

## Palisades

### 4Q/2013 Plant Inspection Findings

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#### Initiating Events

**Significance:** G Mar 31, 2013

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

#### **Failure to Take Corrective Action to Prevent Recurrence of Control Rod Drive Mechanism Pressure Boundary Leakage**

A self-revealing finding of very low safety significance (Green) with associated Non-Cited Violation of 10 CFR Part 50, Appendix B, Criterion XVI, and Technical Specification (TS) 3.4.13, Primary Coolant System (PCS) Operational Leakage, was identified for failure to take corrective actions to prevent recurrence of Control Rod Drive Mechanism (CRDM) cracking and leakage, a significant condition adverse to quality (SCAQ). Specifically, for Criterion XVI the licensee failed to include the internal CRDM housing weld build-up area within the scope of corrective actions taken for a 2001 CRDM through wall leak on CRDM-21, caused by transgranular stress corrosion cracking (TGSCC). Subsequently, a through wall leak recurred in the weld build-up area on CRDM-24 in 2012 due to TGSCC. As a result, the licensee operated with PCS pressure boundary leakage, which is not allowed by TS 3.4.13. Further, because the licensee was not aware that the leakage was PCS pressure boundary leakage, the licensee did not implement the associated TS action statement. The licensee replaced CRDM-24 upper housing and entered the issue into their corrective action program as CR PLP 2013-01134. Additional corrective actions are described in NRC Inspection Report 05000255/2012012.

The inspectors determined that this issue was more than minor in accordance with IMC 0612, Appendix B, "Issue Screening," because it was associated with the Initiating Events Cornerstone attribute of equipment performance and adversely affected the cornerstone objective to limit the likelihood of events that upset plant stability. Specifically, the licensee did not take adequate corrective actions to prevent recurrence of leakage in CRDM housings, which represents pressure boundary leakage. The inspectors determined this finding was of very low safety significance (Green) because the leak would not have exceeded the reactor coolant system leak rate for a small LOCA and could not have likely affected other systems used to mitigate a LOCA resulting in a total loss of their function. Specifically, the slow rate of change for leakage for TGSCC in type 316 stainless steel will experience leakage rates well below a small break LOCA, which would be observed through the crack, alerting operators to take action to shut down the plant prior to experiencing a component rupture. The cause of this finding, non-conservative decision making, occurred over 10 years ago and is well outside of the nominal 3 year period in IMC 0612 for cross-cutting aspects. Therefore, this is not indicative of current performance, because no other opportunities to identify the issue occurred during the previous 3-year period. However more recently, the licensee exhibited non-conservative decision making with respect to addressing the potential for CRDM housing cracking and leakage during the recent root cause (Section 4OA2.4 (b.2) of this report), resulting in another finding. This cross-cutting aspect will be captured through the other finding.

Inspection Report# : [2013002](#) (*pdf*)

**Significance:** G Mar 31, 2013

Identified By: NRC

Item Type: NCV NonCited Violation

#### **Failure to Adequately Address the Generic Implications of the Cracking Identified in Control Rod Drive**

**Mechanism- 24**

The inspectors identified a finding of very low safety significance (Green) with an associated Non-Cited Violation of 10 CFR Part 50, Appendix B, Criterion V, for the licensee's failure to accomplish quality activities in accordance with the prescribed procedures. Specifically, the licensee failed to adequately evaluate and document the generic implications of the cause of the 2012 cracking identified in Control Rod Drive Mechanism (CRDM)-24 in accordance with a quality procedure, Procedure, EN-LI-118, "Root Cause Evaluation." This issue was entered into the licensee's Corrective Action Program (CAP) under CR-PLP-2013-01500. Subsequently, the licensee decided to revise the inspection plan to add additional corrective actions to inspect a sample of welds No. 3 and No. 4 for transgranular stress corrosion cracking (TGSCC) during the upcoming refueling outage.

