

March 29, 2002

MEMORANDUM TO: E. William Brach, Director
Spent Fuel Project Office
Office of Nuclear Material Safety
and Safeguards

FROM: Carl Withee, Issue Leader */RA/*
Nuclear Criticality Safety Committee
Office of Nuclear Material Safety
and Safeguards

SUBJECT: FUTURE FUNDING FOR SCALE CODE MAINTENANCE

The Office of Nuclear Material Safety and Safeguards (NMSS) Nuclear Criticality Safety (NCS) Committee was established in 1996 to provide a mechanism for the U. S. Nuclear Regulatory Commission (NRC) NCS staff to share information, foster professional development, coordinate positions on technical issues, and provide management with recommendations on matters related to NCS. Since that time, the Committee has served in an ad-hoc capacity. The Committee recently met and discussed a major problem concerning future funding for maintenance of the primary NCS computer code system used by both NRC and its applicants/licensees. This memo provides a recommended solution to the problem.

In the late 1970's, NRC recognized that many applicants were using rudimentary methods in performing their nuclear safety analyses, particularly for transportation packages. To improve this situation, NRC funded Oak Ridge National Laboratory (ORNL) to develop general use analytic codes, which are user-friendly and advance the state of the art, to aid the NCS specialist in performing and reviewing safety analyses. These codes have been combined into a computational tool called SCALE (Standardized Computer Analyses for Licensing Evaluation). The SCALE system of codes is now the primary tool used by DWM, FCSS, and SFPO staff when performing confirmatory criticality, shielding, and some thermal calculations. Additionally, SCALE is widely used by NRC applicants/licensees as well as by international entities.

Since 1987, SFPO has been joined by the U. S. Department of Energy (DOE) Package Approval and Safety Program (e.g., most recently in the DOE Office of Environmental Management (DOE-EM)) in providing ORNL with funds for the annual maintenance of the SCALE system to assure continued reliability and availability of this analytic tool. Typically, DOE-EM and SFPO have contributed approximately an equal amount of funds each year. For FY02, SFPO is providing \$220K. However, DOE-EM has decided to eliminate the Package Approval and Safety Program and is currently in negotiations with NRC to have SFPO certify DOE transportation packages. As a result, DOE's portion of the annual SCALE maintenance funding is in doubt. The annual maintenance cost for the SCALE system will not be reduced with the elimination of the DOE Package Approval and Safety Program. Also, DOE will continue to benefit from SCALE maintenance due to the extensive use of SCALE by DOE organizations other than the Package Approval and Safety Program.

The NMSS NCS Committee is concerned that without DOE's contribution to the annual cost of SCALE maintenance, there will be adverse effects to the NRC as well as its applicants/licensees because the SCALE code infrastructure will degrade. Examples of this degradation include the following: (1) the reduction or elimination of the software quality assurance and configuration management programs, which keep SCALE current in new hardware and software environments, including the verification and validation of any changes; (2) the loss of the ability to make minor improvements to address identified problems or to incorporate new nuclear data, as it comes available; and (3) the loss of ORNL personnel who contribute to the scientific and administrative aspects of ensuring the usability of the SCALE system to all of its users. A loss of funding will eventually render the SCALE system out-of-date and unusable.

The Committee recommends that any arrangement between DOE-EM and SFPO to certify DOE transportation packages should ensure that DOE's portion of the annual cost of SCALE maintenance continues to be provided to ORNL. The Committee believes this is the only way to ensure the long term viability of the SCALE system for both the NRC and its applicants/licensees.

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