UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
612 EAST LAMAR BLVD, SUITE 400
ARLINGTON, TEXAS 76011-4125

December 11, 2008

Kevin Walsh, Vice President, Operations
Entergy Operations, Inc.
Waterford Steam Electric Station, Unit 3
17265 River Road
Killona, LA 70057-3093

SUBJECT: WATERFORD STEAM ELECTRIC STATION, UNIT 3 - NRC PROBLEM IDENTIFICATION AND RESOLUTION INSPECTION REPORT 05000382/2008007

Dear Mr. Walsh:

On October 31, 2008, the U. S. Nuclear Regulatory Commission completed a team inspection at your Waterford Steam Electric Station, Unit 3. The enclosed report documents the NRC inspection findings, which the team discussed with you and other members of your staff during an exit meeting.

This inspection was an examination of activities conducted under your license as they relate to the identification and resolution of problems, compliance with the Commission's rules and regulations and the conditions of your operating license. Within these areas, the inspection involved examination of selected procedures and representative records, observations of activities, and interviews with personnel. The team reviewed 243 condition reports, associated root and apparent cause evaluations, and other supporting documents. The team interviewed 30 personnel regarding the condition of your safety conscious work environment.

Based on the samples selected for review, the team concluded that, in most cases, your staff identified, evaluated and prioritized, and implemented corrective actions for conditions adverse to quality. The team determined that licensee personnel felt free to identify safety concerns by using their corrective actions program or by contacting their supervisor, employee concern program, or the NRC.

The team identified two findings of very low safety significance (Green). These findings were determined to be violations of NRC requirements. However, because of their very low safety significance and because they have been entered into your corrective action program, the NRC is treating these findings as noncited violations, in accordance with Section VI.A.1 of the NRC Enforcement Policy. If you contest the violations or the significance of the violations, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U. S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, D.C. 20555-0001, with copies to the Regional Administrator, U. S. Nuclear Regulatory Commission, Region IV, 612 E. Lamar Blvd, Suite 400, Arlington, Texas, 76011; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, D.C., 20555-0001; and the NRC Resident Inspector at the Waterford Steam Electric Station, Unit 3, facility.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA/

Gregory E. Werner, Chief
Plant Support Branch 2
Division of Reactor Safety

Docket: 50-382
License: NPF-38

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Inspection Report 05000382/2008007
w/ Attachments: 1. Supplemental Information
2. Information Request

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SUNSI Review Completed: __GAP____ ADAMS: ☒ Yes □ No Initials: ___GAP___
☒ Publicly Available □ Non-Publicly Available □ Sensitive ☒ Non-Sensitive

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ENCLOSURE

U. S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket:	05000382
License:	NPF-38
Report:	05000382/2008007
Licensee:	Entergy Operations, Inc.
Facility:	Waterford Steam Electric Station, Unit 3
Location:	Hwy. 18 Killona, Louisiana
Dates:	October 6 - 31, 2008
Team Leader:	G. Pick, Senior Reactor Inspector, Engineering Branch 2
Inspectors:	D. Bollock, Project Engineer, Branch B, Division of Reactor Projects P. Goldberg, Reactor Inspector, Plant Support Branch 2 D. Overland, Resident Inspector, Waterford 3
Approved By:	Gregory E. Werner, Chief Plant Support Branch 2 Division of Reactor Safety

SUMMARY OF ISSUES

IR 05000382/2008007; Entergy Operations, Inc.; 10/06-31/2008; Waterford 3; Biennial baseline inspection of the identification and resolution of problems

Three region and a resident inspector conducted the inspection. The team identified two noncited violations during this inspection. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter 0609, "Significance Determination Process." Findings for which the Significance Determination Process does not apply may be Green or be assigned a severity level after NRC management review. The NRC described the program for overseeing the safe operation of commercial nuclear power reactors in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

Identification and Resolution of Problems

The team reviewed 243 condition reports including their associated apparent or root cause evaluations. The team concluded that, in most cases, the licensee identified, evaluated and prioritized, and implemented effective corrective actions for conditions adverse to quality. With few exceptions, the licensee identified deficiencies as conditions adverse to quality. The licensee established a low threshold for initiating corrective action documents and prioritized conditions adverse to quality commensurate with their safety significance. On occasion, the licensee needed to more thoroughly evaluate the causes and implement effective corrective actions for conditions adverse to quality.

The licensee processed operating experience information. The licensee performed self-critical assessments, audits, and evaluations. The team noted that licensee self-assessments and audits had identified problems similar to the team's findings related to the quality of the apparent cause evaluations. The licensee implemented an action plan in July 2007 that resulted in improved performance of the corrective action process.

The team determined the licensee maintained a safety conscious work environment. Personnel would use the corrective action program or talk to their supervisor to identify conditions adverse to quality. Personnel were aware of the employee concerns program. From review of the licensee's corrective actions for human performance weaknesses, the team determined that the licensee had implemented appropriate corrective actions to monitor and correct human performance issues.

A. Inspector-Identified and Self-Revealing Findings

Cornerstone: Barrier Integrity

- Green. The team identified a Green noncited violation of 10 CFR Part 50, Appendix B, Criterion XVI, for failure to promptly identify and correct a condition adverse to quality. Specifically, from March 20, 2007, through October 27, 2008, personnel failed to identify and correct a condition, which allowed containment vacuum relief valve differential pressure switches to operate in pressures that exceeded the designed operating pressure of the switches. The licensee

implemented interim corrective actions to ensure operability. Specifically, the licensee increased the test frequency and adjusted the switches to reduce the effects of the deficient condition. The licensee entered this deficiency into their corrective action program as Condition Report 2008-05106.

The performance deficiency associated with this finding involved the failure to promptly identify and correct a condition adverse to quality that could affect containment integrity. This finding was greater than minor because it affected the Configuration Control attribute of the Barrier Integrity Cornerstone objective to provide reasonable assurance that the containment physical design barrier protected the public from radionuclide releases caused by an event. Using the NRC Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," the team determined the finding had very low safety significance because it did not represent an actual open pathway in the physical integrity of the reactor containment building. This finding had a crosscutting aspect in the area of human performance, associated with the decision-making component, in that, licensee personnel failed to make conservative decisions related to equipment operation in accordance with design requirements (H.1(b)).

