

**Florida
Power**
CORPORATION

May 16, 1988
3F0588-08

Mr. James M. Taylor, Director
Office of Enforcement
U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

Subject: Crystal River Unit 3
Docket No. 50-302
Operating License No. DPR-72
Notice of Violation and Proposed Imposition of Civil Penalty
NRC Inspection Reports 87-35 and 88-03
Enforcement Action 87-216

Dear Sir:

In accordance with 10 CFR 2.205, Florida Power Corporation (FPC) provides Attachment I to this letter as our response to the Proposed Imposition of Civil Penalty dated March 17, 1988. The response documents FPC's position that the Enforcement Policy has been inappropriately applied in this case and that the facts of the matter support full remission of the civil penalty. We believe that the NRC may have mistakenly interpreted FPC's prompt and extensive actions as an admission that our radiation protection program was deficient.

In accordance with 10 CFR 2.201, FPC provides Attachment II to this letter as our response to the Notice of Violation. FPC has agreed with four of the five violations alleged in the Notice and has documented the corrective actions taken as a result of those violations. FPC has also denied one of the alleged violations and presented information supporting that denial.

The attachments to this letter provide considerable information concerning the events in a context not previously considered. We would be pleased to

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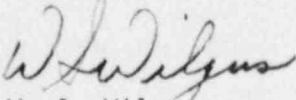
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meet with you and your staff to discuss the issues should you believe this would enhance communications on this or related issues.

Sincerely,



W. S. Wilgus
Vice-President
Nuclear Operations

Attachments

xc: Dr. J. Nelson Grace
Regional Administrator
Region II

Mr. T. F. Stetka
Senior Resident Inspector
Crystal River 3

ATTACHMENT I
FLORIDA POWER CORPORATION
ENFORCEMENT ACTION EA 87-216

ANSWER TO PROPOSED IMPOSITION OF CIVIL PENALTY

I. INTRODUCTION

Florida Power Corporation wishes to make clear that we view with the utmost seriousness any actions by employees to disregard the established procedures and controls for radiation protection. Our commitment in this regard should be clear from (1) our prompt reporting of the shielding removal event, (2) our immediate investigation of that event, (3) the high degree of management attention given, (4) the comprehensive actions that have been taken, and (5) our immediate and decisive disciplinary action (termination of employment at the site) against the contract employee responsible for the unauthorized entries.

Florida Power Corporation sought the NRC's involvement in this matter at the earliest possible time. We engaged in an open and cooperative exchange of information in an effort to identify root causes and to implement conservative actions to prevent recurrence of such events. Until now, Florida Power Corporation has not specifically addressed the factors justifying remission of the proposed civil penalty. This answer is designed for that purpose.

In general, the factual descriptions of the events in the NRC's Inspection Reports and the Notice of Violation (NOV) are correct. However, Florida Power Corporation does not agree with the characterization of some of the facts or the conclusions drawn in the NOV. More specifically, Florida Power Corporation believes that the violations were the result of actions by individuals beyond the authorized scope (hereinafter referred to as unauthorized) and are not indicative of programmatic weaknesses in the radiation protection program. We believe the radiation protection program was adequate in the training and instructions provided to radiation workers and that the procedures and controls were adequate to ensure appropriate Health Physics involvement. The NOV and the associated civil penalty could be read to imply that the adoption of improvements in response to the events in question is an indication of deficiencies in the program. Such a view is fundamentally unfair and is contrary to the Enforcement Policy in that it may tend to discourage voluntary improvements by licensees.

It is also unclear how the NRC applied the mitigation and escalation factors in this case. For example, it is not completely clear what weight was given to any particular factor and how the result was broken down between Violations I and II. Without a clearer discussion of how the factors were applied, it is difficult to specifically address or take exception to the factors used in the escalation of the enforcement action.

The proposed civil penalty is based on violations stemming from unrelated events involving what the staff termed a reactor cavity access incident and unauthorized entries into radiologically controlled areas. We urge caution in using the term "reactor cavity access" since this event differed significantly from this class of events in the industry's experience since access, per se, was never attempted. Nevertheless we

have utilized the term as well for clarity in comparing our positions with your own.

