

# Fort Calhoun

## 4Q/2006 Plant Inspection Findings

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### Initiating Events

**Significance:**  Sep 30, 2006

Identified By: NRC

Item Type: NCV NonCited Violation

#### **Failure to Translate Replacement Pressurizer Weight Into Design Calculations**

The inspectors identified a Green, noncited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," for failure to use the correct total dead weight of the replacement pressurizer in two design calculations.

The failure to correctly translate the total dead weight of the replacement pressurizer into design calculations is a performance deficiency because the licensee failed to meet 10 CFR Part 50, Appendix B, Criterion III, "Design Control," and the cause was reasonably within the licensee's ability to foresee and correct. The finding is more than minor because it affects the design control attribute of the initiating events objective listed in Manual Chapter 0612, "Power Reactor Inspection Reports," Appendix B. Because the incorrect weight was used in the analyses, the analyses were re-evaluated. Since the finding did not result in a loss of function or mitigation capability, the violation has very low safety significance (Green), using Manual Chapter 0609, "Significance Determination Process."

This finding has a crosscutting aspect in the area of human performance because the licensee failed to use conservative assumptions in their decision-making. This caused the licensee to miss opportunities to revise specific design documentation for the pressurizer. A contributing factor is the licensee's regard toward the replacement pressurizer as a "like-for-like" replacement for the original pressurizer. Although the design function of the replacement pressurizer is similar to the original pressurizer, specific design parameters, such as weight, volume, and heater capacity, are actually different.

Inspection Report# : [2006004](#) (*pdf*)

**Significance:**  Jun 30, 2006

Identified By: NRC

Item Type: NCV NonCited Violation

#### **Failure to Identify Potential Missiles During adverse Weather Conditions**

A noncited violation was identified for failure of operators to follow an abnormal operating procedure as required by Technical Specification 5.8.1.a. This failure resulted in the station not identifying that loose material had the potential to become airborne during high winds and potentially cause a loss of off-site power. This finding has a crosscutting aspect in the area of problem identification and resolution because the licensee failed to identify the condition despite numerous opportunities to do so.

This finding was determined to be greater than minor in that it affected the "Protection Against External Factors" attribute of the Initiating Events cornerstone. Further, this condition could also reasonably be viewed as a precursor to a significant event. The inspectors evaluated this finding using Manual Chapter 0609, Appendix A and determined that it was of very low safety significance (Green) because it did not contribute to both the likelihood of a reactor trip and the likelihood that mitigation equipment would not be available. This condition has been entered into the licensee's corrective action program as Condition Report 200602454.

Inspection Report# : [2006003](#) (*pdf*)

**Significance:**  Jun 30, 2006

Identified By: Self-Revealing

Item Type: FIN Finding

#### **Reactor Trip Caused by Inadequate Operator Control During Low Power Operations**

A self-revealing finding was identified for inadequate operator control of plant parameters, which resulted in an unplanned reactor trip during testing. The cause of the finding is related to the crosscutting element of human performance in that the operator's performance directly led to the plant transient.

The finding was greater than minor because it had an actual impact of tripping the reactor, which is a precursor to a significant event. The performance deficiency was also similar to example 4.b in Inspection Manual Chapter 0612, Appendix E. The finding, which is under the Initiating Events cornerstone, was of very low safety significance because it did not contribute both to the likelihood of a reactor trip and that mitigation equipment would not be available. This condition has been entered into the licensee's corrective action program as Condition Report 200500773.

Inspection Report# : [2006003](#) (*pdf*)

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## Mitigating Systems

**Significance:**  Dec 31, 2006

Identified By: NRC

Item Type: NCV NonCited Violation

### **Failure to Promptly Identify and Correct a Degraded Component Cooling Water Pump**

The inspectors identified a Green NCV for the licensee's failure to promptly identify and correct a degraded component cooling water pump. The failure to recognize and fix this condition led to the pump being more likely to fail upon a valid demand to start.

