

## Diablo Canyon 1

### 4Q/2015 Plant Inspection Findings

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#### Initiating Events

**Significance:** G Dec 31, 2015

Identified By: NRC

Item Type: NCV Non-Cited Violation

#### **Failure to Properly Evaluate for Aggregate Impact of Fire Impairments**

The inspectors identified a non-cited violation of Technical Specification 5.4.1.d, "Procedures," for the failure to follow approved fire protection program procedures to review the fire impairments list to assess the aggregate impact on the fire protection design and safe shutdown analysis. Specifically, from August 31 to September 2, 2015, the licensee failed to evaluate the aggregate impact of having three fire doors simultaneously blocked open in adjacent Unit 1 vital battery charger rooms. The licensee implemented immediate corrective actions by assigning a continuous fire watch to the area and documented the issue in the corrective action program as Notification 50826793.

The failure to follow approved fire protection program procedures to review the fire impairments list to assess the aggregate impact on the fire protection design and safe shutdown analysis was a performance deficiency. This performance deficiency was more than minor, and therefore a finding, because it was associated with the Initiating Events cornerstone attribute of Protection against External Factors (Fire) and adversely affected the cornerstone objective of limiting the likelihood of those events that upset plant stability and challenge critical safety functions during plant operations. Specifically, the failure to evaluate the aggregate impact of multiple fire system impairments affected the licensee ability to limit the impact of a potential fire. The inspectors evaluated the finding using IMC 0609, Attachment 4, "Phase 1–Initial Screening and Characterization of Findings." Because the finding involved fire protection, the inspectors transitioned to IMC 0609, Appendix F "Fire Protection Significance Determination Process." The inspectors characterized the finding using IMC 0609, Appendix F, Attachment 1, "Fire Protection SDP Phase 1 Worksheet," dated September 20, 2013. The finding screened as very low safety significance (Green), per Attachment 1, Question 1.4.3-A since the fire finding category was determined to be fire confinement, due to the fire doors being propped open, and the combustion loading on both sides of the door was determined to be a duration of 30 minutes as documented in licensee calculation M-824, "Controlled Combustion Loading Tracking." In addition, the inspectors determined this finding had a cross-cutting aspect in human performance associated with the teamwork component because the licensee's work groups did not properly communicate and coordinate their activities within and across organizational boundaries to ensure nuclear safety was maintained. Specifically, the work planners did not properly communicate to the fire protection department that all three fire doors would be open at the same time during battery charger load testing. [H.4]

Inspection Report# : [2015004](#) (*pdf*)

**Significance:** G Jun 30, 2015

Identified By: NRC

Item Type: NCV Non-Cited Violation

#### **Failure to Appropriately Scope 230 KV Switchyard into the Maintenance Rule Monitoring Program**

The inspectors identified a Green, non-cited violation of 10 CFR 50.65(b)(2) for the licensee's failure to appropriately scope the 230 kV switchyard in the Maintenance Rule monitoring program. Specifically, from the inception of the facilities' monitoring program through May 18, 2015, the licensee failed to properly scope or evaluate the 230 kV switchyard to include the entire switchyard up through the first inter-tie circuit breakers CB262 and CB282 into the

Maintenance Rule program. Electrical faults within the 230 kV switchyard can cause loss of offsite power which is relied upon to mitigate accidents and cause an actuation of a safety-related systems, such as, emergency diesel generators, and should have been included into its Maintenance Rule program. This issue was entered into the licensee's corrective action program as Notifications 50702970 and 50703118.

