfs at El. 1563 msl	Reference 1
Lake Travis (at Mansfield Dam)	508,000 cfs at El. 746 msl	Reference 2

References:

1. Freese and Nichols, Inc. 1987. Stacy Reservoir - Dam, Spillway, and Outlet Works. Construction Plans and Specifications, Approved by the Texas Water Commission, 17 February 1987.

2. Marshall Ford Dam (Locally known as Mansfield Dam) - Statistics, Available at http://www.usbr.gov/dataweb/dams/tx01087.htm, accessed April 22, 2008

No COLA Revision is required as a result of this response.

Question 02.04.03-3

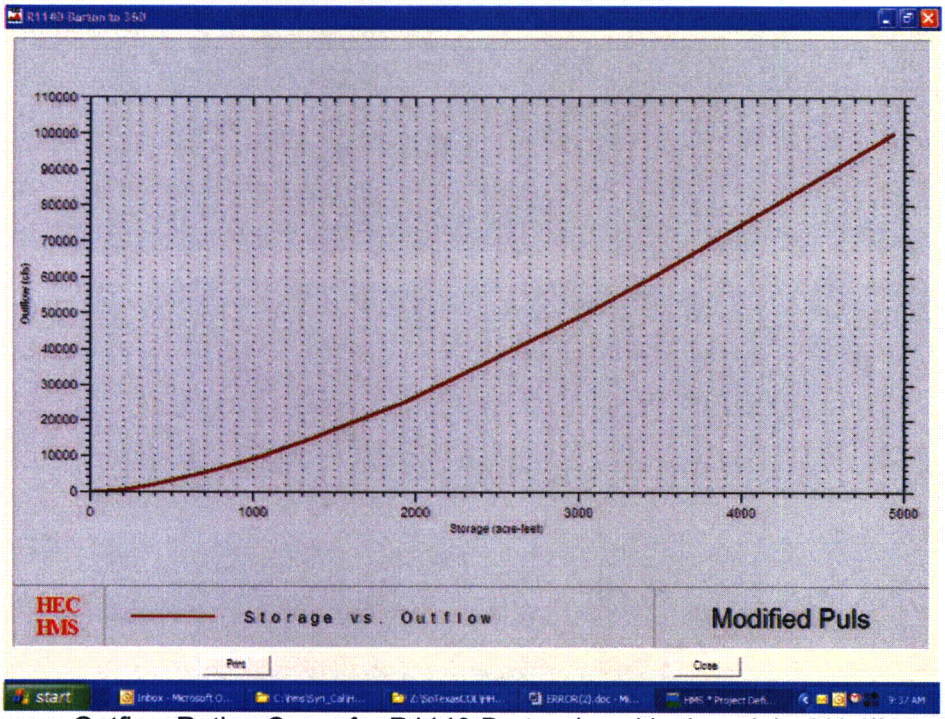
QUESTION:

Provide details of the linear extrapolation used to extend the channel rating curves between Mansfield Dam and Matagorda Bay described in FSAR Section 2.4S.3.3.

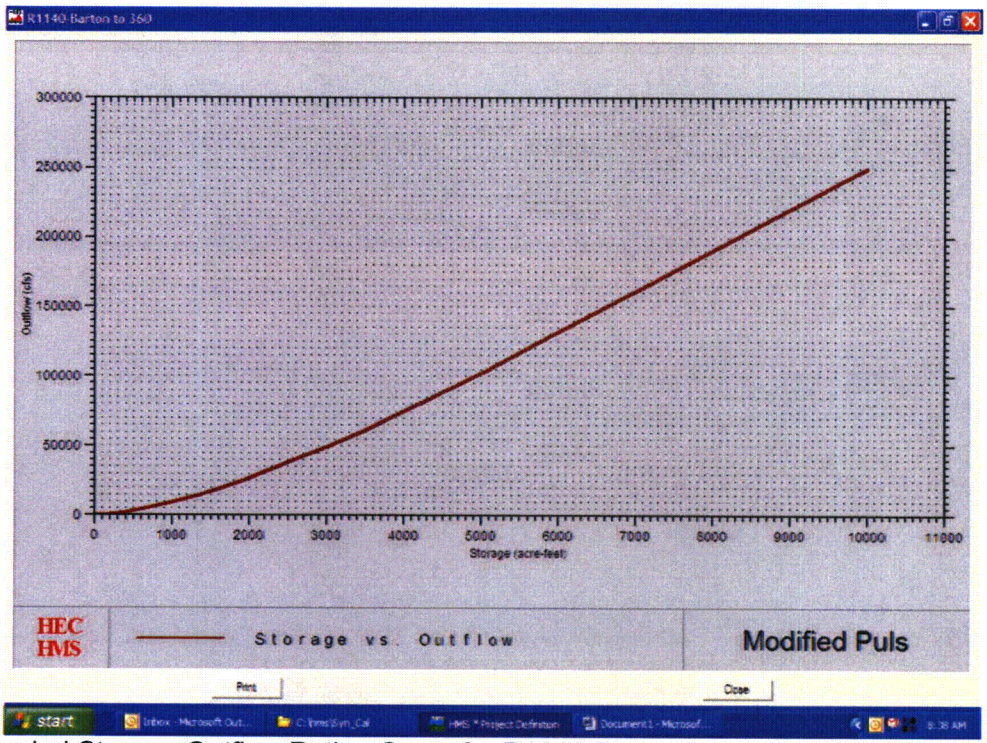
RESPONSE:

A linear extrapolation was used to extend three channel rating curves: R1140-Barton, R420-Walnut Cr, and R430-Gilleland. The following figures provide the original rating curves used in the Halff HEC-HMS Model and the extrapolated rating curves used for the Probable Maximum Flood (PMF) Analysis in FSAR Section 2.4S.3.