This finding was determined to be greater than minor because it affected the "Availability/Reliability" component of the "Equipment Performance" attribute under Mitigating Systems cornerstone. The inspectors evaluated this finding using Manual Chapter 0609, Appendix A, and determined that it was of very low safety significance (Green). This conclusion was reached because the finding wasn't a design or qualification deficiency, the finding did not represent a loss of safety function, was not an actual loss of safety function of a single train for greater than its Technical Specification Allowed Outage time, did not represent an actual loss of safety function for non-Technical Specification equipment, and was not potentially significant due to external events such as flooding, seismic occurrences, etc. This violation was entered into the licensee's corrective action program as Condition Report (CR) 200603835. This finding has a crosscutting aspect in the area of problem identification and resolution because the licensee failed to identify and correct the condition despite numerous opportunities to do so.

Inspection Report# : [2006005](#) (*pdf*)

**Significance:**  Dec 31, 2006

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

### **Inadvertent Pump Down of Intake Bay Resulting in Less Than Required Raw Water Pumps**

A Green finding was identified for failure of operators to follow a standing operational procedure as required by Technical Specification 5.8.1.a. This failure resulted in less than the minimum number of raw water pumps required for decay heat removal from the spent fuel pool.

This finding was determined to be greater than minor in that it affected the "Configuration Control" component of the Mitigating Systems cornerstone, specifically "Shutdown Equipment Alignment." The inspectors attempted to use Manual Chapter 0609, Appendix G because the condition occurred during shutdown conditions, but were unable to because an assumption contained in the worksheets was that fuel was in the reactor vessel. During this transient all fuel was located in the spent fuel pool. Regional management determined that the finding was of very low safety significance (Green). The finding was evaluated considering Manual Chapter 0609, Appendix G, as a bounding case and was used as guidance to determine the significance of the finding. This violation was entered into the licensee's corrective action program as CR 200604505. This finding has a crosscutting aspect in the area of human performance associated with work practices because the operator failed to use error prevention techniques like self-checking and peer checking, which would have prevented this event.

Inspection Report# : [2006005](#) (*pdf*)

**G****Significance:** Dec 31, 2006

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

**Inadvertent Over-Pressurization of Piping During Testing**

A Green finding was identified for failure to follow procedures during testing. This condition resulted in the damage to safety-related equipment and potential over-pressurization of chemical and volume control system (CVCS) and high pressure safety injection (HPSI) piping.

This finding was determined to be greater than minor in that it affected the “Configuration Control” attribute of the Mitigating Systems cornerstone. The inspectors evaluated this finding using Manual Chapter 0609, Appendix G, because the condition occurred during shutdown conditions. Using Checklist 2 the inspectors determined that the finding screened as Green because the condition did not increase the likelihood that a loss of decay heat removal would occur. This violation was entered into the licensee’s corrective action program as CR 200605430. This finding has a crosscutting aspect in the area of human performance associated with work practices because the operator failed to use error prevention techniques like self-checking and peer checking, which would have prevented this event.

Inspection Report# : [2006005](#) (*pdf*)**G****Significance:** Sep 30, 2006

Identified By: NRC

Item Type: NCV NonCited Violation

**Failure to Maintain Shutdown Cooling Train Operable as Required by Technical Specification 2.1.1(3)**

A noncited violation was identified for failure to comply with Technical Specification 2.1.1.(3), which required two operable decay heat removal loops. This failure resulted in a condition where only one shutdown cooling train was operable. This condition existed for 2 days before being detected by operations personnel.

This finding was determined to be greater than minor in that it affected the “Configuration Control” attribute of the Mitigating Systems cornerstone. The inspectors evaluated this finding using Manual Chapter 0609, Appendix G, because the condition occurred and was identified during shutdown conditions. Using Checklist 2, the inspectors determined that the finding screened as Green because the condition did not increase the likelihood that a loss of decay heat removal would occur due to failure of the system itself. This condition was entered into the licensee’s corrective action program as Condition Report 200603965. This finding has a crosscutting aspect in the area of human performance associated with decision making because operations personnel incorrectly concluded that the shutdown cooling header was operable.

