From: Allen Hiser
To: Lawrence Burkhart
Date: 11/20/01 12:47PM
Subject: Re: DAILY STATUS REPORT

NRR

Larry,

Attached is the mark-up of the DSR that I think reads better and is more accurate.

Let me know what you think.

Allen

>>> Lawrence Burkhart 11/20/01 10:02AM >>>
Please don't forget your daily status report info (due by 3 p.m.).

Thanks. Larry.

B-151

PRE-DECISIONAL INFORMATION - NOT FOR PUBLIC DISCLOSURE

November 19, 2001 (6:00 PM)

DAILY STATUS REPORT

□ Davis-Besse

Licensee Plans/Commitments: The ~~L~~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 has based its safety concerns with Davis-Besse (DB) on recent inspection experience finding evidence of cracking for plants similar to DB. The staff notes that (1) DB is a high susceptibility plant per the Bulletin, and ~~(2) 11 of the 13 high susceptibility plants have performed inspection and 10 of these have found cracking or leakage;~~10 out of the 11 high susceptibility plants that have performed inspections have found cracking or leakage (two plants have yet to perform inspections, including DB); (2) the other six B&W plants have performed inspections and have found cracking (DB is the only B&W plant that has not inspected), with three of the six B&W plants finding circumferential cracks~~(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 (43) DB ~~is the only B&W plant that has not inspected, and is also the hottest running~~ has the highest head temperature at operating conditions for any B&W plant (605□F). ~~[Operation at a higher head temperature is a significant driving force for crack growth rate]~~ (operation at higher temperatures increases susceptibility to cracking). Based on the above, it is reasonable to ~~assume~~ conclude that DB ~~has~~ may have cracks that could challenge the integrity of the reactor coolant pressure boundary. It is the staff's position that the ~~only means to~~ licensee can provide reasonable assurance of reactor coolant pressure boundary integrity ~~would be to~~ by performing ~~the~~ inspections by December 31, 2001, as recommended in the bulletin ~~by December 31, 2001~~.

The licensee has sought to justify continued operation until its scheduled refueling outage at the end of March 2002 using the results of prior inspections (from 1996 to the present) and both deterministic and probabilistic risk assessments. The staff has reviewed the ~~The~~ risk assessment provided by DB ~~was reviewed, and the staff found~~ and concluded that the methodology employed by the licensee appears to be reasonable ~~except in two areas~~. However, the staff has numerous questions regarding input parameters and assumptions used in the assessments, including inadequate data and high uncertainty in several cases. Regarding prior inspections, the licensee has stated that four nozzles cannot be inspected using a qualified visual examination due to an inadequate leakage path for these nozzles; one of these four nozzle locations has exhibited circumferential cracking on the nozzle outside diameter at Oconee Unit 3 in within the last week. ~~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.~~

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Next Regulatory Action: The Order was finalized and forwarded by memorandum dated November 16, 2001 from S. Collins, Director, NRR to W. Travers. A memorandum from W. Travers, EDO, to the Commissioners is in process for concurrence. The Order would be issued no sooner that 5 working days from the date of the EDO memo forwarding the Orders to the Commissioners. (NOTE: as of COB 11/19/01, the memo from the EDO to the Commissioners has not been issued, therefore, the orders for DB and D.C. Cook 2 will not be issued prior to Wednesday, 11/28/01).

Meetings & Conf. Call Summaries: A teleconference 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 summary for this teleconference held on Thursday, November 14, will be issued today.

In this teleconference with the licensee, t~~T~~he staff provided its position, as described above, to allow the licensee to focus on items that could provide the staff with a basis to modify its position and find that DB can operate until its scheduled refueling outage in late March 2002. One possibility described by the staff was for the licensee to identify and justify features or factors that would indicate that DB should not be included in the population of high susceptibility plants. The staff also reiterated its intent to continue discussions with the licensee, as appropriate.~~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 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.~~

INTERESTING NOTE: The resident Inspector for DB sat in on a licensee's morning management meeting and observed that licensee management expressed cautious optimism that the NRC would approve their (licensee's) plans to defer the inspections until April 2002. This is contrary to the message provided to DB management in the teleconference on Thursday, November 14.

