



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION IV  
611 RYAN PLAZA DRIVE, SUITE 400  
ARLINGTON, TEXAS 76011-8064

December 15, 2000

Garry L. Randolph, Senior Vice  
President and Chief Nuclear Officer  
Union Electric Company  
P.O. Box 620  
Fulton, Missouri 65251

SUBJECT: CALLAWAY PLANT -- NRC INSPECTION REPORT NO. 50-483/00-15

Dear Mr. Randolph:

This refers to the inspection conducted on October 8 through November 25, 2000, at the Callaway Plant facility. The enclosed report presents the results of this inspection which were discussed with you and members of your staff on November 16 and 27, 2000.

This inspection was an examination of activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. Within these areas, the inspection consisted of selected examination of procedures and representative records, observations of activities, and interviews with personnel.

Based on the results of this inspection, the NRC has identified three issues that were evaluated under the risk significance determination process as having very low safety significance (Green). The NRC has also determined that violations are associated with two of these issues. These violations are being treated as noncited violations, consistent with Section VI.A.1 of the NRC's Enforcement Policy. These noncited violations are described in the subject inspection report. If you contest the violation or significance of these noncited violations, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with copies to the Regional Administrator, U.S. Nuclear Regulatory Commission, Region IV, 611 Ryan Plaza Drive, Suite 400, Arlington, Texas 76011, and the Director, Office of Enforcement, U. S. Nuclear Regulatory Commission, Washington, DC 20555-0001 and the NRC Resident Inspector at the Callaway Plant facility.

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

Should you have any questions concerning this inspection, we will be pleased to discuss them with you.

Sincerely,

*/RA/*

William D. Johnson, Chief  
Project Branch B  
Division of Reactor Projects

Docket No.: 50-483  
License No.: NPF-30

Enclosure:  
NRC Inspection Report No.  
50-483/00-15

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NRR Event Tracking System (**IPAS**)

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RIV:RI:DRP	SRI:DRP/B	PSI:DRS/PSB	SPSI:DRS/PSB	C:DRS/PSB
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**ENCLOSURE**

**U.S. NUCLEAR REGULATORY COMMISSION  
REGION IV**

Docket No.: 50-483  
License No.: NPF-30  
Report No.: 50-483/00-15  
Licensee: Union Electric Company  
Facility: Callaway Plant  
Location: Junction Highway CC and Highway O  
Fulton, Missouri  
Dates: October 8 through November 25, 2000  
Inspectors: V. G. Gaddy, Senior Resident Inspector  
J. D. Hanna, Resident Inspector  
D. W. Schaefer, Physical Security Inspector  
A. B. Earnest, Senior Physical Security Inspector  
Approved By: W. D. Johnson, Chief, Project Branch B

## SUMMARY OF FINDINGS

Callaway Plant  
NRC Inspection Report No. 50-483/00-15

IR 05000483-00-15; on 10/08-11/25/2000; Union Electric Co; Callaway Plant. Integrated Resident & Regional Report; Heat Sink Performance

This inspection report covers a 7-week period of inspection by resident inspectors and a 1-week onsite inspection by two regional physical security inspectors. The inspection identified three findings, two of which were noncited violations. The significance of the findings is indicated by their color (green, white, yellow, red) and was determined by the significance determination process in Inspection Manual Chapter 0609.

### **Cornerstone: Initiating Events**

- Green. On October 18, 2000, the licensee overhauled a 345 kV switchyard breaker without using a procedure. This breaker was part of the licensee's offsite access circuit. During the overhaul a small fire occurred in the breaker control cabinet. A significant contributor to the fire was that there was no formal procedure for performing overhaul on switchyard breakers.

This finding was determined to have very low safety significance because the lack of procedural guidance for performing maintenance on offsite access circuits did not result in any identified loss of safety or safety support system function and the required offsite sources remained available (Section 1R02).

### **Cornerstone: Mitigating Systems**

- Green. Motor-driven auxiliary feedwater Pump A became inoperable and exceeded its Technical Specification allowed outage time when essential service water flow to the pump room cooler fell below its operability requirement. Flow was reduced to the room cooler due to an Asiatic clam infestation in the essential service system. This was a violation of Technical Specification 3.7.5.

This noncited violation was determined to have very low safety significance because, even though Asiatic clams caused the pump to become inoperable, the 100 percent motor-driven auxiliary feedwater Train B and the 200 percent turbine-driven auxiliary feedwater train remained operable. As a result, there was only a small increase in plant risk with the motor-driven auxiliary feedwater Pump A inoperable (Section 1R07).

