

From: Neil Sheehan *NS*
To: INTERNET: DGram@AP.ORG
Date: 5/5/04 12:38PM
Subject: re: Power uprates

Dave,

As of the end of February, the NRC had approved 101 power uprates, dating back to September 1977. They ranged from 0.4 percent to 20 percent.

Extended Power Uprates are those generally involving an increase in power of between 7 and 20 percent. That type of uprate requires significant modifications to major "balance-of-plant" equipment such as the high-pressure turbines, condensate pumps and motors, main generators, and/or transformers. The Extended Power Uprates approved by the NRC to date total a dozen and include:

- * Monticello, in Minnesota, 6.3 percent, granted 9/16/98;
- * Hatch 1 and 2, in Georgia, 8 percent each, granted 10/22/98;
- * Duane Arnold, in Iowa, 15.3 percent, granted 11/6/01;
- * Dresden 2 and 3 plants, in Illinois, 17 percent each, granted 12/21/01;
- * Quad Cities 1 and 2, in Illinois, 17.8 percent each, granted 12/21/01;
- * Clinton, in Illinois, 20 percent, granted 4/5/02;
- * Arkansas Nuclear 2, in Arkansas, 7.5 percent, granted 4/24/02;
- * Brunswick 1 and 2, in North Carolina, 15 percent each, granted 5/31/02.

Here is some background informatio (from an NRC staff report issued last November) on the problems identified at plants that have had Extended Power Uprates:

Damage of Steam Dryer at Quad Cities Unit 2

"In June 2002, approximately 3 months following implementation of a 17.8-percent EPU, Quad Cities Unit 2 experienced an increase in the moisture content of the steam provided by the reactor to drive the turbine. In July 2002, Exelon (the licensee for Quad Cities Unit 2) shut down the plant, identified cracking in the steam dryer as the cause of the increased moisture content, repaired the steam dryer, and returned the unit to power operation at the EPU power level. The steam dryer does not perform an accident-mitigating role or safety function, but is required to maintain its structural integrity. Approximately 10 months following restart of Quad Cities Unit 2 from an outage to repair the steam dryer, the plant experienced a similar increase in the moisture content of the steam. Based on previous experience with increased moisture content, Exelon shut down the plant and performed inspections of the steam dryer. Upon inspecting the steam dryer, Exelon identified cracks in several locations of the steam dryer. In both cases, the licensee identified high-cycle fatigue as the cause of the cracking. The staff conducted a special inspection of Exelon's activities related to the second incident. The staff's inspection focused on Exelon's efforts to identify the cause of the damage and repair the steam dryer. In addition, because Exelon had not completed its root-cause evaluation at the time of the inspection, it committed to keep Quad Cities Unit 2 at pre-EPU power levels until the root-cause evaluation is completed and presented to the NRC staff. On July 25, 2003, Exelon and GENE presented their determination of the cause of the cracking, repairs performed on the steam dryer, and planned actions to return the unit to the EPU power level. Following the July 25 meeting, the NRC staff held several additional discussions with Exelon and GENE to better understand their analyses. Based on the understanding gained from the inspection, the July 25 meeting with Exelon and GENE, and the discussions following the meeting, the staff had no objections to Exelon's plans to return the plant to the authorized EPU power level.

"The staff has determined that the steam dryer failure at Quad Cities Unit 2 is not an immediate safety concern. Nevertheless, the staff has continued to closely monitor industry's generic response to this failure. GENE issued Services Information Letter (SIL) No. 644, "BWR/3 Steam Dryer Failure," on August 21, 2002, to inform its customers of the first steam dryer failure and Supplement 1 to SIL No. 644, "BWR

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Steam Dryer Integrity," on September 5, 2003, to inform its customers of the second steam dryer failure. Both of these documents provided recommendations for monitoring steam dryer performance to ensure that steam dryer degradation is promptly identified. The staff issued Information Notice (IN) 2002-026, "Failure of Steam Dryer Cover Plate after a Recent Power Uprate," on September 11, 2002, to inform licensees of the first failure and Supplement 1 to IN 2002-026, "Additional Failure of Steam Dryer after a Recent Power Uprate," on July 21, 2003, to inform licensees of the second failure. In addition, the staff has reviewed GENE SIL No. 644, Supplement 1, and provided comments to the BWROG on the technical evaluation and recommendations contained in the SIL. The staff is planning to meet with the BWROG, the Boiling Water Reactor Vessel and Internals Project, and GENE in November 2003 regarding the SIL and industry's overall response to the experience with steam dryer cracking. The staff will consider its regulatory options based on industry's generic response."

Please call if you need any additional information.

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