- Green. The team identified a Green noncited violation of 10 CFR Part 50, Appendix B, Criterion V, for a failure to follow procedure, when the licensee failed to complete an adequate operability evaluation for Valve SI-142A. Specifically, on August 21, 2008, the licensee failed to follow Procedure EN-OP-104, "Operability Determinations," Revision 3, because personnel did not determine the leak rate solely through the required pressure boundary valve. The licensee entered this deficiency into their corrective action program as Condition Report 2008-05077.

  The failure to perform an adequate operability evaluation on safety-related plant equipment in accordance with Procedure EN-OP-104 is a performance deficiency. The team determined this finding was greater than minor from review of Manual Chapter 0612, Appendix E, "Examples of Minor Issues." The finding was similar to non-minor finding Example 3.j in that reasonable doubt existed related to the operability of Valve SI-142A. Using Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings", the team determined the finding had very low safety significance because it did not represent an actual open pathway in the physical integrity of the reactor containment building. The finding had a crosscutting aspect in the area of problem identification and resolution because the licensee failed to thoroughly evaluate valve operability (P.1(c)).

B. Licensee-Identified Violations

None

REPORT DETAILS

4 OTHER ACTIVITIES (OA)

4OA2 Identification and Resolution of Problems

The team based the following conclusions, in part, on the sample of condition reports reviewed during the assessment period, which ranged from April 1, 2006, to October 31, 2008.

a. Assessment of the Corrective Action Program Effectiveness

(1) Inspection Scope

The team reviewed plant records, primarily condition reports and job orders and interviewed personnel to verify that the licensee: (1) identified problems at the proper threshold and entered them into the corrective action system, (2) adequately prioritized and evaluated issues, and (3) established effective and timely corrective actions, including actions to prevent recurrence, if required. The team sampled specific technical issues to evaluate the adequacy of operability determinations. The team performed a historical review of condition reports written over the last 5 years that addressed the ultimate heat sink, boric acid control program, and the safety-related chillers. The team conducted field walk downs of the ultimate heat sink and chilled water system to inspect for deficiencies that personnel should have entered into the corrective action program. The team reviewed a sample of self-assessments, trending reports, system health reports, and various other documents related to the corrective action program.

The team also reviewed condition reports that addressed past NRC-identified violations to ensure that the corrective actions addressed the issues as described in the inspection reports. The team reviewed a sample of corrective actions closed to other condition reports, job orders, and tracking programs to ensure that corrective actions were still appropriate and timely.

(2) Assessments

(a) Assessment - Effectiveness of Problem Identification

Generally, the licensee identified deficiencies as conditions adverse to quality and entered them into the corrective action program at a low threshold. The team determined that three examples occurred over the assessment period related to failure take timely corrective actions to correct conditions adverse to quality (Examples 1-3). The team determined that the licensee had established an appropriate threshold for differentiating between conditions adverse to quality, significant conditions adverse to quality and those adverse conditions that were understood and easily corrected with work orders (i.e., broke/fix).

From review of the condition report initiation rate, the team determined that the licensee initiated approximately 4700 condition reports annually for the past 3 years. Based on the sample reviewed, the team determined that licensee identified conditions adverse to quality commensurate with their safety significance. From review of the trending program, the team concluded that the licensee effectively used their trending process to identify potential declining areas through trending of their Category C (easily corrected) and of Category D (administrative) condition reports.

Examples

Example 1: The inspectors identified that the licensee failed to promptly identify and correct an adverse condition involving nonconforming welds at the upper and batwing-to-wrapper bar in the steam generators (Noncited Violation 05000382/2006012-01).

Example 2: The licensee did not identify a seal leak on Reactor Coolant Pump 1A in a timely fashion, which resulted in boric acid degrading the reactor coolant pump cover, main casing stud nuts, shroud wall, and carbon steel flanges through boric acid corrosion (Noncited Violation 05000382/2007005-03).

Example 3: The team identified that the licensee failed to promptly identify and correct a condition adverse to quality. Specifically, personnel failed to identify that containment vacuum relief valve differential pressure switches operated in pressures beyond their design pressures, which caused the switches to stick and could render the containment vacuum relief valves inoperable (Noncited Violation 05000382/2008007-01, Section 4OA2.e.1).

(b) Assessment - Effectiveness of Prioritization and Evaluation of Issues

On occasion, the licensee had weaknesses when performing and/or documenting evaluations of conditions adverse to quality during this assessment period. The team determined that the following nine examples related to poor evaluations. Four instances occurred in which the licensee did not identify a cause for a condition adverse to quality (Examples 1 - 4). The team determined three instances resulted from failure to clearly document the basis for an evaluation (Examples 5 - 7). Overall, the licensee performed adequate operability evaluations even though the team identified one instance of an inadequate operability evaluation (Example 8). One example related to an ineffective evaluation of boric acid leaks (Example 9).

The team concluded that, although instances of poor evaluation had occurred throughout the assessment period, the licensee performed audits and assessments that identified deficiencies in their corrective action program (Examples 3, 5 and 7).

From the sample of condition reports reviewed, the team determined the licensee appropriately established priorities for identified conditions adverse to quality. The licensee performed root and apparent cause evaluations commensurate with their impact on safety.

Examples

Example 1: The team identified that the apparent cause evaluation in Condition Report 2006-01086 did not identify a cause for a boric acid leak on a flow element flange in the safety injection system. Work Order 86371 had a directive to inspect the gasket seating surfaces on the flanges and orifice to determine the causes of the leak. The licensee completed the work order; however, the licensee did not identify an apparent cause.

Example 2: The team identified that the Condition Report 2007-01407 apparent cause evaluation did not describe a specific cause for the failure of the Pressurizer Proportional Heater 2 silicon controlled rectifier power controller. The licensee initiated Work Order 109040 to determine the cause for the power controller failure. The licensee completed the work order; however, the licensee did not identify an apparent cause.

