7/31/08
73FR 44778 (6)

September 5, 2008

I recently became aware that the NRC is soliciting Public Comments on Documents Under Consideration To Establish the Technical Basis for New Performance-Based Emergency Core Cooling System Requirements and that Comments on these documents should be submitted by September 5, 2008. The NRC announced the availability of Research Information Letter (RIL) 0801, ''Technical Basis for Revision of Embrittlement Criteria in 10CFR 50.46'' and NUREG/CR–6967, ''Cladding Embrittlement During Postulated Loss-of-Coolant Accidents,'' and it is seeking public comment on these documents.

On page 15 of 18 in RESEARCH INFORMATION LETTER 0801 I read:

The IRSN report also points out that there have been no bundle tests with irradiated fuel rods, nor any bundle tests with modern cladding alloys. As a consequence of the IRSN concerns, a proposal was made to perform bundle tests in the IRSN PHEBUS test reactor. The proposed tests are very expensive and have not yet received widespread support.

The following reference discloses that NRC has conducted bundle tests with irradiated fuel rods.

Memo to Matthews/Black-Technical Safety Analysis of PRM-50-76, A Petition for Rulemaking to Amend Appendix K to 10 CFR Part 50 and Regulatory Guide 1.157 - ML041210109. April 29, 2004

On page 8 of the above reference I read:

In the early 1980's, the NRC through Pacific Northwest Laboratories (PNL) contracted with National Research Universal (NRU) at Chalk River, Ontario, Canada to run a series of LOCA tests in the NRU reactor. More than 50 tests were conducted to evaluate the thermal-hydraulic and mechanical deformation behavior of a full length 32-rod nuclear bundle during the heatup, reflood and quench phases of a large break LOCA. Two tests were initially selected (References 17 and 18) for COBRA/TRAC (Reference 19) simulation to assess the applicability of that code. The NRC is reviewing the data from this program to determine the value of using it to assess the current generation of codes such as TRAC-M (Reference 20), now renamed TRACE.

And on page 9 I read:

As mentioned above, the NRC is attempting to obtain the NRU Zircaloy clad nuclear fuel bundle test results for further code assessment.

And on page 10 I read:

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NRC has continued to study complex thermal hydraulic effects on ECCS heat transfer processes during accident conditions related to LOCAs (Reference 21) consistent with Commission direction. The NRC funded more than 50 Zircaloy clad bundle reflood experiments at the NRU reactor (References 17 and 18).

References 17, 18, 19, and 21 of the above paragraphs are:

17. C. L. Mohr, et al., "Prototypic Thermal-Hydraulic Experiment in NRU to Simulate Loss-of-Coolant Accidents," PNL-3681 NUREG/CR-1882, Pacific Northwest Laboratory, 1980.

18. C. L. Mohr, et al., "Loss of Coolant Accident Simulations in the National Research Universal Reactor, Safety Analysis Report." PNL-3093 NUREG/CR-1208, Pacific Northwest Laboratory, 1981.

19. M. J. Thurgood, et al., "COBRA/TRAC - A Thermal-Hydraulics Code for Transient Analysis of Nuclear Reactor Vessels and Primary Systems, Developmental Assessment and Data Comparisons." PNL-4385 NUREG/CR-3046, Volume 4, Pacific Northwest Laboratory, 1982.

21. "Compendium of ECCS Research for Realistic LOCA Analysis." NUREG-1230, December 1988.

Now, it has been over four years since Mathews/Black reported on April 29, 2004, that, "*... NRC is attempting to obtain the NRU Zircaloy clad nuclear fuel bundle test results for further code assessment.*" And, that was twenty years after the, "*More than 50 tests were conducted to evaluate the thermal-hydraulic and mechanical deformation behavior of a full length 32-rod nuclear bundle during the heatup, reflood and quench phases of a large break LOCA.*"

Certainly, by now, the NRC should have documented those **more than 50 tests** and applied the results in its licensing of nuclear power plants. It appears that those tests may not have produced acceptable results and it appears that this must be known by the NRC.

On page 3 Mathews/Black quote from PRM-50-76 (ML022240009):

"*...the conditions of the very small scale laboratory tests were thus not typical of the complex thermal-hydraulic conditions that prevail during a LOCA.*"

The NRC persists in pursuing and defending its investigations via pencil length single tubes (Cathcart-Pawel) and thumbnail-size ring sections (NUREG/CR–6967) while it does not disclose the findings of **more than 50 tests** by PNL at NRU.

Robert H. Leyse
P. O. Box 2850
Sun Valley, ID 83353