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Mario V. Bonaca, Chairman  
Advisory Committee on Reactor Safeguards  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555-0001

SUBJECT: FRAMATOME-ANP S-RELAP5 REALISTIC/LARGE-BREAK LOSS-OF-COOLANT ACCIDENT CODE

Dear Mr. Bonaca:

In your letter dated December 20, 2002, on the above subject, the Committee agreed with the staff's decision to approve the use of S-RELAP5 to satisfy the 10 CFR 50.46 requirements for analyses of large-break loss-of-coolant accidents. Several of your observations regarding the staff's review of the S-RELAP5 code are also applicable to future reviews. Those observations will continue to be considered in future reviews of thermal-hydraulic computer codes. The staff's comments on the six recommendations discussed in your letter are provided below.

**RECOMMENDATION 1:** The S-RELAP5 code should be approved for application to realistic large-break LOCA analyses.

The staff of the Office of Nuclear Reactor Regulation has prepared for release its Safety Evaluation Report on the Framatome ANP S-RELAP5 code application to realistic large-break LOCA analyses.

**RECOMMENDATION 2:** The staff should confirm that zirconium oxide spallation during a LOCA is not a significant phenomenon that needs to be modeled in realistic codes.

The Office of Nuclear Regulatory Research (RES) plans to perform tests with complicated and realistic temperature conditions to determine if the conditions produce additional unforeseen effects on high-burnup fuel. The tests will include conditions that might lead to spallation of preexisting zirconium oxide from the cladding. RES and the Office of Nuclear Reactor Regulation will consider the results from those tests and their effect on computer code models.

**RECOMMENDATION 3:** The staff should continue to accept the treatment of the break size as a statistical variable.

The staff will continue to accept the treatment of the break size as a statistical variable.

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RECOMMENDATION 4: Future submittals of this code should include:

- Improved documentation that can be more readily understood by technically knowledgeable reviewers
- Assessment of the sensitivity of code predictions to terms in the momentum equations
- Comprehensive nodalization studies

Documentation submitted in support of the code reviews has shown a steady improvement during the past few reviews. However, the staff will continue its efforts with licensees and vendors to improve code documentation, so that it is more thorough and transparent to the knowledgeable reviewer. As a part of the computer code review process, the staff has been requesting submittal of the code itself. The staff will continue to do so and thus be in position to continue exercising the code under review in such areas as nodalization, and sensitivity to the various models including the momentum equations.

RECOMMENDATION 5: The staff should investigate ways to facilitate updating of the computer platforms on which approved codes can be run.

With respect to the issue of computer platforms, the staff does not believe it should play a role in determining which computer platform a vendor, applicant, or licensee uses to run its computer code. Codes developed for the purpose of satisfying the requirements of 10 CFR 50.46 must be maintained under configuration control in accordance with the requirements of 10 CFR Part 50, Appendix B. Migration of a code from one platform to another is an economic decision made by the individual code owner and has no safety consequences.

Some code owners have determined that it is not economical to move their codes to the latest platform as the platforms change, because doing so means requalifying the code and code users each time it is moved. The staff does not believe that it should be involved in platform migration decisions nor does it believe the quality requirements of 10 CFR Part 50, Appendix B, impose an unnecessary burden on code owners.

RECOMMENDATION 6: The staff should make independent audit calculations as part of the assessment of vendor codes. This will be facilitated when the TRAC-M code becomes operational.

The Office on Nuclear Regulatory Research is moving forward in the development of a new independent confirmatory thermal-hydraulic computer code. This code, TRAC-M, has already been used in limited applications, and we expect that its use by both NRR and RES will become more widespread as it matures.

The Advisory Committee on Reactor Safeguards (ACRS) comments provided throughout the S-RELAP5 code review have been useful in the staff's code review efforts. The recent thermal-hydraulic computer code reviews and the continuing interactions with the ACRS are significant parts of the review process which the staff believes will continue to improve.

Sincerely,



William D. Travers  
Executive Director  
for Operations

cc: Chairman Diaz  
Commissioner Dicus  
Commissioner McGaffigan  
Commissioner Merrifield  
SECY