The inspectors determined that the licensee's failure to scope the 230 kV offsite power source including the switchyard up through the first breakers from the transmission system into the Maintenance Rule program was contrary to the requirements of 10 CFR 50.65 and therefore a performance deficiency. The performance deficiency was determined to be more than minor because it is associated with the initiating events attribute of protections against external factors and adversely affected the cornerstone objective, in that, a 230 kV switchyard failure can upset plant stability and challenge critical safety functions during shutdown as well as power operations. Failure to monitor the performance or condition of 230 kV offsite power source (including the switchyard up through the first breakers from the transmission system) in a manner sufficient to provide reasonable assurance the offsite power was capable of fulfilling the intended functions affected the reliability of the plant equipment to perform their safety function. The inspectors determined if the 230 kV switchyard was properly scoped into the Maintenance Rule program the loss of offsite power due to the flash over event may have been prevented. However the direct cause of the event has been identified as untimely corrective actions associated with an ineffective corrective action program. As such, improper Maintenance Rule scoping was not the direct cause. Therefore, the inspectors determined the finding could be evaluated using the significant determination process in accordance using IMC 0609, Appendix A, "Significance Determination Process (SDP) for Findings At-Power," Exhibit 1, "Initiating Events Screening Questions." The inspectors determined that the finding was of very low safety significance (Green) because the finding was determined not to be the cause of the actual 230 kV failure such that all of the screening questions in Exhibit 1 could be answered "no." The inspectors determined that since the scoping of the switchyard systems had occurred more than 3 years ago, and the opportunity to reevaluate system scoping had not recently occurred, the finding did not represent current licensee performance and therefore a cross-cutting aspect was not assigned.

Inspection Report# : [2015002](#) (pdf)

**Significance:**  Jun 30, 2015

Identified By: Self-Revealing

Item Type: FIN Finding

### **High Voltage Insulator Flashover Resulted in Loss of 230 kV Offsite Power and Start of Emergency Diesel Generators**

The inspectors reviewed a self-revealing, Green finding for the licensee's failure to adequately implement procedure OM7.ID1, Problem Identification and Resolution, to prevent a high voltage insulator flashover event in the 230 kV switchyard that occurred on October 31, 2014. Specifically, corrective actions from three previous root cause evaluations were not effective to prevent a loss of the 230 kV start-up power and subsequent auto start of all of the safety standby emergency diesel generators (EDGs). This issue was entered into the licensee's corrective action program as Notification 50699230.

The licensee's failure to adequately implement procedure OM7.ID1, Problem Identification and Resolution was a performance deficiency. The performance deficiency was more than minor because it was associated with the human performance attribute of the Initiating Events cornerstone and affected the cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions. Specifically, this failure resulted in another high-voltage insulator flashover, which resulted in loss of 230 kV offsite startup power and activation of all safety-related EDGs, on October 31, 2014. In accordance with IMC 0609.04, "Initial Characterization of Findings," the inspectors determined that the impact of the finding on Unit 1 should be evaluated using Exhibit 1 of IMC 0609, Appendix A, "The Significance Determination Process (SDP) for Findings at Power," and further determined that this finding required a detailed risk evaluation by the regional senior risk analyst because the finding involved a partial loss of offsite power, a support system that contributes to the likelihood of an initiating event and affected mitigation equipment.

The risk analyst determined that, with the 230 kV system de-energized, any plant transient would result in a plant-centered loss of offsite power. Therefore, the risk analyst calculated the incremental conditional core damage probability for an exposure period of 9 hours to be  $2.09 \times 10^{-7}$ , which is lower than the  $1 \times 10^{-6}$  threshold in the significance determination process; this finding is of very low safety significance (Green) for Unit 1. In accordance with IMC 0609.04, "Initial Characterization of Findings," the inspectors determined that the impact of the finding on Unit 2 should be evaluated using IMC 0609, Appendix G, "Shutdown Operations Significance Determination Process," because the finding pertained to operations, an event, or a degraded condition while the plant was shut down. Unit 2 was shutdown in a refueling outage when the event occurred on October 31, 2014. Because of the shutdown configuration of Unit 2, the loss of 230 kV support system did not impact the ability to continue to provide decay heat removal for the unit. Therefore, the analyst determined qualitatively that this finding is also of very low safety significance (Green) for Unit 2. This finding has a cross-cutting aspect of work management, in the area of human performance, for failing to implement a process of planning, controlling, and executing work activities such that nuclear safety is an overriding priority. Specifically the licensee failed to effectively plan and coordinate preventative maintenance strategies associated with root causes from previous high-voltage insulators flashover or failures since 2008 to prevent the loss of offsite 230 kV and the transient on October 31, 2014 [H.5].

