

**From:** Bill Bateman  
**To:** Lawrence Burkhart } NRR  
**Date:** 11/19/01 9:56AM  
**Subject:** Re: DAILY STATUS REPORT (UPDATES REQUESTED BY 3 P.M.)

Trying to get letters out to Davis Besse and DC Cook documenting last Thursday's calls. Check with Pickett and Stang. Meeting with DC Cook tomorrow.

>>> Lawrence Burkhart 11/19/01 08:01AM >>>

The attached file contains the 11/16/01 Daily Status Report (DSR) for Bulletin 2001-01, "Circumferential Cracking of Reactor Pressure Vessel Head Penetration Nozzle Cracking." The purpose of this DSR is to provide up-to-date information to NRC Senior Management on the staff's progress on bulletin response reviews, regulatory actions, and inspection findings/results.

In preparation for issuing the DSR for today, please review the attached file and provide any updates by 3 p.m. today. Please provide updates via e-mail and I will incorporate into the document. If nothing has changed please e-mail me stating so.

The DSR will be issued today through Wednesday for this week. No DSR is planned to be issued Friday, 11/23/01.

Thanks.

Larry.

B-146

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### DAILY STATUS REPORT

RE: UNRESOLVED RESPONSES TO THE BULLETIN 2001-01 FOR HIGH SUSCEPTIBILITY PLANTS AND THOSE PLANTS THAT HAVE EXPERIENCED VHP NOZZLE CRACKING

#### □ Davis-Besse

Licensee Plans/Commitments: Licensee plans to shutdown and perform Bulletin recommended inspections in April 2001.

NRC Staff Position: Based on the information available, the staff cannot reconcile the inspection results from recent inspections of other B&W plants and those past inspections described in the licensees' submittals. The staff notes that (1) Davis Besse (DB) is a high susceptibility plant per the Bulletin; (2) 11 of the 13 high susceptibility plants have performed inspections and 10 of these have found cracking or leakage; (3) the remaining 6 B&W plants that have performed inspections have found cracks. Three of the six B&W plants have found circumferential cracks; and (4) DB is the only B&W plant that has not inspected, and is also the hottest running plant (605°F). [Operation at a higher head temperature is a significant driving force for crack growth rate]. Based on the above, it is reasonable to assume that DB has cracks that challenge the reactor coolant pressure boundary. It is the staff's position that the only means to provide reasonable assurance of reactor coolant pressure boundary integrity would be to perform the inspections as recommended in the bulletin by December 31, 2001. The risk assessment provided by DB was reviewed, and the staff found that the methodology employed by the licensee appears to be reasonable except in two areas. Credit for 1996, 1998 and 2000 inspections and the probabilistic fracture mechanics on crack initiation-propagation are unresolved due to inadequate data and ambiguity to support the risk numbers employed in the submittal. Therefore, the PSA is not sufficient to provide reasonable assurance of VHP nozzle integrity through March 2002. However, the staff will keep the lines of communication open with the licensee should new and relevant information become available.

Next Regulatory Action: The Order was finalized and forwarded by memo dated November 16, 2001 from S. Collins, Director, NRR to W. Travers. A memo from W. Travers, EDO to the Commissioners is in process for concurrence. The Order would be issued no sooner than 5 working days from the date of the EDO memo forwarding the Orders to the Commissioners.

Meetings & Conf. Call Summaries: A telecon was held between EMCB and the DB licensee on Thursday, November 14. The purpose of the call was to summarize the staff's assessment of the DB bulletin response.

The staff pointed out that (1) DB is a high susceptible plant per the bulletin; (2) 11 of the 13 high susceptible plants have performed inspections per the bulletin and 10 of these have found cracks; and (3) the 6 other B&W plants have performed inspections and found cracks. Three of the six B&W plants have found circumferential cracks.

Based on this information, we informed the licensee that we believe there is a reasonable likelihood that DB currently has multiple cracks in the VHP nozzles and that one or more may be circumferential. We informed them that we could not make an independent assessment of the VHP nozzles based on the photographs and videotapes from previous refueling outages. In addition, we informed them that their PSA was not sufficient to provide reasonable assurance of

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VHP nozzle integrity through March 2002.

