

10CFR50.90



PECO ENERGY

PECO Energy Company
Nuclear Group Headquarters
965 Chesterbrook Boulevard
Wayne, PA 19087-5691

July 28, 1994

Docket Nos. 5C-277
50-278
License Nos. DPR-44
DPR-56

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

Subject: Peach Bottom Atomic Power Station, Units 2 and 3
Response to Request for Additional Information
Regarding Power Rerate Program (RAI-7)

Dear Sir:

Attached is our response to your request for additional information (RAI-7) discussed in our telephone conversation on July 25, 1994 regarding our planned implementation of the Power Rerate Program at Peach Bottom Atomic Power Station (PBAPS), Units 2 and 3. The Power Rerate Program was the subject of Technical Specifications Change Request (TSCR) No. 93-12 which was forwarded to you by letter dated June 23, 1993.

If you have any questions, please contact us.

Very truly yours,



G. A. Hunger, Jr.
Director - Licensing

Attachment

cc: T. T. Martin, Administrator, Region I, USNRC
W. L. Schmidt, USNRC Senior Resident Inspector, PBAPS
R. R. Janati, Commonwealth of Pennsylvania

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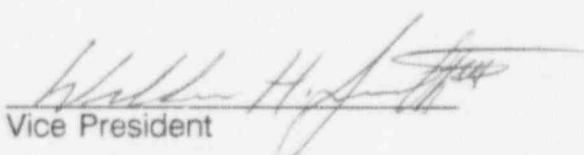
COMMONWEALTH OF PENNSYLVANIA :

: ss.

COUNTY OF CHESTER :

W. H. Smith, III, being first duly sworn, deposes and says:

That he is Vice President of PECO Energy Company; the Applicant herein; that he has read the enclosed response to the request for additional information concerning Technical Specifications Change Request (Number 93-12) for Peach Bottom Facility Operating Licenses DPR-44 and DPR-56, and knows the contents thereof; and that the statements and matters set forth therein are true and correct to the best of his knowledge, information and belief.


Vice President

Subscribed and sworn to
before me this 20th day
of July 1994.



Notary Public

Notarial Seal
Erica A. Sinton, Notary Public
Tredyffrin Twp., Chester County
My Commission Expires July 10, 1995

**RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION (RAI-7)
PEACH BOTTOM ATOMIC POWER STATION, UNITS 2 AND 3**

Question:

Tables 9-3 through 9-7 in Attachment 3 to the licensee's letter dated June 23, 1993, titled "GE Proprietary Topical Report NEDC-32183P, Power Rerate Safety Analysis Report for Peach Bottom 2 and 3," provided radiological consequences analyses for various design basis accidents at uprated reactor power rating (3528 MWt). Provide the major assumptions and parameters used in these analyses complete with, but not limited to, the following:

- (1) Accident source term used

Fission-product release fractions, release timing, and fission-product chemical forms.

Response:

The radiological consequence analyses in support of the Peach Bottom Atomic Power Station (PBAPS), Units 2 and 3 power rerate program, as presented in General Electric's Topical Report NEDC-32183P, "Power Rerate Safety Analysis Report for Peach Bottom 2 & 3", dated May, 1993, were done using the original design basis source terms as presented in the PBAPS Updated Final Safety Analysis Report (UFSAR), Section 14.9, "Evaluations Using AEC Method." To the greatest extent possible, calculations were prepared using the direct ratio of rerated power to original power. In those cases where the original calculations were not available, calculations were reconstituted using the original licensing basis assumptions and original power level, then the values were proportionally increased.

For the Loss-of-Coolant Accident (LOCA), fuel handling and control rod drop accidents, the source terms used for the rerate analyses were obtained by scaling up the original licensing basis source term by the ratio of 102% of rerated power (3528 MWt) to the power used in the original UFSAR analyses (3440 MWt). This scale up was based on the continued applicability of the normalized core source term (Ci/MWt) as shown on Table 1. The scale up ratio is 1.026.

For the Main Steam Line Break (MSLB) and instrument line break analyses, the source terms were adjusted up by 3.2% to reflect the increased mass and energy release associated with the line break at rerated power. There were no changes in specific coolant concentrations since they were based on the maximum allowable coolant concentrations under normal conditions (refer to PBAPS, Units 2 and 3 Technical Specification 3.6.B.1). The concentrations for the MSLB were 0.2 uCi/gm and 4.0

uCi/gm of I-131 dose equivalent for normal and spiking conditions, respectively. The total release increased due to increased coolant loss prior to isolation. The MSLB coolant loss for rerate is 190,920 pounds.