□ D. C. Cook, Unit 2

Licensee Plans/Commitments: The l~~L~~icensee plans to shutdown and perform inspections ~~in~~ on January 19, 2002. The ~~proposed~~ inspections methods proposed by the licensee 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 prior cracking in their 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 914% of the CRDM nozzles (7 CRDM nozzles or 9% were not examined). In addition, the examination of the CRDM nozzles was ~~only~~ an ~~inner~~ inside diameter eddy current examination that did not include the entire "wetted surface" of the CRDM nozzle, since the inspection did not include the [J-groove weld, the nozzle outerside diameter of the nozzles (below the weld), and the nozzle ~~inner~~ inside diameter to a location above the J-groove weld].

Based on the facts of the recent inspection experience at other plants, Cook Unit 2's experience with previously-identified cracking and the limited effectiveness of the 1994 inspection, the staff has concluded that it is reasonable to assume conclude that Cook Unit 2 may have cracks that could challenge the integrity of the reactor coolant pressure boundary. It is the staff's position that the licensee can provide reasonable assurance of reactor coolant pressure boundary integrity by performing inspections by December 31, 2001, as recommended in the bulletin.

The licensee has sought to use deterministic and probabilistic assessments to justify continued operation until their scheduled refueling outage, based on their prior inspection history and limited operation since the 1994 inspection. However, the staff has numerous questions regarding input parameters and assumptions used in the assessments, including inadequate data and high uncertainty in several cases. The staff expects the licensee to provide additional information regarding the operating period since the last inspection and the basis for continued operation until their scheduled refueling outage. ~~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 described its position to the licensee, and provided specific comments regarding their deterministic and probabilistic assessments. ~~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. LPM received comments from OGC on the draft Orders. The staff plan is to forward the Order for Cook Unit 2 to the EDO as an attachment to a memorandum from the Director of NRR no later than Monday, 11/26/01 (NOTE: as of COB 11/19/01 the memo from the EDO to the Commissioners has not been issued, therefore, the DB and D.C. Cook 2 Orders will not be issued prior to Wednesday, 11/28.01).

Meetings & Conf. Call Summaries: The response to the bulletin and justification for delaying

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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~~ the latter telephone conference, the licensee indicated ~~that they would like to~~ it would provide additional information to the staff regarding this issue.

By letter dated November 5, 2001, the licensee provided additional information, including deterministic and probabilistic evaluations. ~~The~~ After reviewing this information, the NRC staff identified ~~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 two telephone calls on November 15, 2001, between J. Stang et al. and M. Rencheck, et al. (I&M). In the latter conference call, the staff provided its position, as described above, to allow the licensee to focus on items that could provide the staff with a basis to modify its position and find that Cook Unit 2 can operate until its scheduled refueling outage beginning on January 19, 2002. The staff also reiterated its intent to continue discussions with the licensee, as appropriate.

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

□ North Anna, Units 1 and 2

Licensee Plans/Commitments: The NRC received a supplemental response on November 19, 2001, regarding information to qualify the fall inspections for North Anna and Surry Units.

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.~~During an inspection in October 2001, the licensee identified several nozzles with cracking on the inside diameter of the nozzle and penetrant testing (PT) indications on the J-groove welds. The licensee determined that the nozzle cracking did not require repair. A staff review of the PT records concurred with the licensee's conclusions that the indications appeared to be surface indications and not relevant to a cracking mechanism. Via letter dated November 19, 2001, the licensee provided the documentation to support a "qualified visual" analysis to demonstrate acceptability of using "design" dimensions of the VHP penetrations and nozzles. The staff is reviewing this information.

