



EQ-Related Enforcement Activity

Fall 2015 EQ Technical Conference

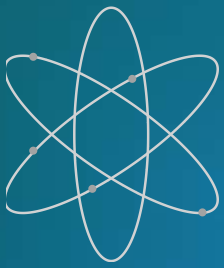
Nuclear Utility Group on Equipment Qualification

November 4-6, 2015

Clearwater, Florida

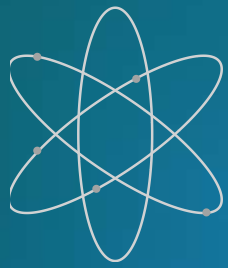
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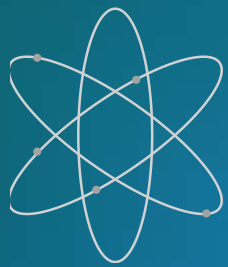
EQ-Related Enforcement Activity

- Summary of EQ-Related Enforcement Activity
 - Summary since 2012
 - Provided in response to need for EQ Pilot Plant inspections to have access to Inspection and Enforcement OE
 - ✦ Distributed to Group and non-Group members
 - Includes both direct EQ and EQ-related findings



EQ-Related Enforcement Activity

Site/Date	Inspection Report	Criterion	ROP Finding/ Violation	Description
Oconee 01/26/12	2011-008 (PI&R)	App. B, CRIT XVI 50.49(f)	Green	Licensee missed opportunities (October to November 2010 (Unit 3)) (April to June 2011 (Unit 1)), and in November 2011 (Unit 2)), an unknown quantity of unqualified Limitorque Actuators were installed
Cooper 02/10/12	2011-005 (Integrated)	App. B, CRIT III	Green/NCV	Licensee failed to translate design requirements associated with Turbine Bldg HELB into design information to demonstrate protection of safety-related 4160v switchgear and EDGs
Braidwood 02/10/12	2011-005 (Integrated)	50.73	SL-IV	Failure to report non-conservative assumption in actuation time for fusible links used in hazard barrier dampers for the ESF Switchgear Rooms, Non-ESF Switchgear Rooms, MEERs and EDG Rooms. Dampers protect rooms from HELB (HELB calculation errors)
Braidwood 05/08/12	2012-002 (Integrated)	50.49(e)	Green/NCV	Licensee failed to consider temp/humidity changes in EDG, ESG and MEER rooms during a Turbine Bldg HELB; rooms incorrectly classified as mild environments-instead of harsh environments
Duane Arnold 05/10/12	2012-002 (Integrated)	App. B, CRIT XVI	Green/NCV	Loss of LPCI safety function due to inoperable ECCS instrumentation caused by miscalibration of Barton Model 288 differential pressure switches
Millstone 07/23/12	2012-003 (Integrated)	TS	Green/NCV	Installation of main steam line pressure transmitters after maintenance using gaskets that were not environmentally qualified rendering them inoperable



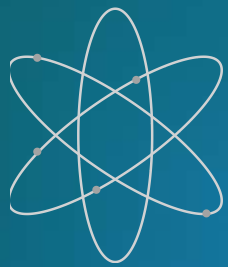
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Catawba 10/18/12	2012-007 (CDBI)	App. B, CRIT V	Green/NCV	Failure to establish a procedure to ensure the maximum MOV cycle requirements in EQMM 1393.01-A01-00, "Environmental Qualification Maintenance Manual," were not exceeded
Columbia 10/29/12	2012-004 (Integrated)	TS	Green/NCV	Failure to implement preventive maintenance schedules for safety-related 480V motor control center starter coils
Sequoyah 02/13/13	2012-005 (Integrated)	App. B, CRIT III	Green/NOV	Inadequate measures used to review the suitability of parts, and equipment essential to the safety-related functions of molded case circuit breakers
Browns Ferry 06/25/13	2013-404 (CDBI)	App. B, CRIT XVI	Green/NCV	Failure to evaluate the effects of the postulated failure of non-safety-related equipment & circuits located in harsh environment on the safety-related Class 1E shutdown board transformers and 480V Shutdown Boards
Fort Calhoun 8/09/13	2013-005 (Integrated)	50.49	Green/NCV	Prior to December 12, 2012, the licensee failed to keep the list and information in the EEQ file current for electric equipment inside containment when the analysis of record for the Main Steam Line Break accident changed