The fission product release fractions, release timing and chemical forms used in the original analyses were maintained for the power rerate analyses (refer to PBAPS UFSAR Table 14.9.8). The values used for LOCA were:

fission product available for release:	Core noble gases: 100%
	Core iodines: 25%
release timing:	immediate to primary containment
chemical forms:	100% elemental

Question:

- (2) Site atmospheric relative concentrations (X/Qs) for EAB (0 to 2 hours) and LPZ (0 to 8 hours, 8 to 24 hours, 1 to 4 days, and 4 to 30 days).

Response:

The site atmospheric relative concentrations (X/Qs) for design basis accidents were calculated according to the guidelines of Regulatory Guide 1.145, "Atmospheric Dispersion Models For Potential Accident Consequence Assessments at Nuclear Power Plants," using the 8/67 through 7/71 meteorological data base and were not changed by rerate.

The specific X/Qs are provided in the attached Table 2.

Question:

- (3) Control Room X/Qs and methodology used to determine their values.

Response:

The Control Room X/Qs were provided in Attachment O to the letter from S. L. Daltroff (Philadelphia Electric Company) to D. G. Eisenhower (U. S. Nuclear Regulatory Commission), dated January 8, 1981, and were not changed by rerate. The methodology used to determine the X/Qs was the Halitsky methodology from Section 5-5 of Meteorology and Atomic Energy, 1968.

The specific X/Qs are provided in the attached Table 2.

Question:

- (4) Containment and MSIV leak rates.

Response:

The primary containment leak rate was not changed for the rerate analysis. Main Steam Isolation Valve (MSIV) leak rates were not considered in the PBAPS original licensing basis and, therefore, were not used for the rerate analysis. The assumptions are provided in the PBAPS UFSAR, Section 14.9.2.1. The primary containment leak rate is assumed to be 0.635% per day. For comparison, the PBAPS, Units 2 and 3 Technical Specifications limit for containment leakage is 0.5% per day.

Question:

- (5) Pressure suppression pool decontamination factors.

Response:

The pressure suppression pool decontamination factors were not considered in the PBAPS original licensing basis and, therefore, were not used for the rerate analysis. The assumptions are provided in the PBAPS UFSAR, Section 14.9.2.1.

Question:

- (6) SGTS charcoal adsorber iodine removal efficiencies.

Response:

The Standby Gas Treatment System (SGTS) charcoal adsorber iodine removal efficiencies were not changed for rerate. The values used are provided in the PBAPS UFSAR, Section 14.9.2.1. The SGTS charcoal adsorber removal efficiency is 90% for all iodines.

Question:

- (7) Reactor building pressure drawdown time and air mixing rate.

Response:

The reactor building pressure drawdown time and air mixing rate were not considered in the PBAPS original licensing basis and, therefore, were not used for the rerate analysis. Primary containment leakage is conservatively assumed to flow directly through SGTS without mixing in the secondary containment building. The assumptions used are provided in the PBAPS UFSAR, Section 14.9.2.1.

Question:

(8) Reactor building air exchange rate.

Response:

The reactor building air exchange rate was not considered in the PBAPS original licensing basis and, therefore, was not used for the rerate analysis. Primary containment leakage is conservatively assumed to flow directly through SGTS without mixing in the secondary containment building. The assumption used is provided in the PBAPS UFSAR, Section 14.9.2.1.

Question:

(9) Containment and reactor building volumes.

Response:

The containment and reactor building volumes were not changed for rerate. The volumes are provided in Attachment O to the letter from S. L. Daltroff (Philadelphia Electric Company) to D. G. Eisenhower (U. S. Nuclear Regulatory Commission), dated January 8, 1981. The volumes are:

containment:	2.78E5 ft ³
reactor building:	2.5E6 ft ³

Question:

(10) Dose conversion factors used; list of associated references.

Response:

The dose conversion factors used in the rerate analyses are slightly more conservative than those used in the original PBAPS licensing basis analyses. The licensing basis assumptions are provided in the PBAPS UFSAR, Section 14.9.2.5. The values used for the rerate analyses are provided in the attached Table 3.

Question:

(11) SGTS filtration rate.

Response:

The SGTS filtration rate was not changed for rerate. Primary containment leakage is not assumed to mix in secondary containment; instead, the leakage is conservatively

assumed to flow directly through SGTS. This assumption is provided in the PBAPS UFSAR, Section 14.9.2.1. The actual SGTS maximum filtration rate is 10,500 cfm as provided in the PBAPS UFSAR, Section 5.3.4.