The inspectors determined that this issue was more than minor in accordance with IMC 0612, Appendix B, "Issue Screening," because if left uncorrected, the performance deficiency would have the potential to lead to a more significant safety concern. Specifically, absent NRC identification, the licensee would not have completed further evaluations or inspections of CRDM housing welds, which could have resulted in additional CRDM housing failure and leakage by TGSCC. In accordance with Table 2, "Cornerstones Affected by Degraded Condition or Programmatic Weakness," of IMC 609, Attachment 4, "Initial Characterization of Findings," the inspectors determined that the finding was associated with the Initiating Events Cornerstone because the failure of a CRDM housing is a Primary System Loss of Cooling Accident (LOCA) initiator contributor. Using Exhibit 1, "Initiating Events Screening Questions," in IMC 0609, Attachment A, "The Significance Determination Process (SDP) for Findings At-Power," the inspectors determined this finding was of very low safety significance because the leak would not exceed the reactor coolant system leak rate for a small LOCA and would not have likely affected other systems used to mitigate a LOCA resulting in a total loss of their function. Specifically, the slow rate of change for leakage for TGSCC in type 316 stainless steel will experience leakage rates well below a small break LOCA, which would be observed through the crack, alerting operators to take action to shut down the plant prior to experiencing a component rupture. The inspectors determined that the primary cause of the failure to adequately consider welds No. 3 and No. 4 in the generic implications section of the root cause report (RCR) related to the decision making cross-cutting component in the human performance area because licensee staff did not use conservative assumptions in decision making. Specifically, the licensee did not use conservative assumptions when excluding welds No. 3 and No. 4 as being susceptible to TGSCC when there was not enough information to exclude them from consideration.

Inspection Report# : [2013002](#) (*pdf*)

**Mitigating Systems**

**Significance:** G Dec 31, 2013

Identified By: NRC

Item Type: NCV NonCited Violation

**Failure to Complete a Transient Combustible Evaluation**

An NRC identified finding of very low safety significance and an associated non-cited violation (NCV) of Technical Specification (TS) 5.4.1, "Procedures," was identified by the inspectors when licensee personnel failed to complete a transient combustible evaluation as required by procedure EN DC 161, "Control of Combustibles." Specifically, transient combustible materials in use for work activities associated with the Spent Fuel Pool Cooling Heat Exchangers were being stored in the Auxiliary Building 590' corridor, a Level 1 Combustible Control Zone, without having a required transient combustible evaluation completed prior to (or during) the work. The licensee entered this issue into their Corrective Action Program (CAP) as Condition Report (CR) PLP-2013-04905, performed a Level 1 Human Performance Evaluation, and removed the materials after the work was completed.

The inspectors determined that the performance deficiency was more than minor because it was associated with the Protection Against External Factors attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e. core damage). Additionally, it was similar to the “not minor if” statement of Example 4.k in IMC 0612, Appendix E. This example stated that an issue was not minor if a credible fire scenario involving the identified transient combustibles could affect equipment important to safety. For this issue, transient combustible materials in use for work in progress were being stored in a Level 1 area where a fire could affect equipment important to safety, and a transient combustible evaluation had not been completed as required by licensee procedures. The finding had a cross-cutting aspect in the Work Practices component of the Human Performance cross-cutting area because workers failed to validate the combustible control zone classification of the work area during the planning and preparation phase of the project, resulting in the group not obtaining a transient combustible evaluation for the work area prior to commencing work. Contributing to this was ineffective change management communication for the newest revision to EN-DC-161, which re classified many areas of the plant into different combustible control zones.

Inspection Report# : [2013005](#) (*pdf*)

**Significance:** G Dec 31, 2013

Identified By: NRC

Item Type: NCV NonCited Violation

**The Aging Effects of the Biological Shield Wall Wetted Environment Were Not Being Managed**

The inspectors identified a finding of very low safety significance and associated non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, “Instructions, Procedures, and Drawings,” when licensee personnel failed to evaluate the aging effects of the biological shield wall wetted environment. Specifically, the licensee identified seeping water from the biological shield wall on several occasions, but did not evaluate the potential aging effects on the structure concrete and rebar. This finding was entered into the licensee’s CAP as CR-PLP-2013-4041 to evaluate the potential aging effects.

