

December 15, 2011

MEMORANDUM TO: Brian W. Sheron, Director
Office of Nuclear Regulatory Research

FROM: Eric J. Leeds, Director */RA/*
Office of Nuclear Reactor Regulation

SUBJECT: AMENDMENT TO USER NEED REQUEST NRR 2010-002,
CONTAINMENT LINER CORROSION

This memorandum updates the Office of Nuclear Reactor Regulation (NRR) subject user need request for assessing through-wall corrosion of containment liners. This user need request is specific to corrosion initiating at the liner-concrete interface and is not related to corrosion that can occur at the containment floor-to-liner joint when moisture barriers are not properly maintained. When completed, the information will assist the staff in determining whether any additional inspection is needed beyond that currently implemented in accordance with the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code) Section XI IWE inspections of the containment liner. In addition, this research may be used in updating various review guidance documents (e.g., Generic Aging Lessons Learned). A greater understanding of the corrosion mechanism may also be important to the Office of New Reactors (NRO) since it could affect the inspection activities related to the construction of new reactor plants.

NRR User Need 2010-002 "Containment Liner Corrosion," was accepted by the Office of Nuclear Regulatory Research in December, 2009. Since that time, a number of activities have occurred including an expert panel workshop, an ACRS Full Committee briefing by NRC staff, and the issuance of two technical letter reports. NRC staff from NRR and RES formed a working group that evaluated the expert panel's final report and recommended additional work be performed under Task 2 to better understand the potential rate of corrosion and the implications for leakage from containment during a design basis accident. The purpose of this memorandum is to amend the user need to acknowledge the tasks that have been completed and to request the additional work.

This amendment was discussed with Darrell Dunn and Mirela Gavrilas of your staff. We understand from these discussions that the scope and schedule of the tasks described below are achievable. In addition, the Directors of the lead Divisions in each of our Offices, Pat Hiland and Michael Case, have discussed and agree with the scope and schedules of the tasks in this request. We have also discussed this request with staff from NRO. The NRR contact responsible for this request is Paul Klein from the Division of Engineering.

CONTACT: Paul A. Klein, NRR/DE
(301) 415-4030

B. Sheron

Technical Issue, Regulatory Application, Deliverables and Schedule of Requested Tasks

Task 1: Evaluate historical information related to liner corrosion

Status

This task was completed by the issuance of technical letter report "Containment Liner Corrosion Operating Experience Summary Technical Letter Report," ADAMS Accession No. ML112070867.

Task 2: Determine the corrosion mechanism related to through-wall liner corrosion

Status

Phase 1 "Identification of the Corrosion Mechanism," and Phase 3 "Influence of Construction Practices, Operation, and Aging," are completed by the issuance of technical letter report "Nuclear Containment Steel Liner Corrosion Workshop: Final Summary and Recommendation Report," ADAMS Accession No. ML112150012.

NRR is requesting additional analysis and modeling be performed under Phase 2. The objectives of this work include:

- (1) Refining the corrosion model to determine the extent of corrosion that could occur over one to two operating cycles if a small through-wall hole propagating from the liner-concrete interface was not immediately detected by visual inspection.
- (2) An analysis of the potential leakage during a design basis accident from the liner hole modeled in item 1. This analysis should consider a range of conditions such as the corrosion site being free of corrosion product or packed with corrosion product and the hole location being close to or remote from a containment penetration.

The results of this task will provide useful information for updating the GALL report and will provide information helpful to the staff in identifying whether additional research or regulatory action is needed.

- (d) Schedule –Technical Letter Report summarizing the results from items 1 and 2 above.

Draft report – July 2012
Final report – October 2012

Task 3: Using the knowledge obtained about the corrosion mechanism, determine if certain plant designs or construction practices result in greater susceptibility to liner corrosion.

B. Sheron

Status

This task was completed by the issuance of technical letter report "Nuclear Containment Steel Liner Corrosion Workshop: Final Summary and Recommendation Report," ADAMS Accession No. ML112150012.

Task 4: Provide technical assistance to NRR in support of public meetings.

This task will continue.

(d) Schedule: As needed, not anticipated to exceed 2 meetings through December 2013.

Priority

NRR has ranked this user need request according to the Planning, Budgeting, and Performance Management process. The priority of this request for assistance was determined to be a high priority. My staff has used this priority value in their discussions with members of your staff to determine whether your office can support our schedule requirements. These discussions indicate that RES can support the scope and proposed schedule identified in this user need request.

Points of Contact

The NRR technical contact for this research is Paul Klein in the Division of Engineering. The RES technical contact is Darrell Dunn in the Division of Engineering.

B. Sheron

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ADAMS Accession No.: ML113490013

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