



JUN 27 2007

U. S. Nuclear Regulatory Commission  
Attn: Document Control Desk  
Mail Stop OP1-17  
Washington, DC 20555

**SUSQUEHANNA STEAM ELECTRIC STATION  
PROPOSED LICENSE AMENDMENT NO. 285  
FOR UNIT 1 OPERATING LICENSE NO. NPF-14  
AND PROPOSED LICENSE AMENDMENT NO. 253  
FOR UNIT 2 OPERATING LICENSE NO. NPF-22  
EXTENDED POWER UPRATE APPLICATION  
SUPPLEMENT TO OPERATOR LICENSING AND  
HUMAN PERFORMANCE, HEALTH PHYSICS AND  
PIPING AND NONDESTRUCTIVE EXAMINATION  
REQUEST FOR ADDITIONAL INFORMATION  
RESPONSES  
PLA-6232**

**Docket Nos. 50-387  
and 50-388**

- References:*
- 1) *PPL Letter PLA-6076, B. T. McKinney (PPL) to USNRC, "Proposed License Amendment Numbers 285 for Unit 1 Operating License No. NPF-14 and 253 for Unit 2 Operating License No. NPF-22 Constant Pressure Power Uprate," dated October 11, 2006.*
  - 2) *PPL Letter PLA-6189, B. T. McKinney (PPL) to USNRC, "Proposed License Amendment Numbers 285 for Unit 1 Operating License No. NPF-14 and 253 for Unit 2 Operating License No. NPF-22 Extended Power Uprate Application Re: Operator Licensing and Human Performance Technical Review - Request for Additional Information Responses," dated May 3, 2007.*
  - 3) *PPL Letter PLA-6194, B. T. McKinney (PPL) to USNRC, "Proposed License Amendment Numbers 285 for Unit 1 Operating License No. NPF-14 and 253 for Unit 2 Operating License No. NPF-22 Extended Power Uprate Application Re: Health Physics Technical Review - Request for Additional Information Responses," dated May 9, 2007.*
  - 4) *PPL Letter PLA-6191, B. T. McKinney (PPL) to USNRC, "Proposed License Amendment No. 285 for Unit 1 Operating License No. NPF-14 and Proposed License Amendment No. 253 for Unit 2 Operating License No. NPF-22 Extended Power Uprate Application Re: Piping and Nondestructive Examination Technical Review Request for Additional Information Responses," dated May 3, 2007.*

ADD 1

NRR

Pursuant to 10 CFR 50.90, PPL Susquehanna LLC (PPL) requested in Reference 1 approval of amendments to the Susquehanna Steam Electric Station (SSES) Unit 1 and Unit 2 Operating Licenses (OLs) and Technical Specifications (TSs) to increase the maximum power level authorized from 3489 Megawatts Thermal (MWt) to 3952 MWt, an approximate 13% increase in thermal power. The proposed Constant Pressure Power Uprate (CPPU) represents an increase of approximately 20% above the Original Licensed Thermal Power (OLTP).

The purpose of this letter is to supplement the responses to several NRC Questions contained in the Request for Additional Information Responses transmitted to NRC in References 2, 3, and 4 based on the teleconference held with the NRC staff.

The Enclosure contains the PPL supplemental responses.

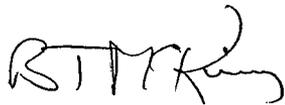
There are no regulatory commitments associated with this submittal.

PPL has reviewed the "No Significant Hazards Consideration" and the "Environmental Consideration" submitted with Reference 1 relative to the Enclosure. We have determined that there are no changes required to either of these documents.

If you have any questions or require additional information, please contact Mr. Michael H. Crowthers at (610) 774-7766.

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

Executed on: 6.27.07



B. T. McKinney

Enclosure: Supplement to Request for Additional Information Responses

Copy: NRC Region I  
Mr. A. J. Blamey, NRC Sr. Resident Inspector  
Mr. R. V. Guzman, NRC Sr. Project Manager  
Mr. R. R. Janati, DEP/BRP

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**Enclosure to PLA-6232  
Supplement to Request for Additional  
Information Responses**

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The following provides supplemental information to several NRC Questions contained in the Request for Additional Information Responses transmitted to NRC in References 2, 3, 4 and 5.

**Reference 2: PLA-6189 Response to NRC Operator Licensing and Human Performance Technical Review Request for Additional Information**

Based on a teleconference held with the NRC Staff on June 13, 2007, the following additional information is provided relative to the PPL Responses to NRC Questions 1f and 2c.

