

July 11, 2001

MEMORANDUM TO: William D. Travers
Executive Director for Operations

FROM: Joseph Murphy, Chairman /RA/
Committee To Review Generic Requirements

SUBJECT: MINUTES OF THE COMMITTEE TO REVIEW GENERIC
REQUIREMENTS MEETING NUMBER 364

The Committee To Review Generic Requirements (CRGR) held a special 364th meeting on Monday, July 2, 2001, from 9:00 a.m. to 11:20 a.m., with the attendees listed in Attachment 1. The purpose of this meeting was to provide the CRGR with an opportunity to review and comment on a preliminary draft of a proposed Bulletin requesting information on control rod drive mechanism (CRDM) cracking, to avoid last minute scheduling delays in its issuance. The CRGR reviewed this preliminary draft with the understanding it was still under development, with further NRC internal review and industry interaction ongoing.

Jack Strosnider, Director, Division of Engineering, Office of Nuclear Reactor Regulation (NRR), provided background on the draft Bulletin (ADAMS Accession No. ML011860092). The Bulletin is needed to obtain information necessary for the NRC to determine what additional actions may be necessary in response to recently discovered circumferential cracking in CRDM reactor pressure vessel (RPV) nozzles. The Bulletin was presented as a Title 10 of the Code of Federal Regulations (CFR) Part 50.54 (f), information request to verify compliance with NRC regulations and plant technical specifications, requiring no backfit analysis. Mr. Strosnider asked the CRGR for technical and process comments on the briefing information supplied (ADAMS Accession No. ML011870110).

In their presentation (ADAMS Accession No. ML011870125), Allen Hiser and Mark Reinhart discussed the following issues with the CRGR members:

- The history of CRDM axial cracks and the circumferential cracking recently found at Oconee Unit 3.
- Regulatory and risk concerns about circumferential CRDM RPV head nozzle cracking.
- How through-wall axial cracks could lead to outer diameter primary water stress corrosion cracking (PWSCC) in CRDM RPV head nozzles.
- The susceptibility model developed by the industry, based on time at temperature, that was used to rank the susceptibility of each plant to PWSCC, in terms of the effective full power years for the plant to achieve the same condition as Oconee Unit 3. This model has large uncertainties. Arkansas Nuclear One, the only other plant than Oconee with observed boric

crystal formation indicating axial cracking, does not validate the accuracy or predictability of this model. The staff addressed issues with the effectiveness of leak detection by visual examinations due to the interference fit of the nozzles with the RPV head, the tightness of the PWSCC cracks, inspection techniques with various insulation configurations, cleanliness of RPV heads relative to prior existing boric acid leakage, and the ability to identify the source of boric acid deposits, e.g., from CRDM nozzles or other sources.

- The limitations in an industry submittal on cracking of CRDM RPV head nozzles that lacked consideration of crack incubation period and growth rates, and had limited consideration of postulated accident analysis/risk insights.
- The qualified visual and volumetric examinations that licensees would use to identify leakage or cracking in RPV head penetration nozzles
- The information the NRC needed to decide how to respond to CRDM nozzle circumferential cracking.
- The applicable regulatory requirements including General Design Criteria, Appendix B to 10 CFR §50, 10 CFR §50.55a, American Society of Mechanical Engineers Codes, and plant technical specifications that maintain primary system integrity by prohibiting through-wall reactor coolant system leakage.
- NRR's conclusion that this Bulletin will request information to verify compliance with existing, applicable regulatory requirements, which does not require a backfit analysis.

The Chairman of the CRGR commended the presenters for clearly communicating this complex technical issue so it was readily understood.

The safety implications of cracking propagation rates compel prompt action. An information request at this time will enable early planning for the inspections during upcoming refueling outages. This could result in lower radiation doses for inspection and repair personnel, in what everyone recognized as a dose-intensive effort that could have significant ALARA consequences.

