Domestic Members
AmerenUE
Callaway
American Electric Power Co.
D.C. Cook 1 & 2
Arizona Public Service Co.
Palo Verde 1, 2 & 3
Constellation Energy Group
Calvert Cliffs 1 & 2
R. E. Ginna
Dominion Nuclear Connecticut
Millstone 2 & 3
Dominion Virginia Power
North Anna 1 & 2
Surry 1 & 2
Duke Energy
Catawba 1 & 2
McGuire 1 & 2
Entergy Nuclear Northeast
Indian Point 2 & 3
Entergy Nuclear South
ANO 2
Waterford 3
Exelon Generation Company LLC
Braidwood 1 & 2
Byron 1 & 2
FirstEnergy Nuclear Operating Co.
Beaver Valley 1 & 2
FPL Group
St. Lucie 1 & 2
Seabrook
Turkey Point 3 & 4
Nuclear Management Co.
Kewaunee
Palisades
Point Beach 1 & 2
Prairie Island
Omaha Public Power District
Fort Calhoun
Pacific Gas & Electric Co.
Diablo Canyon 1 & 2
Progress Energy
H. B. Robinson 2
Shearon Harris
PSEG – Nuclear
Salem 1 & 2
South Carolina Electric & Gas Co.
V. C. Summer
Southern California Edison
SONGS 2 & 3
STP Nuclear Operating Co.
South Texas Project 1 & 2
Southern Nuclear Operating Co.
J. M. Farley 1 & 2
A. W. Vogtle 1 & 2
Tennessee Valley Authority
Sequoyah 1 & 2
Watts Bar 1
TXU Electric
Commanche Peak 1 & 2
Wolf Creek Nuclear Operating Corp.
Wolf Creek

International Members
Electrabel
Doel 1, 2, 4
Tihange 1 & 3
Electricité de France
Kansai Electric Power Co.
Mihama 1
Takahama 1
Ohi 1 & 2
Korea Hydro & Nuclear Power Co.
Kori 1 – 4
Ulchin 3 & 4
Yonggwang 1 - 5
British Energy plc
Sizewell B
NEK
Krško
Spanish Utilities
Asco 1 & 2
Vandellos 2
Almaraz 1 & 2
Ringhals AB
Ringhals 2 – 4
Taiwan Power Co.
Maanshan 1 & 2

November 19, 2004

WOG-04-592

Project Number 694

Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Subject: Westinghouse Owners Group
Transmittal of White Paper "Single Failure Consideration When Technical Specification Actions Are Entered" (PA-LSC-0136)

The Westinghouse Owners Group (WOG) met with the NRC staff on August 17, 2004 to discuss adding an Action to NUREG-1431, "Standard Technical Specifications Westinghouse Plants," Revision 3, to address the condition of two inoperable Reactor Trip System (RTS) or Engineered Safety Features Actuation System (ESFAS) channels. Currently, Technical Specifications 3.3.1, "RTS Instrumentation," and 3.3.2, "ESFAS Instrumentation," in NUREG-1431 do not contain a condition for two inoperable RTS or ESFAS channels; therefore, LCO 3.0.3 must be entered for this condition. The Action is proposed to be added for those RTS and ESFAS Functions that contain four channels, thereby preserving the safety function when two channels are inoperable. The NRC staff stated in the August 17, 2004 meeting that adding this Action to the Technical Specifications would be a violation of the single failure criterion and was unacceptable.

The WOG requested that the NRC document their position regarding this issue and stated that the WOG would prepare a White Paper discussing the background and acceptability of adding the proposed Action to NUREG-1431 to address two inoperable RTS or ESFAS channels.

The NRC's position regarding this issue is discussed in Reference 1. The White Paper prepared by the WOG in response to the NRC's position in Reference 1 is attached to this letter.

The WOG requests a meeting with the NRC staff to discuss the staff's response to the position discussed in the White Paper regarding the consideration of a single failure when the Technical Specification Actions are entered.

D048

November 19, 2004
WOG-04-592

If you have any questions regarding this request, please feel free to call me at 630-657-3897, or Mr. Jim Andrachek (Westinghouse) at 412-374-5018.

