ANS Answers Multipart Inquiry on ANSI/ANS-8.3-1997 (R2017), *Criticality Accident Alarm System* (current standard).

Excerpt of section in question from ANSI/ANS-8.3-1997 (R2017), Sec. 4.4, "Dependability," Paragraph 4.4.1 for reference: "Consideration shall be given to the avoidance of false alarms. This may be accomplished by providing reliable single detector channels or by requiring concurrent response of two or more detectors to initiate the alarm. In redundant systems, failure of any single channel shall not prevent compliance with the detection criterion specified in 5.6."

Question: Does the "redundant systems" requirement in the third sentence mean the "two or more detectors" "requiring concurrent response" in the second sentence OR is it an unrelated "dependability" requirement regarding truly "redundant" detection stations (e.g., redundancy in the sense that if one fails, another is available to detect and alarm)?

This question is split into two parts to make the answer unambiguous.

Question 1: Does the "redundant systems" requirement in the third sentence mean the "two or more detectors" "requiring concurrent response" in the second sentence?

Response 1: No. As stated in the standard, the avoidance of false alarms may be accomplished by providing reliable detector channels or by requiring concurrent response of two or more detectors to initiate an alarm. In both cases, failure of any single channel or single detector shall not prevent compliance with the detection criterion specified in Sec. 5.6. Systems with multiple detectors may or may not be a redundant system, depending on system design. The user is referred to common dictionary definitions of the word "redundant."

Question 2: Is it an unrelated "dependability" requirement regarding truly "redundant" detection stations (e.g., redundancy in the sense that if one fails, another is available to detect and alarm)?

Response 2: No. The overarching requirement in Sec. 4.4.1 is that consideration be given to the avoidance of false alarms, and that failure of the selected detection method not prevent compliance with the detection criterion specified in Sec. 5.6. Redundancy is a permissive, so there is no requirement to have a redundant system. However, if a redundant system is chosen to meet the overarching requirement for avoidance of false alarms, then the requirement that "failure of any single channel shall not prevent compliance with the detection criterion specified in 5.6" shall be met.