

January 26, 2007

Mr. Gordon Bischoff, Manager  
Owners Group Program Management Office  
Westinghouse Electric Company  
P.O. Box 355  
Pittsburgh, PA 15230-0355

SUBJECT: Clarification of Single Failure Considerations and Staff Response to Adding a TS Action Condition for Two Inoperable Instrumentation Channels for Reactor Trip System and Engineered Safety Feature System Instrumentation

References:

1. NRC Memorandum from G. Shukla (NRC) to S. Dembek (NRC), "Summary of Meeting Held on August 17, 2004, with the Westinghouse Owners Group (WOG) to Discuss a Program to Add an Action to NUREG- 1431 for Two Inoperable Reactor Trip System (RTS) or Engineered Safety Features Actuation System (ESFAS) Channels," dated August 27, 2004.
2. WOG-04-592, "Transmittal of White Paper "Single Failure Consideration When Technical Specification Actions Are Entered," (PA-LSC-0136)," November 19, 2004.
3. NRC letter from H. N. Berkow (NRC) to G. Bischoff (Westinghouse), "Response to Westinghouse Owners Group White Paper, "Single Failure Consideration When Technical Specification Actions Are Entered," (TAC No. MC5558)," dated April 13, 2005.
4. NRC letter from T. H. Boyce (NRC) to G. Bischoff (Westinghouse), "Clarification of Single-Failure Considerations In Letter To Westinghouse Owners Group Regarding Technical Specification Actions," dated March 30, 2006.

Dear Mr. Bischoff:

In a recent meeting with the NRC, the Pressurized Water Reactor Owners Group (PWROG) discussed their program for adding an Action to NUREG-1431, "Standard Technical Specifications for Westinghouse Plants." Representatives: (1) sought to confirm that plant operation while in a Technical Specification (TS) Action Condition represents a temporary relaxation of the single failure criterion; (2) sought to address NRC staff concerns regarding the addition of a TS required action for two inoperable Reactor Trip System (RTS) or Engineered Safety Feature Actuation System (ESFAS) channels; and (3) sought NRC staff agreement regarding PWROG plans to develop a topical report on the addition of a TS condition for two inoperable RTS or ESFAS instrument channels. This letter provides the requested information and NRC staff positions.

Regarding item 1 on the temporary relaxation of the single failure criterion, the NRC staff responded to such a request by representatives from the Westinghouse Owners Group (WOG) during a meeting held in early 2006 and provided its response in a letter to you from Thomas Boyce (NRC) dated March 30, 2006. The request clarified that plant operation while relying on a TS remedial action represents a temporary relaxation of the single failure criterion. The following clarification was provided.

The staff's position, as discussed in the Appendix C.2 of Inspection Manual Part 9900, Technical Guidance, which was endorsed by Regulatory Issue Summary 2005-20, "Revision to Guidance Formerly Contained in NRC Generic Letter 91-18," is that the single failure criterion is a general design criterion that is used to evaluate system designs to ensure that a single failure does not result in a loss of the capability for the system to perform its safety function or functions. In addition, as stated in Generic Letter 80-30:

"By and large, the single failure criterion is preserved by specifying Limiting Conditions for Operation that require all redundant components of safety systems to be OPERABLE. When the required redundancy is not maintained, either due to equipment failure or maintenance outage, action is required, within a specific time, to change the operating mode of the plant to place it in a safe condition. The specified time to take action, usually called the equipment out of service time (termed Completion Time in the Standard Technical Specifications), is a temporary relaxation of the single failure criterion, which consistent with overall system reliability considerations, provides a limited time to fix equipment or otherwise make it OPERABLE."

The current NRC staff position is unchanged from the March 30, 2006 letter.

Regarding items (2) and (3) on the addition of a TS required action for two inoperable RTS or ESFAS channels, the NRC staff addressed this issue in a letter to you from Herbert Berkow (NRC) dated April 13, 2005. This letter responded to WOG letter numbered WOG-04-592, "Single Failure Consideration When Technical Specification Actions Are Entered," which submitted a paper in anticipation of a future WOG topical report that would add technical specification remedial actions to permit operation with two inoperable RTS or ESFAS channels rather than enter into a TS-required shutdown. The NRC staff wrote:

"The Nuclear Regulatory Commission (NRC) staff has reviewed the WOG White Paper. In order to justify a temporary relaxation of the single-failure criterion, the WOG needs to provide the NRC staff with the operational necessity incurred by operating under the current design and licensing basis. For example, the operational necessity could be based on the hardware configuration (two-out-of-three logic); or the need to lift wires or add jumpers to perform required testing, which could create the potential for plant transients or reactor trips; or the time needed to do repairs or perform testing. Hence, the WOG must provide sufficient basis in the proposed topical report for a generic temporary relaxation to the single-failure criterion based on a generic industry-based operational necessity consideration."

The current NRC staff position is unchanged from the April 13, 2005 letter.

For a generic report regarding item (3), specific factors identified in the H. Berkow letter dated April 13, 2005, should be evaluated to establish a safety basis for changing the STS precedent which ensures protection function actuation capability is maintained during plant operations when all required redundant channels are not operable. For Westinghouse plants, the premise of standard TS is that if a parameter is used for input to the safety system protection system and a control function, then four channels with a two-out-of-four logic are sufficient to provide the required reliability and redundancy. The circuit must be able to withstand both an input failure to the control system, which may then require the protection function actuation, and a single failure in the other channels providing the protection function actuation. A single failure should neither cause nor prevent the protection function actuation.

The NRC staff evaluation of topical report WCAP-14333, "Probabilistic Risk Analysis of the RPS and ESFAS Test Times and Completion Times" approved a 72 hour time period for plant operation with one channel inoperable before the channel must be placed in trip. For plants without installed channel bypass capability, the safety evaluation also approves a TS note which allows bypassing an inoperable channel for up to 12 hours for surveillance testing of other channels. Thus, during this time period the bypassed channel could not perform its safety function and the second channel would be in trip. This TS note prevents plant shutdown when surveillance testing is required and one channel is inoperable. For plants with installed bypass test capability a TS note permits bypassing one channel for up to 12 hours for surveillance testing, at any time, without entering a TS action. By comparison, plants with installed bypass test capability and plants without installed bypass test capability have equivalent TS conditions if a channel is found to be inoperable and a test of another channel of that function is required. Therefore, provisions of current STS incorporate the WCAP-14333 allowances for bypass and repair and these provisions address conditions of two channels affected simultaneously, albeit, not two inoperable channels.

Thus, for Westinghouse plants with two inoperable channels the two remaining operable channels are needed to perform both actuation and control functions for monitored plant parameters and the NRC staff has not received evidence or been shown an analysis that an allowance is needed for a two channel TS condition beyond those already approved by the staff in WCAP-14333 are necessary.

An operational necessity analysis should consider the effective repair and test times that would result from combined application of risk initiative 4.b and deterministic evaluations. The application should also include an analysis of protection and control function interactions to evaluate how protection system design requirements contained in Appendix A to 10 CFR Part 50, General Design Criteria for Nuclear Power Plants 21, 22, 23 and 24 would be affected by this request.

Mr. G. Bischoff

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If you have any questions, please contact Mr. Carl Schulten at 301-415-1192.

Sincerely,

*/RA/*

Timothy J. Kobetz, Chief  
Technical Specifications Branch  
Division of Inspection and Regional Support  
Office of Nuclear Reactor Regulation

Project No(s). 694

Mr. G. Bischoff

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