The licensee was informed of our position during the conference call. In addition, we also stated that any future discussions or submittals should focus on how the licensee considers DB to be unique or distinguished from the other, high susceptible facilities.

□ **D. C. Cook, Unit 2**

Licensee Plans/Commitments: Licensee plans to shutdown and perform inspections in January 2002. The proposed inspections are not consistent with the recommended inspections described in the bulletin.

NRC Staff Position: D.C. Cook Unit 2 is in a population of plants that have experienced cracking CRDM nozzles. Eleven out of the 13 high susceptibility plants have performed inspections, and 10 of these have found cracking or leakage. The inspection that D.C. Cook Unit 2 performed in 1994 only covered 94% of the CRDM nozzles (7 CRDMs or 9% not examined). In addition, the examination of the CRDM nozzles was only an inner diameter eddy current examination that did not include the "wetted surface" [J-groove weld, the nozzle outer diameter (below the weld), and the nozzle inner diameter to a location above the weld]. The staff has no data regarding the largest flaw that could have been left in service at D.C. Cook Unit 2. The licensee indicated that it may be able to justify operation beyond December 31, 2001 using a nozzle by nozzle stress analysis. However, the staff does not have this additional information at this time. In addition, based on a recent conference call (November 15, 2001), the staff raised concerns on the licensee's risk model, numbers employed, and the regulatory basis of the criteria on the incremental core damage probability.

Next Regulatory Action: The staff is finalizing the Order which was referred to in the memo dated November 16, 2001 from S. Collins, Director, NRR to W. Travers. The staff intends to have the Order ready to issue with the Davis-Besse Order.

Meetings & Conf. Call Summaries: The response to the bulletin and justification for delaying VHP examinations beyond the end of 2001 were discussed in telephone calls on October 11, 2001, between W. Bateman, et al. (NRC) and M. Rencheck, et al. (I&M) and on October 12, 2001, between B. Sheron, et al. (NRC) and M. Rencheck, et al. (I&M). At the conclusion of this telephone conference, the licensee indicated that they would like to provide additional information to the staff regarding this issue.

By letter dated November 5, 2001, the licensee provided additional information. The information has been reviewed by our technical Staff and the following three areas of concern were raised: (1) Crack growth rate; (2) Risk assessment; and (3) Qualified visual examination

These issues were discussed in telephone calls on November 15, 2001, between J. Stang et al. and M. Rencheck, et al. (I&M).

A public meeting has been scheduled for November 20, 2001, to discuss each of the above issues with the licensee.

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 **North Anna, Units 1 and 2**

Licensee Plans/Commitments: Licensee committed to docketing information to qualify the inspections being conducted at both plants. Still waiting for VEPCO response.

NRC Staff Position: North Anna Unit 1 provided sufficient information for the staff to conclude that no cracks were left in service that challenge the reactor coolant pressure boundary. The licensee has not provided the documentation to support a "qualified visual" analysis to demonstrate acceptability of using "design" dimensions of the VHP penetrations and nozzles. North Anna Unit 2 has an outage in progress. The staff cannot provide an informed opinion at this time since the licensee is chasing a crack in a "suspect" nozzle (i.e. nozzle that appears to have the "popcorn" appearance indicative of boric acid leakage). The crack appears to be through-wall.

Next Regulatory Action: None planned at this time.

Meetings & Conf. Call Summaries:

10/5/01- Conference call held to discuss the number of VHP penetrations to be inspected at North Anna, Unit 1.

10/24/01 - Conference call held to discuss the qualification of the visual exams to be conducted at North Anna, Units 1 and 2.

 **Surry, Units 1 and 2**

Licensee Plans/Commitments: Commitment to shut Surry Unit 2 down by 12/31/01 docketed in letter dated 11/14/01. Licensee confirmed by telephone 11/16 that Surry Unit 2 will begin to shut down on 11/18 for head inspections.

