

ANS Issues Clarification on ANSI/ANS-8.23-1997, “Nuclear Criticality Accident Emergency Planning and Response,” & ANS-3.8 Series Standards.

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Inquiry:

I would like your help to clarify an issue relating to criticality accident alarm systems (CAASs). As I understand it in the U.S., the ANS-8 standards do not apply at reactor sites because they are covered by the ANS-3.8 series of standards. Therefore, ANS-8.3 which addresses CAASs, also would not apply. But are CAASs installed at power stations in areas such as fuel handling areas or receipt areas?

Since the ANS-8.23 scope is for “facilities outside of reactors,” it could be argued that consideration of the installation of a CAAS should occur at reactor sites.

I would appreciate any help you could give us in this area.

Response:

Several emergency planning standards have been established to reflect the unique requirements associated with emergency response that apply to various types of nuclear facilities. The ANSI/ANS-3.8 series of standards addresses power reactors. ANSI/ANS-15.16-1982; R2000, “Emergency Planning for Research Reactors,” addresses nuclear facilities outside reactors that process, store, or handle fissionable material. The latter standard assumes that a criticality accident alarm system (CAAS), which complies with ANSI/ANS-8.3-1997, “Criticality Accident Alarm System,” is installed.

Sites that have more than one type of nuclear facility should have a single emergency plan. However, it is also feasible to define two or more segments of a site, where each segment has its own emergency plan. (The practicality of such an approach will depend in part on the physical arrangement and proximity of the facilities involved.) The determining factor in establishing a single emergency plan is the identification of the controlling license, charter, or authorization for the site or site segment. For example, if special nuclear material is present (such as fresh fuel or a fueled experiment) that is under the control of a reactor license or authorization, the emergency plan would be based on a reactor-type standard (ANS-3.8 series or ANS-15.16), but with adequate provision for response to a CAAS. For a nonreactor facility or for special nuclear materials outside the control of a reactor, the emergency plan would rely on ANS-8.23.

In the U.S., neither the NRC nor DOE has required a CAAS for fuel handling or storage at reactor sites. However, DOE regulations permit individual sites to determine the need for a CAAS (or criticality detection system) based on a reasonable assessment of the risk (see DOE Order 420.1, Section 4.3.3.e). Under 10CFR50.68, NRC licensees have two options for fuel handling and storage areas: (a) comply with 10CFR70.24, which requires a CAAS, or (b) comply with a specified set of alternative requirements (as set forth in 10CFR50.68[b]) in lieu of using a CAAS. All U.S. reactor licensees have selected option (b).

A specific example is the emergency plan used at Sandia National Laboratories, which has two research reactors and an adjacent hot cell facility, which has a CAAS. The site emergency plan meets the requirements of ANSI/ANS-15.16. The plan also addresses the presence of and proper response to the hot cell CAAS. ANSI/ANS-8.23 is not applied because DOE has not required its implementation, and the standard is relatively new. However, the emergency plan at Sandia does not conflict with ANS-8.23.