Timothy S. Rausch
Sr. Vice President & Chief Nuclear Officer

PPL Susquehanna, LLC
769 Salem Boulevard
Berwick, PA 18603
Tel. 570.542.3445 Fax 570.542.1504
tsrausch@pplweb.com

AUG 26 2011

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Mail Stop O-P1-17
Washington, DC 20555-0001

SUSQUEHANNA STEAM ELECTRIC STATION RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION ON PROPOSED LICENSE AMENDMENT NOS. 307 AND 278
PLA-6750

Docket No. 50-387 and 50-388

Reference: Letter (PLA-6642) from T. S. Rausch (PPL) to Document Control Desk (NRC), titled, "Proposed Amendment No. 307 to License NPF-14 and Proposed Amendment No. 278 to License NPF-22: Change to Technical Specification Surveillance Requirements (SR) 3.4.3.1 to Revise the Lower Surveillance Tolerances," dated November 10, 2010.

This letter is PPL Susquehanna, LLC's (PPL) response to a request for additional information received from the NRC in an email dated July 21, 2011. This email requested additional information regarding PPL's proposed Technical Specification change previously submitted under PLA-6642, to revise the lower limit of the main steam safety relief valves pressure setpoint limit.

The response is contained in Attachment 1 to this letter.

If you have questions, please contact C. T. Coddington at (610) 774-4019.

Sincerely,

T. S. Rausch

Attachments:
Attachment 1: Response to NRC's Request for Additional Information Dated July 21, 2011
Attachment 2: Excerpt from Crosby Valve and Gage Company Procedure I-11069

Copy: NRC Region I
Mr. P. W. Finney, NRC Sr. Resident Inspector
Mr. R. R. Janati, DEP/BRP
Mr. B. K. Vaidya, NRC Project Manager

ATTACHMENT 1 TO PLA-6750

Response to NRC's Request for Additional Information

Dated July 21, 2011

RAI-1:

American Society of Mechanical Engineers (ASME) Code for Operation and Maintenance of Nuclear Power Plants (OM Code), Mandatory Appendix I, I-1310(e), requires that, "The Owner, based upon system and valve design basics or technical specification, shall establish and document acceptance criteria for tests required by this Appendix." Please provide the valve design document and basics such as consideration of simmering, seat leakages, and reliability for establishing low set-point pressure tolerances including the manufacture recommended low set-point pressure limits for the main steam safety/relief valves PSV141F013A, B, C, D, E, F, G, H, J, K, L, M, N, P, R, and S.

PPL RESPONSE:

PPL Susquehanna, LLC has requested a revision to Unit 1 and Unit 2 Technical Specification Surveillance Requirement (SR) 3.4.3.1 to change the as-found set pressure acceptance criteria tolerance from -3%, +3% of the main steam safety/relief valve (MSRV) safety setpoint to -5%, +3% of the MSRV safety setpoint. The SR 3.4.3.1 revision request does not change the as-left setpoint tolerance of -1%, +1% of the MSRV safety setpoint.

Crosby Valve and Gage Company Procedure I-11069, "Instruction Manual for Crosby Style 6xRx10 HB-65-BP Safety Relief Valve for Main Steam Service" (IOM563) discusses performance in Section 3. Step 3.1.1.4, as amended by PPL IMCN #8, states the following:

"Setpoint repeatability for on line service should be within +3%, -3% of nameplate set pressure. However, the low limit of the setpoint tolerance may be extended to 1067 psig if all other valve functional requirements are met."

The requested SR 3.4.3.1 revision will lower the minimum MSRV as-found setpoint acceptance criteria for the lowest setpoint valves from 1140 psig to 1116 psig. The SR 3.4.3.1 minimum acceptance criteria will still be greater than the manufacturer's recommended low setpoint pressure limit of 1067 psig.

The proposed revision to SR 3.4.3.1 only changes the MSRV setpoint acceptance criteria minimum tolerance. The as-left or as installed setpoint tolerances are unchanged; therefore the revision does not affect the actual operation of the MSRVs. The requested SR 3.4.3.1 revision has no affect on the MSRV design basis such as simmering, seat leakages or valve reliability. As discussed above, the revised setpoint tolerance will still exceed the manufacturer's recommended minimum tolerance for MSRV as-found setpoint testing.

RAI-2:

ASME OM Code Mandatory Appendix I, I-1330(c)(3) requires that the owner evaluate the cause and effect of valves that failed to comply with the set-pressure acceptance criteria established in I-1330(c)(1). I-1330(c)(3) applies to both high and low set-point pressures. Please provide a test history over the past ten years showing any low set-point pressures that exceeded acceptance

criteria, and a summary of the evaluations of the causes and generic concerns of the valves identified in RAI-1 that failed to meet the low set point pressure limits.