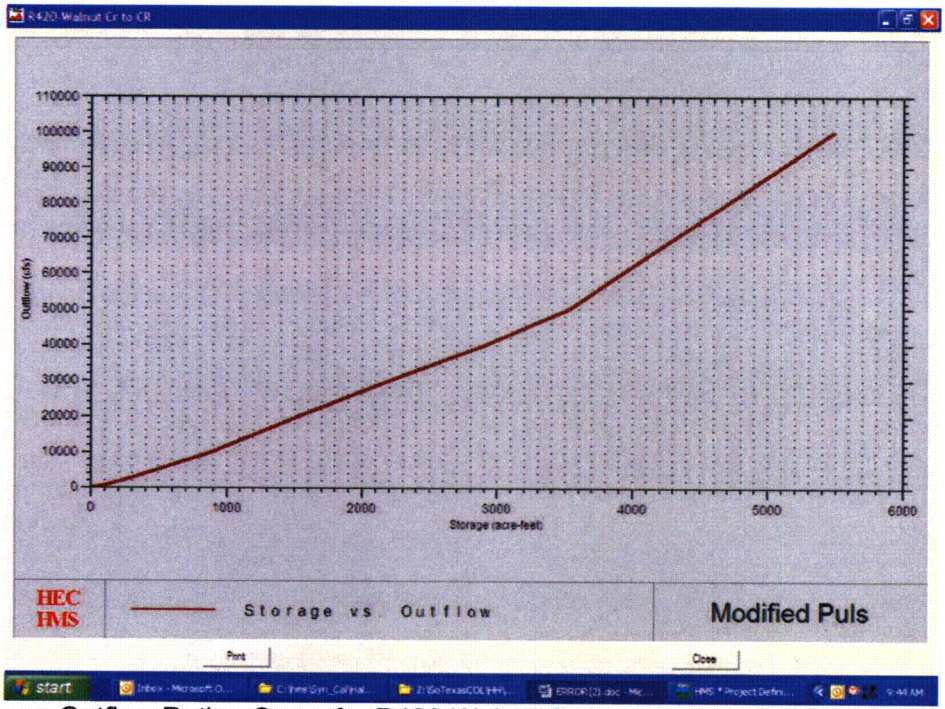
No COLA Revision is required as a result of this response.



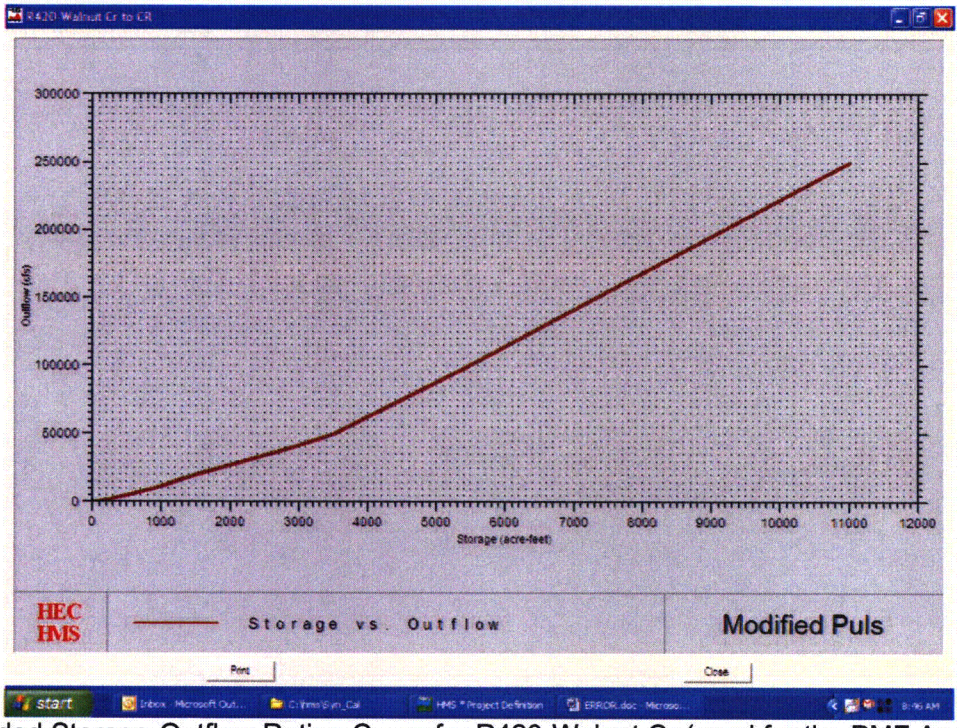
Storage-Outflow Rating Curve for R1140-Barton (used in the original Halff Model)



