

ANS Issues Clarification on ANSI/ANS-8.3-1986, “Criticality Accident Alarm System.”

(*Nuclear News*, July 1992)

Inquiry:

Paragraph 4.2, titled “Coverage,” states “A criticality alarm system is not required by this standard in areas where the maximum foreseeable absorbed dose in free air will not exceed 12 rad. For the purpose of this evaluation, a maximum yield may be assumed not to exceed 2×10^{19} fissions for events outside reactors.”

The question requiring clarification is whether this statement is intended to provide guidance for predetermining areas to be evacuated in the event of activation of a criticality accident alarm system.

Response:

As supported by the following discussion, paragraph 4.2 is *not* intended to provide guidance as to what areas should be evacuated.

The basic purpose of the standard is to provide guidance for evaluating the need for an alarm system, required characteristics of such systems, maintenance and test programs, and employee familiarization with the alarm signal. Among items excluded from the scope of the standard are details of administrative actions necessary to support and augment criticality accident alarm systems, which includes details of emergency response procedures. Such procedures would be expected to be facility dependent.

Paragraph 4.2 focuses on whether or not a criticality accident alarm system is needed, based on (1) the potential for occurrence of a criticality accident, and (2) the potential exposure of personnel to significant levels of radiation assuming an accident were to occur.

If the maximum foreseeable absorbed dose is not expected to exceed 12 rad, then an alarm system (meeting all criteria of the standard) is not required. Such limitation of criticality accident consequences to personnel is achievable only through use of shielded or remotely operated facilities. The 2×10^{19} total fission yield stated is not a recommended value, but instead is suggested as a conservative total fission yield for use in considering consequences to personnel.

In summary, the principles identified in paragraph 4.2 of ANSI/ANS-8.3-1986 focus on whether an alarm system installation is required. Guidance is not provided for predetermining areas to be promptly evacuated in the event a criticality alarm system is activated.