- Green. The licensee's chemical treatment to plant water systems was ineffective in that it did not control the growth of the Asiatic clams in the service water and essential service water systems. As a result, essential service water flow to several safety-related heat exchangers was degraded and flow to the motor-driven auxiliary feedwater Pump A room cooler was reduced below its operability limit. This caused the pump to become inoperable. The failure to establish an adequate chemical treatment program to prevent fouling of heat exchanger surfaces was a violation of Technical Specification 5.4.1.

This noncited violation was determined to have very low safety significance because no other safety-related components, other than motor-driven auxiliary feedwater Pump A, was rendered inoperable due to ineffective chemistry controls. The other auxiliary feedwater pumps remained operable (Section 1R07).

## Report Details

### **1. REACTOR SAFETY**

#### **Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity**

1R02 Evaluations of Changes, Tests, or Experiments (71111.02)

a. Inspection Scope

The inspectors reviewed the circumstances surrounding a small fire in the licensee's switchyard.

b. Findings

While overhauling switchyard Breaker MDV85 on October 18, 2000, a small fire occurred in the breaker control cabinet. This breaker was a 345 kV breaker and was part of the licensee's offsite access circuit. The fire was due to the breaker being closed while 125 Vdc control power was still energized in the control cabinet. With the control power continually energized, two 10-ohm resistors in the control cabinet overheated and melted, causing a small fire. The fire was extinguished when the control power was removed. The breaker had been manually pinned in place, which prevented it from opening. Maintenance personnel performing the overhaul stated that they assumed that control power had been removed from the breaker when the overhaul started.

The inspectors learned that the overhaul was performed by a vendor without the use of an approved procedure. The overhaul was authorized by preventive maintenance Document P489113 and was to be performed as directed by the vendor. However, there were no written instructions for performing the overhaul. Breaker overhauls had previously been performed using electrical maintenance Procedure MPE-MD-NN002, "SF6 Power Circuit Breaker Overhaul Procedure." However, this procedure was deleted in March 1999, in part because it did not contain instructions in sufficient detail to ensure that the overhaul would be performed in the highest quality manner. Additionally, it was stated that using vendor expertise would ensure a higher quality job.

The licensee determined that a significant contributing factor to the fire was that there was no formal procedure for performing breaker overhauls. The inspector determined that no procedures existed for overhauling other switchyard breakers (offsite access circuits). This finding was entered into the licensee's corrective action program as Suggestion-Occurrence-Solution Report 00-2587.

This finding was characterized as having very low safety significance through the use of the significance determination process. The lack of adequate procedural guidance for performing activities on the offsite access circuits did not result in any identified loss of a safety or safety support system function and the required offsite sources remained available. However, performing maintenance on offsite access circuits without a procedure could have a credible impact on safety and could increase the frequency of an initiating event.

In addition, the inspectors reviewed the Final Safety Analysis Report and noted that Table 13.5-5 of the site addendum required procedures for switchyard maintenance. Deleting the procedure was a change to the Final Safety Analysis Report. However, the procedure was deleted without performing a formal safety evaluation as required for a procedure described in the Final Safety Analysis Report. The licensee will address this issue in Suggestion-Occurrence-Solution Report 00-2914.

1R04 Equipment Alignment (71111.04)

a. Inspection Scope

The inspectors performed a partial walkdown of emergency diesel generator Train A while Train B was out of service for maintenance to verify equipment alignment and identify any discrepancies that could impact the function of the system and therefore increase risk. The inspection included a review of component alignment designated in Procedure ON-NE-0001, "Standby Diesel Generator - Train A," Revision 7.

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05)

a. Inspection Scope

The inspectors reviewed the following areas to determine if the licensee had implemented a fire protection program that adequately controlled combustibles and ignition sources within the plant, effectively maintained fire detection and suppression capabilities, and maintained passive fire protection features in good material condition. The areas reviewed were:

- Residual heat removal pump room Train B
- Diesel generator room Train A
- Control room pressurization fan Room A
- Upper and lower cable spread rooms
- Safety-related battery and battery charger rooms

b. Findings

No findings of significance were identified.