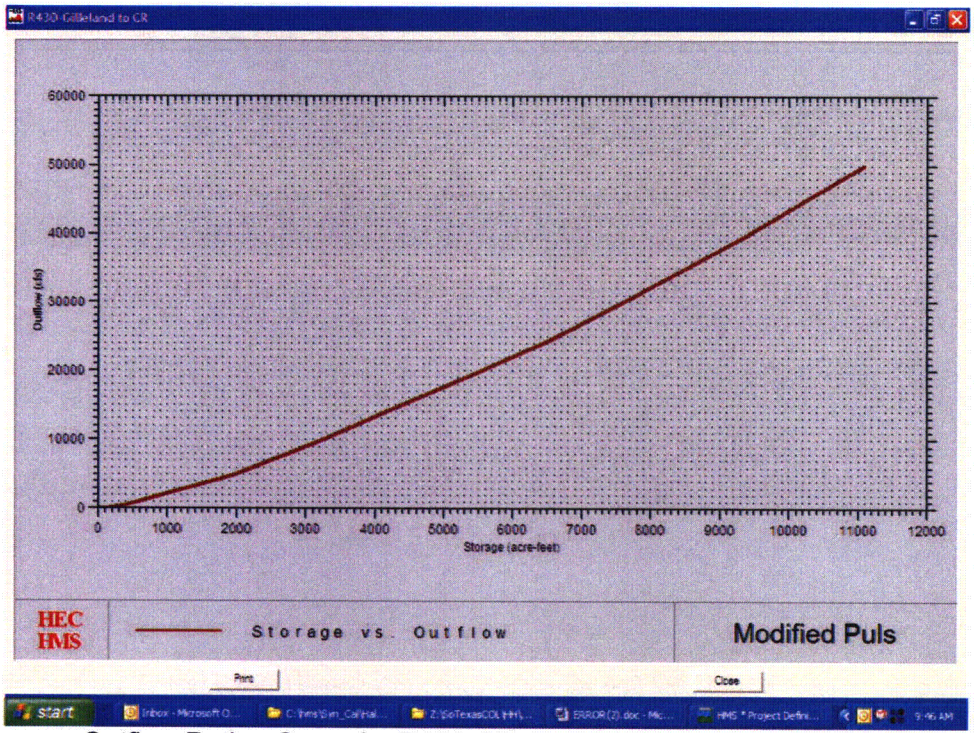
Extended Storage-Outflow Rating Curve for R1140-Barton (used for the PMF Analysis)



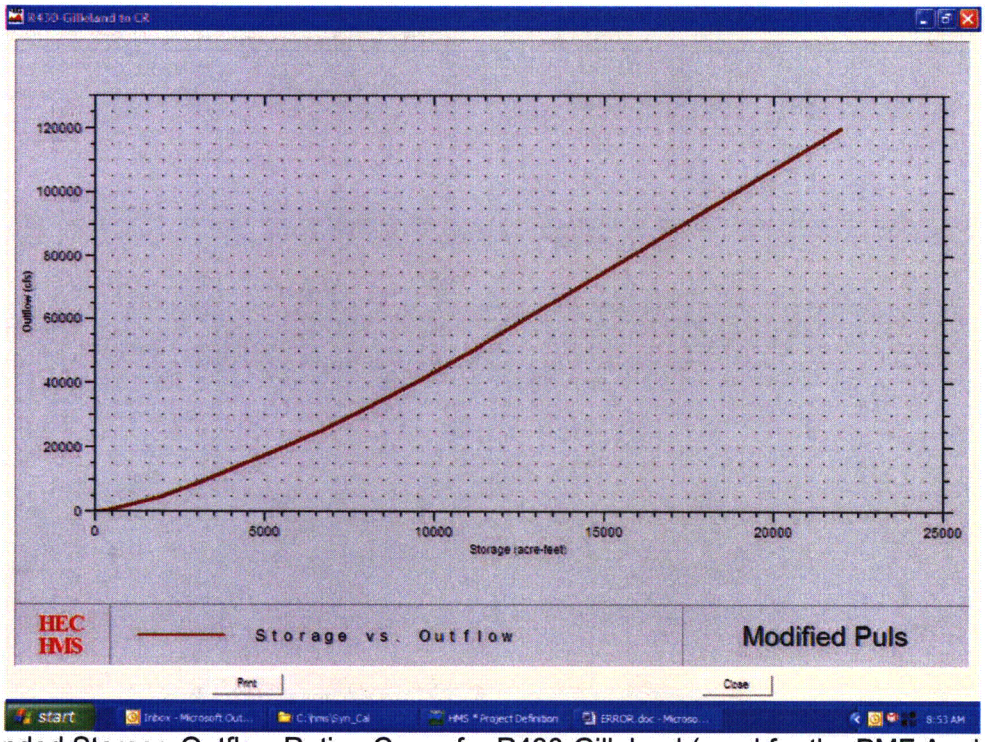
Storage-Outflow Rating Curve for R420-Walnut Cr (used in the original Halff Model)



Extended Storage-Outflow Rating Curve for R420-Walnut Cr (used for the PMF Analysis)



Storage-Outflow Rating Curve for R430-Gilleland (used in the original Halff Model)



Extended Storage-Outflow Rating Curve for R430-Gilleland (used for the PMF Analysis)

Question 02.03.03-1

QUESTION:

FSAR Section 2.3S.3.2 states that the 1999 and 2000 onsite meteorological data were chosen because, among other reasons, they are the most defendable; e.g., using validated data with the least data substitution. Please describe in generals terms any data substitution used to create the 1997, 1999, and 2000 onsite meteorological database submitted in support of the STP 3 & 4 COL application.