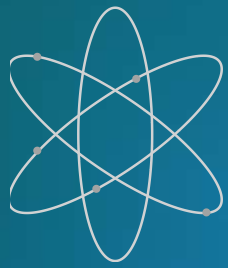
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Columbia 8/22/13	2013-008 (PI&R)	App. B, CRIT XVI	Green/NCV	After identifying missing conduit seals in select residual heat removal flow transmitters that required an assessment of functionality or corrective action to restore the flow transmitters non-conforming conditions to their environmentally qualified state—the licensee failed to appropriately document the condition and to take corrective actions
Columbia 8/22/13	2013-008 (PI&R)	App. B, CRIT III	Green/NCV	Licensee failed to implement measures to control the environmental qualification requirements for select residual heat removal flow transmitters
Davis-Besse 11/01/13	2013-004 (Integrated)	App. B, CRIT III	Green/NCV	Licensee relied on non-safety-related equipment that was not verified to function under a HELB scenario – after performing analysis licensee concluded that the safety-related switchgear rooms would have remained within their EQ limits whether or not the non-safety-related equipment functioned as designed
Millstone 11/08/13	2013-004 (Integrated)	TS	Green/NCV	Historical gaps in Unit 2 High Energy Line Break Barrier
Harris 2/04/14	2013-005 (Integrated)	50.49	Green/NCV	Between September 2013 and November 2013, multiple EQ program deficiencies were identified including design documentation and the qualification of electric equipment installed in the plant
STP 03/28/14	2013-007 (CDBI)	App. B, CRIT III	Green/NCV	Failure to evaluate adequacy of voltage available at AF-19 Valve Motor to close the valve during postulated HELB



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Watts Bar 04/30/14	2014-002 (Integrated)	TS	Green/NCV	Failure to Follow Plant Procedures for Replacement of NAMCO Limit Switches (procedure prohibited removing the back cover of either environmentally qualified or Class 1E (safety related) limit switches)
Browns Ferry 04/30/14	2014-002 (PI&R)	50.49	Green/NCV	From April 3, 2013 until September 25, 2013, the 39 motor leads for the Unit 2 High Pressure Coolant Injection main pump minimum flow valve were spliced with Scotch Electrical Tape resulting in a loss of EQ
Hope Creek 05/13/14	2014-002 (Integrated)	App. B, CRIT III	Green/NCV	Inadequate Evaluation of 480 VAC Motor Control Center Design Change
Browns Ferry 06/09/14	2012-005 (Integrated)	App. B, CRIT XVI	Green/NCV	Failure to adopt corrective actions to address extensive backlog of EQ Information (81 of the licensee's 99 required EQ Files were not updated to reflect the as-installed specifications and configuration of EQ equipment)
Robinson 07/21/14	2014-003 (Integrated)	50.49	Green/NCV	Licensee failed to use the proper heat shrink insulators in accordance with CM-309, "Sealing Low Voltage Electrical Splices for Environmentally Qualified or Safety Related Splices"—subsequently, the licensee replaced the non-environmental qualified splice



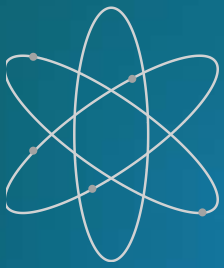
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Site/Date	Inspection Report	Criterion	ROP Finding/ Violation	Description
Indian Point 07/28/14	2014-007 (Changes, Test Experiments)	App. B, CRIT III	Green/NCV	Non-Qualified Component Installed in Harsh Environment for Actuator (During 12-year overhaul of auxiliary boiler feedwater flow control valve, a Masoneilan air pressure regulator was installed in a harsh environment for which it was not designed or qualified)
Callaway 07/31/14	2014-007 (CDBI)	App. B, CRIT III	Green/NCV	Failure to adequately account for increased temperatures within the Class 1E electrical cabinets, and the effect on the components in those cabinets
Cooper 08/12/14	2014-013 (Integrated)	App. B, CRIT III	Green/NCV	From initial construction, licensee failed to fully incorporate applicable design requirements for components needed to ensure the capability to shut down the reactor and maintain it in a safe shutdown condition following a high energy line break
Fort Calhoun 09/18/14	2014-009 (PI&R)	TS	Green/NCV	Licensee's maintenance procedure for NAMCO Type EA 180 limit switches did not specify the correct torque values for the switch top cover to maintain environmental qualification
Fort Calhoun 09/18/14	2014-009 (PI&R)	50.73	SL-IV	Licensee failed to report within 60 days the discovery that the NAMCO Type EA 180 limit switches were not environmentally qualified as required due to inadequate maintenance procedures
Ginna 09/29/14	2014-007 (Changes, Test Experiments)	App. B, CRIT XI	Green/NCV	Inadequate Test Control for MSIV Solenoid-Operated Valves