1R07 Heat Sink Performance (71111.07)

.1 Asiatic Clam Infestation

a. Inspection Scope

The inspectors evaluated the licensee's response to an Asiatic clam infestation that affected the performance of safety-related heat exchangers. The inspectors performed this review to ensure that potential common cause heat sink performance problems were being addressed by the licensee.

b. Findings

Asiatic clams caused essential service water flow to the motor-driven auxiliary feedwater Pump A room cooler to drop below the minimum required value. This caused auxiliary feedwater Pump A to become inoperable. The Technical Specification action statement was entered and then exited when adequate flow was restored by repositioning the outlet valve of the room cooler.

The licensee determined that motor-driven auxiliary feedwater Pump A had been inoperable for a period of 9 days, thereby exceeding the Technical Specification allowed outage time of 72 hours. The licensee submitted Licensee Event Report 2000-06-00 in accordance with 10 CFR 50.73(a)(2)(i) to report this issue. The inspectors reviewed this licensee event report for completeness and accuracy and did not identify any significant problems.

The results of testing all safety-related heat exchangers supplied by essential service water indicated that flow to several other heat exchangers was also degraded due to the Asiatic clams. In cases where the essential service water flow to the heat exchanger had dropped below the minimum required, operability was restored. The inspectors reviewed these occurrences to verify operability and to determine whether Technical Specification allowed outage times had been exceeded for other components. No other performance problems were identified.

The licensee completed the assessment of the significance of the event. The licensee concluded that the following were causal factors in the Asiatic clam infestation:

- Chemistry control problems associated with the clarifiers and the clearwell in the water treatment system
- No physical barrier between the clearwell and the service water bay to prevent clams from entering the service or essential service water systems
- No standard method for sampling the clearwell for clams

Exceeding the allowed outage time for inoperability of motor-driven auxiliary feedwater Pump A required a shutdown to Mode 3 within 6 hours as stated in Technical Specification 3.7.5. Failing to enter Mode 3 within 6 hours was a violation. This

violation is being treated as a noncited violation consistent with Section VI.A.1 of the NRC Enforcement Policy (50-483/0015-01). This noncited violation was characterized as having very low safety significance through the use of the significance determination process. This was due to the very small increase in risk due to motor-driven auxiliary feedwater Pump A being out of service with the given plant configuration. This finding had a credible impact on safety due to its effect on mitigating systems and, if left uncorrected, would become a more significant concern. This violation was entered into the licensee's corrective action program as Suggestion-Occurrence-Solution Report 00-2253.

.2 Adequacy of Licensee Chemistry Controls

a. Inspection Scope

The inspectors evaluated the licensee's response to an Asiatic clam infestation that affected the performance of safety-related heat exchangers. The inspectors performed this review to identify any procedural compliance issues.

b. Findings

During this review the inspectors identified that the licensee had not established procedural requirements for the frequency of chemical treatments of the clearwell and the clarifiers in the water treatment system to adequately control the growth of Asiatic clams. The inspectors determined this through a review of licensee procedures and interviewing chemistry personnel. Root Cause Analysis for Suggestion-Occurrence-Solution Report 00-2222 identified that the lack of chemical treatments was a causal factor in the Asiatic clam macrofouling of service water piping.

Without adequate chemical treatments to control Asiatic clams, the clams grew and affected the performance of safety-related plant equipment. Specifically, the lack of adequate chemistry controls contributed to the Asiatic clam infestation which resulted in the essential service water flow to the motor-driven auxiliary feedwater Pump A room cooler to fall below its minimum acceptance criteria which caused the pump to become inoperable.

Technical Specification 5.4.1 requires, in part, that written procedures shall be established, implemented, and maintained covering the applicable procedures recommended in Appendix A of Regulatory Guide 1.33, Revision 2, February 1978. Regulatory Guide 1.33, Section 10, requires, in part, that "Chemical and radiochemical procedures should be written to prescribe the nature and frequency of . . . the instructions maintaining water quality within prescribed limits, and the limitations on concentrations of agents that may cause corrosive attack or fouling of heat transfer surfaces. . ." Lack of adequate chemistry control procedures resulted in failure to perform chemical additions necessary to prevent the macrofouling of heat exchanger surfaces supplied by the essential service water system and was a violation of Technical Specification 5.4.1. This violation is being treated as a noncited violation consistent with

Section VI.A.1 of the NRC Enforcement Policy (50-483/0015-02). This violation was entered into the licensee's corrective action program as Suggestion-Occurrence-Solution 00-2222.