RESPONSE:

The monthly meteorological data packages, processed by the site technician, include a summary of the editing of data and a brief description of the source of the data. During 1997, 1999, and 2000, the vast majority of editing was to replace data that failed to record on the plant computer system for one or more reasons with backup data recorded at the primary tower independent of the plant computer systems. This replacement data is considered primary tower data since it is the raw data recorded at the tower.

As described further below, the meteorological database also includes 204 hours of data that were estimated using one of three methods. This total includes: (1) 167 hours of delta temperature data that were estimated using sigma theta of the backup tower 10-meter wind direction data; (2) 34 hours of delta temperature data that were estimated using the difference between the 60-meter temperature and the 10-meter temperature on the primary tower; and (3) three hours of data that were estimated using extrapolation to replace single hours of missing data.

The sigma theta data was used to estimate stability class using Table 2.5 in NUREG/CR-3332, *Radiological Assessment - A Textbook on Environmental Dose Analysis.* Since no limits on speed were imposed during this time period the estimates of stability might be biased toward unstable conditions for the nighttime hours. The 167 hours of data using this method occurred during the 198 hour period that began July 21, 1999 at 07:00 and ended July 29, 1999 at 13:00.

Delta temperature was measured by a circuit separate from the temperature measurements in order to meet the required precision. At times during the night, the atmosphere was often stable, and the difference between the upper and lower sensors sometimes exceeded 5 degrees. If the delta temperature circuit did not provide data during these deep inversions, the difference between the 60-meter and 10-meter temperature sensors was used as an estimate of delta temperature. This was acceptable because the temperature sensors were each calibrated to within 0.5 degrees and the resulting one degree uncertainty in the difference between these two measurements would have no effect on stability class when the delta temperature was well over 5 degrees. This method of estimating delta temperature was used for 34 hours in the data for 1997, 1999, and 2000.

Finally, three single hours of missing data were replaced by estimates of stability class based on interpolation. This was reasonable because during the night the atmosphere is typically stable at STP and may be unchanging for several consecutive hours.

In summary, the most significant data substitution was limited to the approximately eight days of data in the period from 07:00 July 21, 1999 to 13:00 July 29, 1999 when sigma theta values were substituted for missing delta temperature values.

No COLA revision is required as a result of this RAI response.

Question 10.04.07-1

QUESTION:

FSAR Section 10.4.7 describes the STP condensate and feedwater system (CFS) which incorporates by reference the information from Section 10.4.7 of the ABWR DCD with departure STP DEP 10.4-5. The departure redesigns the system by adding condensate booster pumps and increasing the number of reactor feed, and heater drain pumps in the CFS, thus modifying the functional arrangement of the system. Tier 1, Section 2.10 of the STP COLA incorporates by reference Tier 1, Section 2.10 of the ABWR DCD, which contains a design description of the CFS and the applicable system design certification ITAAC in Table 2.10.2a, and Figure 2.10.2a. Since the departure taken in FSAR Section 10.4.7 results in a change to the functional arrangement of the system, and the proposed system in the FSAR is no longer consistent with the one in the ABWR DCD, please provide justification for why a departure to ITAAC Table 2.10.2a and Figure 2.10.2a is not being made to be consistent with the STP CFS system described in FSAR section 10.4.7.

RESPONSE:

Adding condensate booster pumps and increasing the number of reactor feed, and heater drain pumps in the CFS alters the specific design, but does not modify the functional arrangement of the system. As stated in Tier1 Section 2.10.2, Design Description, Condensate and Feedwater System, "The function of the CFS is to receive condensate from the condenser hotwells, supply condensate to the Condensate Purification System (CPS), and deliver feedwater to the reactor." The revised design continues to "receive condensate from the condenser hotwells, supply condensate to the Condensate Purification System (CPS), and deliver feedwater to the reactor." This design change simply improves the ability of the system to perform these functions, but does not alter the overall function of the system. The condensate and condensate booster pumps operate in tandem to split the condensate pressure between two pump stages to ensure the condensate purification system operates at peak performance while supplying adequate NPSH to the feedwater pumps.

The addition of condensate booster pumps is more accurately considered to be a Tier 2 change to the method used to perform the design function of the Condensate and Feedwater System. The condensate booster pumps are shown on Tier 2, Figures 10.1-1 and 10.4-5. The ITAAC in Tier 1, Table 2.10.2a for the Condensate and Feedwater System related to the basic system configuration as shown on Tier 1, Figure 2.10.2a is to perform inspections of the as-built system. The acceptance criteria is that the as-built CFS conforms with the basic configuration as shown on Tier 1, Figure 2.10.2a. Detailed design drawings, which will expand the basic configuration to include the condensate booster pumps along with other refinements will be used to perform these inspections; and thus, the appropriate ITAAC will be performed and the acceptance criteria will be met.