Inspection Report# : [2015002](#) (pdf)

## Mitigating Systems

**Significance:**  Dec 31, 2015

Identified By: Self-Revealing

Item Type: NCV Non-Cited Violation

### **Failure to Identify a Cause and Implement Actions to Prevent Recurrence of a Significant Condition Adverse to Quality**

The inspectors reviewed a self-revealing non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVI "Corrective Action," for the failure to identify the cause and take corrective action to prevent recurrence of a significant condition adverse to quality impacting both trains of the Unit 1 safety-related residual heat removal (RHR) system. Specifically, the licensee failed to identify a definitive cause and implement corrective actions to prevent recurrent failures of the socket weld for relief valve RHR-1-RV-8708 for both trains of the RHR system. As immediate corrective actions, the licensee installed additional piping supports to mitigate the vibrations at the socket weld and documented this issue in the corrective action program as Notification 50680750.

The failure to identify the cause of the RHR vibration-induced problems and to take adequate corrective actions to prevent recurrence of the weld failures was a performance deficiency. The performance deficiency was more than minor, and therefore a finding, because if left uncorrected, it could lead to a more significant safety concern. Specifically, no additional supports were installed and no actions were taken to reduce or eliminate the vibrations to prevent recurring weld failures, which could affect the availability of the RHR system. The lack of corrective actions to prevent recurrence could leave RHR components and other components physically connected to the system susceptible to future failures. Using Inspection Manual Chapter 0609, Appendix A, the inspectors determined the issue to have very low safety significance (Green) because the performance deficiency, which affected the mitigating systems cornerstone, did not result in a loss of safety function and did not result in an actual loss of function for greater than the technical specification allowed outage time. The licensee entered this into their corrective action program as Notification 50680750. In addition, this finding has a cross-cutting aspect in the human performance area associated with conservative bias decision making component because individuals failed to use decision making practices that emphasize prudent choices over those that are simply allowable. Specifically, the licensee chose to only install a fatigue resistance weld rather than install additional pipe supports as were in the Unit 2 system [H.14].

Inspection Report# : [2015004](#) (pdf)

**Significance:** G Dec 31, 2015

Identified By: NRC

Item Type: NCV Non-Cited Violation

**Failure to Design the Emergency Diesel Generators to operate under Worst Case Environmental Conditions**

The inspectors identified a non-cited violation of 10 CFR Part 50, Appendix B, Criterion III "Design Control," for the failure to implement design control measures to verify the adequacy of the Unit 1 emergency diesel generators (EDGs) cooling system design to ensure operation of the EDGs under worst-case environmental conditions.

Specifically, since initial licensed operations began in 1984, the licensee failed to ensure the Unit 1 EDGs were designed and built to operate under worst-case high wind and temperature conditions. As a result, sustained high winds from specific directions could have impacted EDG radiator performance resulting in the unavailability of the Unit 1 EDGs. Immediate corrective actions included issuing shift orders to the reactor operators to monitor for specific weather conditions (high air temperature, high wind speed and direction) and provide additional room cooling using established procedures, as necessary. The licensee documented the issue in the corrective action program as Notification 50599190.

The failure to implement design control measures to ensure the emergency diesel generators could perform their design basis function was a performance deficiency. The performance deficiency was more than minor, and is therefore a finding, because it was associated with the design control attribute of the mitigating system cornerstone, and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the performance deficiency resulted in a condition where sustained high winds from specific directions could have impacted EDG radiator performance resulting in the unavailability of the Unit 1 EDGs. The inspectors evaluated the finding using Exhibit 2 of IMC 0609, Appendix A, "The Significance Determination Process for Findings At Power," dated June 19, 2012. The inspectors determined that a detailed risk evaluation by an NRC senior reactor analyst was required since the finding was associated with a loss of EDG function. The regional senior reactor analyst performed a Phase 3 SDP analysis for the finding. The results of analysis established the incremental conditional core damage probability (ICCDP) was 2.74E-07, less than 1E-06, and therefore the analyst determined that the subject finding was of very low safety significance (Green).

