Lent, Susan

From: Gibson, Lauren
Sent: Monday, December 03, 2012 3:11 PM
To: Robert.Roehler@aps.com
Subject: Draft Request for Additional Information Related to LAR to revise LCO 3.7.4, Atmospheric Dump Valves (TAC Nos. ME6566, ME6567, and ME6568)
Attachments: Post Audit RAIs ME6566,7,8.docx

Rob,

By letter dated June 22, 2011, and supplemented by letters dated December 9, 2011, and January 27, 2012, Arizona Public Service Company, the licensee for Palo Verde Nuclear Generating Station Units 1, 2, and 3, requested a license amendment that would revise Technical Specification Limiting Condition for Operation (LCO) 3.7.4, Atmospheric Dump Valves (ADVs). The NRC staff conducted a regulatory audit onsite November 27- 29, 2012. As a result of that audit, the NRC staff identified that the enclosed additional information is required to complete the review.

Please contact me to let me know if you would like to have a clarifying conference call.

Thank you,
Lauren

Lauren K. Gibson
Project Manager
Columbia Generating Station
Palo Verde Nuclear Generating Station
Division of Operating Reactor Licensing
U.S. Nuclear Regulatory Commission
(301) 415-1056

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DRAFT REQUEST FOR ADDITIONAL INFORMATION

PALO VERDE NUCLEAR GENERATING STATION

UNITS 1, 2, AND 3

LICENSE AMENDMENT REQUEST CONCERNING TECHNICAL SPECIFICATION 3.7.4

ATMOSPHERIC DUMP VALVES

TAC NOS. ME6566, ME6567, ME6568

By letter dated June 22, 2011 (Agencywide Document Access and Management System (ADAMS) Accession No. ML11182A908), as supplemented by letters dated December 9, 2011 (ADAMS Accession No. ML11356A088), and January 27, 2012 (ADAMS Accession No. ML12046A649), Arizona Public Service Company, the licensee for Palo Verde Nuclear Generating Station Units 1, 2, and 3, requested a license amendment that would revise Technical Specification Limiting Condition for Operation (LCO) 3.7.4, Atmospheric Dump Valves (ADVs). The NRC staff conducted a regulatory audit onsite November 27- 29, 2012. As a result of that audit, the NRC staff identified that the following additional information is required to complete the review.

1) The following questions pertain to the steam generator tube rupture (SGTR) evolution and supplemental analyses that are discussed in Arizona Public Service (APS) response to NRC request for additional information (RAI) 3, provided by letter dated January 27, 2012.
   a) Provide a tabulated sequence of events for the supplemental analysis.
   b) Compare the Henry-Fauske break flow model to the Homogenous Equilibrium model by providing a plot of steam generator (SG) tube flow versus time that compares the design basis analysis to the supplemental analysis. Provide this comparison for a period of time that extends to the time that the atmospheric dump valves (ADVs) are assumed to actuate in the design basis analysis and discuss the effect that any other significant differences aside from the break flow model have on the compared results.
   c) Provide plots of the following parameters as functions of time:
      i) Leak flow rate
      ii) Pressurizer pressure
      iii) Pressurizer volume
      iv) RCS subcooling
      v) Steam generator pressure
      vi) Steam generator level (wide range)
   d) Since licensed operators are trained and expected to mitigate SGTRs, characterize the agreement between a simulator projection of a SGTR and a CENTS[1] analysis of a SGTR, given a roughly analogous scenario executed with each tool.

