UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

July 22, 1996

MEMORANDUM TO: Richard W. Cooper, II, Director
Division of Reactor Projects
Region I

FROM: Phillip F. McKee, Director
Northeast Utilities Project Directorate
Division of Reactor Projects - I/II

SUBJECT: TASK INTERFACE AGREEMENT EVALUATION REGARDING INSTRUMENT ACCURACY AFFECTING MILLSTONE UNIT 2 (TAC NO. M95177)

By memorandum dated April 5, 1996, you requested that NRR provide an evaluation of the Millstone Nuclear Power Station, Unit 2, licensee's position on how instrument uncertainties should be accommodated for those instruments (except for RPS and ESFAS) that are used to judge compliance to Millstone's Technical Specifications (TSs). The particular instance identified involved the measurement of ultimate heat sink (UHS) temperature.

The Instrumentation and Controls Branch (HICB) staff has reviewed the licensees interpretation of the applicability of instrument uncertainties against its TSs and the guidelines of Regulatory Guide (RG) 1.105, "Instrument Setpoints for Safety Related Systems," Revision 2, dated 1986. The HICB evaluation is attached.

The HICB staff notes that instrumentation, other than RPS and ESFAS, are not explicitly required by RG 1.105. The instrumentation used to measure the UHS temperature and other similar variables provide operability determination criteria and/or determination that a design limit is met. The instrumentation uncertainty can be accounted for in the plant safety analysis, the TS limiting value, the measured value, surveillance testing, or the emergency procedure.

Using RG 1.105 to address instrumentation uncertainties for these instruments in addition to the RPS and ESFAS instruments would be acceptable; however, as previously noted, is not required. Other means or methodologies, such as using the guidance provided in the Combustion Engineering's topical report referenced by the licensee, may be utilized. Thus, the licensee's approach to address the instrument uncertainties over the next year as part of its conversion to the Improved Standard TSs is an acceptable approach.

This completes our effort in response to your request.

Docket No. 50-336

Attachment: As stated

Contact: Cliff Doutt, HICB
415-2847

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TASK INTERFACE AGREEMENT EVALUATION

BY THE OFFICE OF NUCLEAR REACTOR REGULATION

MILLSTONE, UNIT NO. 2

DOCKET NO. 50-336

The Instrumentation and Controls Branch staff has reviewed the Millstone Unit 2 licensee's position on application of instrument uncertainties to technical specifications as requested in the April 5, 1996, memorandum from R. Cooper, Region I, to S. Varga, NRR, and noted the following points:

1. The licensee states that a requirement only exists to consider instrumentation uncertainties for the reactor protection system (RPS) and engineered safety feature actuation system (ESFAS) and selected technical specification (TS) Limiting Conditions of Operation (LCOs). RG 1.105 addresses the application of instrument uncertainties to protective system instrumentation and states that the RG does not address LCOs.

2. Historically, instrumentation uncertainties have not been explicitly required for LCOs.

3. Millstone Unit 2 instrumentation uncertainties have been explicitly considered for RPS and ESFAS setpoints and for some TS LCOs. The licensee considers this consistent with the licensing basis of the plant.

4. Consideration of instrument uncertainties in all LCOs, like ultimate heat sink temperature was never explicitly required nor applied.

5. The licensee notes that the industry has been inconsistent in the application of instrument uncertainties to non-RPS/ESFAS parameters.

6. The licensee states, however, that they intend to address the reliance on certain instrumentation in the emergency operating procedures in the coming year, and suggests that a review of LCOs for the inclusion of instrument uncertainties for these instruments is recommended.

The applicability of applying instrument uncertainties to plant safety systems has its basis in 10 CFR 50.36 TS in that 10 CFR 50.36 Part (c) requires that TS include items in the following categories; safety limits, limiting safety system settings (LSSS), and limiting control settings. Safety limits are limits on important process variables that are necessary to reasonably protect the integrity of certain of the physical barriers that guard against the uncontrolled release of radioactivity. LSSS are settings for automatic protective devices related to those variables having significant safety functions. These settings are chosen such that automatic operation will correct the abnormal situation before a safety limit is exceeded. Limiting control settings or LCOs on the other hand do not have a LSSS assigned to them per 10 CFR 50.36. This is based, in part, on the LCO being attributed to functional requirements. However, RPS setpoints outside the allowable value require entry into the RPS LCO.

The standard TS lists the RPS safety limits in Section 2.1 and the associated LSSS (trip setpoint and allowable value) in Section 2.2. The improved standard TS (NUREG-1432) lists the safety limits in Section 2.1. with only the associated safety limit violations listed in Section 2.2. The LSSS (trip setpoint and allowable values) are no longer referenced in Section 2.2 of the TS. The result is that the LSSS is now essentially defined in the TS bases per the setpoint methodology (one column or two column format-allowable value and trip setpoint or allowable value only). Secondly, since the LSSS is specified for a variable on which a safety limit has been placed, an LSSS is only defined and developed with respect to the RPS. A safety limit and an LSSS are not defined for LCOs per 10 CFR 50.36 and subsequently the TS.

ISA Std. S67.04-1982, "Setpoints for Nuclear Safety Related Instrumentation Used in Nuclear Power Plants," as endorsed by Regulatory Guide (RG) 1.105, "Instrument Setpoints for Safety Related Systems," provides a means to establish an LSSS in terms of an allowable value/trip setpoint and satisfy the LSSS requirement in 10 CFR 50.36. The purpose and scope of ISA 67.04 1982 appears inconsistent in that the purpose stated in the standard indicates that it was developed to provide a basis for establishing setpoints for protection systems, while the scope of the standard states that it provides minimum requirements so that setpoints are established and held within specified limits in nuclear safety-related instruments.