A cross-cutting aspect was not assigned to the finding since the finding did not represent current licensee performance. The condition existed since original construction of the plant.

Inspection Report# : [2015004](#) (pdf)

**Significance:** G Sep 30, 2015

Identified By: NRC

Item Type: NCV Non-Cited Violation

**Failure to Document an Adequate Evaluation for a Change in Seismic Load Combination Methodology**

The inspectors identified a Severity Level IV, Green, non cited violation of 10 CFR 50.59(d)(1) which requires, in part, that the licensee shall maintain records of changes in the facility, of changes in procedures, and of tests and experiments made pursuant to paragraph (c) of this section. These records must include a written evaluation which provides the bases for the determination that the change, test, or experiment does not require a license amendment pursuant to paragraph (c)(2). Specifically, the licensee changed the method for combining earthquake loads and loss of coolant accident loads from the absolute summation method to square root sum of the squares (SRSS) method without sufficient justification to demonstrate the change did not require prior NRC approval.

The licensee's failure to implement the requirements of 10 CFR 50.59 and adequately evaluate changes to determine if prior NRC approval is required was a performance deficiency. The licensee entered the issue into the corrective action program as Notification 50811191. In accordance with the licensee's corrective action program, this issue will

be addressed by the licensee through a re-evaluation of the methodology change and the required actions that need to be taken by the licensee will be implemented. Additionally, the licensee performed an operability determination for the affected structures, systems, and components that established a reasonable expectation for operability pending final resolution of the issue.

This performance deficiency was more than minor, and therefore a finding, because it was associated with the design control attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective to ensure the reliability, availability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the licensee failed to determine that use of SRSS in the Watts Bar safety evaluation report cited in the PG&E evaluation represented a change in a method of evaluation, in that the Watts Bar safety evaluation report was very narrow in scope and not appropriate for the intended application at Diablo Canyon. In accordance with Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At Power," dated June 19, 2012, Exhibit 2, "Mitigating Systems Screening Questions," the issue screened as having very low safety significance (Green) because it was a design or qualification deficiency that did not result in the inoperability of the system. Because this performance deficiency had the potential to impact the NRC's ability to perform its regulatory function, the inspectors also evaluated the performance deficiency using traditional enforcement. Since the violation is associated with a Green finding having very low safety significance, the traditional enforcement violation was determined to be a Severity Level IV violation, consistent with the example in paragraph 6.1.d(2) of the NRC Enforcement Policy. This finding had a cross cutting aspect in the area of human performance associated with design margins because individuals failed to ensure margins were carefully guarded and changed only through a systematic and rigorous process [H.6].

Inspection Report# : [2015003](#) (pdf)

**Significance:**  Jun 30, 2015

Identified By: NRC

Item Type: NCV Non-Cited Violation

**Failure to Appropriately Pre-plan and Perform Maintenance on Hydrogen Guard Piping**

The inspectors identified a Green, non-cited violation of Technical Specification 5.4.1 involving the failure to appropriately pre-plan and implement written procedures associated with configuration control of the hazard barrier hydrogen guard piping in the proximity and impacting safety-related equipment. This issue was entered into the licensee corrective action program as Notification 50778755.

The inspectors determined that the failure to consider the impact to the fire hazard analysis and the seismic configuration of the hydrogen guard pipe was a performance deficiency. The performance deficiency was more than minor because it was associated with the protection against external events attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems (i.e. hazard barriers) that respond to initiating events, such as fires, to prevent undesirable consequence. Though there were no actual consequences, the breaching of the seismically qualified hydrogen guard piping removed a designed hazard barrier and has the potential to vent hydrogen into rooms containing safety related equipment. Using IMC 0609, Appendix F, "Fire Protection Significance Determination Process, Phase 1 Worksheet," the finding was determined to be of very low safety significance (Green) because it represented a low degradation of fire prevention and administrative controls element of the plant combustible material controls program, and the breaching of the hydrogen guard piping would not have prevented the safe shutdown of the plant. This finding has a cross-cutting aspect of design margins associated with the human performance area. Specifically, the most significant contributor for the performance deficiency was the licensee did not have an adequate work process that focused on maintaining defense in depth related to a fire hazard barrier, such as a hydrogen guard piping, during maintenance activities. Breaching hydrogen guard piping impacts defense in depth and design margins used to protect safety-related equipment, and special attention is required to carefully guard and change the configuration with great thought and care [H.6].