No COLA revision is required as a result of this RAI response.

Question 09.01.03-1

QUESTION:

COL Information Item 9.1.6.10 states that the applicant shall assure that the RHR system connections are adequately protected from the effects of pipe whip, internal flooding, internally generated missiles, and the effects of a moderate energy pipe rupture in the vicinity. The applicant stated in FSAR Section 9.1.6.10 that a description of this analysis will be provided in an FSAR amendment in accordance with 10 CFR 50.71(e) prior to fuel load (Commitment 9.1-6). The staff requests the applicant to justify why this COL information item can not be completed within the COL review period or be addressed by a new ITAAC.

RESPONSE:

(Also see Response to RAI 03.06.01-1)

Section 9.1.6.10 of the COLA will be revised to commit to notifying the NRC staff of the availability of the design analyses that assure the RHR system connections are adequately protected from the effects of pipe whip, internal flooding, internally generated missiles, and the effects of a moderate energy pipe rupture in the vicinity, prior to installation of the RHR system or components. The necessary details of that information will be provided in the next COLA revision occurring beyond three months after completion of the analyses.

Section 9.1.6.10 will be revised as follows:

> *"The COL applicant shall assure that the RHR system connections are adequately protected from the effects of pipe whip, internal flooding, internally generated missiles, and the effects of a moderate energy pipe rupture in the vicinity (Subsection 9.1.3.3).*
>
> The NRC staff will be notified of the availability of the design analyses that assure the RHR system connections are adequately protected from the effects of pipe whip, internal flooding, internally generated missiles, and the effects of a moderate energy pipe rupture in the vicinity, prior to installation of the RHR system or components. The necessary details of that information will be provided in the next COLA revision occurring beyond three months after completion of the analyses.
>
> ~~This~~ as-built analysis is dependent on plant walk-downs to identify as-built plant conditions in the vicinity of the RHR connections. A description of this analysis will be provided in an FSAR amendment in accordance with 10 CFR 50.71(e) prior to fuel load. (COM 9.1-6)
>
> Flood protection for RHR system connections will be evaluated in accordance with SRP 3.4.1. Internal Missile probability will be shown by analysis to be less than 10-7 per year or approved methods of missile protection will be implemented in accordance with SRP 3.5.1.1.
>
> RHR protection against moderate energy pipe failures will be analyzed in accordance with SRP 3.6.1."

Question 09.03.03-1

QUESTION:

ABWR DCD Tier 2 Section 9.3.8.1.1, "Safety Design Bases", states that the radioactive drain transfer collection piping shall be non-nuclear safety class and Quality Group D with the exception of the containment penetrations and piping in the drywell, which should be Seismic Category 1 and Quality Group B. Please clarify if MOV 006 and MOV 007 in Sheet 1 of COLA FSAR Revision 1, Figure 9.3 11, are containment isolation valves. Also, given the low quality/resolution of the drawings, the staff was unable to verify the designations of the Seismic Category 1 and Quality Group B portions of the system described above. In addition, the staff noted that there are inconsistencies between COLA FSAR Figure 9.3-11 and ABWR DCD Tier 2 Figure 1.7-1. For example, the piping identification format does not follow the convention described in Note 10 of Figure 1.7-1. Also, in Sheets 13, 15, and 17 of Figure 9.3-11 the symbols for some check valves are inconsistent with Note 6 of Figure 1.7-1. Please provide P&IDs with higher resolution and symbols that are legible and consistent with Figure 1.7 1.

RESPONSE:

POINT 1:
Please clarify if MOV 006 and MOV 007 in Sheet 1 of COLA FSAR Revision 1, Figure 9.3 11, are containment isolation valves.

RESPONSE to POINT 1
The valves numbered as MOV 0006 and MOV 0007 in Sheet 1 of Figure 9.3.11 are containment isolation valves. Sheet 5 of Figure 9.3.11 in the current FSAR revision incorrectly shows the containment isolation valves, which are numbered 0057 and 0065, as ball valves. Sheet 5 will be corrected to show both as motor operated isolation valves as attached.

POINT 2:
Please provide P&IDs with higher resolution and symbols that are legible and consistent with Figure 1.7 1.

- The staff was unable to verify the designations of the Seismic Category 1 and Quality Group B portions of the system described above due to low quality of drawing.
- The staff noted that there are inconsistencies between COLA FSAR Figure 9.3-11 and ABWR DCD Tier 2 Figure 1.7-1. For example, the piping identification format does not follow the convention described in Note 10 of Figure 1.7-1.
- In Sheets 13, 15, and 17 of Figure 9.3-11 the symbols for some check valves are inconsistent with Note 6 of Figure 1.7-1.

RESPONSE TO POINT 2:

The COLA will be revised to provide P&IDs with higher resolution and symbols that are legible and consistent with ABWR DCD Figure 1.7-1. For your review, the designations of the Seismic Category 1 and Quality Group B portions of the Radioactive Drain Transfer System are shown on the next page of this Attachment.