–North Anna, Unit 2, has ~~an~~ a special outage for nozzle inspections in progress. Results from the visual examination indicated several nozzles that appeared to have boric acid deposits consistent with the findings at the Oconee plants and Crystal River Unit 3. Thus far the licensee has identified one of these nozzles with a through-wall crack in the J-groove weld (event report #38498). This crack was identified by the licensee due to staff insistence that the licensee destructively confirm the benign nature of PT indications on the J-groove welds dispositioned by the licensee as surface only and not relevant to a cracking mechanism.

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Repairs are being conducted on this nozzle and additional examinations are underway on two other suspect nozzles. Ultrasonic examination of the inside diameter of these three nozzles identified no cracking in the nozzle base metal.

With the findings at Unit 2, the staff will address with the licensee the PT findings at Unit 1.

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.

Drop-in visits were held by the licensee with the Commissioners and the EDO on November 19, 2001. A general status of the nozzle inspections at the North Anna and the Surry plants was provided by the licensee.

□ **Surry, Units 1 and 2**

Licensee Plans/Commitments: The licensee has committed ~~Commitment~~ to shutdown Surry Unit 2 ~~down~~ by 12/31/01, as docketed in a letter dated 11/14/01. This shutdown was scheduled to occur on November 19, 2001. The NRC received a supplemental response on November 19, 2001, regarding information to qualify the fall inspections for all North Anna and Surry Units.

NRC Staff Position: Surry Unit 1 has an outage in progress. The licensee is nearing completion of repairs on six penetrations (this is a correction as the last DST stated that only 5 repairs were ongoing) at Surry Unit 1. As mentioned above, the licensee committed to shutdown Surry Unit 2 prior to 12/31/01 to conduct inspections.

Staff will review the licensee's supplemental response regarding qualification of visual inspections for these units.

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 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 19, 2001
6:00 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~~This is the highest ranked moderate susceptibility plant.

□ North Anna, Unit 1

Inspections completed in September 2001. The licensee identified eight shallow axial cracks below the J-groove weld and penetrant testing (PT) indications on the J-groove welds. The licensee did not perform any repairs because these cracks were not part of the reactor coolant pressure boundary. A staff review of the PT records concurred with the licensee's conclusions that the indications appeared to be surface indications and not relevant to a cracking mechanism.

□ North Anna, Unit 2

North Anna, Unit 2, found a through-wall leak in a CRDM nozzle (event report issued). Repairs are being conducted on this nozzle and additional examinations are underway on two other suspect nozzles. Ultrasonic examination of the inside diameter of these three nozzles identified no cracking in the nozzle base metal.

□ Surry, Unit 1

The licensee is nearing completion of repairs on six penetrations (this is a correction as the last DST stated that only five repairs were ongoing).

□ Surry, Unit 2

The licensee intends to shutdown this plant on November 19, 2001 and perform inspections later in the week.

□ TMI-1

Following shutdown for a scheduled refueling outage in October 2001, TMI-1 performed visual inspections of the reactor vessel CRDM nozzles as recommended in NRC Bulletin 2001-01. The inspections revealed axially-oriented flaw indications in eight CRDM

nozzles, six nozzles were found to have cracks within the pressure boundary (five nozzles had through-wall cracks and one did not), the other two nozzles had cracks that were outside the pressure boundary. The licensee completed Code repairs on all six of the CRDM nozzles that had flaws within the pressure boundary. Additionally, the licensee performed visual inspections of the eight thermocouple (T/C) nozzles and found evidence of leakage on all of them. Two of the leaking T/C nozzles were replaced and the remaining six were plugged in accordance with Code requirements or as allowed by an NRC-approved relief request. These corrective actions are complete.

- **Oconee, Unit 3**

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

As of the morning of Monday, November 19, 2001, nine CRDM nozzles have been ultrasonically examined. These nozzles include the four nozzles that had visual indications of leakage, the three nozzles that were categorized as potential leakers based on visual examination results, and two additional nozzles. UT has verified that five nozzles have through-wall cracks. One nozzle (nozzle 2) has a circumferential indication which is not through-wall (approximately. 48 degrees in length).

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MODERATE SUSCEPTIBILITY PLANT INSPECTION RESULTS
NOVEMBER 19, 2001
6:00 P.M.

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.