The first incident occurred on October 8, 1987, and involved the unauthorized removal of a small portion of the lead bricks from the reactor cavity access path which resulted in one individual receiving a measured whole body dose of 441 mrem which was conservatively adjusted to a whole body dose of 1.8 Rem and an extremity dose of 6.6 Rem. The individual did not exceed the legal dose limits as a result of the incident. The NRC identified three violations associated with this event.

- A. The licensee failed to adequately control access to high radiation areas in that:
 1. Between 1985 and October 9, 1987, a locked door was not provided to control access to the reactor cavity located on the 95 foot elevation of the Reactor Building.
 2. On October 9, 1987, the licensee failed to barricade, post as a high radiation area, and control by issuance of a Radiation Work Permit access to such a high radiation area on the 95 foot elevation of the Unit 3 Reactor Building in the vicinity of the reactor cavity access. The intensity of radiation in the area was up to 40 Rem/hour at 18 inches from the opening to the reactor cavity.
- B. The licensee failed to adequately provide instruction to an Auxiliary Nuclear Operator working in the restricted area of the Reactor Building on October 9, 1987, on the limitations and possible failure modes of a radiation survey instrument that had been provided for his use in controlling his exposure in the restricted area and on the appropriate response to take when the radiation level present exceeded the maximum scale reading on the radiation survey meter.
- C. The licensee's procedures for personnel radiation protection and refueling operations were inadequate as evidenced by the October 8, 1987 reactor cavity access shielding removal event in that they did not specify that:
 1. permanent shielding removed during outage activities is to be reinstalled properly;
 2. health physics is to be notified prior to the removal of permanent shielding;
 3. health physics is to be notified when unexpected radiological conditions are encountered or scope of previously authorized work changes;
 4. high radiation areas in the Reactor Building area are to be posted and controlled following a plant shutdown and prior to allowing general access; and

5. personnel assigned to observe for seal leakage in the Reactor Building while filling the fuel transfer canal are to be instructed in the procedure for observing leaks and the precautions to be observed while performing that task, particularly with regard to entries into the reactor cavity.

The second issue involved two separate events associated with the unauthorized entry of a contract employee into radiologically controlled areas. The NRC identified two violations associated with this issue.

- A. On December 23, 1987, a radiation worker entered the "B" D-Ring area of the Reactor Building, a posted high radiation area with dose rates up to 350 mrem per hour, without a radiation monitoring device which continuously indicated the radiation dose rate in the area.
- B. On October 24, 1987, a radiation worker entered the "A" D-Ring area of the Reactor Building, a radiographer's controlled area, without approval from the radiographer-in-charge.

As noted in the Reply to Notice of Violation (Attachment II), Florida Power Corporation admits certain of the violations but denies others. The purpose of this answer is to explain our denials and to protest the amount of the proposed civil penalty. Florida Power Corporation does not believe that the 100% escalation of the base civil penalty is warranted. In fact, we believe full remission is appropriate because the violations stemmed from unauthorized individual actions, and in view of our prompt and voluntary reporting of the event, as well as our decisive and extensive corrective actions.

Florida Power Corporation addresses in Section II of this response (1) denial of specific alleged violations, (2) extenuating circumstances, (3) error in the NOV, and (4) other reasons why the civil penalty should not be imposed for the alleged violations. In addition, each of the NRC's points is discussed in Section III within the context of the mitigation factors listed in 10 CFR Part 2, Appendix C, Section V.B.

II. ANSWER TO SPECIFIC VIOLATIONS

In this section of the Answer, Florida Power Corporation addresses the specific alleged violations that are denied or for which it is believed that extenuating circumstance or other factors warrant mitigation.

Violation I: Reactor Cavity Access Event

Violation I.A: Technical Specification 6.12.1

Violation I.A specifies two examples of alleged violations of Technical Specification 6.12.1: (1) the failure to provide a locked door in addition to the lead brick shielding at the reactor cavity access opening, and (2) the failure to control the radiation field created by removal of lead bricks. Florida Power Corporation admits Violation I.A., Examples 1 and 2, but believes mitigation of the civil penalty is warranted in view of the extenuating circumstances and other factors.

