

LA-UR-

04-4711

Approved for public release;
distribution is unlimited.

Title: ANSI/ANS-8.23-1997: Nuclear Criticality Accident Emergency Planning and Response

Author(s): James S. Baker, HSR-6

Submitted to: American Nuclear Society
2004 Winter Meeting
Washington, D.C.
November 14-18, 2004



Los Alamos National Laboratory, an affirmative action/equal opportunity employer, is operated by the University of California for the U.S. Department of Energy under contract W-7405-ENG-36. By acceptance of this article, the publisher recognizes that the U.S. Government retains a nonexclusive, royalty-free license to publish or reproduce the published form of this contribution, or to allow others to do so, for U.S. Government purposes. Los Alamos National Laboratory requests that the publisher identify this article as work performed under the auspices of the U.S. Department of Energy. Los Alamos National Laboratory strongly supports academic freedom and a researcher's right to publish; as an institution, however, the Laboratory does not endorse the viewpoint of a publication or guarantee its technical correctness.

ANSI/ANS-8.23-1997: Nuclear Criticality Accident Emergency Planning and Response

James S. Baker, Los Alamos National Laboratory
July 8, 2004

American National Standard ANSI/ANS-8.23 was developed to expand upon the basic emergency response guidance given in American National Standard, "Administrative Practices for Nuclear Criticality Safety" ANSI/ANS-8.19-1996 (Ref. 1). This standard provides guidance for minimizing risks to personnel during emergency response to a nuclear criticality accident outside reactors. This standard is intended to apply to those facilities for which a criticality accident alarm system, as specified in American National Standard, "Criticality Accident Alarm System", ANSI/ANS-8.3-1997 (Ref. 2) is in use. The Working Group was established in 1990, with Norman L. Pruvost as chairman. The Working Group had up to twenty-three members representing a broad range of the nuclear industry, and has included members from Canada, Japan and the United Kingdom. The initial edition of ANSI/ANS-8.23 was approved by the American National Standards Institute on December 30, 1997. It provides guidance for the following topics:

- Management and technical staff responsibilities
- Evaluation of a potential criticality accident
- Emergency plan provisions
- Evacuation
- Re-entry, rescue and stabilization
- Classroom training, exercises and evacuation drills

This guidance is not for generic emergency planning issues, but is specific to nuclear criticality accidents. For example, it assumes that an Emergency Plan is already established at facilities that implement the standard.

During the development of the initial edition of ANSI/ANS-8.23, each Working Group member evaluated potential use of the standard at a facility with which the member was familiar. This revealed areas where a facility could have difficulty complying with the standard. These reviews helped identify and eliminate many potential problems and ambiguities with the guidance. The Working Group has received very limited feedback from the user community since the first edition of the standard was published. Suggestions for improvements to increase the usefulness of this standard are being solicited.

The Working Group currently has ten members and is drafting a revision of ANSI/ANS-8.23. The focus of this effort is to include additional technical guidance on the following topics:

- Recommendations for radiation monitoring instruments that may be used during an emergency response to a criticality accident.

- Recommended resources for a criticality safety specialist during an emergency response to a criticality accident.
- An example showing how to construct an emergency exercise for a fissile material processing facility. This includes:
 - Estimating the fission source term based on a credible accident scenario
 - Estimating doses to nearby personnel
 - Estimating doses to rescuers
 - A discussion of evacuation and rescue considerations
 - A review of dosimetry and medical response issues
 - Recommendations for the conduct of drills and exercises

This additional guidance will be contained in appendices to the revised standard. In addition, the revised standard will include a reference to an extensive bibliography of resources for emergency planning. The first revision of ANSI/ANS-8.23 should be provided to ANS-8 for ballot by the fall of 2004.

1. “Administrative Practices for Nuclear Criticality Safety”, ANSI/ANS-8.19-1996, American Nuclear Society (1996).
2. “Criticality Accident Alarm System”, ANSI/ANS-8.3-1997, American Nuclear Society (1997).