Example 3: The licensee identified in Condition Report 2008-03371 that they performed an ineffective apparent cause evaluation for Condition Report 2008-02643, which identified problems with refueling equipment. The team verified that, after quality assurance personnel identified the cause as inadequate, the licensee subsequently completed an appropriate apparent cause evaluation.

Example 4: Condition Report 2006-01365 identified that the temperature switch for the Essential Chiller AB oil reservoir had drifted out-of-specification high; however, the licensee had not determined a cause for the drifting temperature switch. Rather, the licensee concluded the apparent cause for the drifting temperature switch was a drifting temperature switch.

Example 5: The licensee documented in Condition Report 2008-02819 that Condition Report 2008-02367 had an inadequate apparent cause evaluation. The licensee had not discussed the method used to determine the apparent cause (e.g., "the why tree").

Example 6: The team identified that the licensee had performed a poor evaluation in Condition Report 2005-04398 related to a Maintenance Rule (a)(1) evaluation for a main steam isolation valve closure function. From more detailed review and discussions, the team determined that the licensee had not included sufficient information in the condition report; however, the team concluded that a functional failure had not occurred and that this deficiency was not more than minor.

Example 7: The licensee initiated Condition Report 2008-01329 to document that the Level 2 human performance evaluation reports evaluated during the Condition Report 2008-00682 common cause analysis contained minimal documentation of the evaluated human performance condition and behavioral feedback process related to the deficiencies. The team verified that the licensee determined that other areas in condition reports contained the required information.

Example 8: The team identified that the licensee failed to complete an adequate operability evaluation on Valve SI-142A, low pressure safety injection header to reactor coolant Loop 2B inside containment check valve (Noncited Violation 05000382/2008007-02).

Example 9: The resident inspector identified that the licensee failed to evaluate identified boric acid leaks on High Pressure Safety Injection Pump A and Safety Injection Valve SI-MVAAA120A, which had deteriorated since initial discovery (Noncited Violation 05000382/2008002-01).

(c) Assessment - Effectiveness of Corrective Actions

In some cases, the licensee had weaknesses when implementing effective corrective actions either because the actions were not timely or actions taken did not correct the adverse condition. The team determined that the licensee had four examples related to failure to address longstanding issues (Examples 1 - 4) and one example of failure to implement corrective actions in a timely manner to prevent recurrence (Example 5) The licensee had three examples related to ineffective corrective actions (Examples 6 - 8). The licensee's efforts to improve the quality of their corrective action process resulted in the licensee determining that their corrective actions to address human performance deficiencies were ineffective (Example 9).

Examples

Example 1: The licensee identified in Condition Report 2006-02735 that they failed to take timely corrective actions to address the plant monitoring computer multiplexer hardware deficiencies identified in Condition Report 2006-01291.

Example 2: The licensee identified in Condition Report 2007-00428 and Condition Report 2007-00483 that they failed to take timely corrective actions for the qualified safety parameter display system power supply failures.

Example 3: The resident inspector identified that the licensee failed to promptly correct a deficient pre-fire plan that provided insufficient guidance for removing smoke from a fire area that required performing an operator manual action (Noncited Violation 05000382/2007004-03).

Example 4: The inspectors identified that the licensee failed to promptly correct a condition adverse to quality. Specifically, the licensee had no basis for the specified 5-year-cleaning interval for the dry cooling towers and had not cleaned the towers for approximately 11 years (Noncited Violation 05000382/2007007-05).

Example 5: The resident inspectors determined the licensee failed to take timely corrective actions for an emergency diesel generator starting air system deficiency, originally identified by the NRC in September 2003. The starting air system could not supply sufficient air to start the emergency diesel generator a minimum of five times (Noncited Violation 05000382/2006003-01).

Example 6: The licensee failed to implement effective corrective actions to prevent recurrence of a significant condition adverse to quality in that Valve SI-405B, Train B shutdown cooling suction from reactor coolant system, failed to stroke open while attempting to place shutdown cooling in service (Noncited Violation 05000382/2006005-01).

Example 7: The resident inspector identified that the licensee failed to implement effective corrective actions for a deficient emergency diesel generator fuel tank filling procedure in that the licensee failed to correct all deficient sections of the affected procedure. Subsequently, when operators used a different section to fill the fuel tank the problem recurred (Noncited Violation 05000382/2008002-02).

Example 8: The resident inspector identified that the licensee performed ineffective actions to correct a condition adverse to quality that resulted in failure of the auxiliary component cooling water pump bearing. Specifically, the licensee established an operator aid in response to a previous failure that contained incorrect and confusing information (Noncited Violation 05000382/2008002-04).

Example 9: The licensee identified in Condition Report 2008-02996 that corrective actions implemented in Condition Reports 2008-00121 and 2008-00618 did not effectively correct poor human performance behaviors. Specifically, the organizations failed to institutionalize the corrective actions and did not ensure sustained improvement after implementing the corrective actions.

b. Assessment of the Use of Operating Experience

(1) Inspection Scope

The team examined licensee programs for reviewing industry operating experience. The team selected a number of operating experience notification documents (NRC information notices, 10 CFR Part 21 reports, licensee event reports, vendor notifications, et cetera), which had been issued during the assessment period, to verify whether the licensee had appropriately evaluated each notification for relevance to the facility. The team then examined whether the licensee had entered relevant operating experience into their corrective action program. The team reviewed significant conditions adverse to quality and conditions adverse to quality to verify if the licensee had appropriately evaluated them for industry operating experience.

(2) Assessment

The licensee effectively processed operating experience information. Although three examples related to ineffective processing of industry operating experience occurred, the team determined in each instance the licensee had identified and corrected the condition or their quality assurance organization had identified the issue and the licensee responded appropriately to correct the condition. The licensee identified that they had two earlier missed opportunities in a root cause evaluation for a dropped watertight

container (Example 1). The team determined two instances of failure to process industry information had occurred but they had no plant impact (Examples 2 and 3). The licensee had identified similar conclusions regarding their operating experience program and use of operating experience during a self-assessment.

