

REQUEST FOR ADDITIONAL INFORMATION
REGARDING PROPOSED LICENSE AMENDMENT
EXTENDED POWER UPRATE
HOPE CREEK GENERATING STATION
DOCKET NO. 50-354

By letter dated September 18, 2006 (ML062680451), as supplemented by letters dated October 10 (ML062920092) and October 20, 2006 (ML063110164), February 14 (ML070530099), February 16 (ML070590182), February 28 (ML070680314), March 13 (2 letters) (ML070790508 and ML070810360), March 22 (ML070930442), March 30 (2 letters) (ML071010243 and ML070960103), April 13 (ML071140157), April 18 (ML071160121), April 30 (ML071290559), May 10 (ML071360375), May 18 (3 letters) (ML071500294, ML071720368, and ML071500317), May 24 (ML071630305), June 22 (ML071840167), July 12 (ML072110215), August 3 (ML072250369), August 17 (2 letters) (ML072480515 and ML072480515), August 27 (ML072480570), August 31 (ML072540651), September 11 (ML072640410), October 10 (ML073100791), October 23 (ML073040393), November 15 (ML073320601), and November 30, 2007 (ML073460793), PSEG Nuclear, LLC (PSEG or the licensee) submitted an amendment request for an extended power uprate (EPU) for the Hope Creek Generating Station (Hope Creek). The proposed amendment would increase the authorized maximum power level by approximately 15 percent, from the current license thermal power (CLTP) of 3,339 megawatts thermal (MWt) to 3,840 MWt.

The Nuclear Regulatory Commission staff has reviewed the information the licensee provided that supports the proposed amendment and would like to discuss the following issues to clarify the submittal.

RAI 14.79 2nd Follow-Up

PSEG analyzes the stress convergence properties of a section of the Hope Creek dryer model loaded with pressures computed from Hope Creek main steam line (MSL) inputs to the acoustic circuit model (ACM). A static analysis (with gravitational loads) and dynamic analyses at three representative frequencies show that the finite element model used to analyze the Hope Creek dryer stresses is accurate to within **[[]]**. Please evaluate the effect of this **[[]]** on the minimum alternate stress ratios for the Hope Creek steam dryer at EPU conditions.

RAI 14.107 2nd Follow-Up

PSEG estimates that a standpipe resonance may be excited at 118 Hz. Since the frequencies of resonance/instability coupling are known to shift slightly with increasing flow rate, it is possible that the actual observed resonance frequency may be closer to 120 Hz. Please explain whether current filtering of 120 Hz signal from the MSL measurements would affect the magnitude of the standpipe resonance signal, which may be close to 120 Hz. Please also explain how the standpipe resonance signal would be quantified.

Enclosure 1 (NON-PROPRIETARY)

RAI 14.110 2nd Follow-Up

In response to RAI 14.110 Follow-Up, PSEG states that the frequency-based analysis may introduce a frequency discretization error of [[]] as a worst case. Please explain how this error will be accounted for in estimating the minimum alternating stress ratio for the Hope Creek steam dryer at EPU conditions.

RAI 14.115 Follow-Up

PSEG confirms that only one parameter in the new ACM model (Rev. 4) has been changed from the previous model (ACM Rev. 2). This parameter is the [[]]. It is increased by [[]]. PSEG is requested to discuss the basis for using a different [[]] in ACM Rev. 4.

RAI 14.116(a) Follow-Up

The signal to noise ratio assumed in the analysis is not apparent from the response. PSEG is requested to provide typical values of the factor [[]], which is used to remove the background noise.

RAI 14.116(c) Follow-Up

The PSEG response does not provide the basis for correcting the coherence between [[]].

RAI 14.118 Follow-Up

- (a) Please discuss whether there are any low frequency data from Quad Cities Unit 2 pressure measurements that were not used in benchmarking the ACM Rev. 4. If so, discuss the importance of the unused data for validation of ACM Rev. 4.
- (b) Substantiate the choice of various model parameters such as [[]] at the inlet of the MSLs.
- (c) If the dipole source strengths show a high degree of asymmetry, explain the reason of this large asymmetry by referring to pressure measurements on the dryer which cause this large asymmetry.

RAI 14.120 Follow-Up

PSEG compares measurements of [[]].

- (a) What is the purpose of Figure 14.120-1? Why are the unfiltered data at low flow conditions (1000#) compared with [[]] at CLTP? Are the CLTP data in Figure 14.120-1c filtered or unfiltered? Why are there no CLTP data in Figure 14.120-1d?

- (b) Are the dryer loads (shown in Figure 14.120-2) for the low flow condition based on filtered or raw MSL pressures? If they are based on filtered MSL pressures, please provide additional comparisons of the filtered MSL pressures at CLTP and at low flow rates [[]].
- (c) Why are data for MSL pairs with coherence less than [[]]? What is the basis for this assumption?
- (d) Will improved strain gage calibrations be used to reduce extraneous MSL pressure signals at 80 Hz in future submissions, as discussed in recent meetings with PSEG? Specifically, during the October 11, 2007, meeting, it was mentioned that the 80 Hz signal may be due to [[]]. Please provide variations in [[]] and how they are accounted for in estimating acoustic pressures at those locations.
- (e) What is the final PSEG stress margin for the dryer: [[]]?
- (f) To conclusively confirm the reasonableness of removing a portion of the 80 Hz dryer loads at CLTP, provide a dryer stress analysis using the filtered MSL inputs at 1000# and compare the dryer stress margins at high CLTP stress locations against those computed using filtered CLTP loads. In particular, explain the differences in stresses at 80 Hz. To ensure consistency, be sure to use signal processing and filtering for the 1000# stress analyses that are identical to those used for the previous CLTP stress analysis.

RAI 14.121(c) Follow-Up

PSEG provides dryer pressure data for frequencies between 75 and 85 Hz in 1 Hz increments to justify linearly interpolating acoustic pressure loads in 5 Hz increments (Figure RAI14.121.1).

- (a) Where are these pressure/velocity ratios computed?
- (b) How do the pressure loads vary at the frequencies where peaks are observed in the MSL data [[]]?
- (c) The comparison shown in Figure RAI14.121.1 indicates that if the load frequency were [[]], then there will be a nonconservative error of about [[]]. If the load frequency were [[]], then there will be a conservative error of about [[]]. Should these errors be treated as uncertainties and included in the dryer stress estimates? For other peaks below 100 Hz, are there any other uncertainties or bias errors?

RAI 14.121(d) Follow-Up

The response to RAI 14.121(d) is not clear why the steam dryer hold down brackets do not provide any vertical constraints to the steam dryer. Please provide a sketch for the installation of the steam dryer and a summary of the related information from the BWRVIP-139 report.