



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

MEMORANDUM
MAY 13th, 2004

TO: Jack Strosnider, Director
Office of Nuclear Material Safety
and Safeguards

FROM: Alexander P. Murray, Senior Chemical Process Engineer
Mixed Oxide Facility Licensing Section
Special Projects Branch
Division of Fuel Cycle Safety
and Safeguards

Alex

SUBJECT: STATUS OF DIFFERING PROFESSIONAL VIEW CONCERNING
MODELING CHEMICAL CONSEQUENCE EFFECTS FOR
DETERMINING SAFETY REQUIREMENTS AT THE PROPOSED
MIXED OXIDE (MOX) FUEL FABRICATION FACILITY, DOCKET
NUMBER: 070-03098
(NMSS-DPV-2002-03)

The subject Differing Professional View (DPV) was submitted on December 19, 2002, with three recommendations. The DPV Panel essentially agreed with the DPV and made four recommendations in its report (September 30th, 2003). On October 3rd, 2003, the Director of NMSS directed the Office of Fuel Cycle Safety and Safeguards (FCSS) to take specific actions in response to the four DPV Panel recommendations. FCSS responded on January 12th, 2004, indicating no further actions are necessary and implied all actions have been completed.

I provided an analysis of the FCSS response on January 22nd, 2004, and noted the following concerns:

- The information cited in the FCSS memorandum for closure had already been reviewed by the DPV Panel and found not to address the safety issues.
- The DPV Panel's recommendations on guidance do not appear to have been followed, particularly for software quality assurance and code validation/verification for safety determinations.

A copy of my memo is attached. I have not received any explicit response to this memo. However, the MOX Newsletter dated March 2004 affirmed that all recommendations regarding this DPV have been implemented.

Please provide me with the NMSS assessment of the DPV status.

cc: Robert O'Connell, IMNS

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MEMORANDUM
JANUARY 22, 2004

TO: Robert C. Pierson, Director
Division of Fuel Cycle Safety
and Safeguards
Office of Nuclear Material Safety
and Safeguards

FROM: Alexander P. Murray, Senior Chemical Process Engineer *Alex*
Special Projects Section
Special Projects and Inspection Branch
Division of Fuel Cycle Safety
and Safeguards
Office of Nuclear Material Safety
and Safeguards

SUBJECT: COMMENTS ON JANUARY 12, 2003 MEMO, ENTITLED,
"FCSS ACTIONS TO IMPLEMENT NMSS DIRECTOR'S DECISION ON
DIFFERING PROFESSIONAL VIEW CONCERNING MODELING
CHEMICAL CONSEQUENCE EFFECTS FOR DETERMINING SAFETY
REQUIREMENTS AT THE PROPOSED MIXED OXIDE (MOX) FUEL
FABRICATION FACILITY, DOCKET NUMBER: 070-03098
(NMSS-DPV-2002-03)"

Thank-you so much for providing me with a copy of the subject memo. As the Lead Chemical Safety Reviewer and the author of the Differing Professional View (DPV) cited in the memo, I am a little surprised because nobody contacted me beforehand to solicit my input, comments, and suggestions. As explained below, I am concerned that some items in the subject memo appear rushed and do not adequately respond to the safety issues raised by the DPV or the DPV Panel's report, which echoed and endorsed most of the DPV issues. I want to emphasize that these safety issues directly impact the ongoing safety assessment of the principal structures, systems, and components (PSSCs) and their design bases in the proposed facility, and are appropriate for the Construction Authorization Request (CAR) stage. I am willing to discuss these concerns with you further and assist with the FCSS response.

On Director's Decision 1, my reading of the DPV Panel's report indicates the information in Attachments 1-4 of the subject memo was reviewed by the DPV Panel and found not to address the safety issues. The DPV Panel concluded additional information should be provided on the license application's docket, such as software qualification and validation, and tailoring of the code to the specific site, including diffusion coefficient modifications, data output, interpolations, and uncertainties. Such site specific information would include comparison of site dispersion testing with model predictions, and adjustments as necessary. As noted by the

DPV Panel and the NMSS Office Director, the applicant should be required to submit on the docket such technical rationale demonstrating the reasonableness of their use of ARCON 96 for MOX safety-related decision-making. At the present time, the applicant's use of the ARCON 96 dispersion code appears to produce concentration results that are lower than predictions from other acceptable codes by one or two orders of magnitude, and that these concentration results may be unrealistic and nonconservative, resulting in potential safety controls being overlooked. Thus, at the present time, the applicant's use of the ARCON 96 code does not appear to be sufficiently justified and documented for the specific MOX use on the docket, and does not seem to meet the acceptance criteria of bounding and conservative concentration estimates, as discussed in Chapters 5 and 8 of the MOX Standard Review Plan (NUREG-1718).

On Director's Decisions 2 and 4, the DPV and the DPV Panel's report noted that the guidance used for the MOX review mentions multiple examples of computer codes that could be used by the applicant and the staff. However, the DPV and DPV Panel's reports also found the exercise of these codes can give results that differ significantly (e.g., by up to two orders of magnitude) even with the same input data. The staff does not have adequate guidance on differentiating between the acceptability of code results nor what constitutes acceptability, realism, and adequate conservatism. As noted above and in the DPV, the code results cited by the applicant and the prevailing staff/management position result in the lowest concentrations and consequences - again, this appears to be neither realistic nor conservative. Also, NRC guidance on software quality assurance and validation does not appear to have been followed.

On Director's Decision 3, the issuance of the "user-need" memo is positive. Please keep me informed and, as the situation develops, involve myself and other safety reviewers.

cc:

Frederick Burrows, FCSS
Jennifer Davis, FCSS
Margaret Federline, NMSS
Robert O'Connell, IMNS
Walter Schwink, FCSS
Marty Virgilio, NMSS