However, design limits may exist for a system or LCO and be included in the TS. Design limits for ESFAS are traditionally treated as safety limits and as a result an allowable value and a trip setpoint have been developed for these variables and included in the plant TS. Although the 1982 ISA Std. does not provide a discussion on design limits, ISA 67.04-1994, Section 4.1 states that design limits for ESFAS are treated as safety limits in the standard. [illegible] states that the RPS emergency core cooling, containment isolation, and containment heat removal systems would require a stringent setpoint methodology based on the requirements of the standard.

The 1994 version of ISA S67.04 states in the scope that the standard is applicable to safety related setpoints as defined in Section 3. Section 4, "Establishment of Setpoints," in the 1994 standard includes those safety related setpoints that may not be credited in the safety analysis, or do not have limiting values. The caveat presented for these setpoints is that the setpoint methodology and associated rigor of the calculation can be less than that required for RPS setpoints. The process of "grading" an instrument setpoint calculation based on a defined classification approach has been accepted on a limited basis by the staff. The process of setpoint grading is generally accepted within the industry and a set of draft standardized setpoint grading methodologies has been developed in association with ISA S67.04. The staff is currently in the process of updating RG 1.105 and is evaluating the endorsement of setpoint grading in the regulatory guide.

The staff notes that 10 CFR Part 50, Appendix A, Criterion 13, Instrumentation and Control, provides requirements to monitor variables and that appropriate controls be applied. Part 50 of Appendix B, Part XI of Title 10 of the Code of Federal Regulations, Test Control states that a test program be established and test procedures incorporate the requirements and acceptance limits contained in applicable design documents. Also, 10 CFR of Part 50, Appendix B, Part XII, control of Measurement and Test equipment, requires that measures be established to maintain measurement and test equipment accuracy within necessary limits.

Regulatory Guide 1.27, "Ultimate Heat Sink for Nuclear Power Plants," Revision 2, January 1976 (for comment) states that the ultimate heat sink (UHS) performs two principal safety functions: (1) dissipation of residual heat after reactor shutdown, and (2) dissipation of residual heat after an accident. The guide also states that sufficient conservatism should be provided to ensure that a 30-day supply of water is available and that the design basis temperatures of safety-related equipment are not exceeded. For a UHS where the supply may be limited and/or the temperature of plant intake water from the sink may become critical, transient analysis of supply and/or temperature should be performed. Sufficient information should be available to substantiate the assumptions and analytical methods used, i.e., 30-day cooling supply analysis.

A review of Combustion Engineering Owners Group (CEOG) topical report CE-NPSD-925, "Guidelines for Addressing Instrument Uncertainties in Emergency Operating Procedures and Technical Specifications," indicates that the UHS temperature is defined as use code U33 and a Category 1 variable. Use code 33 as defined by CE-NPSD-925 applies to instrument applications used to verify that equipment needed to place or maintain the plant in HOT or COLD SHUTDOWN are operable. Category 1 as stated by CE-NPSD-925 applies to instrument applications that possess a high degree of nuclear safety significance. A Category I instrument application requires an explicit instrument uncertainty calculation be performed using ISA S67.04 as guidance. The staff notes that this is a guidance document and employs techniques (grading) not presented or endorsed by ISA S67.04-1982 or RG 1.105, Revision 2, 1986. Therefore, the licensees evaluation of UHS instrumentation may have justified an alternative classification or other treatment of uncertainty than the guidance provided by CE-NPSD-925.

Based on our review, the staff concludes that the application of ISA S67.04-1982 as endorsed by R.G. 1.105, Revision 2, 1986, to instrumentation other than RPS or ESFAS instrumentation setpoints even if used for the evaluation of TS compliance (LCOs) is not specifically addressed by ISA S67.04-1982, R.G. 1.105 or 10 CFR 50.36. The staff notes that the UHS temperature is an LCO without a LSSS or a specific safety limit assigned. However, the UHS LCO provides operability determination criteria and confirmation that a design limit is met. Both GDC 13, and 10 CFR Part 50, Appendix B, indicate that for monitored variables such as UHS temperature,

instrumentation shall be provided to maintain these variables within a prescribed operating range and that the test incorporate requirements and acceptance limits. An evaluation may show that instrument uncertainty for the Millstone Unit 2 UHS is included in the plant safety analysis, accounted for in the TS limiting value, or accounted for in the measured value, surveillance, or emergency procedure. It is the staff's position, therefore, that for variables such as UHS temperature, the instrumentation, measurement and test equipment, and procedures are to be evaluated such that the stated acceptance criteria is bounding for the safety analysis including any uncertainties assumed in the analysis. The application of ISA S67.04-1982/ R.G. 1.105 to other than RPS or ESFAS instrumentation provides an acceptable means to identify and document instrument uncertainty assumptions, comply with 10 CFR Part 50, Appendix A, Criterion 13 and 10 CFR Part 50, Appendix B, Part XI and ensure that these assumptions are maintained by the installed instrumentation, test equipment, and procedures. However, ISA standard S67.04-1982 is not required in that other means or methodologies may be utilized in lieu of the ISA standard.