Examples

Example 1: The licensee identified in the root cause analysis for Condition Report 2007-02403 that they had performed ineffective operating experience evaluations related to positive verification and engagement of spreader lift locks for rigging devices. The team verified that the licensee implemented appropriate corrective actions.

Example 2: The licensee identified in Condition Report 2006-01953 that they had not implemented all the vendor recommendations related to the core operating limits supervisory system recommended by Technical Bulletin TB-04-01, "COLSS Range Limits." The inspectors verified the conclusions that the failure did not affect operability.

Example 3: The team identified that the licensee did not evaluate the impact of external corrosion conditions described in Information Notice 2007-06, "Potential Common Cause Vulnerabilities in Essential Service Water Systems." Additional review verified the external corrosion conditions did apply and that the licensee had ongoing actions to address external corrosion.

c. Assessment of Self-Assessments and Audits

(1) Inspection Scope

The team reviewed audits, self-assessments, quality surveillances, and site performance indicators. The team reviewed program procedures and interviewed process managers related to the performance improvement group, the corrective action program, and the Quality Assurance department. The team evaluated the use of self- and third party assessments, the role of quality assurance,department and the role of the performance improvement group related to licensee performance.

(2) Assessment

The licensee performed critical self-assessments and audits. For example, the team determined that the licensee performed detailed self-critical assessments of their corrective action and operating experience programs, which identified weaknesses in completing apparent causes and processing of operating experience. The corrective action and assessment department had initiated a corrective action program excellence plan in July 2007 to improve the corrective action process. The licensee implemented the improvements through critical feedback to plant personnel following condition review group meetings, through the use of pre-panel department evaluations prior to presenting root and apparent causes to the corrective action review board. The quality assurance department performed critical, detailed audits and surveillances of line organizations. The team determined that the line organizations continued to use audits and

surveillances as a tool to improve their performance. Licensee self-assessments and audits identified problems similar to the team's findings related to the quality of the apparent cause evaluations.

d. Assessment of Safety Conscious Work Environment

(1) Inspection Scope

The team reviewed the 2006 Nuclear Safety Culture Assessment results. The team reviewed NRC allegations and employee concerns program concerns that occurred since January 1, 2006. The team conducted interviews with an organizational cross-section of 30 site personnel and informal interviews with other members of licensee staff to assess their willingness to raise safety issues and use the corrective action program. These interviews assessed whether conditions existed that would challenge the safety-conscience work environment.

(2) Assessment

The licensee maintained a safety conscious work environment. From the interviews, the team found that almost all personnel would initiate condition reports. Those that did not initiate condition reports would discuss the deficiency or concern with their supervisor. The personnel were aware of the Entergy Open Door Policy, knew of the employee concern program, and would raise concerns to NRC if needed.

The team determined the last safety culture assessment had occurred more than 2 years previously and the onsite organizations had undergone significant changes since then with the implementation of the Entergy realignment. The safety culture assessment determined that the licensee had a strong safety culture. However, the team noted that some concerns identified during the last safety culture assessment, which included higher workload and loss of personnel, continued to be a concern in some departments. The team determined that the concerns related to higher workload had no impact on the safety culture; however, if left uncorrected, these general culture concerns could have a future impact on the safety culture. The licensee plans to perform another safety culture assessment in 2009.

e. Specific Issues Identified During This Inspection

.1 Failure to promptly identify and correct a condition adverse to quality

Introduction. The team identified a Green noncited violation of 10 CFR Part 50, Appendix B, Criterion XVI, for failure to promptly identify and correct a condition adverse to quality. Specifically, from March 20, 2007, through October 27, 2008, personnel failed to identify and correct a condition which allowed containment vacuum relief valve differential pressure switches to operate in pressures that exceeded the designed operating pressure of the switches. The licensee entered this deficiency into their corrective action program as Condition Report 2008-05106.

Description. The containment vacuum relief system, a safety-related system, provides the means to prevent potential containment failures resulting from a vacuum condition inside containment. If the pressure inside the containment building reach 8.5 or 10 inches water column less than the shield building pressure, differential pressure switches (Train A(B) Differential Pressure Switches DP-5221A(B) or DP-5220A(B), respectively) actuate Containment Vacuum Relief Valves CVR-101 and CVR-201, which opens the vacuum relief valves between the shield building and the containment building to equalize the pressure.

On March 20, 2007, Differential Pressure Switch DP-5221B failed to actuate on two attempts as required during functional testing of Containment Vacuum Relief Valve CVR-101. The licensee initiated Condition Report 2007-00961 to document the functional test failure. On the third attempt, Differential Pressure Switch DP-5221B became unstuck and responded normally to the applied pressure. The licensee replaced Differential Pressure Switch DP-5221B and successfully completed the calibration and functional test.

Condition Report 2007-00961 describes that these differential pressure switches have a design range from 0 to 15 inches water and that the vendor recommends applying pressure at 150 percent of scale (22.5 inches water column) to ensure that the pointer indicates correctly. The licensee identified that, under normal conditions, the differential pressure switches experience differential pressures that exceed the calibration pressure of 22.5 inches water column. Licensee engineers concluded the internal hard stops for the differential pressure switch would prevent any bellows over travel and prevent any damage to the pointer. The licensee concluded that this sticking was an isolated occurrence since no other records identified differential pressure switches sticking. During this inspection, the team determined that engineers did not contact the vendor and question whether the differential pressure switches were designed to experience prolonged pressure beyond their design pressures. The team identified this failure to question the operating conditions for the differential pressure switches as the first opportunity to identify and correct the adverse condition.

On April 14, 2008, Differential Pressure Switch DP-5221B, again, failed to respond correctly during a functional test of Valve CVR-101. The licensee initiated Condition Report 2008-01456 to document the test failure. The licensee replaced Differential Pressure Switch DP-5221B. The licensee did not initiate any detailed evaluation or question why a second failure occurred after operating 22 years without any documented sticking or failures of the switches.