Inspection Report# : [2006004](#) (*pdf*)**G****Significance:** Sep 30, 2006

Identified By: NRC

Item Type: NCV NonCited Violation

**Failure to Implement reasonable and Feasible Manual Actions**

The inspectors identified a noncited violation of Technical Specification 5.8.1.c for failure to have an adequate procedure to implement postfire safe shutdown actions. Specifically, Procedure SO-G-28, “Station Fire Plan,” Revision 61, Attachment 14, failed to list operable diagnostic instrumentation, actions needed to respond to faults on 4 kV busses, and had operators re-enter an area without ensuring it was safe to enter.

This finding is of greater than minor safety significance because it had the potential to impact the mitigating systems cornerstone objective to ensure the availability, reliability, and capability of systems that respond to external events (such as fire) to prevent undesirable consequences. Consequently, the inspectors evaluated these deficiencies using Manual Chapter 0609, Appendix F. Since the issue involved postfire safe shutdown actions in the auxiliary building related to maintaining reactor coolant system inventory and maintaining a heat sink, had existed for more than 30 days, and had a moderate degradation rating, the issue did not screen out in Phase 1. Because of the room volumes and the forced ventilation flow rates, the sources did not generate sufficient heat in the hot gas layer to damage the targets. Consequently, in accordance with the Appendix F, Step 2.3, of the Phase 2 significance determination process, the inspectors concluded that this finding was of very low safety significance. In addition, this finding had a crosscutting aspect in the area of human performance because the licensee did not ensure complete, accurate and up-to-date procedures needed to implement manual actions existed for postfire safe shutdown.

Inspection Report# : [2006004](#) (*pdf*)

**Significance:**  Sep 30, 2006

Identified By: NRC

Item Type: NCV NonCited Violation

### **Inadequate Alternate Shutdown Procedure**

The inspectors identified a noncited violation of Technical Specification 5.8.1.c for failure to have an adequate procedure to implement postfire safe shutdown actions. Specifically, simulated operator actions during a walkthrough of Procedure AOP-06, "Fire Emergency," could not be performed in the time specified in engineering calculations, nor were all appropriate steps specified.

This finding is of greater than minor safety significance because it had the potential to impact the mitigating systems cornerstone objective to ensure the availability, reliability, and capability of systems that respond to external events (such as fire) to prevent undesirable consequences. Specifically, the issue involved postfire safe shutdown actions in the auxiliary building upon evacuation from the control room related to maintaining a heat sink. Because of other actions that would likely have been taken, the inspectors concluded this issue had a low degradation rating and, therefore, the inspectors concluded the issue was of very low safety significance in Phase 1. In addition, this finding had a crosscutting aspect in the area of human performance because the licensee did not ensure complete, accurate and up-to-date procedures needed to implement the actions existed.

Inspection Report# : [2006004](#) (*pdf*)

**Significance:**  Jun 30, 2006

Identified By: NRC

Item Type: NCV NonCited Violation

### **Nonfunctional Fire Barrier Separating Corridor 23 (Fire Area 20.1) and Room 61 (Fire Area 20.4)**

A noncited violation of Technical Specification 5.8.1.c, Fire Protection Program Implementation, was identified for the failure to ensure that all fire barriers protecting safety-related areas were functional. Specifically, Fire Door 1007-10 between Fire Area 20.1 and Fire Area 20.4 was chained opened and would have allowed flame propagation between Corridor 26 and Room 61.

This finding was more than minor since it was associated with the protection against external factors attribute of the mitigating systems cornerstone. Using the Significance Determination Process, Manual Chapter 0609, Appendix F, the finding was determined to be in the Fire Confinement category because the fire barrier separated one fire area from another. A high degradation rating was assigned because the fire barrier was defeated by chaining open the fire door. The finding was characterized as having very low safety significance. Although the exposed fire area (Corridor 26) contains safe shutdown equipment, the exposing fire area (Room 61) does not. Therefore, a fire in Room 61 that spreads to Corridor 26 would not affect safe shutdown. The same systems and components available to achieve safe shutdown in the case of a fire in Corridor 26 will be available to perform the safe shutdown for a fire that spreads from Room 61 into Corridor 26. This condition has been entered into the licensee's corrective action program as Condition Report 200602029.