This noncited violation was characterized as having very low safety significance through the use of the significance determination process. This was because no other safety-related equipment was rendered inoperable due to the ineffective chemistry controls. This finding had a credible impact on safety due to its effect on mitigating systems and, if left uncorrected, would become a more significant concern.

- .3 (Closed) Unresolved Item 50-483/0014-01: degraded performance of heat exchangers as a result of Asiatic clam infestation. This item was discussed in Sections 1R07.1 and 1R07.2 of this report. This item is closed.

1R11 Licensed Operator Requalifications (71111.11)

a. Inspection Scope

On November 6, 2000, the inspectors observed a simulator exercise for operations personnel. The inspectors reviewed the scenario, which involved a loss of all ac power and a loss of essential service water. The inspectors evaluated crew communications and performance, command and control, use of procedures, emergency plan usage, and fidelity of the simulator to the actual control room.

b. Findings

No findings of significance were identified.

1R12 Maintenance Rule Implementation (71111.12)

a. Inspection Scope

The inspectors verified proper implementation of the maintenance rule to assess the effectiveness of maintenance efforts. Specifically, the inspectors verified structure and component scoping, characterization, safety significance, performance criteria, and the appropriateness of goals and corrective actions. These aspects of the maintenance rule were reviewed for the following components:

- Relay XA4 on reactor trip bypass circuit Breaker A
- Containment recirculation sump level Indicator B
- 125 Vdc vital battery charger Number 4

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Evaluation (71111.13)

a. Inspection Scope

Throughout the inspection period, the inspectors reviewed the daily and weekly schedules to determine when risk significant activities were scheduled and to verify how the licensee managed risk. The inspectors discussed selected activities with operations and work control personnel regarding risk evaluations and overall plant configuration control. The inspectors evaluated the effectiveness of the risk assessment performed by the licensee for the week beginning October 30, 2000.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15)

a. Inspection Scope

The inspectors reviewed the operability evaluation for component cooling water Pumps A and C room cooler tube blockage due to Asiatic clams (Suggestion-Occurrence-Solution Report 00-2254) to ensure that operability was properly justified.

b. Findings

No findings of significance were identified.

1R19 Postmaintenance Testing (71111.19)

a. Inspection Scope

The inspectors observed or evaluated the following postmaintenance tests to determine whether they were adequate to verify system operability and functional capabilities:

- Motor-driven auxiliary feedwater Pump B
- Valve ALHV0005, essential service water to motor-driven auxiliary feedwater Pump B isolation valve
- Containment spray Pump B

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors observed or reviewed the following surveillance tests to ensure the systems tested were capable of performing their safety function and to assess their operational readiness. Specifically, the inspectors verified that the following surveillance tests met Technical Specification, ASME Section XI test, Final Safety Analysis Report, and licensee procedural requirements:

- Surveillance Procedure OSP-EJ-P0001B, "RHR Train B Inservice Test," Revision 25
- Surveillance Procedure OSP-EM-P001A, "Section XI Safety Injection Train "A" Operability," Revision 24
- Surveillance Procedure OSP-NE-0001B, "Standby Diesel Generator "B" Periodic Tests," Revision 7

b. Findings

No findings of significance were identified.

3. **SAFEGUARDS**

**Cornerstone: Physical Protection**

3PP3 Response to Contingency Events (IP 71130.03)

a. Inspection Scope

The inspectors:

- Reviewed licensee event reports and safeguards event logs to identify problems with response and response capabilities.
- Reviewed performance indicators relating to response and alarm equipment performance to determine if problems with any sections of the alarm system were predictable and exploitable by an adversary.
- Reviewed the licensee's current protective strategy, including analysis of established target sets and response program implementing procedures. The review included the licensee's documented response plan, defense strategy, time lines, and number of armed responders including their location, armament, capabilities, and tactics.
- Reviewed the participation of the licensee's operations department in defining and validating the overall protective strategy.

- Examined the protected area intrusion detection system to identify areas of potential exploitable vulnerabilities in the system.
- Examined the vital area defensive positions.
- Conducted four table top drills with security shift supervisors and alarm station operators to determine the licensee's capability to protect vital area target sets against the design basis threat and its ability to interdict the adversary in a timely manner with sufficient numbers of responders, appropriately armed, and in protected positions. The inspectors ensured that the licensee's response only included those capabilities outlined in its security plan, protective strategy, and implementing procedures.
- Observed 10 security officers demonstrate weapons proficiency with handguns and contingency weapons.
- Reviewed response and firearm proficiency training requirements for regulatory and tactical content.
- Evaluated the training of central and secondary alarm station operators.
- Examined the fields of view of assessment aids in the alarm stations.
- Reviewed licensee records of response drill performance and verified the licensee's ability to identify performance weaknesses and program vulnerabilities.
- Verified that the licensee's assessment of problems and issues were of sufficient scope to address the key attributes of the overall protective strategy and response to contingency events.

b. Findings

No findings of significance were identified.