On September 22, 2008, Differential Pressure Switch DP-5220A failed to respond correctly during a functional test of Valve CVR-201. The licensee initiated Condition Report 2008-04453 to document the failure. The licensee replaced Differential Pressure Switch DP-5220A. The Condition Review Group requested that engineering perform an equipment failure evaluation. The licensee closed this condition report to Condition Report 2008-04583.

On September 30, 2008, Differential Pressure Switch DP-5221B failed to respond correctly during a functional test. The licensee initiated Condition Report 2008-04583 to document the failure. As immediate corrective action, the licensee replaced Differential Pressure Switch DP-5221B. The licensee performed a higher tier apparent cause evaluation to resolve this issue. The team verified that the higher tier apparent cause evaluation addressed these multiple failures.

On October 27, 2008, Differential Pressure Switch DP-5221B failed to respond correctly during a functional test of Valve CVR-101. The licensee initiated Condition Report 2008-04992 to document the failure. The licensee adjusted the stop limits on Differential Pressure Switch DP-5221B, rather than replacing the differential pressure switch.

Over the last 19 months, the containment vacuum relief valve differential pressure switches experienced five failures. The team determined that the licensee initiated action to identify a cause for the sticking differential pressure switches after the fourth failure. Condition Report 2007-00961, which evaluated the first differential pressure switch failure, described that the differential pressure switches operated in pressures outside of their design. During this inspection, the team questioned engineers regarding whether the differential pressure switches were designed to normally operate in pressures that exceeded their design pressures. After questioning, engineers contacted the vendor who indicated that the differential pressure switches were not intended to operate for prolonged periods at pressures that exceeded 150 percent of their design range.

Overall, the team determined the licensee performed an appropriate cause analysis. The licensee attributed the root cause to a failure of design engineers to perform a thorough evaluation of the operating conditions in 1987 as part of a Technical Specification change evaluation. The licensee suspected that preconditioning prior to 2008 had masked potential sticking during prior functional tests. The licensee assigned the human performance error related to preconditioning as a contributing cause. The team concluded that the licensee had three prior opportunities to recognize that design engineers failed to address equipment operation outside of design limits. Further, the licensee failed to recognize this as a contributing cause similar to the preconditioning. During discussions, the licensee indicated that until September 30, 2008, they had considered the failures as isolated since they had no records of additional failures since initial licensing.

The team verified that the licensee had taken interim actions to ensure the vacuum breakers remained operable. The licensee increased the functional test frequency for the four differential pressure switches from semiannually to monthly. The licensee contacted the vendor and determined that it would be acceptable to adjust the internal travel stops in the indicating switch to minimize the potential for sticking in the differential pressure switches. Three of the four differential pressure switches already had the indicator switch internal hard stops adjusted to limit the bellows travel. The team verified that the licensee had satisfactorily completed the next monthly functional test for each differential pressure switch. Further, the team determined that each time a Train A or

Train B differential pressure switch had failed the other differential pressure switch for that train had remained operable and the containment vacuum relief valves would have performed their design function. As of the end of the inspection, the licensee did not identify a permanent corrective action for the sticking differential pressure switches.

Analysis. The performance deficiency associated with this finding involved the failure to promptly identify and correct a condition adverse to quality that could affect containment integrity. This finding was greater than minor because it affected the Configuration Control attribute of the Barrier Integrity Cornerstone objective to provide reasonable assurance that the containment physical design barrier protected the public from radionuclide releases caused by an event. Using the NRC Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," the team determined the finding had very low safety significance because it did not represent an actual open pathway in the physical integrity of the reactor containment building. This finding had a crosscutting aspect in the area of human performance, associated with the decision-making component, in that, licensee personnel failed to make conservative decisions related to equipment operation in accordance with design requirements (H.1(b)).

Enforcement. Title 10 Code of Federal Regulations Part 50, Appendix B, Criterion XVI, requires, in part, that conditions adverse to quality are promptly identified and corrected. Contrary to the above, the licensee failed to promptly identify and correct a condition adverse to quality. Specifically, from March 20, 2007, until October 27, 2008, the licensee failed to promptly identify that containment vacuum relief valve differential pressure switches were operated in pressures beyond their design pressure. Because the violation is of very low safety significance and the licensee documented this deficiency in their corrective action program as Condition Report 2008-05106, this violation is being treated as a noncited violation, consistent with Section VI.A.1 of the NRC Enforcement Policy: NCV 05000382/2008007-01, Failure to promptly identify and correct a condition adverse to quality.

.2 Inadequate operability determination of a pressure boundary valve

Introduction. The team identified a Green noncited violation of 10 CFR Part 50, Appendix B, Criterion V, for a failure to follow procedure, when the licensee failed to complete an adequate operability evaluation for Valve SI-142A. Specifically, the licensee failed to follow Procedure EN-OP-104, "Operability Determinations," Revision 3, because personnel inappropriately based operability on a leak rate test that did not determine the leak rate solely through the required pressure boundary valve. The licensee entered this deficiency into their corrective action program as Condition Report 2008-05077.

Description. On August 21, 2008, the licensee initiated Condition Reports 2008-03975 and 2008-03976 because the level in Safety Injection Tank 2B had lowered at a rate of 2.9 percent per day. The licensee identified that the level increased in the refueling water storage pool. Engineering performed an inventory balance calculation that determined level decrease in Safety Injection Tank 2B corresponded to the level

increase in the refueling water storage pool. The licensee concluded that the inventory leaked from Safety Injection Tank 2B through several closed valves, including Valve SI-142A, low pressure safety injection header to reactor coolant Loop 2B inside containment check valve, and into the refueling water storage pool at a rate of 0.3 gpm.