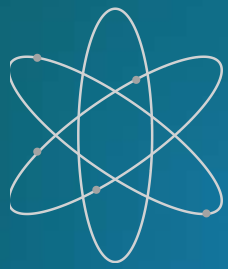
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River Bend 11/05/14	2014-007 (CDBI)	App. B, CRIT V	Green/NCV	Failure to complete and justify extension of preventative maintenance on Division III 4160 VAC Safety Related Breakers
River Bend 11/05/14	2014-007 (CDBI)	App. B, CRIT XVI	Green/NCV	From December 2011 to August 20, 2014 licensee failed to correct design basis documents to demonstrate RCIC MOVs close during postulated HELB conditions
River Bend 11/05/14	2014-007 (CDBI)	App. B, CRIT V	Green/NCV	Failure to perform an adequate operability determination for missed preventive maintenance on Safety-Related Circuit Breakers
Fort Calhoun 11/25/14	2013-018 (IMC 0350)	App. B, CRIT III	White/NOV (EA-14-187)	From initial construction through October 2013, licensee failed to fully incorporate applicable design requirements for components needed to ensure the capability to shut down the reactor and maintain it in a safe shutdown condition following a HELB
Fort Calhoun 11/25/14	2013-018 (IMC 0350)	App. B, CRIT III	Green/NCV	Licensee's use of non-conservative inputs to analyze the pipe break loads during a HELB resulted in a condition where SSCs to mitigate the effects of a high energy pipe break may not have functioned as required
Duane Arnold 02/04/15	2014-005 (Integrated)	App. B, CRIT III	Green/NCV	Licensee failed to properly select and review the suitability of application of several electrical cable splices and terminal strips during the replacement of safety-related electrical cables (two mod packages did not appropriately evaluate the impacts of EQ program)



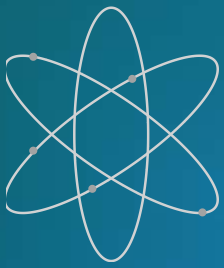
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Dresden 03/26/15	2014-005 (Integrated)	App. B, CRIT III	White/NOV (EA-15-001)	From November 29, 2010, to November 6, 2014, the licensee failed to establish measures to ensure that the application of the ADS ERV actuators remained suitable for operation
Oyster Creek 04/27/15	2014-009 (PI&R)	App. B, CRIT III; TS	Yellow/NOV (EA-14-178)	Failure to recognize defect in design of ERV actuators since installation in 1969
Prairie Island 05/06/15	2015-001 (Integrated)	50.49	Green/NCV	Licensee failed to keep information in EQ file PI-19.1A.001, "ASCO Solenoid EQ File," current and incorrectly determined the designated life of multiple solenoid valves to be 17 years based after the application of an incorrect test report and temperature rise data (designated life was determined to be 4.96 years) – However, once the revised design life was known, no action was taken to replace or refurbish the specific valves or justify why valves had additional life
Comanche Peak 05/07/15	2015-001 (Integrated)	App. B, CRIT V	Green/NCV	Licensee disabled the HELB/EQ door and failed to evaluate operability of the safety-related equipment protected by this door
ANO 05/13/15	2015-001 (Integrated)	App. B, CRIT III	Green/NCV	Failure to protect safety-related equipment from potential HELB between January 3, 2002, and February 12, 2014 (battery room operability)



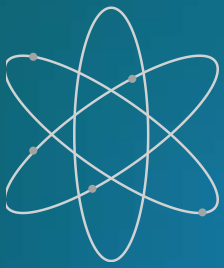
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Columbia 05/13/15	2015-007 (PI&R)	App. B, CRIT V	Green/NCV	Licensee failed to determine and document the operability of molded case circuit breakers installed beyond the useful life
McGuire 07/23/15	2015-007 (CDBI)	App. B, CRIT III	Green/NCV	Since 1981, licensee's design control measures failed to verify the adequacy of GE model TED and Eaton model HFB molded case circuit breakers in the Class 1E electric system
Columbia 08/07/15	2015-002 (Integrated)	App. B, CRIT V	Green/NCV	Procedure PPM 1.3.57, "Barrier Impairment," Revision 0-32 failed to establish appropriate measures to maintain electrical instrument racks operable following a postulated HELB because the licensee incorrectly concluded that HELB events are slow developing events with sufficient time to implement compensatory measures
Diablo 08/07/15	2015-002 (Integrated)	App. B, CRIT III	Green/NCV	Licensee allowed obstruction of a credited flow path (grated doors) with acrylic glass plates not qualified in the original design and not verified to function under a HELB scenario invalidating safety function of the grated doors
Monticello 09/02/15	2015-007 (CDBI)	App. B, CRIT III	Green/NCV	Licensee failed to review for suitability of application of safety-related Agastat and General Electric relays that had exceeded their service life
Dresden 09/16/15	2015-002 (Integrated)	App. B, CRIT III TS	White/NOV (EA-15-115)	From December 1, 2009, to February 7, 2015, the licensee failed to establish measures for the review of suitability of application for the ADS ERV actuators



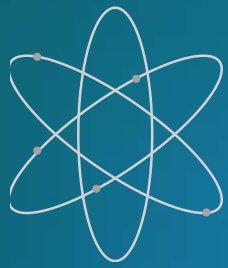
EQ-Related Enforcement Activity

- Since last fall conference, 17 different findings deemed EQ-related
 - Service Life/Maintenance (5)
 - HELB (7)
 - Qualification/Operability(Technical) (2)
 - Defect in Design (3)
- Only one finding cited against EQ (50.49)



EQ-Related Enforcement Activity

- **Lessons-Learned**
 - Not all EQ-related actions are cited as 50.49 violations. In fact, few are so referenced.
 - Easier to cite against an Appendix B Criterion, general requirements
 - HELB issues still dominate and reflect a potential focus in the EQ Pilot Inspections as well



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QUESTIONS?