Inspection Report# : [2015002](#) (pdf)

**Significance:** G Jun 30, 2015

Identified By: Self-Revealing

Item Type: NCV Non-Cited Violation

**Failure to Maintain Operator Licensing Examination Integrity**

The inspectors reviewed a self-revealing, Severity Level IV non-cited violation of 10 CFR 55.49, “Integrity of Examinations and Tests,” and an associated Green finding for the licensee’s failure to provide adequate examination security measures during administration of the 2015 biennial requalification examination. On May 26, 2015, a licensed operator was able to obtain plant computer information that led to the discovery of specific plant events contained on the NRC-required annual operating test. The licensee entered this issue into the corrective action program as Notification 50704195 and retested the crew with a new scenario.

The failure of the licensee to provide adequate measures for examination security for the biennial requalification examinations was a performance deficiency. The performance deficiency was more than minor, and therefore a finding, because it adversely affected the human performance attribute of the Mitigating Systems cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using NRC Inspection Manual Chapter 0609, “Significance Determination Process,” Attachment 4, Tables 1 and 2 worksheets (issue date June 19, 2012); and the corresponding Appendix I, “Licensed Operator Requalification Significance Determination Process (SDP),” Flowchart Block #10 (issue date December 6, 2011), the finding was determined to have very low safety significance (Green). Although the 2015 finding resulted in a compromise of the integrity of biennial dynamic simulator examinations had no compensatory actions been taken, the equitable and consistent administration of the biennial dynamic simulator examination was not actually affected by this compromise. The traditional enforcement violation was determined to be a Severity Level IV violation consistent with Section 6.4.d of the Enforcement Policy. This finding has a cross-cutting aspect in the resources component of the human performance cross-cutting area because the licensee failed to ensure the procedures are adequate to ensure nuclear safety [H.1].

Inspection Report# : [2015002](#) (*pdf*)

**Significance:** G Jun 30, 2015

Identified By: NRC

Item Type: NCV Non-Cited Violation

**Inadequate Design Control for High-Energy Line Break Vent Flow Path**

The inspectors identified a Green, non-cited violation of 10 CFR Part 50, Appendix B, Criterion III, “Design Control,” involving the licensee’s failure to ensure credited design features, such as flow vent paths, protect safety-related systems, from temperature and pressure effects of a high-energy line break (HELB) in the auxiliary building. Specifically, the licensee allowed obstruction of a credited flow path with acrylic glass plates not qualified in the original design and not verified to function under a HELB scenario. The licensee entered this issue into the corrective action program as Notifications 50697910 and 50698102, and took immediate actions to remove the acrylic glass plates from the vent path doors in the auxiliary building.

The performance deficiency was determined to be more than minor because it affected the Mitigating Systems Cornerstone attribute of Design Control and adversely affected the cornerstone objective of ensuring the reliability, availability and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the licensee did not have adequate measures in place to ensure that qualified components were available to mitigate the consequences of a HELB in the auxiliary building. The finding screened as of very low safety significance (Green) because the finding did not affect the design or qualification of mitigating structures, systems, and components; the finding did not represent a loss of system and/or function; the finding did not represent an actual loss of a function of a single train for greater than the technical specification (TS) allowed outage time; the finding did not represent an actual loss of a function of one or more non-TS trains of equipment; and did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. The finding was not assigned a cross-

cutting aspect since the performance deficiency is not indicative of current plant performance.

