1 Scope

This standard provides the nuclear power industry methods for assuring that nuclear safety-related instrument channels satisfy acceptable calibration, response time, and other factors affecting the performance of the instrument channel. This standard applies only to those instrument channels whose primary sensors measure pressure, differential pressure, temperature, or neutron flux. Primary flow elements are addressed by other standards.

2 Purpose

The purpose of this standard is to provide guidance to the nuclear power industry in demonstrating acceptable performance of safety-related instrument channels.

3 Definitions and terminology

For the purposes of this standard, the following definitions apply:

3.1 accuracy:
the conformance of an instrument signal to an accepted value of the variable being measured; it is often expressed as inaccuracy.

3.2 calibration:
a process of achieving an input/output relationship for an instrument channel so it conforms within specified requirements to the desired relationship.

3.3 channel check:
a qualitative comparison of the readings of two or more instrument channels to determine the operability of the channel that may be (1) the comparison of redundant channels that monitor the same process parameter, (2) the comparison of instruments that cover different process variable ranges at a common point on their scales, or (3) the comparison of diverse channels whose inputs have a known relationship to each other, such as steam pressure and temperature.

3.4 cross calibration:
a procedure of intercomparison of the indications among similar channels under conditions where the process variables are expected to indicate the same value, such as temperature and/or pressure, or to have a known relationship to each other.

3.5 design basis:
information that identifies the specific functions to be performed by a structure, system, component, or a facility, and the specific values or ranges of values chosen for controlling parameters as reference bounds for design. These values may be either (1) restraints derived from generally accepted "state-of-the-art" practices for achieving functional goals, or (2) requirements derived from analysis (based on calculation and/or experiments) of the effects of a postulated event for which a structure, system, or component must meet its functional goals.

3.6 direct test method:
a test method that substitutes a controlled parameter for the monitored process parameter and can be modulated to demonstrate the performance of the instrument channel.

3.7 diverse parameter:
instruments that use different measurement principles to obtain the value of a given monitored process variable as distinct from redundant instruments.