From: Stephen Dembek
To: Ahmed, Iqbal; Barrett, Richard; Berkow, Herbert; Calvo, Jose; Cwalina, Gregory; Dick, George; Doutt, Clifford; Fields, Mel; Grimes, Christopher; Lyon, Warren; Marinos, Evangelos; Pruett, Troy; Salgado, Nancy; Wermiel, Jared
Date: 7/15/04 3:08PM ← Date
Subject: FYI: Palo Verde's UFM Problem ← Title

I just wanted to pass on information given to me by Caldon. Region IV is already on-top of looking into this Palo Verde issue. Therefore, I'm not pursuing this further.

As background, in early June, Palo Verde told the NRC that they were informed by their ultrasonic flow meter (UFM) vendor (Caldon) that they needed to reduce power at all three units since the UFM might underestimate their power level. Palo Verde uses Caldon's external UFM to measure feedwater flow instead of the venturis. Palo Verde returned to using the venturis for feedwater flow after receiving the letter from Caldon. Palo Verde said this problem was similar to a problem noted in an LER from River Bend. Since what happened at River Bend occurred in mid-2003, I asked Caldon why it took so long to find out a similar problem existed at Palo Verde.

Herb Estrada from Caldon gave me his view on this: When River Bend made its report, all three Palo Verde units were T-hot limited so they had extra margin to their licensed power level. Therefore, Palo Verde believed this wasn't an important issue and it received a low priority. Early this year, Palo Verde informed Caldon that Unit 2's steam generators were replaced (so Unit 2 was no longer T-hot limited) and they requested Caldon to verify the UFM's accuracy.

To check the accuracy of the UFM, Caldon did a best estimate analysis (i.e., they use every detector available to get the best estimate of the actual reactor power to determine true feedwater flow). This requires gathering turbine first stage pressure, blowdown flow, reheat steam flow, measured flow through the venturi, and measured steam flow. This effort started around March. Once Caldon calculated the best estimate, they looked at each of the instruments to see if they were within their tolerances. This analysis was completed in June and the preliminary results, which indicated the UFM was underestimating the actual power, were given to the licensee on June 9. At this time, the licensee went back to using the venturis and they informally informed the NRC about this issue.

Caldon then did further analysis which showed there was a shortcoming in the Palo Verde feedwater flow model which did not account for flow swirls. In Caldon's final report to the licensee, which was sent to the licensee yesterday, they determined that Unit 1 exceeded it's licensed power level by one-quarter percent (Unit 1 was 1% over its limit for a portion of the period, probably due to an error on Palo Verde's part), Unit 2 exceeded it's power level by one-quarter percent until the SGs were replaced, at that time it exceeded its licensed power level by 1%, Unit 3 exceeded its licensed power level by one-quarter percent. All of these levels are within the 2% error assumed in Palo Verde's accident analyses (they did not receive an improved instrument error power uprate) so this does not appear to be a safety issue.

Palo Verde will make a report on this today, stating they exceeded their

licensed power level by up to 1%.

This info is based on the notes I took during my discussion with Herb Estrada. The info will need to be verified before any further action is taken on this issue.

Steve