**NRC Question 1f:**

The SSES FSAR has been reviewed, and as stated in the teleconference held June 13, 2007, none of the operator action times credited in the FSAR analyses within the first hour of an event are reduced as a result of CPPU. Some operator action times have been extended. For example, in an ATWS scenario, the operator response times assumed in the analysis for placing suppression pool cooling in service has been extended for CPPU. The current analysis assumes no operator actions to place suppression pool cooling in service for the initial 10 minutes (600 seconds). The CPPU analysis was performed assuming the first loop of suppression pool cooling is placed in-service at 1100 seconds and the second loop is placed in-service at 1600 seconds. The 1100 and 1600 second time periods represent reasonable time periods during an ATWS to place suppression pool cooling in-service using the error prevention techniques now employed by control room operators.

**NRC Question 2c:**

Response 2c of PLA-6189 describes that operator manual action is required to be taken within 3 hours to close the new manual bypass valves. The 3 hours was determined accounting for operator actions that were "reasonable and timely." In the case of the new manually operated bypass valve, it was decided that 3 hours was "reasonable and timely." The 3 hours was chosen balancing the impact on the operator and the impact on the spray pond. Selecting too short a time to take the action could impact other operator activities. Selecting a time to take action that is too long could impact the spray pond by adding unnecessary heat to the spray pond, which could result in exceeding the maximum water temperature limits under worst case design bases assumptions. The 3-hour limit was determined accounting for the following operator related factors:

- During the 1<sup>st</sup> hour, the operators are busy managing the transient and stabilizing the plant.

- During the 2<sup>nd</sup> hour, the Technical Support Center (TSC) and Operations Support Center (OSC) are staffed as the Nuclear Emergency Response Organization is mobilized in response to the transient. The TSC and OSC provides additional oversight and manpower with the ability to assess plant conditions and take actions to compensate for equipment failures and perform in-plant actions. The control room personnel and the TSC personnel will have time to diagnose the failure of the motor-operated spray pond bypass header isolation valve to close based on valve position indication in the control room, spray pond temperature rise, and field observation that the bypass header is not isolated. The OSC will have time to brief an in-plant field team to take action to close the new manually operated valve.
- During the 3<sup>rd</sup> hour, the in-plant field team will have time to obtain the locally stored valve operating equipment (pre-staged handle) and manually close the valve. The valve operates full open to full close in 17 turns.

**Reference 4: PLA-6194 Response to NRC Health Physics Technical Review  
Additional Information**

Based on a teleconference held with the NRC Staff on June 13, 2007, the below additional NRC Question was discussed. The PPL Response is provided.

**NRC Question 11:**

1) The table in Question 11 to your response states that the annual dose at the Towers Club WSW Sector from SSES Unit 1 and Unit 2 Turbine Building skyshine is 0.403 mrem per year. This is inconsistent with Section 8.6 of the PUSAR, which states that a member of the public will receive a dose of 4 mrem per year from skyshine at EPU conditions.

Clarify the discrepancies and demonstrate that SSES Unit 1 and Unit 2 continues to meet the requirements of 10 CFR 20 for onsite dose to a member of the public and 40 CFR 190 for offsite dose to a member of the public at EPU conditions.

- a) Include in your discussion the basis for calculating the dose to a member of the public for the dose contributor in the table, for using 500 hours per year for the annual occupancy of a member of the public, and for determining the limiting site location.
  - b) Provide the pre-EPU and post-EPU total body dose to a member of the public as part of your discussion.
  - c) Clarify the discrepancies for using 500 hours per year as an annual occupancy for a member of the public in Question 11 but only use one hour per quarter for the determination of radiation dose from skyshine in Question 2 of the RAIs dated March 22, 2007.
- 2) As a result of the above question, provide an update to NRC Question 11.

**PPL Response:**

The 4 mrem annual turbine skyshine radiation dose provided in PUSAR Section 8.6 is based on the dose calculated at a residence located in the SE Sector as opposed to 0.403 mrem per year estimated at the Towers Club location. The estimated turbine and condensate skyshine contributions to the doses at the 4 critical site locations was provided in the response to Question 8. As shown in the table below the Towers Club location provides the highest overall (direct plus skyshine) estimated annual dose (12.6 mrem) whereas the direct and skyshine total body dose to the residence in the SE sector is approximately 4.5 mrem per year.

Critical locations considered within the SSES property boundaries were three residences and the Towers Club facility. The Towers Club is a non-resident facility that is utilized by Susquehanna personnel and visitors for sporting events (e.g. volleyball) and family events such as birthday parties, picnics, Easter egg hunts etc. Events typically last 3 to 5 hours and the Club is not used every week. It is conservatively estimated that any individual member of the public would be at the club significantly less than 500 hours per year. Occupancy time assumed for the onsite residences is 8760 hrs/yr.

