

December 19, 2007

MEMORANDUM TO: Frank P. Gillespie, Director
Advisory Committee on Reactor Safeguards

FROM: Farouk Eltawila, Director */RA/*
Division of Systems Analysis
Office of Nuclear Regulatory Research

SUBJECT: INFORMATION FOR BRIEFING THE ACRS ON "FINDINGS AND
USE OF RESULTS FROM PHÉBUS-FP TESTS TO VALIDATE
THE NRC'S MELCOR SEVERE ACCIDENT CODE AND
REVISED ACCIDENT SOURCE TERM (NUREG-1465)"

RES is scheduled to brief the ACRS in March 2008 on the findings and use of the Phébus Fission Product (Phébus-FP) tests to validate the NRC's MELCOR Severe Accident Code and the Revised Accident Source Term (NURG-1465). The enclosed draft research information letter summarizes the insights from the Phébus-FP test results, which are being used to validate aspects of the NRC's revised "Accident Source Terms for Light-Water Nuclear Power Plants" (NUREG-1465), as well as the NRC's integral severe accident analysis code, MELCOR. In addition, an evaluation of the Phébus-FP data suggest that - the control of the pH of sumps in reactor containment has no significant impact on the development of a gaseous iodine concentration in the reactor containment following an accident involving core degradation.

The Phébus-FP tests are performed in the Phébus test reactor in Cadarache, France, under a program that receives support from the NRC under a bilateral agreement with the Institut de Radioprotection et de Sécurité Nucléaire (IRSN). Overall, Phébus-FP integral test data and the analyses of these data have contributed to our confidence in the use of MELCOR code for safety analysis and risk-informed decision making. The test data have also bolstered confidence in NUREG-1465 as appropriate for the use in design basis dose assessment reviews (i.e., Regulatory Guide 1.183). Any necessary revision to NUREG-1465 in regard to the need for pH control in the sump will be undertaken once the confirmatory research is completed to address gaseous iodine evolution from containment surfaces that are not directly affect by pH control measures (i.e., iodine in the containment atmosphere or deposited on containment

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surfaces). The confirmatory research is carried out under the IRSN Phébus-Source Term Separate Effects Test (STSET) program and the Committee on the Safety of Nuclear Installations (CSNI) Behavior of Iodine Project (BIP). NRC is participating in both the Phébus-STSET and CSNI-BIP.

We look forward to discussing this important work with ACRS and appreciate comments from the ACRS thereafter.

Enclosures:

1. RIL 0702
2. NRC's Revised Accident Source Term
3. Phébus-FP Program
4. The Need for Sump Buffering

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