The licensee evaluated operability of Valve SI-142A by calculating whether the leakage exceeded the 1 gpm limit specified in Technical Specification 3.4.5.2. When determining compliance with Technical Specification 3.4.5.2, the licensee concluded that Valve SI-142A remained operable since the calculated leakage from Safety Injection Tank 2B was less than the technical specification limit. However, the licensee failed to consider that the leakage rate included the leakage past several valves in series, not just leakage through Valve SI-142A. The team identified that leakage past Valve SI-142A could potentially exceed the technical specifications limit if one of the other valves acted as a throttle valve and limited the leakage to calculated rate. The team concluded that the existing operability determination to demonstrate compliance with Technical Specification 3.4.5.2 was inadequate. After questioning by the team, the licensee used the appropriate section of the system operating procedure to determine leakage across Valve SI-142A. This involved starting a high pressure safety injection pump to reseat Valve SI-142A and then measure the leakage across the valve. The licensee determined that the leak rate remained below the 1 gpm limit specified in Technical Specification 3.4.5.2 and that the valve had remained operable.

Analysis. The failure to perform an adequate operability evaluation on safety-related plant equipment in accordance with Procedure EN-OP-104 is a performance deficiency. The team determined this finding was greater than minor from review of Manual Chapter 0612, Appendix E, "Examples of Minor Issues." The finding was similar to non-minor finding Example 3.j in that reasonable doubt existed related to the operability of Valve SI-142A. Using the NRC Manual Chapter 0609, "Significance Determination Process," Phase 1 Screening Worksheet, the team determined the finding had very low risk significance because it did not represent an actual open pathway in the physical integrity of the reactor containment building. The finding had a crosscutting aspect in the area of problem identification and resolution because the licensee failed to thoroughly evaluate valve operability (P.1(c)).

Enforcement. Title 10 Code of Federal Regulations Part 50, Appendix B, Criterion V, requires, in part, that activities affecting quality shall be prescribed by procedures, and shall be accomplished in accordance with these procedures. Procedure EN-OP-104, Step 5.3 [7](b)(3) requires that the licensee provide a basis for operability. Contrary to the above, on August 21, 2008. The licensee failed to provide an adequate basis for operability for Valve SI-142A in that the licensee had not evaluated the leakage in a manner to demonstrate the leak rate remained below the technical specification limit of 1 gpm. Because the violation is of very low safety significance and the licensee documented this deficiency in their corrective action program as Condition Report 2008-05077, this violation is being treated as a noncited violation, consistent with Section VI.A.1 of the NRC Enforcement Policy: NCV 05000382/2008007-02, Inadequate operability determination of a pressure boundary valve.

f. Review of Human Performance Issues

(1) Inspection Scope

In the midcycle assessment, the NRC identified a potential Substantive Cross-cutting issue because of six findings related to human error prevention techniques. The NRC decided not to issue a substantive cross-cutting issue because the licensee recognized the cross-cutting theme affected multiple work groups and had promptly commenced broad corrective actions.

During this inspection, the team assessed the scope of the corrective actions, including activities implemented to improve human performance. The team reviewed the corrective action documents issued related to human performance deficiencies, interviewed personnel, and evaluated training performed.

(2) Assessment

The team determined that the licensee used their existing structure of supervisor observations and leadership effectiveness logbooks to establish a more formalized, measurable, and structured process for monitoring and improving human performance.

Specifically, the licensee:

- Established site-wide and department fundamentals of behavior and conduct,
- Developed department specific performance criteria,
- Provided expectations for supervisors to monitor and to measure individual conduct and performance,
- Provided continuing leadership and supervisor training for evaluating human performance,
- Established a database to capture the feedback provided by supervisors against performance criteria,
- Monitored human performance continuously,
- Established requirements to provide assessments weekly, and
- Developed a monitoring and assessment tool to provide feedback and effect any necessary corrective actions.

The team determined that the licensee was taking actions to address their declining trend in human performance with some improvements noted; however, the licensee had not implemented the actions for a sufficient period for the team to conclude whether these actions would provide continued human performance improvement.

4OA6 Exit Meeting

On October 31, 2008, the team presented their inspection results to Mr. K. Walsh, Vice President Operations, and other members of his staff who acknowledged the findings. The inspectors returned all proprietary and confidential information provided during the inspection.

Attachments: 1. Supplemental Information
2. Information Request

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

S. Fontenot, Industrial Safety/Human Performance Systems
J. Kowalewski, General Manager Plant Operations
R. Murillo, Manager, Licensing
K. Nichols, Director, Engineering
O. Pipkins, Licensing Engineer
B. Proctor, Manager, System Engineering
R. Putnam, Manager, Engineering Programs
J. Ridgel, Manager, Quality Assurance
K. Walsh, Vice President Operations

LIST OF ITEMS OPENED AND CLOSED

Opened and Closed

05000382/2008007-01	NCV	Failure to promptly identify and correct a condition adverse to quality (Section 4OA2.e.1)
05000382/2008007-02	NCV	Inadequate operability determination of a pressure boundary valve (Section 4OA2.e.2)

LIST OF DOCUMENTS REVIEWED

Section 40A2a

Calculations

EC-I00-002, "Main Steam Isolation Valve Nitrogen Dome Pressure," Revision 0

EC-M00-002, "Closure Time Analysis for Main Steam Isolation Valves MS-124 A and B," Revision 1

Drawings

5817-10438, "Hydraulic Schematic MSIV," Revision 5
G1114, "Shutdown Cooling Flowpath Through LPSI – Elevation Drawing," Revision 9

Procedures

EN-DC-204, "Maintenance Rule Scope and Basis," Revision 1
EN-DC-206, "Maintenance Rule (a)(1) Process," Revision 1
EN-DC-207, "Maintenance Rule Periodic Assessment," Revision 1
EN-HU-101, "Human Performance Program," Revision 5
EN-HU-103, "Human Performance Error Reviews," Revision 1
EN-HU-104, "Engineering Task Risk & Rigor," Revision 2