[1] CENTS is an interactive computer code for simulation of the nuclear steam supply system and related systems. It is described in WCAP-15996.

e) Describe how plant personnel mitigate an SGTR loss of power (LOP) event when ADVs are not available for operation from the control room. Include discussion of applicable procedures, and provide procedure excerpts for the steps leading up to and after establishing reactor coolant system (RCS) cooldown using the steam bypass control system, contingency actions (including Appendix 18 – Local ADV actuation), and main steamline isolation. Explain how these procedures are implemented in regards to maintaining availability of required equipment to cooldown.

f) During mitigation of a SGTR, there exists a possibility of overfilling a steam generator if a RCS cooldown/depressurization is delayed. The result may be a liquid release to the environment through the main steam safety valves, which is outside the current analysis. In the event the ADVs are all inoperable, the ability to commence a RCS cooldown/depressurization may be delayed. Therefore, the staff requests the licensee to describe defense in depth measures to control the liquid inventory in the steam generator until a method is available to commence a cooldown.

2) The following questions pertain to the main steam line break evaluation and supplemental analysis that is discussed in APS response to NRC RAI 3, by letter dated January 27, 2012.
   a) Provide a table of results. Identify the acceptance criteria for pressurizer fill and for water entrainment in the pressurizer safety valve (PSV) effluent.
   b) Provide plots of the following parameters as functions of time. It is acceptable to truncate the plots if a stable or quasi-stable condition is reached. If this is done, please describe the system behavior for the period that is not included.
      i) Instantaneous SI flow
      ii) Total SI flow
      iii) Pressurizer pressure
      iv) Pressurizer volume
      v) Subcooling margin
      vi) Steam generator pressure
      vii) Steam generator level
3) The following questions pertain to the feedwater line break (FWLB) evaluation and supplemental analysis that is discussed in APS response to NRC RAI 3, by letter dated January 27, 2012.
   a) Provide a table of results.
   b) Provide plots of the following parameters as functions of time. It is acceptable to truncate the plots if a stable or quasi-stable condition is reached.
      i) Instantaneous charging flow
      ii) Total charging flow
      iii) Pressurizer pressure
      iv) Pressurizer volume
      v) Steam generator pressure
      vi) Steam generator level
   c) Discuss how, in the context of a FWLB event and associated control room procedures, operators will ensure that the charging pumps are secured independently of taking action to open ADVs slightly. Also identify how procedures differ from the supplemental analysis assumptions, and explain why this is the case. For example, while the analysis

assumes that charging pumps are secured within 20 minutes, operators may attempt to control pressurizer level and pressure using auxiliary spray from the charging pumps. Please explain such deviations between procedures and analysis.

d) In a control room simulator scenario where a FWLB occurs with a coincident loss of offsite power, and ADVs are unavailable, characterize the pressurizer level and pressure response that an operator may see.

4) The RAI response refers to the use of the non-safety related SBCVs (steam bypass control valves) as a defense in depth measure while the plant is in the 24 hour condition statement with all four ADVs inoperable and a design basis event such as a SGTRLOP occurs. The FSAR describes two SBCVs as atmospheric relief valves with the same relief capacity as an ADV. However, the atmospheric SBCVs are nonsafety related valves located in the turbine building, downstream of the MSIVs.

   a) The staff requests the licensee to describe why the 1007/1008 SBCVs would be available as a defense in depth measure when there are no ADVs available to mitigate accidents and transients described in their FSAR. Include description of means to control operation of the valve, i.e. control power, medium to physically reposition valve, and remote/local/manual capabilities.

   b) Since the atmospheric SBCVs are downstream of the MSIVs, describe whether the SBCVs will be available during transients and accidents or if the SBCVs can be made available through operator actions in a reasonably short period of time to provide accident mitigation and whether sufficient flow can be achieved through these normal/alternate/bypass lines.

   c) In the event the ADVs are not available during an accident, the atmospheric SBCVs may be used to conduct a RCS cooldown. Describe how operators will execute steps in the steam generator tube rupture procedures in regards to use of the SBCVs and closing the MSIVs, and achieving the use of the SBCVs with the MSIVs closed in feedline break and main steam line procedures.

   d) Determine whether any measures are necessary or in place to assure that the 1007/1008 SBCVs are available for accident mitigation prior to entering TS Condition statement for all four ADVs not available.