PPL RESPONSE:

The 10-year main steam safety/relief valve (MSRV) test history (2002 – 2011) is listed below. There were no MSRV test failures due to exceeding the maximum tolerance of +3% of the safety setpoint. There were 14 failures due to the initial as-found setpoint being below the minimum tolerance of -3% of the safety setpoint. Twelve (12) of the 14 failures were in the range of -3% to -5% of the safety setpoint.

MSRV S/N	Date Tested	Set Press (psig)	As-found lift pressure (psig)	Deviation (%)
N63790-00-0019	3/24/02	1195	1185	-0.84
	4/22/09	1195	1155	-3.35
-0020	3/25/02	1205	1178	-2.24
	4/22/09	1205	1165	-3.32
-0021	3/21/08	1195	1177	-1.51
	4/15/11	1195	1144	-4.27
-0022	3/24/02	1205	1199	-0.50
	4/29/09	1205	1215	+0.83
-0023	3/30/03	1205	1185	-1.66
	3/22/08	1205	1207	+0.17
-0024	3/28/03	1205	1196	-0.75
	3/21/10	1205	1196	-0.75
-0025	3/30/03	1205	1169	-2.99
	3/21/08	1205	1137	-5.64
-0026	3/31/03	1195	1174	-1.76
	3/23/10	1195	1207	+1.00
-0027	3/24/02	1195	1162	-2.76
	4/22/09	1195	1204	+0.75
-0028	3/16/06	1195	1190	-0.42
	4/25/11	1195	1200	+0.42
-0029	3/26/04	1195	1188	-0.59
	3/13/10	1195	1208	+1.09

MSRV S/N	Date Tested	Set Press (psig)	As-found lift pressure (psig)	Deviation (%)
-0030	3/16/07	1195	1190	-0.42
-0031	3/31/03	1195	1180	-1.26
	3/17/06	1195	1166	-2.43
	4/15/11	1195	1174	-1.76
-0032	3/25/04	1205	1176	-2.41
	3/13/10	1205	1224	+1.58
-0033	3/31/03	1195	1190	-0.42
	3/21/10	1195	1225	+2.51
-0034	3/11/05	1195	1188	-0.59
	3/22/10	1195	1188	-0.59
-0081	3/15/06	1195	1154	-3.43
	4/15/11	1195	1148	-3.93
-0082	3/31/03	1205	1200	-0.41
	3/21/08	1205	1159	-3.82
-0083	3/28/03	1175	1161	-1.19
	3/20/10	1175	1175	0
-0084	3/28/04	1195	1184	-0.92
	4/26/11	1195	1193	-0.17
-0085	3/9/05	1175	1195	+1.70
	4/23/09	1175	1123	-4.42
-0086	3/28/04	1175	1191	+1.36
	5/2/11	1175	1161	-1.19
-0087	3/17/06	1205	1191	-1.16
	4/16/11	1205	1189	-1.33
-0088	3/22/08	1205	1205	0
-0089	3/16/06	1205	1210	+0.41
	4/15/11	1205	1209	+0.33

MSRV S/N	Date Tested	Set Press (psig)	As-found lift pressure (psig)	Deviation (%)
-0090	3/27/04	1205	1195	-0.83
	4/20/11	1205	1178	-2.24
-0091	3/29/04	1205	1193	-1.00
	4/23/09	1205	1187	-1.49
-0092	3/30/04	1195	1200	+0.42
	4/22/11	1195	1208	+1.09
-0093	3/10/05	1205	1154	-4.23
	3/20/10	1205	1153	-4.32
-0094	3/26/04	1205	1174	-2.57
	4/25/11	1205	1179	-2.16
-0095	3/11/05	1205	1199	-0.50
	3/19/10	1205	1173	-2.66
-0096	3/9/05	1205	1194	-0.91
	3/23/10	1205	1160	-3.73
-0112	3/26/02	1205	1220	+1.24
	3/15/07	1205	1209	+0.33
-0113	3/21/08	1175	1164	-0.94
-0128	3/23/02	1175	1193	+1.53
	3/15/07	1175	1184	+0.77
-0129	3/16/07	1205	1199	-0.50
-0130	3/24/02	1205	1184	-1.74
	3/15/07	1205	1145	-4.98
-0131	3/15/06	1205	1215	+0.83
	4/25/11	1205	1148	-4.73
-0132	3/10/05	1195	1134	-5.10
	3/14/10	1195	1180	-1.26
-0133	3/24/02	1195	1208	+1.09
	3/14/07	1195	1190	-0.42

There were no MSRV setpoint test failures from 2002 – 2005. From 2005 – 2009, cause evaluations were not performed for MSRVs that failed because they were below the minimum tolerance of -3% of the safety setpoint. This is documented in non-cited violations 05000387 & 05000388/2009003-01 and CR 1177479. CR 1177479 stated that the cause of the 9 MSRV test failures that occurred from 2005 – 2009 is setpoint variance that is inherent to the Crosby 6xRx10 relief valve design.