EN-HU-105, "Human Performance – Managed Defenses," Revision 5
EN-LI-100, "Process Applicability Determination," Revision 7
EN-LI-102, "Corrective Action Process," Revision 12
EN-LI-118, "Root Cause Analysis Process," Revision 7
EN-LI-119, "Apparent Cause Evaluation Process," Revision 7
EN-LI-121, "Entergy Trending Process," Revision 7
EN-OE-100, "Operating Experience Program," Revision 5
EN-OP-104, "Operability Determinations," Revision 3
EN-WM-100, "Work Request (WR) Generation, Screening and Classification," Revision 3
OI-002-00, "Control Room Instrumentation and Workarounds Status Control," Revision 301
OP-008-005, "Containment Vacuum Relief," Revision 300
OP-009-008, "Safety Injection System," Revision 23
OP-500-011, "Control Room Cabinet M," Revision 27
OP-500-012, "Control Room Cabinet N," Revision 26
OP-903-120, "Containment and Miscellaneous Systems Quarterly IST valve Tests," Revision 8
OP-903-188, "Primary Auxiliaries Quarterly IST Valve Tests," Revision 15
UNT-006-030, "Administrative Control of External Corrosion," Revision 302

Work Orders

86371	91262	91780	98726	109040	161660

Condition Reports (WF3-CR-)

2003-02502	2006-01291	2006-02517	2006-04138	2007-00923
2005-01178	2006-01365	2006-02567	2006-04144	2007-00938
2005-02195	2006-01391	2006-02572	2006-04203	2007-00951
2005-02959	2006-01512	2006-02692	2006-04274	2007-00961
2005-03162	2006-01631	2006-02735	2006-04395	2007-00963
2005-03296	2006-01654	2006-02851	2006-04441	2007-00981
2005-03314	2006-01660	2006-02914	2006-04455	2007-01039
2005-03983	2006-01730	2006-02944	2006-04510	2007-01093
2005-04356	2006-01801	2006-02983	2006-04571	2007-01122
2005-04398	2006-01937	2006-03085	2006-04620	2007-01129
2006-00119	2006-01953	2006-03125	2006-04643	2007-01246
2006-00161	2006-02008	2006-03147	2007-00050	2007-01407
2006-00314	2006-02033	2006-03289	2007-00123	2007-01433
2006-00357	2006-02038	2006-03357	2007-00158	2007-01456
2006-00366	2006-02115	2006-03510	2007-00428	2007-01490
2006-00397	2006-02184	2006-03540	2007-00461	2007-01494
2006-00577	2006-02199	2006-03556	2007-00483	2007-01542
2006-00735	2006-02200	2006-03559	2007-00498	2007-01627
2006-00746	2006-02204	2006-03610	2007-00557	2007-01679
2006-00756	2006-02248	2006-03675	2007-00736	2007-01695
2006-01086	2006-02250	2006-03922	2007-00741	2007-01701
2006-01177	2006-02288	2006-03966	2007-00766	2007-01722
2006-01194	2006-02351	2006-04057	2007-00818	2007-01744
2006-01204	2006-02384	2006-04122	2007-00824	2007-01766
2006-01217	2006-02398	2006-04135	2007-00830	2007-01859
2006-01249	2006-02502	2006-04136	2007-00905	2007-01869

2007-01884	2007-02690	2007-03733	2008-01345	2008-02755
2007-01896	2007-02698	2007-03774	2008-01435	2008-02922
2007-01936	2007-02727	2007-03899	2008-01456	2008-02955
2007-01998	2007-02877	2007-04096	2008-01457	2008-03097
2007-02002	2007-03016	2007-04195	2008-01488	2008-03181
2007-02004	2007-03048	2007-04274	2008-01499	2008-03257
2007-02041	2007-03146	2007-04373	2008-01703	2008-03371
2007-02061	2007-03202	2007-04580	2008-01722	2008-03410
2007-02070	2007-03264	2008-00050	2008-01821	2008-03476
2007-02145	2007-03301	2008-00075	2008-02280	2008-03507
2007-02244	2007-03315	2008-00305	2008-02306	2008-03783
2007-02259	2007-03379	2008-00306	2008-02355	2008-03975
2007-02304	2007-03455	2008-00350	2008-02358	2008-03976
2007-02403	2007-03467	2008-00355	2008-02367	2008-04453
2007-02430	2007-03558	2008-00372	2008-02423	2008-04583
2007-02456	2007-03590	2008-00491	2008-02427	2008-04992
2007-02517	2007-03598	2008-00564	2008-02431	2008-05038
2007-02574	2007-03612	2008-00688	2008-02458	2008-05054
2007-02578	2007-03624	2008-00706	2008-02500	2008-05057
2007-02610	2007-03659	2008-00778	2008-02643	
2007-02614	2007-03697	2008-00845	2008-02699	
2007-02664	2007-03712	2008-00972	2008-02744	

ECH-2006-00366
ECH-2007-00236
ECH-2007-00377

Section 40A2b

Operating Experience Documents (LO-NOE-)

2006-00174	2006-00400	2007-00120	2007-00315	2008-00090
2006-00303	2006-00446	2007-00128	2007-00319	2008-00150
2006-00314	2006-00489	2007-00207	2007-00363	2008-00173
2006-00357	2007-00013	2007-00218	2007-00398	
2006-00393	2007-00078	2007-00227	2008-00075	

Section 40A2c

Audits, Self-Assessments and Surveillances

QA-04-2006-WF3-1, "Design Engineering, Systems Engineering, and Nuclear Engineering"

QA-10-2006-WF3-1, "Maintenance & Planning and Scheduling/Outage"

QA-19-2006-WF3-1, "Training Program"

QA-03-2007-WF3-1, "Corrective Action Program"

QA-08-2007-WF3-1, "Configuration Management/Engineering/Fire Protection and Engineering Programs"

QA-14-2007-WF3-1, "Radiation Protection"

QA-15-2007-WF3-1, "Radwaste/Radiation Protection"

LO-WLO-2004-00154, "Assessment of Core Protection Calculator System for Waterford 3 Nuclear Power Station," dated March 17, 2005

LO-WLO-2007-0001-CA-60, "Self-Assessment Program Effectiveness Assessment"