The performance deficiency was determined to be more than minor because, if left uncorrected, it would have the potential to lead to a more significant safety concern. The finding screened as having very low safety significance (Green) because it did not result in a loss of operability or functionality. Specifically, the biological shield wall wetted environment had not resulted in the loss of functionality of the structure because recent wall visual inspection had not identified indications of immediate structural flaws, such as significant cracks or spalling. The inspectors determined that this finding had a cross-cutting aspect in the CAP component of the Problem Identification and Resolution cross-cutting area because the licensee failed to consider the potential aging effects following the discovery of water seeping from the biological shield wall.

Inspection Report# : [2013005](#) (*pdf*)

**Significance:** G Jun 30, 2013

Identified By: NRC

Item Type: NCV NonCited Violation

**Inadequate Control of Welding at the F East Nozzle Reinforcement Plate**

The inspectors identified a finding of very low safety significance and an associated non-cited violation of 10 CFR 50, Appendix B, Criterion IX, “Control of Special Processes,” for the licensee’s failure to perform adequate pre weld cleaning and control the welding process in a manner that ensured proper weld fusion of the F East nozzle reinforcement plate weld joint within the safety injection refueling water storage tank (SIRWT). Consequently, this weld failed in service causing leakage from the SIRWT. The licensee subsequently replaced the floor of the SIRWT and included instructions in the floor replacement work order that required pre weld cleaning with acetone or other approved solvents. The licensee entered the issue in their corrective action program (CAP) as CR PLP 2013 03185.

The finding was determined to be more than minor in accordance with IMC 0612, Appendix B, "Issue Screening," because the inspectors answered "yes" to the More than Minor screening question, "If left uncorrected, would the performance deficiency have the potential to lead to a more significant safety concern"? Absent NRC identification, the failure to adequately clean aluminum prior to welding and adequately control the repair welding techniques may have been repeated during future repairs to the SIRWT and resulted in lack of fusion type weld defects/cracks returned to service. Unstable cracks could propagate and create failure of the SIRWT pressure boundary resulting in loss of inventory and increase the risk for insufficient core cooling for post Loss-of-Coolant Accident (LOCA) conditions. Therefore, this finding adversely affected the mitigating systems cornerstone attribute of equipment performance (reliability). The inspectors determined this finding was of very low safety significance (Green) based on answering "no" to the questions in Part A of Exhibit 2, "Mitigating Systems Screening Questions," in IMC 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At Power." Specifically, the small amount of leakage from the SIRWT weld leak did not result in loss of a mitigating system function. Therefore, this finding screened as having very low safety significance (Green). This finding has a cross cutting aspect in the area of human performance for the resources component because the licensee did not ensure that personnel, equipment, procedures, and other resources were available and adequate to assure nuclear safety was supported.

Inspection Report# : [2013003](#) (*pdf*)

**Significance:**  Jun 30, 2013

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

**Failure to Follow Corrective Action Process for Service Water Leaks**

A finding of very low safety significance with an associated non-cited violation of 10 CFR 50 Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was self revealed for the failure to adhere to the requirements of the site's corrective action process. Specifically, the station failed to complete corrective actions to address cavitation induced erosion of service water system components, which resulted in additional through wall leaks and other adverse conditions in that safety related system. Since 1993, this phenomenon caused several through wall leaks and the failure of a valve, which isolated normal service water flow to a component cooling water heat exchanger. Corrective actions to replace valves susceptible to this type of erosion were not implemented, and actions to utilize more effective non destructive examination (NDE) techniques to assess piping or development of pre-emptive repair/replacement strategies were not performed, resulting in further leaks from the service water system. The current corrective action process procedure, EN LI 102, states that corrective actions are determined, implemented, and adequate to resolve conditions. The licensee entered the issue in their corrective action program (CAP) as CR PLP 2013 05813.

The issue was determined to be greater than minor in accordance with IMC 0609 Appendix B, "Issue Screening," issue date September 7, 2012, because it adversely affected the equipment performance attribute of the mitigating systems cornerstone whose objective is to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, a through wall leak can challenge the integrity of the piping and system function. The inspectors concluded the finding was of very low safety significance (Green) utilizing IMC 0609, "Significance Determination Process," issue date June 2, 2011. Specifically, in Attachment 4, issue date June 19, 2012, utilizing Exhibit 2 of Appendix A, all questions in Section A were answered 'no' since the leaks did not result in a loss of safety function. The finding had an associated cross cutting aspect in the area of problem identification and resolution for the operating experience component. Specifically, the licensee did not implement and institutionalize operating experience through changes to station processes and procedures.