#### **4. OTHER ACTIVITIES**

##### **4OA1 Performance Indicator Verification**

a. Inspection Scope

A random sampling of security event logs; maintenance logs; security tracking, trending, and analysis of perimeter security equipment problems; corrective action reports; and safety system unavailability for the auxiliary feedwater system were reviewed to determine the accuracy and completeness of the following performance indicators:

- safety system unavailability for the auxiliary feedwater system
- fitness-for-duty/personnel reliability program
- personnel screening program
- protected area security equipment

b. Findings

No findings of significance were identified.

4OA3 Event Followup

(Closed) Licensee Event Report 483/00-06-00: macrofouling in the motor-driven auxiliary feedwater Pump A room cooler resulting in inoperability of the pump in excess of the time allowed in the Technical Specifications. This event was discussed in Section 1R07 of this report. No new information was provided. This licensee event report is closed.

.4OA6 Management Meetings

Exit Meeting Summary

The resident inspectors presented their inspection results to Mr. Ron Affolter, Vice President Nuclear, and other members of licensee management on November 27, 2000.

The inspectors presented the inspection results relating to security to Mr. Garry Randolph, Senior Vice President and Chief Nuclear Officer, and other members of licensee management at the conclusion of the inspection on November 16, 2000.

The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

ATTACHMENT 1  
SUPPLEMENTAL INFORMATION  
KEY POINTS OF CONTACT

Licensee

R. Affolter, Vice President Nuclear  
J. Blosser, Manager, Operations Support  
P. Davis, Nurse, Fitness for Duty  
M. Evans, Superintendent, Protective Services  
M. Faulkner, Assistant Superintendent, Security  
J. Hiller, Engineer, Quality Assurance Regulatory Support  
D. Hollabaugh, Superintendent Design Engineering  
D. Hopkins, Supervisor, Operations  
J. Laux, Manager, Quality Assurance  
A. Lee, Supervisor, Access Control  
A. Lord, Supervising Engineer, Nuclear Engineering Systems  
G. Pendergraff, Evaluator, Protective Services  
G. Randolph, Senior Vice President and Chief Nuclear Officer  
M. Reidmeyer, Supervisor, Region Regulatory Affairs  
R. Rist, Superintendent, Administration  
R. Roselius, Superintendent, Radiation Protection and Chemistry  
L. Sandbothe, Superintendent, Operations  
M. Taylor, Manager, Nuclear Engineering

Contractor

J. Coash, Supervisor, Security Training  
M. Dunbar, Project Manager, Wackenhut Corporation  
M. Elliott, Instructor, Security Training  
J. Lehman, Supervisor, Security Operations  
K. Weith, Security Shift Supervisor, Wackenhut Corporation

Other

P. Serra, Manager, Plant Protection, South Texas Project

ITEMS OPENED AND CLOSED

Opened

NCV 50-483/0015-01	Motor-driven auxiliary feedwater pump rendered inoperable due to Asiatic clams (Section 1R07)
NCV 50-483/0015-02	Failure to effectively maintain water chemistry to control the growth of Asiatic clams (Section 1R07)

Closed

NCV	50-483/0015-01	Motor-driven auxiliary feedwater pump rendered inoperable due to Asiatic clams (Section 1R07)
NCV	50-483/0015-02	Failure to effectively maintain water chemistry to control the growth of Asiatic clams (Section 1R07)
LER	483/00-06-00	Macrofouling in the motor-driven auxiliary feedwater Pump A room cooler resulting in inoperability of the pump in excess of the time allowed in the Technical Specifications (Section 4OA3)
URI	50-483/0014-01	Degraded performance of heat exchangers as a result of Asiatic clam infestation (Section 1R07)

DOCUMENTS REVIEWED

The following documents were selected and reviewed by the inspectors to accomplish the objectives and scope of the inspection and to support any findings:

Evaluations of Changes, Tests, or Experiments

Preventive Maintenance Document P638476, Inspect and Service Breaker

Preventive Maintenance Document P611322, Inspect and Service Breaker

Procedure M.P.E.-MD-NN001, "SF6 Power Circuit Breaker 18 Month PM Procedure," Revision 1