LO-HQNLO-2008-00001-CA-00001, "Waterford 3 2008 Operating Experience Program Focused Self Assessment," dated March 3, 2008

LO-WLO-2008-00031, "Corrective Action Program Pre-Problem Identification and Resolution Inspection Self-Assessment," dated February 29, 2008

"Waterford 3 Technical Training Corporate Assessment," dated April 4, 2007

Section 40A2d

Safety Conscious Work Environment

Regulatory Issue Summary 2005-18, "Guidance for Establishing and Maintaining a Safety Conscious Work Environment," dated August 25, 2005

Regulatory Issue Summary 2006-13, "Information on the Changes Made to the Reactor Oversight Process to More Fully Address Safety Culture," dated July 31, 2006

2006 Safety Culture Survey

Procedure EN-EC-100, "Guidelines for Implementation of the Employee Concerns Program," Revision 4

Employee Concerns Program and NRC Allegation Statistics from January 1, 2006, through October 31, 2008

Section 40A2f

Human Performance Cross-cutting Issue

2nd and 3rd Quarter 2008 Industrial Safety and Human Performance Department Trend Reports

The following Condition Reports WF3-CR-

2008-00355	2008-00423	2008-00618	2008-00682
2008-01499	2008-02818	2008-02996	

Fundamental Sheets for Leadership and Common, Maintenance, Engineering, Training, Radiation Protection, Operations and Planning and Scheduling/Outage Departments

Performance Measures for Operations, Maintenance, Engineering, and Radiation Protection

Monthly supervisor training power point presentations related to various aspects of leadership that have been presented regarding human performance from January through September 2008

HU Trending Grid

LO-WLO-2008-00025, "Supervisor Effectiveness Condition Report Snapshot Assessment," dated May 14, 2008

Numerous yellow and red announcements related to Human Performance

Procedure OI-030-000, "Improving Operator Performance," Revision 17

Miscellaneous

1st and 2nd Quarters 2008 Waterford 3 Quarterly Trend Reports

2nd Quarter Core Protection Calculator System Health Report

Core Protection Calculator Quarterly Condition Report, Events, and Board Replacement Trends

LPL-EQA-52.02, "Environmental Qualification Assessment for EGS (Patel) Conduit Seals Used at the Waterford SES Unit No. 3," Revision 1

QSPDS Reliability Improvement Plan

SD-CHW, "Essential Chilled Water System Description," Revision 6

TD-I204.0205, "ITT Barton Installation and Operation Manual Model 199 Differential Pressure Unit for Nuclear Services," Revision 0

TD-I204.0225, "ITT Barton Installation and Operation Manual Model 581A-1 Differential Pressure Indicating Switch," Revision 0

Technical Bulletin TB-04-01, "COLSS Range Limits," dated January 5, 2004

W3-DBD-001 "Safety Injection System Design Basis Document," Revision 3-10

Information Request
August 8, 2008
Waterford 3 Problem Identification and Resolution Inspection
(IP 71152B; Inspection Report 05000382/2008007)

The inspection will cover the period of March 1, 2006, to October 31, 2008. All requested information should be limited to this period unless otherwise specified. As agreed when announcing the inspection, please upload the information to the Certec Inspection website by September 11, 2008. We would also like the information provided on a CD prior to the preparation week that begins

Some information, depending on the size of the file, may be provided by e-mail. Information provided in electronic media may be in the form of e-mail attachment(s), CDs, or thumb drives. The Agency has converted to Microsoft Office (Word, Excel and PowerPoint). We have document viewing capability for Adobe Acrobat (.pdf) and other image files.

Note: On summary lists please include a description of problem, status, initiating date, and owner organization.

1. Summary list of Category A condition reports of significant conditions adverse to quality opened or closed since 1/1/2006.

2. Summary list of Category B, C and D condition reports that were generated since 1/1/2006. Please separate each list by their Category.

3. Roll up summary list of all condition reports in Excel to allow for sorting/trending.

4. A list of all corrective action documents (Adverse Trends) that aggregate or "roll-up" one or more smaller issues for the period since 3/1/2006.

5. Summary list of all condition reports that were downgraded or upgraded in significance since 3/1/2006.

6. List of all root cause analyses completed since 3/1/2006 – if different than item one.

7. List of root cause analyses planned, but not complete at end of the inspection.

8. List of all apparent cause analyses completed since 3/1/2006 – if different than #2 for Category B and C.

9. List of issues raised or addressed by the employee concerns program since 1/1/2006 – note usually provided in hard copy. Mail index or list to RIV in proprietary envelope.

10. List of action items generated or addressed by the plant safety review committees since 3/1/2006.

11. List of all quality assurance audits and surveillances and/or assessments completed since 1/1/2006.

12. A list of all quality assurance audits and surveillances scheduled since 1/1/2006, which were not completed.

13. All corrective action activity reports, functional area self-assessments, and non-NRC third party assessments completed since 1/1/2006.

14. Corrective action performance trending/tracking information generated since 3/1/2006 and broken down by functional organization.

15. Current revisions of corrective action program procedures for: Condition Reporting, Corrective Action Program, Root Cause Evaluation/Determination, Operator Work Arounds, Work Requests, Requests for Engineering Assistance, Temporary Modifications, Procedure Change Requests, Deficiency Reporting and Resolution, Operating Experience Evaluation

16. A listing of all external events (OE) evaluated for applicability at Waterford 3 since 3/1/2006.

17. Condition reports or other actions generated since 3/1/2006 for each of the items below:

    1) Part 21 Reports
    2) [Applicable] NRC Information Notices
    3) All LERs issued by W3
    4) NCVs and Violations issued to W3 (including licensee identified)

18. Current system health reports or similar information for the ultimate heat sink and 4 kV electrical systems.

19. Current predictive performance summary reports or similar information.

20. Corrective action effectiveness review reports generated since 3/1/2006.

21. Summary list of condition reports separated by unit and systems for the ultimate heat sink and 4 kV electrical systems (risk significant system selection).

22. Information relative to any efforts related to a plant improvement program or human performance improvement program since the last PIR inspection.