



U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR REGULATORY RESEARCH
DRAFT REGULATORY GUIDE AND VALUE/IMPACT STATEMENT

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Division 1
Task IC 010-5

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PROPOSED REVISION 2 TO REGULATORY GUIDE 1.105
INSTRUMENT SETPOINTS

A. INTRODUCTION

Criterion 13, "Instrumentation and Control," of Appendix A, "General Design Criteria for Nuclear Power Plants," to 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities," requires, among other things, that instrumentation be provided to monitor variables and systems and that controls be provided to maintain these variables and systems within prescribed operating ranges.

Paragraph (c)(1)(ii)(A) of § 50.36, "Technical Specifications," of 10 CFR Part 50 requires that, where a limiting safety system setting is specified for a variable on which a safety limit has been placed, the setting be so chosen that automatic protective action will correct the most severe abnormal situation anticipated without exceeding a safety limit.

This guide describes a method acceptable to the NRC staff for complying with the Commission's regulations for ensuring that instrument setpoints in systems important to safety are initially within and remain within the technical specifications.

B. DISCUSSION

Subcommittee SP67.04, Setpoints for Safety-Related Instruments in Nuclear Power Plants, under the Nuclear Power Plant Standards Committee of the Instrument Society of America (ISA) has developed a draft standard containing minimum requirements to be used for establishing and maintaining setpoints of

This regulatory guide and the associated value/impact statement are being issued in draft form to involve the public in the early stages of the development of a regulatory position in this area. They have not received complete staff review and do not represent an official NRC staff position.

Public comments are being solicited on both drafts, the guide (including any implementation schedule) and the value/impact statement. Comments on the value/impact statement should be accompanied by supporting data. Comments on both drafts should be sent to the Secretary of the Commission, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, Attention: Docketing and Service Branch, by FEB 12 1982

Requests for single copies of draft guides (which may be reproduced) or for placement on an automatic distribution list for single copies of future draft guides in specific divisions should be made in writing to the U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, Attention: Director, Division of Technical Information and Document Control.

individual instrument channels in systems important to safety. This standard is identified as ISA S67.04 (ANSI N719), "Setpoints for Nuclear Safety-Related Instrumentation Used in Nuclear Power Plants."

Revision 1 to Regulatory Guide 1.105, "Instrument Setpoints," dated November 1976, was published in response to the large number of reported instances of protection system instrument setpoints drifting outside the limits specified in the technical specifications. The method described in Revision 1 to Regulatory Guide 1.105 for complying with the Commission's regulations regarding instrument setpoints has now been incorporated into Draft F of ISA S67.04, and additional criteria on establishing and maintaining setpoints have been included.

C. REGULATORY POSITION

Draft F, May 22, 1979, of ISA S67.04, "Setpoints for Nuclear Safety-Related Instrumentation Used in Nuclear Power Plants,"* establishes the minimum requirements acceptable to the NRC staff for ensuring that instrument setpoints in systems important to safety are initially within and remain within the technical specification limits subject to the following:

1. The term "safety-related instruments" is used throughout the ISA Standard. This term shall be understood to mean "instruments in systems important to safety." The term "systems important to safety" is defined in the Introduction of Appendix A to 10 CFR Part 50 as "...systems...that provide reasonable assurance that the facility can be operated without undue risk to the health and safety of the public."
2. Section 5, "Qualification," of ISA S67.04 states that the requirements of this section are supplemental to those of IEEE Std 323-1974. When using IEEE Std 323-1974, "IEEE Standard for Qualifying Class 1E Equipment for Nuclear Power Generating Stations," the guidance presented in Regulatory Guide 1.89, "Qualification of Class 1E Equipment for Nuclear Power Plants," should also be followed.

* Copies are available from the Instrument Society of America, 400 Stanwix Street, Pittsburgh, Pa. 15222

D. IMPLEMENTATION

This proposed guide has been released to encourage public participation in its development. Except in those cases in which an applicant or a licensee proposes an acceptable alternative method for complying with specified portions of the Commission's regulations, the method to be described in the active guide reflecting public comments will be used to evaluate whether instrument setpoints in systems important to safety in all nuclear power plants are established and maintained within the technical specification limits after the implementation date to be specified in the active guide. This implementation date will in no case be earlier than June 1982.

DRAFT VALUE/IMPACT STATEMENT

1. THE PROPOSED ACTION

1.1 Description

The proposed action would enumerate the several factors embodied in ISA S67.04, "Setpoints for Nuclear Safety-Related Instrumentation Used in Nuclear Power Plants," that must be considered when (1) establishing an instrument setpoint that will automatically correct the most severe abnormal situation anticipated without exceeding a safety limit and (2) maintaining setpoints to meet the requirements for limiting safety system settings as specified in paragraph (c)(1)(ii)(A) of § 50.36 of 10 CFR Part 50 and IEEE Std 323-1974, "IEEE Standard for Qualifying Class 1E Equipment for Nuclear Power Plants."