In 2010, valves -0093 and -0096 failed their setpoint tests due to as-found initial test results that were below -3% of the safety setpoint. CR 1247012 determined that the -0093 valve failed due to setpoint variance that is inherent to the Crosby 6xRx10 relief valve design. The -0096 test failure was attributed to minor weepage through the seat, which is also a known industry cause of setpoint drift in the lower direction.

In 2011, valves -0021, -0081 and -0131 failed their setpoint tests due to as-found initial test results that were below -3% of the safety setpoint. CR 1399810 determined that the -0081 and -0131 valves failed due to setpoint variance that is inherent to the Crosby 6xRx10 relief valve design. The -0021 test failure was attributed to minor weepage through the seat, which is also a known industry cause of setpoint drift in the lower direction.

RAI-3:

On page 8 of the submittal referenced above, {PPL's submittal PLA-6642, dated November 10, 2210}, PPL states that no additional valves will be tested if the as-found set point is below the nameplate set point. This appears to conflict with I-1330(c)(1), which requires that additional valves be tested if the specified set-point pressure tolerance limits including the lower set-point pressures are not met. During a conference call on June 8, 2011, PPL cited relief request RR-02 for basis not complying with I-1330(c). RR-02 was submitted to the NRC for review in a letter from PPL dated May 24, 2004. A revised letter was submitted to the NRC on June 1, 2010. Specifically, RR-02 requested relief from ASME OM Code, Appendix I, paragraph I-1330(a), "Test Frequencies, Class 1 Pressure Relief Valves." The NRC staff reviewed these two letters and authorized the proposed alternative including that no additional valves will be tested if the as-found set-point pressure is below the nameplate set-point. Note that the relief request was authorized for low set-point pressure tolerance of -3% in letters dated March 10, 2005 and January 4, 2011. However, the current proposed technical specification amendment will revise the low set-point pressure tolerances from -3% to -5 %, which represents an additional 67% set point pressure drifting or accelerated valve degradation. As a valve experiences abnormal degradation, it is prudent to verify the condition of additional valves in the same group. Therefore, PPL is requested to provide justification for not testing additional valves if the low set-point pressure exceeds -5%.

PPL RESPONSE:

According to Crosby Valve and Gage Company Procedure I-11069, "Instruction Manual for Crosby Style 6XRX10 HB-65-BP Safety Relief Valve for Main Steam Service" (attached), the low limit of the setpoint tolerance may be extended to 1067 psig if all other valve functional requirements are met and still assure normal valve response. For the lowest pressure setpoint

valve at Susquehanna SES (1175 psig), the low limit of the setpoint tolerance would be -9% and for the highest pressure setpoint valve (1205 psig) the low limit would be -11.5%.

Based on the above, the pressure setpoint would have to exceed -9% of name plate rating to be outside the acceptable range specified by the vendor for valve performance. The lower pressure setpoint tolerance limit of -5% was exceeded 3 times in 308 tests performed at Susquehanna since 1985. The lowest pressure setpoint observed was -5.64%. Based on the manufacturer's procedure, this pressure setpoint is well with in the valve's acceptable range of performance. The lower tolerance limit was chosen conservatively. A lower setpoint is conservative in that the MSRV would open sooner to provide over pressure protection. Therefore, testing of additional valves would not provide any increase in quality or safety.

ATTACHMENT 2 TO PLA-6750

Excerpt from Crosby Valve and Gage Company Procedure I-11069

3. Performance

3.1 Safety Valve Mode of Operation

3.1.1 Set Pressure

3.1.1.1 The specified set pressure for each valve is stamped on the valve nameplate.

3.1.1.2 All valves are Factory set to a tolerance of +0, -2% of nameplate set pressure.

3.1.1.3 All valves are Factory set for a thermally stabilized ambient temperature of 135°F.

3.1.1.4 Set point (+3% repeatability for on line service should be within a tolerance of ~~+1~~, -3% of nameplate set pressure. However, the low limit of the set point tolerance may be extended to 1067 psig if all other valve functional requirements are met. / IMCN # 8

3.1.1.5 The nozzle ring is Factory set to provide a clean "popping" action. Field adjustment should not be required.

3.1.2 Blowdown

3.1.2.1 All valves are Factory adjusted to blowdown within the range of 2% to 11% of the actual popping pressure that is within ~~+1~~ +3/-3% of the nameplate value. / IMCN # 8

3.1.2.2 The blowdown range of 2% to 11% applies for all back pressure values applicable to a specific back pressure range per plant discharge line configuration.

3.1.2.3 Whenever a part critical to the lifted position force balance is replaced, the valve must be retested for blowdown. These parts are the adjusting ring (Pc. 64), the disc ring-disc holder-bellows assembly (Pcs. 5, 6 and 7), the eductor (Pc. 11) and the spring (Pc. 24).

3.1.2.4 The adjusting ring is Factory set to provide the correct blowdown range. Field adjustment should not be required. If adjustment is required due to part replacement, valve set point change or plant modifications, refer to Section 6.3 of of this manual.