

June 19, 2001

Dr. William D. Travers
Executive Director for Operations
U.S. Nuclear Regulatory Commission
Washington D.C. 20555-0001

SUBJECT: RESPONSE TO YOUR APRIL 12, 2001 LETTER ON ISSUES RAISED BY
ACRS PERTAINING TO INDUSTRY USE OF THERMAL-HYDRAULIC
CODES

Dear Dr. Travers:

Thank you for your letter of April 12, 2001, in which you describe the actions that the staff is taking to manage the issues raised by the ACRS concerning thermal-hydraulic codes. We suggest that you reconsider two of your responses.

In response to our Recommendation 6, you state that the study would "require substantial resources." This assessment needs to be balanced against the cost to the NRC in credibility with the informed technical community, and perhaps eventually in public safety, of continuing to approve codes that for decades have contained questionable simplifications at a fundamental level. Some of these simplifications are extreme enough to invite serious questions by expert reviewers regarding their adequacy. We suggest that the staff assess a range of appropriate studies to justify these simplifications. In addition to increasing confidence in code predictions, results that could be published in the open literature would help to reassure the technical community that these codes work for good reasons and would support the Commission's Performance Goal of increasing public confidence.

Furthermore, you suggest that the present system, based on PIRT (Phenomena Identification and Ranking Table) is adequate to address the issue. PIRT is a method whereby experts agree on the important phenomena to model in a code. Although in some cases it may provide insight into why a code may give satisfactory results despite limitations, the PIRT does not address the question of how adequately the phenomena are actually modeled.

The "PIRT-based assessment matrix," mentioned in your letter as being used to assess the TRAC-M code of the Office of Nuclear Regulatory Research appears to be an attempt to tie the assessment process more rigorously to the results of the PIRT. We look forward to discussing the results of this improvement with the staff later this year. In the past, the code assessment process has been overly qualitative and has permitted the persistence of weak elements in the codes.

We also wish to clarify Recommendations 8 and 9.

We accept that both the Code Scaling, Applicability, and Uncertainty evaluation methodology and draft Regulatory Guide DG-1096 address the importance of uncertainty analysis. We are also aware that Regulatory Guide 1.174 recognizes that many sources of uncertainty are not readily quantifiable at the present time.

What concerns us is an excess of leeway in the expectations of the staff. This allows treatment of uncertainties to take place in an atmosphere of negotiation in which many arguments are qualitative and criteria for evaluation are unspecified. We believe that the NRC should move toward establishing a mature process for evaluating uncertainties — a process that has an intellectual backbone, is validated by data and experience, and can be clearly communicated to the informed public.

Sincerely,

/RA/

George E. Apostolakis
Chairman

References:

1. Letter dated April 12, 2001, from William D. Travers, Executive Director for Operations, NRC, to George E. Apostolakis, Chairman, ACRS, Subject: Issues Associated With Industry-Developed Thermal-Hydraulic Codes.
2. Report dated January 11, 2001, from George E. Apostolakis, Chairman, ACRS, to Richard A. Meserve, Chairman, NRC, Subject: Issues Associated With Industry-Developed Thermal-Hydraulic Codes.
3. U.S. Nuclear Regulatory Commission, Draft Regulatory Guide, DG-1096, "Transient and Accident Analysis Methods," dated July 18, 2000.
4. U.S. Nuclear Regulatory Commission, Regulatory Guide 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis," July 1998.