Inspection Report# : [2006003](#) (*pdf*)

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## **Barrier Integrity**

**Significance:**  Dec 31, 2006

Identified By: NRC

Item Type: NCV NonCited Violation

### **Failure to Determine Operability of Component Cooling Water Valves to Containment Cooling Units**

The inspectors identified a noncited violation of Technical Specification 2.4. The violation was identified as a result of the licensee's failure to identify corrective actions two years ago that caused the Licensee to incorrectly determine the operability of component cooling water (CCW) inlet and outlet valves that supply CCW to the containment air cooling and containment air cooling and filtering units. On two occasions, June 29, 2006 and July 18, 2006, the licensee initially

determined that air or nitrogen leaks associated with the CCW valves did not affect the operability of the valves. This incorrect operability determination was based on the valves failing-as-is and not being subject to flow-induced hydrodynamic operation. Because the valves are subject to flow-induced hydrodynamic operation caused the violation of technical specification.

The finding was more than minor since it affected the Containment Configuration Control attribute of the Barrier Integrity cornerstone. Using Significance Determination Process, Manual Chapter 0609, the phase one analysis directs the use of Appendix H since the finding involves the actual reduction in defense-in-depth for the atmospheric pressure control. Manual Chapter 0609 Appendix H characterized the finding as having a very low safety significance because it was determined to have no impact on core damage frequency or large early release frequency. The finding also has a crosscutting aspect in the problem identification and resolution area because the licensee failed to take appropriate corrective actions to address the safety issue in a timely manner. This issue was entered into the licensee's corrective action program.

Inspection Report# : [2006005](#) (*pdf*)

**Significance:**  Jun 30, 2006

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

#### **Failure to Identify a Condition Adverse to Quality Associated with an Inoperable Personnel Access Lock**

A noncited self-revealing violation of 10 CFR Part 50, Appendix B, Criterion XVI, was identified for the failure to ensure that conditions adverse to quality are promptly identified and corrected. Specifically, a licensed operator and radiation protection technician failed to promptly identify and correct Personnel Access Lock inner door equalizing valve leakage, a condition adverse to quality that affected containment integrity and resulted in a technical specification violation. The finding has crosscutting aspects in the corrective action program component of the problem identification and resolution crosscutting area in that the inner Personnel Access Lock door equalizing valve leakage was not promptly identified and corrected.

The finding was considered self-revealing since the inner door equalizing valve leakage revealed itself when contamination smears were blown off the step-off pad after opening the outer door. The finding was more than minor since it is associated with the reactor safety barrier cornerstone attribute to maintain functionality of containment. The finding also affected the cornerstone objective by not providing reasonable assurance that the physical design barrier protected the public from radionuclide releases caused by events when the outer Personnel Access Lock door was open. Using the Significance Determination Process, Inspection Manual Chapter 0609 Appendix A, the finding represented an actual bypass of the reactor containment therefore Inspection Manual Chapter 0609 Appendix H was used to evaluate the finding. In Inspection Manual Chapter 0609, Appendix H, the finding was classified as Type B, since there was no impact on core damage frequency but did potentially contribute to large/early release frequency. The initial screening determined the finding to be of very low safety significance (Green) since it was not related to a containment structure, system, or component defined in Appendix H, Table 4.1. This condition has been entered into the licensee's corrective action program as Condition Report 20060144.

Inspection Report# : [2006003](#) (*pdf*)

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## **Emergency Preparedness**

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## **Occupational Radiation Safety**

**Significance:**  Nov 17, 2006

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

#### **Failure to Obtain High Radiation Area Briefing**

The inspector identified a self-revealing, noncited violation of Technical Specification 5.11.1, in which a worker failed to



obtain a high radiation area access authorization and associated radiological briefing prior to entering the posted area. Specifically, on October 24, 2006, a worker entered the containment building on a radiation work permit (RWP) for rigging and equipment moves. This assignment did not require entry into a posted high radiation area (HRA). After entering the containment building and beginning work, the individual's foreman reassigned the person to a job in a posted HRA. The individual did not change RWPs and did not receive the HRA briefing prior to starting work in the new area. This issue was entered into the licensee's corrective action program.