Question:

- (12) Control room volume (effective), emergency air intake rate, air recirculation rate, and charcoal adsorber iodine removal efficiency.

Response:

The control room volume (effective) emergency air intake rate, air recirculation rate and charcoal adsorber iodine removal efficiency were not changed for rerate. The assumptions used are provided in the PBAPS UFSAR, Section 14.9.1.5, and Attachment O to the letter from S. L. Daltroff (Philadelphia Electric Company) to D. G. Eisenhower (U. S. Nuclear Regulatory Commission), dated January 8, 1981. The values used for the rerate analysis are:

control room volume:	1.76E5 ft ³
emergency air intake rate:	3000 cfm
air recirculation rate:	0 cfm
charcoal adsorber iodine removal efficiency:	90%

Question:

For LOCA radiological consequence analysis, provide dose contributions from each of the following sources:

- (1) Containment leak
- (2) ECCS system leak outside containment
- (3) MSIV leak

Response:

The LOCA radiological consequence analysis was not changed for rerate. In accordance with the original PBAPS licensing basis and the PBAPS UFSAR, Section 14.9.2, only containment leakage is considered in Table 9-3 of NEDC-32183P.

TABLE 1
Normalized Accident
Source Term

Isotope	Source Term (Ci/MWt)
I-131	2.508E+04
I-132	3.806E+04
I-133	5.622E+04
I-134	6.575E+04
I-135	5.103E+04
Br-83	1.055e+03
Br-84	1.904E+03
Br-85	2.672E+03
Kr-83m	4.152E+03
Kr-85	4.102E+02
Kr-85m	1.297E+04
Kr-87	2.335E+04
Kr-88	3.200E+04
Kr-89	3.979E+04
Xe-131m	2.595E+02
Xe-133m	1.384E+03
Xe-133	5.622E+04
Xe-135m	1.557E+04
Xe-135	5.363E+04
Xe-137	5.103E+04
Xe-138	4.775E+04

TABLE 2

PBAPS SITE SPECIFIC RELATIVE CONCENTRATIONS

X/Q (sec/m³)

	ELEVATED STACK RELEASE	GROUND LEVEL RELEASE
EAB		
0 - 2 hr	1.360E-05	4.900E-04
LPZ		
0 - 8 hr		2.011E-05
8 - 24 hr		1.308E-05
24 - 96 hr		5.141E-06
96 - 720 hr		1.347E-06
CONTROL ROOM		
0 - 8 hr	2.400E-06	1.010E-03
8 - 24 hr	9.000E-07	5.950E-04
24 - 96 hr	6.600E-08	2.270E-04
96 - 720 hr	2.000E-09	6.680E-05

Note:

Due to terrain corrections, all LPZ doses are calculated assuming a ground level release.

TABLE 3 -- DOSE CONVERSION FACTORS

A. Beta and Gamma Dose Conversion Factors Used in Post-Accident Radiological Consequences Rerate Analyses

Isotope	Semi-Infinite Cloud (Rem/hr per Ci/m ³)		Gamma Dose Conversion Factors in A Room of Finite Size (Rem/hr per Ci/m ²)
	K _β	K _γ	K _R
I-129	48.0	22.5	0.0277
I-131	173.0	338.0	2.84
I-132	349.0	2061.0	17.2
I-133	334.0	572.0	3.53
I-134	462.0	2259.0	13.0
I-135	393.0	1314.0	11.5
I-136	693.0	2493.0	14.6
Br-83	283.0	3.6	0.052
Br-84	787.0	1656.0	10.15
Br-85	662.0	0.0	0.0
Br-87	1010.0	2160.0	14.7
Kr-83m	28.1	4.5	0.0062
Kr-85m	83.6	140.0	1.15
Kr-85	189.0	1.9	0.016
Kr-87	840.0	770.0	7.87
Kr-88	254.0	1800.0	10.4
Kr-89	828.0	1998.0	6.70
Xe-131m	112.0	19.8	0.025
Xe-133m	158.0	21.6	0.25
Xe-133	104.0	65.7	0.23
Xe-135m	74.5	396.0	3.12
Xe-135	250.0	223.0	1.89
Xe-137	1134.0	173.0	1.11
Xe-138	468.0	839.0	5.74

TABLE 3 -- DOSE CONVERSION FACTORS

B. Thyroid Dose Conversion Factors Used in Post-Accident Radiological Consequences Rerate Analyses

Isotope	K_{thy} (Rem/hr per Ci/m ³)
I-131	1.85×10^6
I-132	6.67×10^4
I-133	5.00×10^5
I-134	3.13×10^4
I-135	1.55×10^5