The CRGR discussed the applicable regulatory requirements to be verified by this Bulletin and agreed that 10 CFR §50.55a and plant technical specifications should apply to every plant of concern.

The CRGR made the following suggestions:

- It would be prudent for the staff to consider contingency plans in terms of available regulatory options if the NRC is not satisfied with the responses from this Bulletin's request for information, and whether those options could be supported by a backfit analysis.
- The authors should consider using the specific language in 10 CFR §50.54(f) that the information is being sought "to enable the Commission to determine whether or not the license should be modified, suspended, or revoked."

- The Bulletin should request only that information that the NRC needs to know to decide how to respond to CRDM RPV nozzle cracking.
- The staff should not treat the 100% visual and volumetric examination suggestions in the discussion section as requirements.
- It would be prudent for the staff to consider developing a Temporary Instruction regarding the onsite inspection needed on the various aspects of this bulletin.

A final CRGR meeting on this subject may be held if any of the Committee members wish, after reviewing a red line/strike out version of the final Bulletin that incorporates comments from the Advisory Committee on Reactor Safety.

Questions about these meeting minutes should be referred to Robert Spence at RAS2@nrc.gov.

Attachment: As stated

cc w/att: See attached list

Memorandum dated: 07/11/01

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E. William Brach, NMSS	O-13 D13
Samuel J. Collins, NRR	O-5 E7
Ashok C. Thadani, RES	T-10 F12
Roy P. Zimmerman, RES	T-10 F12
Michael E. Mayfield, RES/DET	O-10 D20
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Edwin M. Hackett, RES/DET/MEB	T-10 E10
Deborah A. Jackson, RES/DET/MEB	T-10 E10
Wallace Norris, RES/DET/MEB	T-10 E10
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David B. Matthews, NRR/DRIP	O-12 E5
Jack R. Strosnider, Jr., NRR/DE	O-9 E3
William H. Bateman, NRR/DE/EMCB	O-9 H6
Keith R. Wichman, NRR/DE/EMCB/A	O-9 H6
Allen L. Hiser, Jr., NRR/DE/EMCB/A	O-9 H6
C.E. (Gene) Carpenter, Jr., NRR/DE/EMCB/A	O-9 H6
Jacob I. Zimmerman, NRR/DLMP	O-8 B1
James W. Clifford, NRR/DLPM/PDI-2	O-8 B1
Suzanne C. Black, NRR/DSSA	O-8 E1
Frank P. Gillespie, NRR/DRIP	O-12 E5
Ledyard B. (Tad) Marsh, NRR/DRIP/REXB	O-12 D12
James W. Shapaker, NRR/DRIP/REXB	O-12 D1
Robert K. Caldwell, NRR/DRIP/REXB	O-12 D1

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Ralph R. Landry, NRR/DSSA/SRXB
Jin Wook Chung, NRR/DSSA/SPSB
F. Mark Reinhart, NRR/DSSA/SPSB
Bruce A. Boger, NRR/DIPM
William M. Dean, NRR/DIPM
John A. Zwolinski, NRR/DLPM
Hubert J. Miller, Regional Administrator, Region I
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Bruce S. Mallett, Deputy Regional Administrator, Region II
James E. Dyer, Regional Administrator, Region III
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RGN-IV

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CRGR MEETING No. 364
LIST OF ATTENDEES
(July 2, 2001)

CRGR Members

Joseph A. Murphy, Chairman
R. William Borchardt, NRR (alternate)
E. William Brach, NMSS (alternate)
Bruce S. Mallett, RGN-II
Janice E. Moore, OGC (alternate)
Roy P. Zimmerman, RES

Robert A. Spence, CRGR Staff

OGC Staff

Richard K. Hoefling, OGC

RES Staff

Deborah A. Jackson, RES/DET/MEB
Edwin M. Hackett, RES/DET/MEB
Wallace Norris, RES/DET/MEB
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