Inspection Report# : [2013003](#) (*pdf*)

**Significance:**  Mar 31, 2013

Identified By: NRC

Item Type: NCV NonCited Violation

### **Failure to Establish an Acceptable Component Cooling Water Heat Exchanger Final Test Frequency**

The inspectors identified a finding of very low safety significance (Green) and associated Non-Cited Violation of 10 CFR Part 50, Appendix B, Criterion XI, "Test Control", for failure to establish testing to demonstrate the safety-related Component Cooling Water (CCW) heat exchangers would perform satisfactorily in service. Specifically, the licensee failed to demonstrate the heat exchanger's fouling factors would remain acceptable to ensure adequate heat transfer capability prior to changing the inspection, cleaning, eddy current testing, and thermal performance testing frequency to 12 years. The licensee entered this issue into their Corrective Action Program as CR-PLP-2012-05132 and CR-PLP-2013-00544 and implemented actions to revise the inspection, cleaning, testing, and maintenance frequencies to less than 5 years.

The issue was more than minor because it was associated with the equipment performance attribute of the Mitigating Systems Cornerstone and adversely affected the cornerstone objective of ensuring the availability reliability and capability of systems needed to respond to initiating events to prevent undesired consequences. Specifically, the inappropriate test frequency affected the licensees' ability to ensure the CCW heat exchangers were available and capable to reliably perform as expected. The finding screened as of very low safety significance (Green) because the inadequate test program was not a design deficiency and did not result in a loss of system or component function. This finding has a cross-cutting aspect in the area of human performance, decision making because the licensee did not use conservative decision making and did not conduct effectiveness reviews of safety significant decisions to verify the validity of underlying assumptions, identify possible unintended consequences, or determine how to improve future decisions. Specifically, the licensee failed to use conservative decision-making or verify the validity of underlying assumptions when evaluating the effect that reducing the frequency of testing, inspection, cleaning, and maintenance would have on the CCW heat exchangers.

Inspection Report# : [2013002](#) (*pdf*)

**Significance:**  Mar 31, 2013

Identified By: NRC

Item Type: NCV NonCited Violation

### **Inadequate Work Instructions for Component Cooling Water Heat Exchanger**

The inspectors identified a finding of very low safety significance (Green) with an associated Non-Cited Violation of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for the failure to properly plan and document work on the safety-related 'A' Component Cooling Water (CCW) heat exchanger during a forced outage to repair leaks in the heat exchanger. Contrary to Criterion V and site implementing procedures EN-DC-115, Engineering Change Process, and EN-WM-105, Planning, the licensee did not ensure that appropriate quantitative or qualitative acceptance criteria for determining that important activities affecting quality were included in the work done to re-plug a population of leaking tubes in the heat exchanger. The licensee changed the work instructions to include the acceptance criteria after questioning by the inspectors. The licensee also interviewed workers to ensure the criteria had been utilized during earlier plug installation. The licensee entered the issue into their Corrective Action Program as CR-PLP-2013-00773 and CR-PLP-2013-00969.

The issue was determined to be greater-than-minor per IMC 0612, Appendix B, "Issue Screening," because if left uncorrected, it could lead to a more significant safety concern. The inspectors' decision was informed by examples 3j and 3k in IMC 0612, Appendix E, "Examples of Minor Issues." The examples refer to an issue not being minor if significant programmatic deficiencies were identified with the issue that could lead to worse errors if left uncorrected. When the issue was first raised by the inspectors, only one of the two critical parameters was initially added to the revised work instructions. Further, two examples of inadequate documentation were identified. A basis for removing steps to check for leaks was not properly documented; and it was not clear from the completed work packages that the engineering acceptance criteria were met. Given these issues, the inspectors determined the threshold for a finding

was met. The inspectors concluded the finding adversely impacted the Mitigating Systems Cornerstone objective and was of very low safety significance (Green) utilizing IMC 0609, "Significance Determination Process." Specifically, utilizing Exhibit 2 of Appendix A, all questions in Section A were answered 'no'. The finding had an associated cross-cutting aspect in the work control component of the human performance area. Specifically, the licensee did not coordinate work activities by incorporating actions to ensure interdepartmental alignments were made while planning and executing the work to assure plant and human performance