This finding is greater than minor because it is associated with one of the cornerstone attributes (exposure/contamination control) and affects the Occupational Radiation Safety cornerstone objective, in that the failure to obtain authorization for entry into the posted high radiation area and the radiological briefing could result in additional personnel exposure. Using the Occupational Radiation Safety Significance Determination Process, the inspector determined that this finding was of very low safety significance because it did not involve: (1) an as low as is reasonably achievable, (ALARA) finding, (2) an overexposure, (3) a substantial potential for overexposure, or (4) an impaired ability to assess doses. Additionally, this finding has a cross-cutting aspect in the area of human performance work control because the foreman failed to appropriately coordinate work activities and evaluate the impact of changes to work assignments.

Inspection Report# : [2006005](#) (*pdf*)

**Significance:**  Nov 17, 2006

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

#### **Failure to Wear Appropriate Alarming Dosimetry**

The inspector identified a self-revealing, noncited violation of Technical Specification 5.11.1.b, in which a contractor's ALARA Coordinator failed to wear an alarming device that could be heard while working in a High Radiation Area. Specifically, on October 24, 2006, the individual inadvertently signed in on a Radiation Work Permit task that was suspended, and entered a High Radiation Area inside the containment building. The access control computer automatically set the dosimeter alarms for suspended tasks at 1 mrem for dose and 1 mrem/hr for dose rate. When the individual entered the High Radiation Area with high background noise levels, the individual was unable to hear the dosimeter alarm after it accumulated 1 mrem integrated dose. The individual worked in the area for a total of 1.7 hours. Upon exiting, the individual noticed the dosimeter was alarming and had accumulated a total dose of 6 mrem. This issue was entered into the licensee's corrective action program.

This finding is greater than minor because it is associated with one of the cornerstone attributes (exposure/contamination control) and affects the Occupational Radiation Safety cornerstone objective, in that the failure to provide adequate alarming dosimetry resulted in additional personnel exposure. Using the Occupational Radiation Safety Significance Determination Process, the inspector determined that this finding was of very low safety significance because it did not involve: (1) an ALARA finding, (2) an overexposure, (3) a substantial potential for overexposure, or (4) an impaired ability to assess doses. Additionally, this finding has a cross-cutting aspect in the area of human performance work practices because the worker failed to use error prevention tools such as self and peer checking.

Inspection Report# : [2006005](#) (*pdf*)

**Significance:**  Nov 17, 2006

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

#### **Failure to Provide Adequate Instructions**

The inspector identified a self-revealing, noncited violation of Technical Specification 5.8.1.a, in which instructions for the use of a high-efficiency particulate air (HEPA) filtration units were not adequately incorporated into RWP instructions resulting in the contamination of three workers. Specifically, on September 28, 2006, three individuals received intakes of radioactive material while cutting instrument lines from the bottom of the pressurizer. The work area was set up using scaffolding with a small work platform to access the bottom of the pressurizer and an HEPA ventilation unit in place on the floor below the work platform with ductwork extending to the work platform. The workers were given a briefing on dosimetry, dress requirements, and dose rates just prior to the start of the job; however, neither the briefing nor the RWP addressed the proper placement of the HEPA hose during the cutting evolution. Consequently, the three workers were assigned doses of 60, 75, and 86 millirems committed effective dose equivalent respectively. This issue was entered into the licensee's corrective action program.

This finding is greater than minor because it is associated with one of the cornerstone attributes (exposure/contamination control) and affects the Occupational Radiation Safety cornerstone objective, in that the failure to incorporate adequate work instructions in the radiation work permit resulted in additional personnel exposure. Using the Occupational Radiation Safety Significance Determination Process, the inspector determined that this finding was of very low safety significance because it did not involve: (1) an ALARA finding, (2) an overexposure, (3) a substantial potential for overexposure, or (4) an impaired ability to assess doses. Additionally, this finding has a cross-cutting aspect in the area of human performance resources because the licensee failed to provide complete and accurate work instructions in the RWP.

