

**U.S. NRC**

UNITED STATES NUCLEAR REGULATORY COMMISSION

*Protecting People and the Environment*

# **NRC Evaluation of AREVA NP RAI Response 7.7-18**

**Kenneth Mott**

**Instrumentation, Controls, and Electrical Engineering Branch 1  
Division of Engineering  
Office of New Reactors  
U.S. Nuclear Regulatory Commission**

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# Requirements for Setpoints

- 10 CFR 50.55a(h) provides requirements for safety-related instrumentation and control (I&C) systems and incorporates by reference IEEE Std. 603-1991.
- Clause 6.8.1 of IEEE Std. 603-1991 requires the allowance for uncertainties between the process analytical limit and the device setpoint.



## Requirements for Setpoints (cont.)

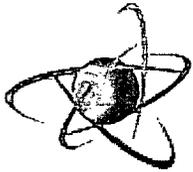
- 10 CFR Part 50, Appendix A General Design Criteria (GDC) 13 and 20 and 10 CFR 50.36(c)(1)(ii)(A) also provide requirements to ensure adequate setpoints are provided to monitor plant variables initiate safety functions when necessary.



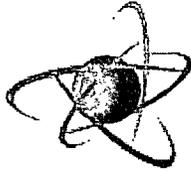
# Guidance for Setpoints

- Regulatory Guide (RG) 1.105 describes an acceptable means for meeting the regulations associated with setpoints and endorses ISA Std. S67.04-1994.
- The RG states that the standard [ISA S67.04-1994] provides a basis for establishing setpoints and addressing known contributing errors from the process (including the primary element and sensor) through and including the final setpoint device.

- **NRC staff requested AREVA NP to discuss why Regulatory Guide (RG) 1.105, “Setpoints for Safety-Related Instrumentation,” Revision 3, did not apply to the incore and excore instrumentation system.**
- **Incore instrumentation provide signals for the high linear power density and departure from nucleate boiling reactor trips.**



- **NRC staff's understanding of AREVA NP's response:**
  - Incore and excore instrumentation system does not develop or use setpoints for actuation.
  - Committing to RG 1.105 for the Protection System implies incore and excore instrument uncertainties will be accounted in the setpoint calculation.



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## **RAI 7.7-18 (cont.)**

- NRC disagrees with AREVA NP's response.
  - Discussion section of RG 1.105 describes applicability to the setpoints and components that contribute errors in a particular channel, including the instruments.



## Staff Conclusion

- For the incore and excore instrumentation system, which provides signals for reactor trip functions, AREVA NP does not commit to RG 1.105; nor is there discussion of an alternate method and justification for its acceptability.



## Staff Conclusion (cont.)

- The staff cannot conclude that the U.S. EPR design meets the requirements of 10 CFR 50.55a(h), 10 CFR 50.36(c)(1)(ii)(A), and 10 CFR Part 50, Appendix A, GDCs 13 and 20.
- Therefore, the staff does not plan to approve the U.S. EPR I&C design with the current RAI response and Final Safety Analysis Report description as it relates to this issue.