NRC Staff Position: Surry Unit 1 has an outage in progress. The staff cannot provide an informed opinion at this time. The licensee is in the process of repairing 5 out of 10 leaking or cracked nozzles. As mentioned above, the licensee committed to shutdown Surry Unit 2 prior to 12/31/01 to conduct inspections. The licensee has not provided the documentation to support a "qualified visual" analysis to demonstrate acceptability of using "as-built" dimensions of the VHP penetrations and nozzles.

Next Regulatory Action: None planned at this time.

Meetings & Conf. Call Summaries:

10/12/01- Surry agreed to provide a supplement to their Bulletin response addressing qualified visual inspection (supplement sent 11/14/01). Still uncertain as to when Surry 2 would be inspected.

10/31/01 - NRC gave verbal relief for Surry Unit 1 relief requests SR-27 and SR-28 so that repair of cracks could proceed. Relief was based on NRC questions and licensee responses in previous North Anna phone calls (Surry Unit 1 relief and North Anna Unit 1 reliefs previously

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submitted, reviewed and withdrawn) and previous similar reliefs granted for Duane Arnold, Fitzpatrick, and Nine Mile Point.

11/6/01 - Surry agreed to docket a commitment to provide evidence of weld procedure qualification for P43 to P3 with F43 filler. Also agreed to provide analyses for weld repair and flaw evaluation prior to restart. Also agreed to address crack triplepoint, and to state there will be a PT report documenting J weld crack.

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VHP NOZZLE INSPECTIONS/RESULTS  
NOVEMBER 16, 2001  
4:00 P.M.

**Crystal River, Unit 3**

Inspections completed in October 2001. The licensee identified one leaking CRDM nozzle with a 90° circumferential crack which was subsequently repaired. The staff notes that the licensee did not perform any destructive examination to further characterize the flaw. In addition, this is the highest ranked moderate susceptibility plant.

**North Anna, Unit 1**

Inspections completed in September 2001. The licensee identified 8 shallow axial cracks below the J-groove weld. The licensee did not perform any repairs because these cracks were not part of the reactor coolant pressure boundary.

**North Anna, Unit 2**

Inspection began 10/2001 and is still in progress. Licensee found 3 possible leaking CRDMs. The licensee is chasing a crack in a "suspect" nozzle (i.e. nozzle that appears to have the "popcorn" appearance indicative of boric acid leakage). The crack appears to be through-wall. The licensee has not indicated whether or not any of the flaws are circumferential.

**Surry, Unit 1**

Inspections complete. Weld repairs to be done on 6 penetrations---3 done, working on 4th. Four other penetrations had indications ground out and dispositioned as acceptable. The licensee has not indicated whether or not any of the flaws are circumferential.

**Surry, Unit 2**

Inspections to begin week of 11/20.

**TMI-1**

During their 10/2001 outage, the licensee identified 8 leaking or cracked CRDM nozzles, and repaired 6 out of the 8. The two that were not repaired did not have cracks in the pressure boundary. The licensee also repaired all 8 of their cracked thermocouple nozzles. The staff notes that the licensee did not perform any destructive examination to further characterize the flaws.

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□ **Oconee, Unit 3**

The licensee initially identified cracking in February of 2001 (9 leaking CRDMs, 3 circumferential cracks) during a maintenance outage. On November 12, 2001, during its regularly scheduled outage Oconee Unit 3 identified indications of leakage evidenced by boric acid buildup around 4 CRDM nozzles. Three additional nozzles require further inspection and were categorized as potential leaking nozzles. The licensee expects to conduct additional inspections during the weekend of November 17, 2001.

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MODERATE SUSCEPTIBILITY PLANT INSPECTION RESULTS NOVEMBER 16, 2001 4:00 P.M.
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The following plants have performed the recommended inspections as defined in Bulletin 2001-01 this fall and found no indications of leakage. All of these plants are ranked as moderately susceptible to primary water stress corrosion cracking. The licensee for these plants performed 100% bare metal visual inspections.

Beaver Valley, Unit 1  
Farley, Unit 1  
Kewaunee  
Turkey Point, Unit 3

St. Lucie, Unit 2, has an outage scheduled to start on 11/26/01. Inspections should commence on or about 11/30/01.

No other moderate plants are scheduled for outages before 12/31/01.

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