Regulatory Guide Periodic Review

Regulatory Guide Number:	**1.151, Revision 1**
Title:	**Instrument Sensing Lines**
Office/division/branch:	**RES/DE/ICEEB**
Technical Lead:	**David Dawood**
Staff Action Decided:	**Revise**

1. What are the known technical or regulatory issues with the current version of the Regulatory Guide (RG)?

RG 1.151, Revision 1, "Instrument Sensing Lines," was issued in July 2010. This guide describes a method that the U.S. Nuclear Regulatory Commission (NRC) staff considers acceptable for use in complying with the agency's regulations with respect to the design and installation of safety-related instrument sensing lines in nuclear power plants.

RG 1.151, Revision 1 endorses, in part and with certain clarifications, the American National Standers Institute (ANSI)/International Society of Automation (ISA) standard ANSI/ISA 67.02.01-1999, "Nuclear Safety-Related Instrument-Sensing Line Piping and Tubing Standard for Use in Nuclear Power Plants." This standard provides design, physical protection, and installation recommendations for safety-related instrument sensing lines and for sampling lines. The NRC staff does not endorse the parts of this standard relating to sampling lines.

ISA 67.02.01-1999 included some incorrect technical information on some of the standard's figures. NRC did not take exception to this incorrect information in RG 1.151, Revision 1.

In 2014, ISA issued a revision to the standard ANSI/ISA-67.02.01-2014. This revision corrected technical information in the figures in this standard and added additional criteria for when instrument sensing lines with slopes of less than 1 inch per foot are acceptable.

In 2007, the International Organization for Standardization (ISO) issued a revision to the standard ISO 2186, "Fluid Flow in Closed Conduits - Connections for Pressure Signal Transmissions between Primary and Secondary Elements." This international standard was not addressed in the 2010 revision of RG 1.151. This standard includes criteria for sensing line slope and minimum instrument sensing line diameter based on the length of the sensing line.

Recent operating experience has shown instrument sensing lines contributing to degradation of safety related instrumentation operation. NRC issued Information Notice (IN) 13-12, "Improperly Sloped Instrument Sensing Lines," to address recent operating experience regarding instrument sensing line sloping problems issues caused by improper design or installation, including inadequate sensing line slope that have occurred at U.S. nuclear power plants. This IN emphasized the importance of applying related design and installation criteria and providing adequate oversight.

In addition, Inspection Procedure (IP) 65001.10, "Inspection of ITAAC-Related Installation of Instrument Components and Systems," directs the use of ISA 67.02.01, but does not reference a specific revision date.

2. What is the impact on internal and external stakeholders of <u>not</u> updating the RG for the known issues, in terms of anticipated numbers of licensing and inspection activities over the next several years?

ISA 67.02.01 is specifically referred to in the inspections, tests, analyses, and acceptance criteria (ITAAC) inspection procedures for new plants. Inspectors should have technically correct information when performing inspections. The 1999 revision of this standard does not have the correct information for air or gas sensing lines. At present, there are four plants under construction where this RG and ISA standard should be used for field inspections. In addition, this RG and ISA standard could be used at all operating plants for field inspections.

3. What is an estimate of the level of effort needed to address identified issues in terms of full-time equivalent (FTE) and contractor resources?

NRC staff requires approximately 0.6 FTE to complete a full revision of Regulatory Guide 1.151 to current regulatory guide guidance and format.

4. Based on the answers to the questions above, what is the staff action for this guide (Reviewed with no issues identified, Reviewed with issues identified for future consideration, Revise, or Withdraw)?

Revise RG 1.151 to address ISA 67.02-2014, International Organization for Standardization (ISO) 2186-2007, and issues identified from operating experience.

5. Provide a conceptual plan and timeframe to address the issues identified during the review.

1. Identify the portions of RG 1.151 that need revision, specifically the portions that relate to the ISA and ISO standards.
2. Add information from related operating experience and IN related to instrument sensing line slope.
3. Review the revised RG to ensure agency program guidance for RGs is met.
4. Transmit to the Regulatory Guidance and Generic Issues Branch for processing by second quarter FY17.
5. Issue for public comment estimated for the fourth quarter FY17.

References

1. ANSI/ISA 67.02.01-2014, Nuclear Safety-Related Instrument-Sensing Line Piping and Tubing Standard for Use in Nuclear Power Plants

2. ANSI/ISA 67.02.01-1999, Nuclear Safety-Related Instrument-Sensing Line Piping and Tubing Standard for Use in Nuclear Power Plants

3. International Organization for Standardization (ISO) 2186, Fluid flow in closed conduits — Connections for pressure signal transmissions between primary and secondary elements - Second Edition

4. NRC Inspection Procedure IP 65001.10, Inspection of ITAAC-Related Installation Of Instrument Components And Systems

NOTE: This review was conducted in September 2016 and reflects the staff's plans as of that date. These plans are tentative and are subject to change.