Example 1: Locked Door

The intent of Technical Specification 6.12.1 is to adequately control access to high radiation areas. Florida Power Corporation believes that the intent of this requirement was met in that three of the four means of access control were in fact provided for the reactor cavity, *i.e.*, the area was barricaded, the "D" ring area was conspicuously posted and controlled by issuance of a Radiation Work Permit (RWP). The use of the double lead brick wall as a permanent shield was considered a means of control at least equivalent to a locked door. In response to NRC Information Notice 82-51, an evaluation of the need to install a locked gate was performed in January 1983, and the action rejected as unnecessary due to the installation techniques employed in the construction of the lead barricade. Since the NRC did not note noncompliance before 1985, the staff apparently agrees with this conclusion. Following removal of the barricade during the 1985 refueling outage, the lead bricks were apparently not reinstalled in such a manner as to continue to serve as a permanent barrier, though the wall was adequate for shielding. As a result, had FPC recognized this change, a permanent barrier to preclude entry would have been established. Nevertheless, three of the four means of access control remained, and radiation protection training was adequate to alert workers not to remove any of the shielding. (See also section III.B.1)

Example 2: Control of Radiation Field after Removal of Shielding

The requirements to barricade, post, and control the high radiation field created by the removal of the lead bricks were fulfilled at the time of discovery of the incident. The unauthorized actions of the Auxiliary Nuclear Operator (ANO) created the condition by violating the established controls (the RWP), removing the barricade (the lead bricks), and creating, by removal of shielding, an area requiring posting. Because the creation of the high radiation area was the result of the unauthorized actions by the ANO, no appropriate purpose would be served by imposition of a civil penalty against the licensee. As described in the reply to the Notice of Violation, effective actions were taken immediately upon discovery of the condition. Among other things, the area was promptly secured, the ANO involved was counseled, high-level management attention

was given to this event, and extensive corrective actions were taken to prevent recurrence.

It is clear that the ANO took precautions to minimize his exposure and potential exposure of others. First, the ANO removed only the top two rows of lead bricks, kept clear of the beam emanating from the opening, and checked inside the reactor cavity for leaks only periodically and very briefly. Second, the ANO repositioned his dosimetry in an attempt to register the maximum exposure, placing the dosimetry high on his coveralls and next to his head while looking into the opening. Third, the ANO warned other workers nearing the area to avoid the opening and he informed his relief of the radiation conditions. Fourth, immediately upon leaving the area, he reported his off scale low-range dosimeter reading to Health Physics. He also immediately notified the control room of his unexpected dose so that the relieving operator was protected.

As a result of these precautions, the ANO did not receive a dose in excess of regulatory limits. His actual measured whole body exposure was 441 mrem; however, as the NOV recognizes, a conservative adjustment was applied to give him an exposure of 1.8 Rem to the whole body and 6.6 Rem to the extremities. The conservatively calculated dose was still well within regulatory limits. The ANO's exposure for the entire calendar quarter also was within regulatory limits. The precautions taken ensured that no other workers received any significant exposures (all personnel working in the reactor building at the time were immediately monitored for exposures). While Florida Power Corporation in no way condones the unauthorized actions of the ANO, he did take meaningful precautions. We believe it is unfair to characterize as "fortuitous" the fact that other workers were not exposed.

Violation I.B: Alleged Failure to Provide Adequate Radiation Protection Instructions to Auxiliary Nuclear Operator

Florida Power Corporation denies the violation and believes it should be withdrawn. The ANO received training on radiation detection instruments during the Radiation Protection lesson provided in the Assistant Nuclear Auxiliary Operator course and the Auxiliary Nuclear Operator courses for non-licensed operators. This training included information on radiation detection principles, ionization chambers, proportional counters, and Geiger-Mueller (GM) tubes. The radiation detection instrument utilized by the ANO did not respond incorrectly or fail, it indicated an off-scale reading in response to the high radiation field to which it was exposed. Based on the individual's training and extensive work experience history including nuclear navy experience, non-licensed operator training, General Employee Training, and his Crystal River Unit 3 (CR-3) work experience, it is reasonable to assume he knew the correct response to an off-scale radiation detection instrument. It is also clear from the ANO's actions (i.e., pattern of brick removal, dosimetry positioning, warning of others, etc.) that additional training was unnecessary. The ANO failed to take the proper actions not out of lack of training but due to his decision to perform work that exceeded the authorized scope of approved activities.