Inspection Report# : [2015002](#) (*pdf*)

**Significance:** G Jun 30, 2015

Identified By: Self-Revealing

Item Type: NCV Non-Cited Violation

**Technical Specification 3.3.4 Not Met Due to Inoperable Remote Shutdown System Function**

The inspectors reviewed a self-revealing Green, non-cited violation of Technical Specification 3.3.4 “Remote Shutdown System,” for the licensee’s failure to maintain adequate configuration control of fuses associated with an emergency diesel generator (EDG). The licensee’s failure to maintain adequate configuration control by not verifying that fuses were properly installed, and adequate post maintenance testing was performed, following maintenance activities was a performance deficiency. Specifically, following the 1R17 refueling outage, from approximately June 13, 2013 until November 22, 2013, EDG 1-3 would not have been able to perform its remote shutdown function due to not being able to be adequately operated at the local EDG control cubicle. The licensee entered this issue into the corrective action program as Notification 50595473, and took prompt actions to restore the fuses to the correct position and verify the positions of the fuses in the other EDG output breaker cubicles.

The failure to properly install fuses in the local manual operation circuitry of EDG 1-3 was a performance deficiency. The performance deficiency was more than minor because it was associated with the protection against external events (fire) attribute of the Mitigating Systems Cornerstone, and it adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, it affected the ability to reach and maintain safe shutdown conditions in case of a fire causing a control room abandonment. The inspectors evaluated this finding using Inspection Manual Chapter 0609, Appendix F, “Fire Protection Significance Determination Process,” dated September 20, 2013. Because it affected the ability to reach and maintain safe shutdown conditions in case of a fire that led to control room evacuation, the Phase 2 methodology of Inspection Manual Chapter 0609, Appendix F, was not appropriate for this finding. Therefore, the senior reactor analyst performed a Phase 3 evaluation to determine the risk significance. The analyst determined that the performance deficiency only increased the risk of the plant as it related to the need to locally control EDG 1-3 following a postulated control room evacuation. The Senior Risk Analyst determined that the change in core damage frequency was less than  $1 \times 10^{-6}$ , and the finding was not significant with respect to large, early release frequency. The analyst determined that this finding was of very low risk significance (Green). This finding had a cross-cutting aspect in the area of human performance associated with the work practices component, because the licensee did not ensure supervisory and management oversight of work activities, such that nuclear safety was supported [H.5].

Inspection Report# : [2015002](#) (*pdf*)

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## Barrier Integrity

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## Emergency Preparedness

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## Occupational Radiation Safety

**Significance:**  Sep 30, 2015

Identified By: Self-Revealing

Item Type: NCV Non-Cited Violation

**Failure to Secure a Locked High Radiation Area**

The inspectors reviewed a self-revealing non-cited violation (NCV) of Technical Specification 5.4.1(a), “Procedures,” for failure to secure a locked high radiation area. Specifically, the padlock on the Letdown Filter 1-1 locking bar was found unlocked. Upon discovery, the licensee guarded the area until properly secured. This issue was entered into the licensee’s corrective action program as Notification 50710852.

The failure to secure a locked high radiation area was a performance deficiency. The performance deficiency was more than minor because, if left uncorrected, it had the potential to lead to a more significant safety concern. Specifically, failure to adequately secure the locked high radiation area could result in unintended exposure to high levels of radiation. Using Inspection Manual Chapter 0609, Appendix C, “Occupational Radiation Safety Significance Determination Process,” dated August 19, 2008, the inspectors determined the violation was of very low safety significance (Green) because: (1) it was not an as low as reasonably achievable (ALARA) finding, (2) there was no overexposure, (3) there was no substantial potential for an overexposure, and (4) the ability to assess dose was not compromised. The finding had an avoid complacency cross-cutting aspect, in the area of human performance, because individuals failed to recognize and plan for the possibility of mistakes, even while expecting positive outcomes. Specifically, licensee personnel failed to ensure that the padlock was secured after completing the task [H.12].  
Inspection Report# : [2015003](#) (*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

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