

May 22, 2997

COMSECY-07-0019

MEMORANDUM TO: Chairman Klein
Commissioner McGaffigan
Commissioner Merrifield
Commissioner Jaczko
Commissioner Lyons

FROM: Luis A. Reyes */RA William F. Kane Acting for/*
Executive Director for Operations

SUBJECT: STATUS OF NRC RESEARCH CONDUCTED BY THE RUSSIAN
RESEARCH CENTER AND THE RUSSIAN ACADEMY OF
SCIENCES

This memorandum provides a biennial report on the status of research conducted by the Russian Research Center (RRC) and the Russian Academy of Science (RAS) and requests Commission approval to discontinue submitting biennial reports given the stability of the program.

The RRC and the RAS have been performing research for the Nuclear Regulatory Commission (NRC) under bilateral agreements since 1991. This work has been funded by the Office of Nuclear Regulatory Research (RES) and has involved research in code development and assessment, hydrogen combustion experiments, high-burnup fuel test data, in-vessel debris coolability experiments, evaluation of reactor pressure vessel surveillance data, uncertainty analysis methods, and development of concrete-containment failure criteria. Over time, the parties have developed a solid working relationship and there have been no significant concerns with the administration of this work. From 1991 through 2003, RES provided annual reports to the Commission describing the NRC research programs being conducted in Russia. As identified in SECY-03-0081, "Status of USNRC Research Conducted by the Russian Research Center (I.V. Kurchatov Institute) and the Russian Academy of Sciences and Letters of Agreement," dated May 19, 2003, interactions between the agencies became routine and staff requested to eliminate the reporting requirement. In Staff Requirements Memorandum to SECY-03-0081, dated June 10, 2003, the Commission disapproved the staff recommendation, and directed staff to reduce the reporting frequency to once every two years.

The bilateral agreement with the RRC took effect on August 11, 2002, and expires on August 11, 2007. There are no plans to extend the agreement for the fuel behavior and material science research program. The RRC program analyzed and published high-burnup fuel data from a pulse reactor, which became part of the database RES used to resolve the reactivity-initiated accident issue (Research Information Letter 0401, dated March 31, 2004). The data results and analysis of this high-burnup fuel experimental study were formally

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published as NUREG/IA-0213 "Experimental Study of Narrow Pulse Effects on the Behavior of High Burnup Fuel Rods with Zr-1%Nb Cladding and UO₂ Fuel (VVER Type) under Reactivity-Initiated Accident Conditions," in 2006 (Volume 1, dated May 2006 and Volume 2, dated March 2006). In addition, loss-of-coolant accident related data on the Russian's E110 cladding has been instrumental in understanding the behavior of Framatome's M5 cladding and preparing for rulemaking on 50.46b. Finally, successful comparisons between the Russian BARS neutron kinetics code and NRC's Purdue Advanced Reactor Core Simulator (PARCS) code have put RES in a position to analyze reactivity transients with 3-D accuracy.

The bilateral agreement with RAS addresses MELCOR modernization and assessment. The current agreement spans from 2005 to 2009 at a cost of \$220K per year. The RAS program restructured the code architecture from FORTRAN 77 to FORTRAN 95 to facilitate future MELCOR maintenance and development activities. This was completed in 2006, and a new version of the code, MELCOR 2.0, was released in September 2006. Ongoing activities in the RAS program include performing an independent assessment of the MELCOR code and developing a graphical user interface.

In view of the stability of the program, the annual review provided through the planning, budgeting and performance management process, and the ongoing project monitoring by RES, the staff recommends that the biennial report to the Commission be discontinued. Staff will keep the Commission informed, if necessary, of any developments regarding this program through Notes to the Commissioners' Assistants, Memo to the Commission, or other communication vehicle. Accordingly, the staff believes that this should be the last biennial update on the subject research programs.

SECY, please track.

cc: SECY
OGC
OCA
OPA
CFO