Very truly yours,

Steven M. DiTommaso for

Frederick P. "Ted" Schiffley, II
Chairman, Westinghouse Owners Group

mjl

Attachment

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.

cc: WOG Steering Committee
WOG Management Committee
WOG Licensing Subcommittee
H. Berkow, USNRC
G. Shukla, USNRC (via Federal Express)
WOG Project Management Office
J. Andrachek, Westinghouse
G. Andre, Westinghouse
K. Vavrek, Westinghouse

Single Failure Consideration When Technical Specification Actions Are Entered

Attachment to WOG-04-592

Background

The Westinghouse Owners Group (WOG) met with the NRC staff on August 17, 2004 to discuss adding an Action to NUREG-1431, "Standard Technical Specifications Westinghouse Plants," Revision 3, to address the condition of two inoperable Reactor Trip System (RTS) or Engineered Safety Features Actuation System (ESFAS) channels. Currently, Technical Specifications 3.3.1, "RTS Instrumentation," and 3.3.2, "ESFAS Instrumentation," in NUREG-1431 do not contain a condition for two inoperable RTS or ESFAS channels; therefore, LCO 3.0.3 must be entered for this condition. The Action is proposed to be added for those RTS and ESFAS Functions that contain four channels, thereby preserving the safety function when two channels are inoperable. The NRC staff stated in the August 17, 2004 meeting that adding this Action to the Technical Specifications would be a violation of the single failure criterion and was unacceptable.

The design basis single failure requirements and relationship to the Technical Specifications are discussed below in response to the following NRC staff's comment contained in Reference 1:

"Based on the WOG presentation, the staff expressed concerns with the proposal as this will be a violation of the single failure criteria required by 10 CFR 50.55(a)(h). The staff has previously allowed exception to single failure criteria because of the hardship consideration based on the hardware design configuration. However, this is not the case for the WOG's proposal and violation of the single failure criteria affects one element of the defense-in-depth approach to reactor safety. Based on this, the staff does not believe that there is enough justification to proceed with the proposed TR and compliance with the required single failure criteria should be addressed if the WOG intends to submit a TR for staff review."

Appendix A to Part 50 - General Design Criteria for Nuclear Power Plants

Appendix A, "General Design Criteria for Nuclear Power Plants," to Part 50, "Domestic Licensing of Production and Utilization Facilities," of Title 10, "Code of Federal Regulations," contains the principal design criteria which establish the design, fabrication, construction, testing, and performance requirements for structures, systems, and components important to safety. The General Design Criteria (GDC) contain specific requirements for the design of electric, protection, and fluid systems with regard to redundancy and the consideration of a single failure, as well as the inspection and testing of these systems. The GDCs provide design requirements.

10 CFR 50.55a - Codes and Standards

10 CFR 50.55(a)(h)(2), "Protection systems," requires that protection systems meet the requirements stated in IEEE Std. 279, "Criteria for Protection Systems for Nuclear Power Generating Stations," (Reference 2).

IEEE Std. 279, Requirement 4.2, "Single Failure Criterion," states:

"Any single failure within the protection system shall not prevent proper protective action at the system level when required."

IEEE Std. 279 contains design requirements for the protection system.

10 CFR 50.36 - Technical Specifications

10 CFR 50.36 (c)(2)(i), "Limiting conditions for operation," states:

"Limiting conditions for operation are the lowest functional capability or performance levels of equipment required for safe operation of the facility. When a limiting condition for operation of a nuclear reactor is not met, the licensee shall shut down the reactor or follow any remedial action permitted by the technical specifications until the condition can be met."