Procedure M.P.E.-MD-NS001, "Operation and Maintenance of SF6 Gas Cart," Revision 10

Procedure request form for deleting Procedure M.P.E.-MD-NN001, "SF6 Power Circuit Breaker Overhaul Procedure," Revision 0

Licensed Operator Requalifications

Simulator exercise scenario for November 6, 2000

Procedure EIP-ZZ-00101, "Classification of Emergencies," Revision 23

Performance Indicator Verification

Historical safety system unavailability and safety system functional failure data

Various auxiliary feedwater-related suggestion-occurrence-solution reports

Performance indicator data summary Report Q3/2000

Control room operator logs for 2000

Security Related Documents

Safeguards Event Logs from April 1 to September 30, 2000

List of security target sets

Response Drill Evaluations (20) from April 1999 through August 2000

Table Top Exercises (8) from February through July 2000

Quality Assurance Audit AP00-007, "FFD Program," dated November 10, 2000

Self-assessments of security program, SAOO-SE-001 and SAOO-SE-002, dated May 2000 and August 2000, respectively

Self-Assessment of Continual Behavior Observation Program, SA00-AA-002, dated June 2000

Self-Assessment of Security Contractor Hiring Requirements, SAOO-AA-005, October 2000

Normal Operating Group Procedure OTO-SK-00001, "Plant Security Event," Revision 2

Security Post Instruction, "Code Red," Revision 21

Correct Action Reports from January 1, 2000, to present pertaining to closed-circuit television cameras, intrusion detection system, and access authorization/fitness-for-duty

## ATTACHMENT 2

### NRC'S REVISED REACTOR OVERSIGHT PROCESS

The federal Nuclear Regulatory Commission (NRC) revamped its inspection, assessment, and enforcement programs for commercial nuclear power plants. The new process takes into account improvements in the performance of the nuclear industry over the past 25 years and improved approaches of inspecting safety performance at NRC licensed plants.

The new process monitors licensee performance in three broad areas (called strategic performance areas): reactor safety (avoiding accidents and reducing the consequences of accidents if they occur), radiation safety (protecting plant employees and the public during routine operations), and safeguards (protecting the plant against sabotage or other security threats). The process focuses on licensee performance within each of seven cornerstones of safety in the three areas:

Reactor Safety	Radiation Safety	Safeguards
<ul style="list-style-type: none"><li>•Initiating Events</li><li>•Mitigating Systems</li><li>•Barrier Integrity</li><li>•Emergency Preparedness</li></ul>	<ul style="list-style-type: none"><li>•Occupational</li><li>•Public</li></ul>	<ul style="list-style-type: none"><li>•Physical Protection</li></ul>

To monitor these seven cornerstones of safety, the NRC used two processes that generate information about the safety significance of plant operations: inspections and performance indicators. Inspection findings will be evaluated according to their potential significance for safety, using the Significance Determination Process, and assigned colors of GREEN, WHITE, YELLOW or RED. GREEN findings are indicative of issues that, while they may not be desirable, represent very low safety significance. WHITE findings indicate issues that are of low to moderate safety significance. YELLOW findings are issues that are of substantial safety significance. RED findings represent issues that are of high safety significance with a significant reduction in safety margin.

Performance indicator data will be compared to established criteria for measuring licensee performance in terms of potential safety. Based on prescribed thresholds, the indicators will be classified by color representing varying levels of performance and incremental degradation in safety: GREEN, WHITE, YELLOW, and RED. GREEN indicators represent performance at a level requiring no additional NRC oversight beyond the baseline inspections. WHITE corresponds to performance that may result in increased NRC oversight. YELLOW represents performance that minimally reduces safety margin and requires even more NRC oversight. RED indicates performance that represents a significant reduction in safety margin but still provides adequate protection to public health and safety.

The assessment process integrates performance indicators and inspection so the agency can reach objective conclusions regarding overall plant performance. The agency will use an Action Matrix to determine in a systematic, predictable manner which regulatory actions should be taken based on a licensee's performance. The NRC's actions in response to the significance (as represented by the color) of issues will be the same for performance indicators as for inspection findings. As a licensee's safety performance degrades, the NRC will take more and increasingly significant action, which can include shutting down a plant, as described in the Action Matrix.

More information can be found at: <http://www.nrc.gov/NRR/OVERSIGHT/index.html>.