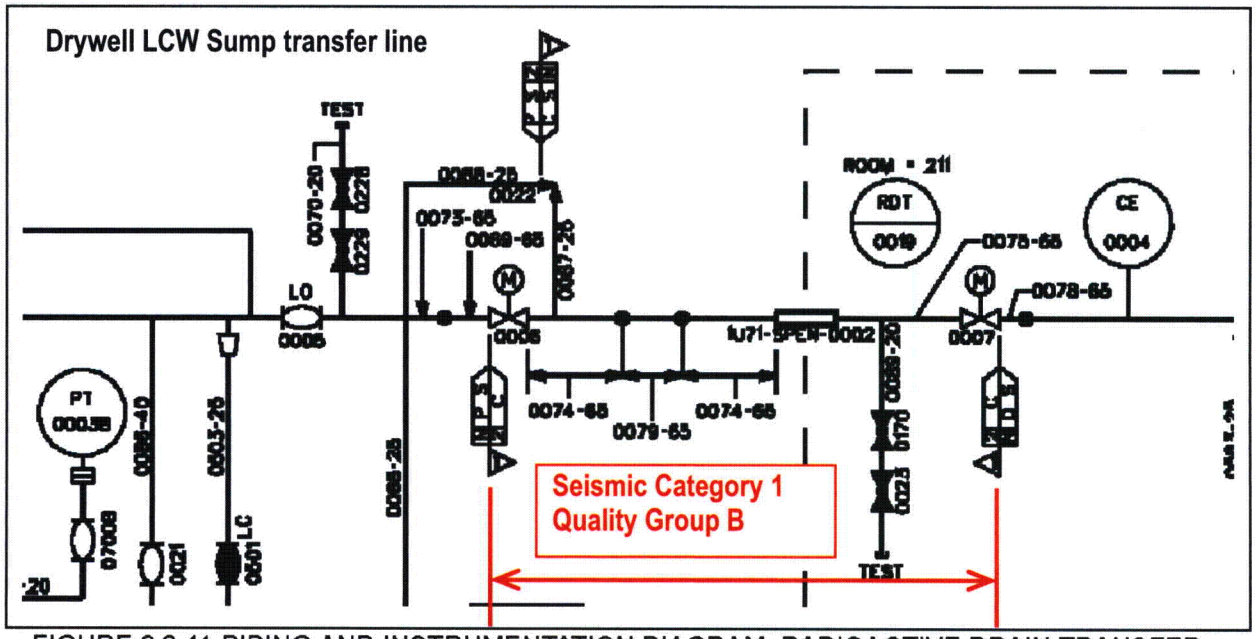


FIGURE 9.3-11 PIPING AND INSTRUMENTATION DIAGRAM, RADIOACTIVE DRAIN TRANSFER (SHEET 1 0F 22)

STP 3 & 4 *Rev. 0*

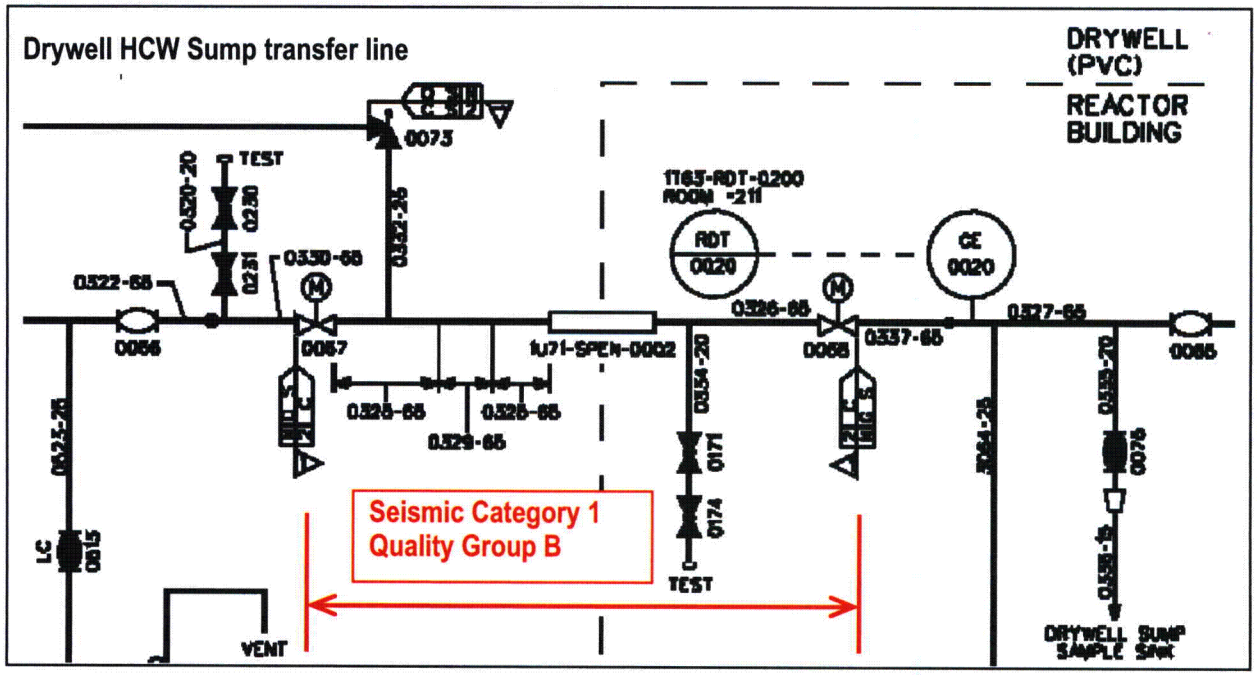


FIGURE 9.3-11 PIPING AND INSTRUMENTATION DIAGRAM, RADIOACTIVE DRAIN TRANSFER (SHEET 5 0F 22)