Inspection Report# : [2006005](#) (*pdf*)

**Significance:**  Sep 30, 2006

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

### **Failure to Obtain High Radiation Area Access Authorization and an Associated Radiological Briefing**

The inspectors reviewed two examples of a self-revealing, noncited violation of Technical Specification 5.11.1 in which workers failed to obtain high radiation area access authorization and associated radiological briefing before entering the area. The first example occurred on March 26, 2005, when a worker received a dose rate alarm while assisting with the movement of an equipment cutter known to generate a high radiation area. The second example occurred on September 16, 2006, when a worker received two dose rate alarms while working on two fire detectors in the overhead. The worker passed through a high radiation area while performing work on the second fire detector. For the first example, the licensee enhanced pre-job briefings to verify appropriate authorizations and briefings via self and peer checking. For the second example, corrective actions are still being implemented.

This finding is greater than minor because it is associated with one of the cornerstone attributes (exposure/contamination control) and affects the Occupational Radiation Safety cornerstone objective, in that the failure to obtain high radiation area authorized access and associated radiological briefings resulted in additional personnel exposure. Using the Occupational Radiation Safety Significance Determination Process, the inspectors determined that this finding was of very low safety significance because it did not involve: (1) an ALARA finding, (2) an overexposure, (3) a substantial potential for overexposure, or (4) an impaired ability to assess doses. Additionally, this finding had a cross-cutting aspect in the area of human performance because the workers failed to use error prevention tools such as self and peer checking.

Inspection Report# : [2006004](#) (*pdf*)

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## **Public Radiation Safety**

**Significance:**  May 12, 2006

Identified By: NRC

Item Type: NCV NonCited Violation

### **Failure to train hazardous material employees**

The team identified a non-cited violation (NCV) of 49 CFR 172.704(a) because the licensee failed to provide required training to hazardous material employees involved in the shipment of radioactive material. Specifically, the licensee did not provide function-specific training of applicable sections of the shipping regulations to machinists involved in the reassembly the shipping casks. Corrective actions were still being evaluated; however, the licensee plans to provide hazardous material training to these employees.

The finding is greater than minor because it is associated with the Public Radiation Safety Cornerstone attribute (Transportation Program) and process. The finding affects the cornerstone objective which is to ensure adequate protection of public health and safety from exposure to radioactive materials in the public domain because it involved the potential to impact the licensee's ability to safely package and transport radioactive material on public roadways. When processed through the Public Radiation Safety Significance Determination Process, the finding was determined to be of very low safety significance because it: (1) was associated with radioactive material control, (2) involved the licensee's program for radioactive material packaging and transportation, (3) did not cause radiation limits to be exceeded, (4) did not result in a breach of package during transit, (5) did not involve a certificate of compliance issue, (6) did not involve a low level burial ground nonconformance, and (7) did not involve a failure to make notifications or to provide emergency information. In

addition, this finding had cross-cutting aspects associated with human performance in that the organization failed to implement regulatory requirements for training hazardous material employees.

Inspection Report# : [2006014](#) (*pdf*)

**Significance:**  May 12, 2006

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

**Failure to survey and control radioactive material.**

The team reviewed a self-revealing, non-cited violation of 10 CFR 20.1501(a) that resulted from the licensee's failure to properly survey items contaminated with radioactive material. On March 8, 2005, the licensee failed to adequately evaluate the radiological hazards associated with releasing concrete cutters from the site protected area for unrestricted use in the public domain and assure compliance with 10 CFR 20.1301. Subsequently, the licensee calculated that they had released contaminated concrete cutters offsite into the public domain which had the potential for a member of the public to receive 1.7 millirem/year of unnecessary radiation exposure.

The finding is greater than minor because it was associated with a Public Radiation Safety Cornerstone attribute (material release), and it affected the associated cornerstone objective to ensure adequate protection of public health and safety from exposure to radioactive materials released into the public domain because the failure to adequately survey items and control radioactive material decreases assurance that the public will not receive unnecessary dose. When processed through the Public Radiation Safety Significance Determination Process, the finding was determined to be of very low safety significance because: (1) the finding was a radioactive material control issue, (2) it was not a transportation issue, and (3) it did not result in a dose to the public greater than 0.005 rem. This finding also had crosscutting aspects associated with human performance in that licensee's organization failed to implement regulatory requirements necessary to establish survey techniques in procedures in order to prevent the release of equipment internally contaminated with radioactive material.

Inspection Report# : [2006014](#) (*pdf*)

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## Physical Protection

[Physical Protection](#) information not publicly available.

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## Miscellaneous

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