

August 9, 2000

MEMORANDUM TO: William F. Kane, Director  
Office of Nuclear Material Safety and Safeguards

FROM: Ashok Thadani, Director */RA/*  
Office of Nuclear Regulatory Research

SUBJECT: PUFF-III COMPUTER CODE

Attached is a copy of NUREG/CR-6650, "PUFF-III: A Code for Processing ENDF Uncertainty Data Into Multigroup Covariance Matrices." It is a deliverable in response to a user need memo from Carl Paperiello to David Morrison dated January 4, 1996, "Request for Assistance in Developing Independent Capabilities for Processing Nuclear Cross-Section Data" as well a user need memo from Robert Bernero to Eric Beckjord dated July 29, 1994, "Request for Technical Assistance for the Extrapolation of Criticality Benchmark Data." This activity is part of a larger effort that is being carried out by RES to support the development of criticality safety technology for licensing review, which includes developing a Standard Review Plan (SRP) for use by the NRC in the review of license applications that incorporate burnup credit. The SRP will provide the NRC with guidance and criteria for assessing the technical information provided by the applicant.

The eventual aim in the implementation of burnup credit is to reduce unnecessary regulatory burden while still maintaining sufficient margins of safety. Until recently, with the limited actinide only burnup credit guidance of ISG8, criticality safety analyses for spent nuclear fuel casks were performed under the assumption that the fuel was unirradiated (not burned). This fresh fuel assumption had been used as a bounding condition because of unresolved issues over the technical bases and methods for including reactivity credit for fuel burnup in the criticality analysis of spent fuel casks. However, use of the fresh fuel assumption leads to overly conservative criticality constraints on cask design since no negative reactivity credit is taken for the actual increase in neutron absorptions due to fuel irradiation. The objective of the present work is to supply the technical bases for relaxation of some of these overly conservative restrictions on the limited actinide only burnup credit guidance as well as provides for extension to full burnup credit (actinide and fission products) for PWR, BWR and MOX fuel casks. This process will lead to more effective, efficient and realistic decisions made by the NRC.

In addition to the above, we are utilizing the Phenomena Identification and Ranking Tables (PIRT) methodology to identify and rank phenomena or processes that are important to criticality safety. The PIRT process is being carried out through a series of public meetings posted on the NRC/RES Web site. This activity provides information to the public about criticality safety issues, and a path for meaningful input and dialogue.

William F. Kane

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Additional copies may be obtained from David Ebert of my staff, and is available directly through ADAMS @ML003732281 as well as the NRC Web site:  
<http://www.nrc.gov/NRC/NUREGS/R6650/cr6650.pdf>

Attachment: As stated

cc w/att.: C. Paperiello, EDO

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