Inspection Report# : [2013002](#) (*pdf*)

**Significance:**  Mar 31, 2013

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

#### **Damage to 'A' Auxiliary Feedwater (AFW) Pump Packing During Surveillance Run**

A self-revealed finding of very low safety significance (Green) and an associated NCV of 10 CFR 50, Appendix B, Criterion V was identified for the failure to conduct the 'A' Auxiliary Feedwater (AFW) pump technical specification surveillance test in accordance with the prescribed in-service test procedure. Specifically, plant personnel conducting the surveillance test on the 'A' AFW Pump adjusted packing when it was not required per the guidance in the procedure, which caused the pump packing to overheat and start smoking, resulting in unplanned inoperability of the pump. The licensee documented the issue in their corrective action program as CR-PLP-2013-01128 and completed an apparent cause evaluation. Planned corrective actions included revising the in-service test procedure.

The finding was more than minor in accordance with IMC 0612, Appendix B, "Issue Screening," because it was associated with the Mitigating Systems Cornerstone attribute of human performance and adversely impacted the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, a packing adjustment was made without being required by the procedure, causing the pump to overheat, which resulted in unplanned inoperability of the safety-related and risk significant 'A' AFW pump. The finding had an associated cross cutting aspect in the area of human performance related to the cross cutting component of resources, in that the licensee ensures plant personnel have complete, accurate, and up-to-date design documentation, procedures, and work packages. In this finding, the fact that the 'A' AFW pump has a unique packing design was not evident in the procedure being used and was not discussed during the pre-job briefs.

Inspection Report# : [2013002](#) (*pdf*)

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## **Barrier Integrity**

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## **Emergency Preparedness**

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## **Occupational Radiation Safety**

**Significance:**  Dec 31, 2013

Identified By: NRC

Item Type: NCV NonCited Violation

### **Inadequate Control of Entry into High Radiation Areas**

. The inspectors identified a finding of very low safety significance and two associated NCVs of TS 5.7.1 and one associated NCV of TS 5.7.2 when on three separate occasions, three separate workers unknowingly entered areas with greater than expected dose rates. Specifically, on April 10, 2012, the radiation protection (RP) staff inappropriately authorized plant personnel to enter a locked high radiation area in the Auxiliary Building Pipechase (ABP) 602' elevation that had not been appropriately radiologically characterized prior to the entry; and on April 25, 2012, and again on April 27, 2012, workers inside the containment 607' elevation staging equipment at the 'B' steam generator (S/G) manway inappropriately traversed high radiation areas with elevated dose rates near the 'A' S/G cubicle. On both occasions, workers deviated slightly from the briefed travel paths. The licensee entered this issue into their CAP as CR-PLP-2012-03229 and CR-PLP-2012-03313, and as part of their corrective actions, shared lessons learned from this issue with the RP staff to address survey adequacy and for enhanced communications with workers during pre job briefings.

The inspectors determined that the performance deficiency was more than minor because it was associated with the Program and Process attribute of the Occupational Radiation Safety cornerstone and adversely affected the cornerstone objective of ensuring the adequate protection of worker health and safety from exposure to radiation, in that, worker entry into areas without knowledge of their radiological conditions placed them at increased risk for unnecessary radiation exposure. Additionally, it was similar to the "not minor if" statement of Example 6.h in IMC 0612, Appendix E. The finding was determined to be of very low safety significance because the problem was not an as low as reasonably achievable (ALARA) planning issue, there was no overexposure nor substantial potential for an overexposure, and the licensee's ability to assess dose was not compromised. The finding had a cross-cutting aspect in the Work Practices component of the Human Performance cross-cutting area because the licensee failed to define and clearly communicate expectations regarding procedural compliance and ensure that personnel followed procedures.