For clarification, the SSES Site Facilities and Boundary Map is attached depicting the critical locations used for determining onsite doses to members of the public. (Please note that the residence in the WSW sector (~1.3 mi) Location 4 has recently been demolished and thus is not included in the Table.). Pre and post EPU total body dose estimates are tabulated below:

Annual Dose Contributors	Residence in SE Sector (7) (mrem)		Towers Club WSW Sector (12) (mrem) <sup>1</sup>		Residence in NNW Sector (16) (mrem)	
	1	2	3	4	5	6
Locations	1	2	3	4	5	6
Nominal Distance from site center (miles)	0.5	0.4	0.6			
EPU	Pre	Post	Pre	Post	Pre	Post
Unit 1 & 2 Turbine Bldg. Skyshine Dose	3.27E+00	3.46E+00	3.80E-01	4.03E-01	1.55E+00	1.64E+00
Unit 1 Turbine Bldg. Direct Dose		-	-	-	4.10E-03	4.34E-03
Unit 2 Turbine Bldg. Direct Dose	5.64E-01	5.98E-01	-	-	-	-
Condensate Storage Tank Skyshine Dose	4.40E-03	4.40E-03	-	-	-	-
<b>Skyshine Subtotals</b>	<b>3.84E+00</b>	<b>4.06E+00</b>	<b>3.80E-01</b>	<b>4.03E-01</b>	<b>1.55E+00</b>	<b>1.64E+00</b>
Other Direct Sources:						
Temporary Laundry	2.05E-04	2.05E-04	3.53E-02	3.53E-02	4.80E-03	4.80E-03

Annual Dose Contributors	Residence in SE Sector (7) (mrem)		Towers Club WSW Sector (12) (mrem) <sup>1</sup>		Residence in NNW Sector (16) (mrem)	
Facility						
Low Level RW Storage	3.80E-03	3.80E-03	1.14E-01	1.14E-01	2.54E-03	2.54E-03
ISFSI Storage	2.10E-01	2.10E-01	2.32E+00	2.32E+00	1.04E+00	1.04E+00
Storage of Radioactive Material at LLRWSF	1.5E-01	1.5E-01	5.70E+00	5.70E+00	4.30E-01	4.30E-01
Transport of Radioactive Material	9.6E-03	9.6E-03	1.40E+00	1.40E+00	6.7E-03	6.7E-03
ISFSI Transport	3.60E-02	3.60E-02	3.60E-02	3.60E-02	3.60E-02	3.60E-02
SEALAND Container Storage	2.80E-01	2.80E-01	2.58E+00	2.58E+00	7.52E-02	7.52E-02
<b>Other Direct Subtotal (all except effluent)</b>	6.9E-01	6.9E-01	1.22E+01	1.22E+01	1.60E+00	1.60E+00
<b>Total Body Dose Calculations</b>	4.53E+00	4.75E+00	1.26E+01	1.26E+01	3.15E+00	3.24E+00

- 1) Total annual dose at the Towers Club is based on 500 hours/year occupancy; other locations (residences) are 8760 hours/year.

Based on the above estimates, the Towers Club location is considered the limiting site location for demonstrating compliance with 40 CFR 190 requirements.

The use of one hour per quarter for determining the radiation dose from skyshine in the response to RAI Question 2 dated March 22, 2007 assumed that the occupancy time for a member of the public is no more than one hour during each calendar quarter near any onsite TLD. The annual doses listed in the response were for TLDs located at the protected area boundary fence. This occupancy time is considered conservative for the following reasons.

1. The expected exposure to members of the public at onsite locations, except where private residences exist, is considered to result from their presence during tours conducted by PPL Energy Information staff.
2. An entire tour typically lasts about one hour. While in the buses used for the tours, the presence of the public at any particular location should be brief because the bus is usually in motion or stopped for only brief periods.
3. It is expected that a member of the public would take no more than one tour per year.

**Reference 6: PLA-6191 Response to NRC Piping and Nondestructive Examination  
Technical Review Additional Information**

Based on a teleconference held with the NRC Staff on June 18, 2007, the following additional information is provided relative to the PPL Responses to NRC Question 4.

In PPL's Response to question 4, it was identified that "SSES also utilizes a Moderate Hydrogen Water Chemistry (HWC-M) program to mitigate IGSCC. SSES is a Category 1 plant in accordance with BWRVIP-130, EPRI BWR Water Chemistry Guidelines." BWRVIP-130 has not been submitted to NRC. It is however, with regard to the categorization, similar to BWRVIP-62 (submitted and is being reviewed by NRC - see ML070460401).

Thus, the sentence in the response to question 4 of Reference 6 can be replaced with "SSES utilizes a Moderate Hydrogen Water Chemistry (HWC-M) program to mitigate IGSCC. SSES is a Category 1 plant in accordance with BWRVIP-62."