STP 3 & 4 *Rev. 0*

Question 09.03.03-2

QUESTION:

ABWR DCD Section 9.3.8.1.1, "Safety Design Bases" Item 5(a) states that backflow check valves should be included in the ECCS equipment room sumps. Item 5(b) states that floor drain piping in each divisional area of the ECCS pump rooms and the Control Building shall be arranged so that flooding or backflow in one quadrant will not adversely affect other quadrants. The staff could not locate in the P&IDs the check valves and sumps for each ECCS equipment room. Please include these components (or add a reference to) in COLA FSAR Figure 9.3-11.

RESPONSE:

The drains from the ECCS equipment rooms A, B and C are collected in the individual HCW sumps located in each room. The sumps are HCW Sump 4A on Sheet 6 of Figure 9.3-11, and 4B and 4C on Sheet 7 of Figure 9.3-11. The sump pump is actuated on a water level high signal to prevent flooding. The suction line of each of the relevant sump pumps has a check valve to prevent backflow. The check valve is located in the HCW sump in the individual ECCS equipment room.

Please note that the name of the sump in Sheet 6 is Reactor Building "HCW" SUMP 4A not "LCW" SUMP.

Reactor Building HCW Sump 4A

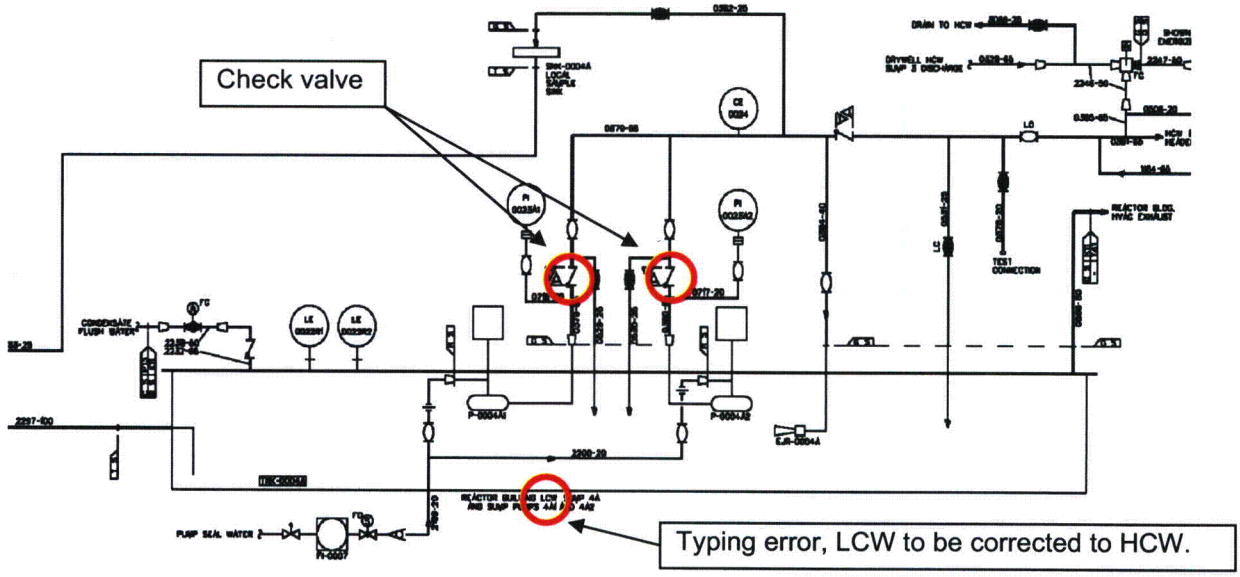


FIGURE 9.3-11 PIPING AND INSTRUMENTATION DIAGRAM, RADIOACTIVE DRAIN TRANSFER (SHEET 6 0F 22)