Florida Power Corporation subsequently provided specific supplemental retraining to the ANO on the use and limitations of survey instruments. Radiation Safety Procedures have also been enhanced with respect to response to off-scale readings, and General Employee Training has been enhanced to include failure modes of survey instruments. These actions by Florida Power Corporation represent positive actions to improve the training and instruction already provided to radiation workers. The NOV could be read to assume that adoption of these additional measures is an indication that previous practices were insufficient to meet regulatory requirements. Such a view is contrary to the Enforcement Policy in that it could discourage improvements out of fear that the NRC will construe such improvements as an admission of past violations.

Violation I.C: Deficiencies In Procedures

Florida Power Corporation admits Violation I.C, Examples 3 and 5, but believes mitigation of the civil penalty is warranted. Florida Power Corporation denies Violation I.C., Examples 1, 2, and 4. Each of these is discussed below.

Example 1

This example alleges that procedures for radiation protection and refueling operations were inadequate in that they did not specify that permanent shielding removed during outage activities is to be reinstalled properly. To the contrary, the practices and procedures were adequate in this regard. Shielding installation and reinstallation instructions are routinely included on Radiation Work Permits in the "Remarks and Special Instructions" section. A review of RWP's 85-550 and 85-551 which covered installation and removal of shielding for the 1985 refuel outage provided the following instructions:

- (a) HP to direct placement of shielding
- (b) HP to be present at the start of each job.

These RWP's show that it was and is standard practice at CR-3 for Health Physics to oversee evolutions involving shielding.

The original function of the lead bricks placed at the reactor cavity access was two-fold, first to function as shielding and second as a barrier to prevent access to the cavity area. Since FPC accepts the violation of A.1 which states that the barrier was inadequate to meet the locked gate criteria, the shielding qualities of the barrier is the issue here. FPC contends that work instructions are adequate to control the removal and installation of shielding. The lead bricks were installed properly at the end of CR-3's 1985 refueling outage for shielding purposes as shown by the reduction of radiation levels on radiation surveys taken in the reactor cavity area following the installation of the lead bricks. FPC concludes that the lead bricks provided adequate shielding prior to their unauthorized removal. It remains FPC's position that adequate guidance was and is provided for the control of shielding.

Example 2

Example 2 alleges that procedures were inadequate in not specifying that Health Physics is to be notified prior to removal of permanent shielding.

It is clear, however, that procedures were adequate in this regard.

Radiation workers at CR-3 are provided a copy of RSP-101, "Basic Radiological Safety Information and Instructions for Radiation Workers," and are required to comply with the Radiation Safety Procedures (RSP). General Employee Training also specifies that removal of temporary shielding without Health Physics approval is prohibited. The procedure RSP-101 Revision 8, was in effect at the time of the incident and states in Section 3.1.3, "Rules within the RCA," step 3.1.3.7, "notify Health Physics personnel and obtain appropriate approvals prior to breaching any container, containment system and/or component integrity." Section 2.3.5 defines containment(s)/container(s) as "any device (e.g. bag, box, drum, tent, glove box, etc.) used to control the release of radioactive material or radiation." The lead bricks served as a containment device and a radiological control device in regard to the high radiation area that existed in the cavity. The ANO proceeded to remove the shielding contrary to radiation protection program instructions and procedure requirements in an effort to discover leakage from the seal plate. If the ANO had followed RSP-101, he would have contacted Health Physics prior to removing the shielding as required.

Radiation Safety Procedures have been revised to specify even more clearly the requirement to obtain Health Physics' approval before repositioning or removal of shielding. This voluntary improvement should not be taken as an indication that prior procedures were inadequate.

Example 3

Example 3 alleges that procedures were inadequate with respect to notification of Health Physics when unexpected radiological conditions occur or scope of previously authorized work changes. Florida Power Corporation does not contest this example but believes that extenuating circumstances and other factors warrant mitigation of the civil penalty. Further, the ANO's fundamental misunderstanding of his assigned work would have precluded him from considering his actions a change in scope.

