

June 26, 2002

MEMORANDUM TO: File (Davis-Besse)

FROM: Douglas V. Pickett, Senior Project Manager, Section 2 **/RA/**
Project Directorate III
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

SUBJECT: DAVIS-BESSE NUCLEAR POWER STATION - SUMMARY OF
NUCLEAR REGULATORY COMMISSION (NRC) ACTIVITIES FOR THE
WEEK OF MARCH 18, 2002, RE: CONTROL ROD DRIVE MECHANISM
NOZZLE PROJECT (TAC NO. MB4479)

March 18:

Attachment 1 is the licensee daily status summary, which is used as the agenda for the daily status call. Attachment 2 is the vendor procedure for visual examination for leakage of reactor head penetrations.

March 19:

Attachment 3 is the licensee daily status summary with attached head cleaning plan. Items discussed included:

- Ultrasonic test (UT) results for Nozzle 11 under question.
- Concern raised about possible delamination between stainless steel cladding and ferritic steel.
- Nozzle 46 UT shows shadow that licensee is evaluating. No wastage identified associated with Nozzle 46.
- Nozzle 2 to be removed early or middle of next week.
- Discussion of as-found clad thickness. Mean thickness using one standard deviation is 0.297 inch. Minimum clad thickness measured to be 0.24 inch. We suggest they look at a range of numbers and sensitivity as part of their safety analysis.
- Licensee making standard Framatome repairs to Nozzles 1, 5 & 47.
- Milestone scheduled being worked on.

Attachment 7 includes the slides presented by the MRP at a meeting with the staff concerning the generic implications of Davis-Besse reactor pressure vessel (RPV) head corrosion.

March 20:

Public meeting with external stakeholders was held at NRC Headquarters. Attachment 8 is a copy of the slides from the meeting.

March 21:

Attachment 4 is the licensee daily status summary with attached integrated plan to inspect, evaluate, and remove Nozzle No. 2. Other items discussed included:

- The preliminary root cause report will not be made available to either Nuclear Reactor Regulation or Region III staff. The augmented inspection team (AIT) will see the report onsite and report to us.
- Advisory Committee on Reactor Safeguards would like for Davis-Besse to report to them on April 9 at 1:00 p.m.
- Licensee expected to submit milestone schedule.

Headquarters participants included:

Jay Collins	Andrea Lee	Allen Hiser	Mag Weston
Bill Cullen	Bill Bateman	Steve Bloom	Doug Pickett
Mike Switzer	Steve Long	Terence Chan	
Tim Steingass	Ken Karwoski	Tony Mendiola	

March 21:

Separate telecon held between staff and AIT team. Issues discussed included:

- Reactor coolant system (RCS) leakage during 1998 time-frame linked to excessive fouling of containment air coolers with boron residue. Differential pressure across coolers increases.
- Pressurizer rupture disk leakage may have masked boron buildup. Licensee intentionally breaks rupture disk in 1998.
- Boric acid accumulation in containment. Stalactites formed in containment. Eight bags of boron crystals swept out. Several containment entries documented to search for unidentified RCS leakage. RCS leakage at 0.2 to 0.3 gpm.
- Radiation elements getting high differential pressure alarms in May 1999. Reddish residue forming on filters. Monthly filter change-out increases to nearly daily. Laboratory analysis of filters indicates deposits were steam corrosion of ferritic metal. Licensee concludes the source was physically high in containment. Plume emanates from service structure.
- No one from Davis-Besse management recalls problems. One control room shift raised issue.
- Discussed history of flange leakage. Significant flange leakage in 1980s. Revised flange design installed in 1990 -1996 time frame. New flange leakage identified 1998 and 2000 outages.
- Tapes of previous refueling outages reviewed. Boron identified on RPV head in refueling outage (RFO) RF7 (1991). Boron identified on RPV head in RF8 (1993) and removed by water cleaning. RPV head inspected via camera in RF10 (1996) and boric acid identified. AIT team having trouble agreeing that 100 percent RPV head inspection occurred in RF10. Boric acid also found in RF11 (1998). Boric acid colors changes from white to brownish-red. Boron observed flowing downhill from areas between Nozzles 3 and 11. RPV head in RF12 (2000) characterized as "hideous." Weepholes clogged with boron. Described as thick, lava-like. Crow bars needed to remove.

Licensee convinced that source of boron was steam cut on flange. Licensee accepting boron on RPV head. Boron characterized as brown/red, rock hard, lava-like in RF13 (2002).

- Licensee's response to Generic Letter 88-05 says 100 percent nozzle inspection in 1996. Operators now acknowledge that video tapes can't support.
- Modification to install access ports deferred. Reasons for deferral included (1) analyses shows peripheral rods most susceptible to cracking. Did not expect cracks in center of RPV head, and (2) Cracking is an aging related mechanism. Licensee believes Oconee lead plant in this regard.
- Plant operators acknowledge that RPV head treated differently in boron control program. They used "engineering judgement" for RPV head.

March 22:

Attachment 5 is the licensee preliminary probable cause summary report. Attachment 6 is a draft list of NRC questions regarding the root cause analysis that need to be resolved with the licensee. Attachment 9 is the licensee daily status summary.

Headquarters participants included:

Bill Cullen	Andrea Lee	Steve Long	Doug Pickett
Carol Moyer	Bill Bateman	Steve Bloom	

March 22:

Call with AIT team and NRR technical staff. AIT team has preliminary root cause report (4 pages) in possession. Concern of why team has possession. Primary water stress corrosion cracking suspected in report.

Docket No. 50-346

- Attachments:
1. March 18 licensee status summary (1 page)
 2. Framatome ANP Procedure for Visual Examination for Leakage of Reactor Head penetrations (11 pages)
 3. March 19 licensee status summary (2 pages)
 4. March 21 licensee status summary with integrated plan for nozzle No. 2 (4 pages)
 5. Memorandum from S. Loehlein (licensee) to H. Bergendahl (licensee), dated March 22, preliminary probable cause summary report for CR2002-0891 (5 pages)
 6. Draft list of NRC questions regarding the root cause analysis (3 pages)
 7. Slides for MRP-NRC March 19 meeting on generic implications (12 pages)
 8. Slides from March 20 public meeting (13 pages)
 9. March 22 licensee status summary (1 page)

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