The Technical Specification Limiting Conditions for Operation (LCOs) ensure that the design basis requirements are met, including the consideration of a single failure as assumed in the safety analyses. Technical Specification surveillance testing, in-service testing, pre-planned preventive maintenance and emergent corrective maintenance are required to be performed during power operation (Mode 1). During the performance of this testing and maintenance, various components, subsystems, and trains are made inoperable, and the applicable Technical Specification Actions are entered for the inoperable equipment. When the LCO is not met, the Required Action for the applicable condition is required to be met within the associated Completion Time. The Completion Time provides a limited period of time for power operation to continue, to restore the inoperable equipment to operable status to meet the LCO. If the equipment is not restored to operable status within the associated Completion Time, the Technical Specifications require either a power reduction or a reactor shutdown. The single failure criterion is not applicable when the Actions are entered, since the Completion Time limits the amount of time that operation may continue in that condition, and the resultant condition is considered in the safety analyses (e.g., loss of one train of a two train system). The relaxation of the single failure criterion when the Actions are entered is required for the performance of the Technical Specification surveillance testing, in-service testing, pre-planned preventive maintenance and emergent corrective maintenance, otherwise the unit would have to be shutdown to perform the testing and maintenance. Therefore the Technical Specification Actions provide operating requirements, as opposed to design requirements when the LCO is not met.

NRC Generic Letter 80-030

NRC Generic Letter 80-030, (Reference 3), acknowledges the relaxation of the single failure criterion when the Technical Specification Actions are entered and states:

"The NRC's Standard Technical Specifications (STS) were formulated to preserve the single failure criterion for systems that are relied upon in the safety analysis report. By and large, the single failure criterion is preserved by specifying Limiting Conditions for Operation (LCOs) that require all redundant components of safety related systems to be OPERABLE. When the required redundancy is not maintained, either due to equipment failure or maintenance outage, action is required, within a specified 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, 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. If equipment can be returned to OPERABLE status within the specified time, plant shutdown is not required."

NRC Inspection Manual, Part 9900

NRC Inspection Manual, Part 9900, Technical Guidance, STS, Section 1.0, "Operability," (Reference 4), also acknowledges the relaxation of the single failure criterion when the Technical Specification Actions are entered.

C. 1. b. states:

"The system operability requirements, including related regulatory requirements may be waived as a consequence of specified action statements."

The fourth paragraph in C. 3. states:

"For those design basis events for which an analysis is provided during the power mode of operation, the technical specifications do allow exceptions to the requirements of the General Design Criteria (GDC) for limited periods of time. For example systems or components are allowed to be out-of-service for testing or maintenance for specified time intervals. During such times, the requirements of the single failure criterion as specified in the GDC for specific systems may not be satisfied."

Regulatory Guide 1.93

Regulatory Guide 1.93, (Reference 5), also supports the above position regarding the consideration of a single failure when the Technical Specification Actions are entered.

The second paragraph of the Introduction states:

"This guide describes operating procedures and restrictions acceptable to the Regulatory staff which should be implemented if the available electric power sources are less than the LCO."

ANSI/ANS-58.9-1981

ANSI/ANS-58.9-1981, (Reference 6), also acknowledges the relaxation of the single failure criterion when the Technical Specification Actions are entered.

Exemption 4.3 states:

"If one train of a redundant safety-related fluid system or its safety supporting systems is temporarily rendered inoperable due to short-term maintenance as allowed by the unit technical specifications, a single failure need not be assumed in the other train."

Conclusion

In summary, 10 CFR 50.55(a)(h)(2) (IEEE Std 279) provides design requirements for protection systems, including requirements for single failures. These RTS and ESFAS designs will not be modified by adding an Action to NUREG-1431 for two inoperable channels for Functions that contain four channels. The safety analysis assumptions for these RTS and ESFAS Functions will still be maintained by the two operable channels. A single failure in one of the two operable channels does not have to be considered when the Technical Specification Action is entered as discussed above and supported by References 3 through 6.

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. IEEE Std 279-1971, "Criteria for Protection Systems for Nuclear Power Generating Stations."

3. NRC Generic Letter 80-030, "Clarification of the Term "Operable" as it Applies to Single Failure Criterion for Safety Systems Required by TS," dated April 10, 1980.

4. NRC Inspection Manual, Part 9900, Technical Guidance, Standard Technical Specifications, Section 1.0, "Operability," dated May 12, 1986.

5. NRC Regulatory Guide 1.93, "Availability of Electric Power Sources," dated December 1974.

6. ANSI/ANS-58.9-1981, "Single Failure Criteria for Light Water Reactor Safety-Related Fluid Systems."