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Subject: **PWROG Program to Add an Action to NUREG-1431 for Two Inoperable Reactor Trip System or Engineered Safety Features Actuation System Instrumentation Channels (PA-LSC-0136)**

Reference: (1) "Request for Meeting Regarding 'Single Failure Consideration When Technical Specification Actions Are Entered' (PA-LSC-0136 and PA-LSC-0249)", OG-06-182, June 7, 2006.

The Pressurized Water Reactor Owners Group (PWROG) met with the NRC staff on July 27, 2007 to discuss the PWROG Program to add an Action to NUREG-1431 for two inoperable Reactor Trip System (RTS) or Engineered Safety Features Actuation System (ESFAS) channels. One of the items discussed at the meeting was the operational necessity for the proposed change. The PWROG took an action to collect additional information regarding instances when a request for discretionary enforcement was prepared but never requested, when an emergency license amendment request (LAR) was prepared but not submitted, or when LCO 3.0.3 was entered because the Technical Specifications did not contain a Condition for two inoperable RTS or ESFAS channels.

The number of occurrences of each of these situations is discussed below.

As discussed in Reference 1, a Notice of Enforcement Discretion (NOED) was granted at least three times because the Technical Specifications did not contain a Condition for two inoperable ESFAS channels. The details of these NOEDs are discussed below.

On July 23, 1998, lightning disabled two Refueling Water Storage Tank (RWST) level channels at a Westinghouse NSSS unit. Troubleshooting determined that the RWST level transmitters could not be calibrated, and needed to be replaced. The licensee requested 48 hours to replace one RWST level transmitter that was damaged by lightning. An NOED was granted on July 23, 1998. One RWST level channel was restored to operable status in less than the 48 hours requested, therefore LCO 3.0.3 was exited.

On January 24, 2003, two RWST level channels at a Westinghouse NSSS unit were declared inoperable due to indicating a high level. The apparent cause was frozen sensing lines due to the loss of the associated instrument box heaters during freezing weather. The licensee requested 48 hours to restore or replace at least one of the two inoperable RWST level channels to operable status.

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An NOED was granted on January 24, 2003. Subsequent to granting the NOED, one RWST level channel was restored to operable status, and LCO 3.0.3 was exited.

On August 16, 2003, lightning caused two RWST level channels to fail high at a Westinghouse NSSS unit. LCO 3.0.3 was entered and power was reduced to 82 percent of rated thermal power. The licensee requested 48 hours to restore one RWST level channel to operable status. An NOED was granted on August 16, 2003. One RWST level channel was restored to operable status prior to the 7 hours required to be in Mode 3, therefore LCO 3.0.3 was exited, and the NOED was not utilized.

One Westinghouse NSSS unit prepared an emergency LAR because the Technical Specifications did not contain a Condition for two inoperable Containment Pressure channels, but did not submit the LAR as discussed below.

On September 16, 2004, a Containment Pressure sensor demonstrated erratic behavior and was declared inoperable. One of the troubleshooting activities determined that the strain gage, which is connected to the outer bellows of the pressure sensor was the cause of the problem. The bellows and strain gage could not be repaired and had to be replaced as a unit. TIG welding was required to replace this unit. The Containment Pressure transmitters are sensitive to welding in the vicinity of the transmitters, and electrical noise in the operable transmitters could result in spurious actuation of various ESFAS functions actuated by the Containment Pressure transmitters. Therefore a LAR was prepared that would allow only one Containment Pressure transmitter to be operable for up to 1 hour for four different periods of time to allow replacement of the bellows and strain gage of the sensor. Another troubleshooting activity was evaluating the electronics associated with the channels. The electronics associated with the two channels were replaced, and the channels were restored to operable status, and therefore this LAR was not submitted.

One Westinghouse NSSS unit entered LCO 3.0.3 because the Technical Specifications did not contain a Condition for two inoperable RWST level channels. An NOED was being prepared, but was not requested as discussed below.

On January 24, 2003, two RWST level channels at a Westinghouse NSSS unit were declared inoperable due to indicating a high level. The apparent cause was frozen sensing lines during freezing weather. An NOED was being prepared because two RWST level channels were restored to operable status prior to the 7 hours required to be in Mode 3, therefore LCO 3.0.3 was exited.

One Westinghouse NSSS unit entered LCO 3.0.3 because the Technical Specifications did not contain a Condition for two inoperable Underfrequency Reactor Coolant Pump (RCP) RTS channels. The details of the LCO 3.0.3 entries are discussed below.

On November 15, 2007, two planned entries into LCO 3.0.3 were made to perform corrective maintenance repairs to a potential transformer in a 12 KV bus "E" RCP undervoltage relay that had failed on October 28, 2007. After the failure of the potential transformer on October 28, 2007, the RCP 1-3, Bus "E", 12 KV undervoltage relay tripped, resulting in an increased trip risk (a trip of one

of the two undervoltage relays on the other bus would satisfy the reactor trip system logic of 1/2 relays on 2/2 busses). The licensee evaluated several options to repair the potential transformer and decided to perform the repair while the unit was online. This required a planned LCO 3.0.3 entry in order to provide electrical isolation for employee safety during the repair and to eliminate a unit trip risk during the transfer of power supplies to support the repair.

The planned LCO 3.0.3 entries were made as a result of more than one Underfrequency RCPs channel being inoperable while the underfrequency relays were being jumpered (to prevent actuation while transferring power supplies) during the repair. The RTS Underfrequency RCP trip logic results in a reactor trip on 2/3 relays on 1/2 busses. Two LCO 3.0.3 entries were made during the repair when more than one Underfrequency RCPs relay was jumpered, the first entry was for 36 minutes and the second entry was for 44 minutes.

In summary, these situations occurred for an RTS function (Underfrequency RCP) and two different ESFAS functions (RWST and Containment Pressure). The inoperable RWST ESFAS channels were caused by lightning strikes and frozen sensing lines.

If you have any questions, please do not hesitate to contact me at (254) 897-5851 or Mr. Chad Holderbaum of the PWR Owners Group Program Management Office at (412) 374-6230.

Regards,

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Dennis Buschbaum, Chairman  
PWR Owners Group

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