1.2 Need

The most common cause of the drift of a setpoint out of compliance with a technical specification has been the failure to allow a sufficient margin between the setpoint and the technical specification limit to account for instrument inaccuracy, the expected environment, and minor calibration variations. In some cases, the setpoint selected was numerically equal to the technical specification limit and stated as an absolute value, thus leaving no apparent margin for drift. In other cases, the setpoint was so close to the upper or lower limit of the instrument's range that instrument drift placed the setpoint beyond the instrument's range, thus nullifying the trip function. Other causes for the drift of a setpoint out of conformity with the technical specification have been instrumentation design inadequacies and questionable calibration procedures.

1.3 Value/Impact

1.3.1 NRC

The proposed action will assist NRC in ensuring that systems important to safety are initially within and remain within the technical specification limits by providing a means for establishing and maintaining setpoints of individual instrument channels. Because of a reduction in the number of instruments operating with incorrect setpoints, there should be both fewer Licensee Event Reports to review and remedial actions to enforce, thereby reducing the manpower expended by the NRC. There is no perceived adverse impact upon the NRC.

1.3.2 Other Government Agencies

The proposed action should not affect other government agencies, unless the government agency is a licensee, such as TVA.

1.3.3 Industry

The impact on industry will be requirements for stricter setpoint limits and increased paperwork. Required paperwork will increase as a result of stricter instrument qualification, documentation, and justification of positions. The value to industry will be that the proposed action should result in a reduction of setpoint readjustment, less chance for unwarranted reactor shutdowns, and fewer Licensee Event Reports.

1.3.4 Public

The value to the public will be enhanced public safety from more accurate settings of setpoints in systems important to safety. Use of the revised guidance may result in allowing smaller margins between nominal setpoints and safety limits, thus producing greater reactor output power with attendant cost savings to consumers. These consumer savings may be slightly reduced by the impact of higher costs to the licensee from stricter requirements.

1.4 Decision

The proposed action should be undertaken to provide guidance on instrument setpoints.

2. TECHNICAL APPROACH

Since the proposed action, revising Regulatory Guide 1.105 to endorse a standard that contains guidance now included in Revision 1 of the guide, is procedural, no technical alternatives have been considered.

3. PROCEDURAL APPROACH

3.1 Procedural Alternatives

One of the following procedural alternatives could be used to provide this guidance:

1. Regulation
2. Regulatory guide
3. Regulatory guide endorsing the ISA standard.

3.2 Comparison of Procedural Alternatives

The advantage of alternative 1, a regulation, is that it would have the full force and authority of a law. The disadvantage of alternative 1 is that a long period of time is required to obtain approval and that it would lack flexibility in implementation.

The advantage of alternative 2, a regulatory guide, is that it would achieve the desired result with sufficient flexibility to allow innovation by licensees. However, the disadvantage of alternative 2 is that its use would not capitalize on the work performed by a national standards committee, resulting in a longer period of preparation and a greater expenditure of NRC manpower.

The advantage of alternative 3, a regulatory guide endorsing a standard, is that it would achieve the desired result by taking advantage of the work performed by the standards committee on ISA S67.04, "Setpoints for Nuclear Safety-Related Instrumentation Used in Nuclear Power Plants."

The disadvantage of alternative 3 is that effort would have to be expended by the NRC in preparing, reviewing, and issuing a regulatory guide. However, it is estimated that this effort would be greater if alternatives 1 or 2 were selected.

3.3 Decision on Procedural Approach

The proposed action should be accomplished by issuing a regulatory guide endorsing Draft F, dated May 22, 1979, of ISA S67.04 (ANSI N719).

4. STATUTORY CONSIDERATIONS

4.1 NRC Authority

The authority to take the proposed action is derived from the Atomic Energy Act of 1954, as amended, and the Energy Reorganization Act of 1974, as amended, and implemented through the Commission's regulations; in particular, 10 CFR Part 50.

4.2 Need for NEPA Assessment

An environmental impact statement is not required because the proposed action is not a major action that may significantly affect the quality of the human environment.

5. RELATIONSHIP TO OTHER EXISTING OR PROPOSED REGULATIONS OR POLICIES

The proposed action would revise Regulatory Guide 1.105, Revision 1, dated November 1976.

6. SUMMARY AND CONCLUSION

A regulatory guide should be prepared endorsing Draft F of ISA S67.04 (ANSI N719), "Setpoints for Nuclear Safety-Related Instrumentation Used in Nuclear Power Plants," dated May 22, 1979. Endorsement of the ISA standard will define minimum requirements for ensuring that setpoints are established and maintained within specified limits in instrumentation systems important to safety.

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