

**Remaining Questions Identified During NRC Staff Review of
Palo Verde Nuclear Generating Station Generic Letter 2004-02 Supplemental Responses**

1. In previous RAI #11 from its December 16, 2008, letter to the licensee, the NRC staff requested that the licensee provide justification that the debris used for strainer head loss testing to represent Thermo-Lag had the expected properties of Thermo-Lag debris destroyed under prototypical plant conditions. The licensee stated in its response dated March 13, 2009, that the Thermo-Lag debris used for the final strainer qualification testing was modeled as consisting of square pieces in three size categories (1 inch, 2 inch, and 3 inch), as well as an unspecified quantity of fines generated from cutting these pieces and exposing them to a high-pressure water jet. Based on the information provided, it was not clear to the staff that this debris preparation process led to a prototypical quantity of Thermo-Lag fines being added to the head loss test. Therefore, please provide additional basis for concluding that the quantity of Thermo-Lag fines used in the test was representative with regard to the quantity of fines that would be expected to be generated from Thermo-Lag debris due to the blowdown from a pipe rupture. Please include in the response the actual distance of the plant Thermo-Lag source(s) from potential pipe break locations.

2. In previous RAI #17, the staff requested that the licensee provide an evaluation of deaeration that could occur across the strainer debris bed. The licensee provided an evaluation of deaeration that was conservatively based on the maximum design structural differential pressure across the strainer. This evaluation predicted deaeration. However, the licensee stated that any gases liberated from the fluid due to the pressure drop would be reabsorbed during the transit to the pump suction due to the additional elevation head at the pump compared to the strainer. While the staff acknowledges that some gases may be reabsorbed, there are significant uncertainties in the physical processes that govern the dissolution of gases in water (e.g. transit time, bubble size, etc.). The staff has not seen adequate justification that effectively all liberated gases will be reabsorbed before entering the pump suction. Therefore, please reevaluate the deaeration and determine any required adjustment to net positive suction head required (NPSH_r). The licensee should ensure that NPSH margin is not exceeded under a sufficient range of conditions to provide assurance that deaeration does not adversely affect operability of pumps. In resolving similar questions at other plants, the staff has found it acceptable for licensees to consider strainer head loss based on testing, delayed onset of chemical effects, ideal gas compression of evolved gasses, and other realistic assumptions.