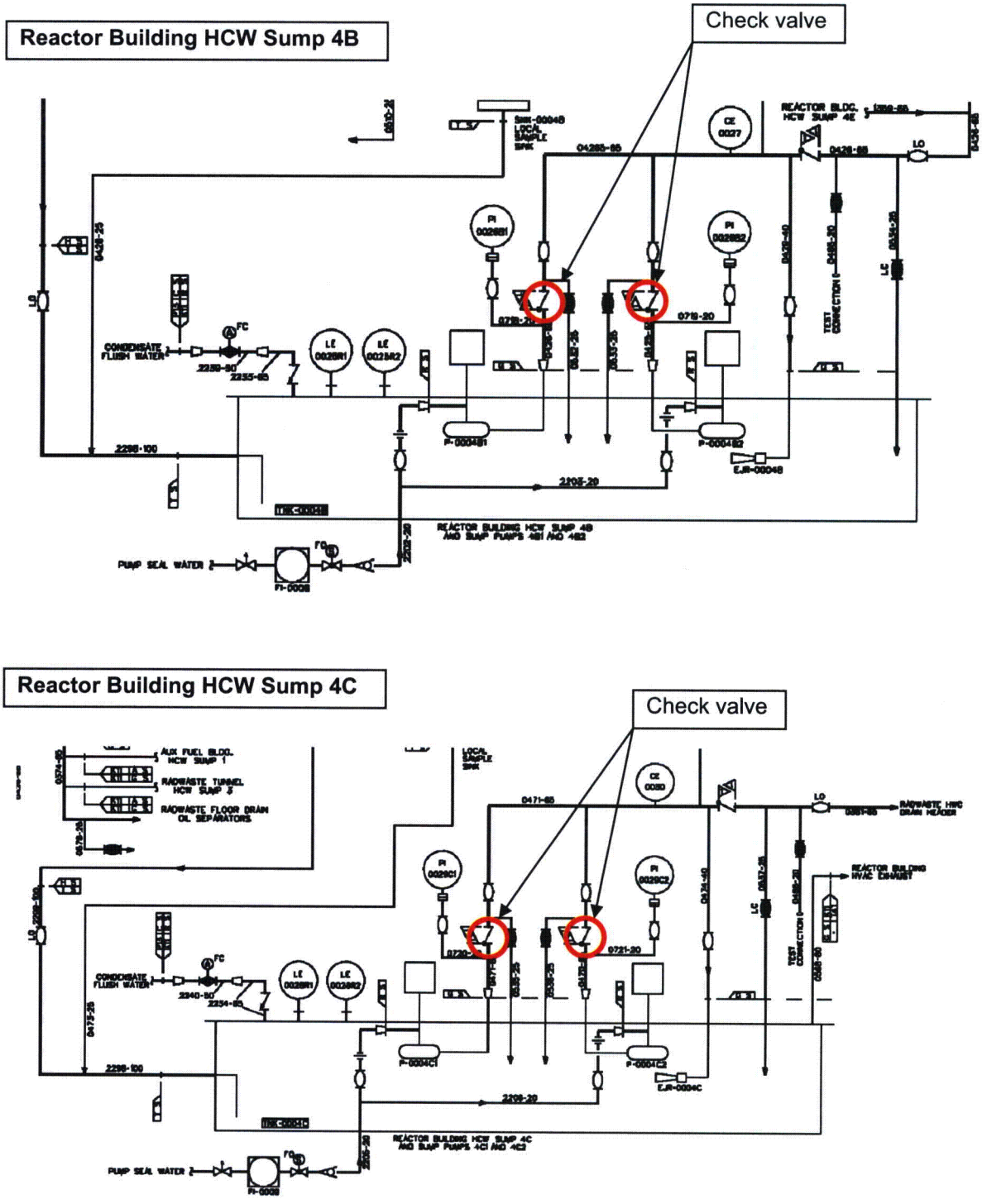


FIGURE 9.3-11 PIPING AND INSTRUMENTATION DIAGRAM, RADIOACTIVE DRAIN TRANSFER (SHEET 7 0F 22)

Question 09.03.03-3

QUESTION:

ABWR DCD COL Item 9.15, "Radioactive Drain Transfer systems" states that the COL applicant will provide P&ID for the radioactive drainage system. COLA FSAR Section 9.3.3.2 "Non Radioactive Drains (Interface Requirements)" indicates that this section addresses COL license Information Item 9.15. However, COL information Item 9.15 only refers to the radioactive drainage system and does not require (nor the staff found in the FSAR) additional P&IDs regarding the non-radioactive drainage system. Please revise the FSAR to remove the reference to COL Item 9.15 for the non-radioactive drainage system.

RESPONSE:

STPNOC has confirmed that COL Item 9.15 is addressed in FSAR section 9.3.12.4 and will revise the FSAR to delete reference to COL Item 9.15 from FSAR section 9.3.3.2. as shown below.

9.3.3.2 Non-radioactive Drains (Interface Requirements)
~~The following site-specific supplement addresses COL License Information Item 9.15.~~

The design of the continuation of the non-radioactive drain system from the ABWR Standard Plant Buildings to the site discharge outfall is provided in Figure 9.3-12 and is discussed in this subsection.

Question 09.03.03-4

QUESTION:

ABWR DCD Section 9.3.3.2.5, "Instrumentation (Interface Requirement)," states that provisions for obtaining water samples from the non-radioactive drain system and a sampling analysis program shall be provided to show that radioactive liquids are not being discharged from the non-radioactive drain system. A conceptual drawing of this system is provided in COLA FSAR Figure 9.3-12. However, the staff could only verify radiation monitoring. FSAR Section 9.3.3.2.3 states that means are provided to perform any required tests or analyses required by the discharge permit. However, the provisions for obtaining samples are not specifically discussed in the FSAR or shown in Figure 9.3-12. Please, address the instrumentation interface requirements by describing in more detail the sampling and analysis program and the sampling design provisions for the non-radioactive drainage system.

RESPONSE:

ABWR DCD subsection 9.3.3.2.5 is incorporated by reference in the FSAR. As such, DCD subsection 9.3.3.2.5 is included in the FSAR with no supplements or departures. NUREG 1503 documents the NRC review and approval of this DCD subsection with no identified actions required from a combined license applicant.