UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
WASHINGTON, DC 20555 - 0001

ACRSR-2048

September 22, 2003

The Honorable Nils J. Diaz
Chairman
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

SUBJECT: DRAFT FINAL REVISION 1 TO REGULATORY GUIDE 1.53, "APPLICATION OF THE SINGLE-FAILURE CRITERION TO SAFETY SYSTEMS"

Dear Chairman Diaz:

During the 505th meeting of the Advisory Committee on Reactor Safeguards, September 10-13, 2003, we met with representatives of the NRC staff and the Institute of Electrical and Electronics Engineers, Inc. (IEEE) to discuss the draft final Revision 1 to Regulatory Guide (RG) 1.53, "Application of the Single-Failure Criterion to Safety Systems." We also had the benefit of the documents referenced.

**Recommendation**

Revision 1 to RG 1.53, "Application of the Single-Failure Criterion to Safety Systems," should be issued.

**Discussion**

In June 1973, the NRC issued revision 0 to RG 1.53, "Application of the Single-Failure Criterion to Safety Systems," which describes acceptable methods for complying with the NRC's regulations for meeting the single-failure criterion in the electrical power, instrumentation, and control portions of nuclear power generating station safety systems. Revision 0 conditionally endorses IEEE Std 379-1972, "IEEE Trial-Use Guide for the Application of the Single-Failure Criterion to Nuclear Power Generating Station Protection Systems."

The NRC staff has never updated RG 1.53 as had been planned at the time of issuance. The IEEE revised and published new editions of Std 379 in 1977, 1988, 1994, and 2000. These later editions clarified and strengthened the procedure for a single-failure analysis and provided additional guidance to address single-failure analysis in designs that use digital computers. These editions also provided guidance for applying the single-failure criterion to shared systems on using a probabilistic assessment to determine whether certain failures and events can be excluded from a single-failure analysis.

Given the outdated guidance in RG 1.53, licensees have been using various editions of IEEE Std 379 when making modifications to their plants. Revision 1 to RG 1.53 endorses IEEE Std 379-2000, "IEEE Standard Application of the Single-Failure Criterion to Nuclear

Power Generating Station Safety Systems," which provides methods acceptable to the NRC staff for satisfying the NRC's regulations with respect to the application of the single-failure criterion to the electrical power, instrumentation, and control portions of nuclear power plant safety systems. Revision 1 to RG 1.53 should be issued.

Sincerely,

**/RA/**

Mario V. Bonaca
Chairman

References:

(1) Memorandum dated July 11, 2003, from Ashok Thadani, Director, Office of Nuclear Regulatory Research, to John T. Larkins, Executive Director, ACRS, Subject: Revision 1 of Regulatory Guide 1.53, "Application of the Single-Failure Criterion to Safety Systems."

(2) U.S. Nuclear Regulatory Commission, Office of Nuclear Regulatory Research, Draft Regulatory Guide DG-1118, "Application of the Single-Failure Criterion to Safety Systems," May 2002.

(3) The Institute of Electrical and Electronics Engineers, Inc., IEEE Std 379-2000 (Revision of IEEE Std 379-1994), "IEEE Standard Application of the Single-Failure Criterion to Nuclear Power Generating Station Safety Systems," September 21, 2000.