Inspection Report# : [2013005](#) (*pdf*)

**Significance:**  Sep 30, 2013

Identified By: NRC

Item Type: NCV NonCited Violation

### **Failure to Monitor in Alpha 3 Area**

The inspectors identified a finding of very low safety significance and an associated NCV of Technical Specification (TS) 5.4.1. Specifically, the licensee failed to perform air sampling as required by station procedure EN RP-122 "Alpha Monitoring." The issue was entered in the licensee's Corrective Action Program (CAP) as CR PLP 2013 02054. The licensee's immediate corrective actions included performance management of the radiation protection technician and direct radiation protection supervisor oversight of the work activity.

The finding is more than minor because it was associated with the program and process attribute of the occupational radiation safety cornerstone and affected the cornerstone objective of ensuring adequate protection of worker health and safety from exposure to radiation. Specifically, not monitoring the worker intake in an Alpha Level 3 area affected the licensee's ability to assess workers internal exposures in a timely manner, and adversely impacted the licensee's ability to monitor, control, and limit radiation exposures (i.e., committed effective dose equivalent or internal dose). In accordance with IMC 0609 Appendix C, "Occupational Radiation Safety Significance Determination Process," the inspectors determined that the finding had very low safety significance (Green) because the finding did not involve: (1) as low as reasonably achievable (ALARA) planning and controls; (2) a radiological overexposure; (3) a substantial potential for an overexposure; and (4) a compromised ability to assess dose. The inspectors determined that the primary cause of this finding was related to the cross cutting aspect of problem identification and resolution in the component of corrective actions, specifically the licensee did not take appropriate corrective actions to address safety issues and adverse trends in Alpha monitoring in a timely manner, commensurate with their safety significance and complexity.

Inspection Report# : [2013004](#) (pdf)

**Significance:**  Mar 31, 2013

Identified By: NRC

Item Type: NCV NonCited Violation

### **Failure to Perform Derived Air Concentration (DAC)-Hour Tracking**

The inspectors identified a finding of very low safety significance and an associated Non-Cited Violation of Technical Specification 5.4.1. Specifically, the licensee failed to perform Derived Air Concentration (DAC)-Hour tracking for airborne transuranic radioactivity as required by a quality plant procedure, EN-RP-131, "Air Sampling," resulting in untimely internal dose assessments for selected plant workers. The issue was entered in the licensee's corrective action program as CR-PLP-2012-02683. The licensee's immediate corrective actions included re-evaluating the use of site-specific work instructions. Long-term corrective actions included procedure changes and completing the required personnel dose assessments utilizing upper bounding radiological conditions.

The finding is more than minor because it was associated with the program and process attribute of the Occupational Radiation Safety Cornerstone and adversely affected the cornerstone objective of ensuring adequate protection of worker health and safety from exposure to radiation. Specifically, not performing DAC-Hour tracking for airborne transuranic radioactivity affected the licensee's ability to assess workers internal exposures in a timely manner and adversely impacted the licensee's ability to monitor, control and limit workers' radiation exposures (committed effective dose equivalent or internal dose). In accordance with IMC 0609 Appendix C, "Occupational Radiation Safety Significance Determination Process," the inspectors determined that the finding had very low safety significance (Green) because the finding: (1) did not involve as-low-as-is-reasonably-achievable (ALARA) planning and controls; (2) did not involve a radiological overexposure; (3) there was not a substantial potential for an overexposure; and (4) there was no compromised ability to assess dose. The inspectors determined that the primary cause of this finding was related to a cross-cutting aspect in the area of human performance, resources component, such that the licensee maintains complete, accurate and up-to-date procedures and work packages.

Inspection Report# : [2013002](#) (pdf)

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## **Public Radiation Safety**

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### **Security**

Although the Security Cornerstone is included in the Reactor Oversight Process assessment program, the Commission has decided that specific information related to findings and performance indicators pertaining to the Security Cornerstone will not be publicly available to ensure that security information is not provided to a possible adversary. Other than the fact that a finding or performance indicator is Green or Greater-Than-Green, security related information will not be displayed on the public web page. Therefore, the [cover letters](#) to security inspection reports may be viewed.

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## **Miscellaneous**

Last modified : February 24, 2014