The requirement to notify Health Physics when unexpected conditions are encountered or the scope of work changes is routinely communicated to workers during pre-job planning activities or ALARA meetings. Because of the apparent misunderstanding of this requirement by the ANO when his work scope changed, Florida Power Corporation recognized promptly that this requirement should be made explicit in procedures.

Accordingly, Radiation Work Permits were immediately revised to state: "Advise HP when job scope changes." Radiation Safety Procedures (RSPs) have also been revised to include requirements to stop work and notify the Health Physics Department whenever the scope of work changes or work conditions deviate from those described on the RWP. A requirement for the job supervisor to contact Health Physics for a RWP revision if the original scope of work changes has also been included. In addition, a Health Physics Procedure (HPP) has been changed to more clearly state the Health Physics Department's responsibilities and actions concerning changing work scope and RWP revisions.

Example 4

Example 4 alleges that procedures were deficient in not specifying that high radiation areas are to be posted and controlled prior to allowing access to the Reactor Building. Florida Power Corporation disagrees with this violation.

In order for the Reactor Building to be accessed, RWPs must be issued. For an RWP to be issued, surveys must be performed in the designated work areas. When high radiation areas are identified during these surveys, they must be posted and controlled. Therefore, following a plant shutdown, surveys must be performed and high radiation areas posted and controlled prior to allowing general access to the Reactor Building. These actions are covered in HPP-106, "Radiation Work Permit Procedure," and HPP-202, "Scheduled Radiological Surveys and Controls." These procedures are considered adequate to assure the Reactor Building is posted and controlled following a plant shutdown prior to allowing general access.

Example 5

Example 5 alleges that procedures for filling the fuel transfer canal were inadequate in that personnel assigned to observe for seal leakage are to be instructed in the procedure for inspecting for leaks and the precautions to be observed, particularly with regard to entries into the reactor cavity. Florida Power Corporation accepts this violation but believes that mitigation of the civil penalty is appropriate.

The instructions for observing and identifying reactor vessel seal plate leakage were not specifically addressed in procedures. It was not considered feasible that personnel would check for leaks by attempting to access the reactor vessel cavity, since inadvertent access had been and should have remained prohibited by the lead brick barrier.

Prompt and extensive correction actions have been implemented:

- The Operating Procedure has been revised to include requirements for a pre-job briefing and to provide specific instructions for monitoring the transfer canal fill and seal plate leakage. A specific precaution was also added with regard to removal or alteration of shielding without proper authorization.
- A leak detection mechanism will be installed prior to the next filling of the fuel transfer canal for improved leak detection capability of the reactor vessel seal plate. Procedures will be revised to reflect the new seal plate leak detection mechanism.
- Other procedural changes on provisions for altering shielding were discussed in the preceding paragraphs.

These actions should preclude recurrence of the event.

Violation II: Unauthorized Entries

Violation II involves two incidents in which the same individual (a contract employee) made unauthorized entries. During the October 24, 1987 incident, Violation II.B, the individual entered a radiographer's controlled area without obtaining the required authorization from the radiographer in charge. On December 23, 1987, Violation II.A, the same individual entered a high radiation area without the required monitoring device. Florida Power Corporation accepts both violations but believes (1) that the violations should be restated to make clear that they arose from the unauthorized acts of a single individual, and (2) that extenuating circumstances and our prompt and decisive corrective actions warrant mitigation of the civil penalty.

The contract employee acted on his own volition out of his stated concern that other workers were in danger as a result of certain industrial (as distinguished from radiological) conditions. Subsequent investigation led FPC to conclude that his concern was exaggerated and his actions could have been accomplished by other means without violating Radiation Protection Program mandates. In each case, the violation arose from the employee's unauthorized action even though he was fully aware of the restrictions and in one case had been instructed on the area requirements minutes before the violation. The employee's actions could not have been foreseen and no amount of additional procedural requirements or training could have prevented the occurrence.

The individual was counseled after the first incident, and his contract was terminated following the second incident and he was excluded from the site.

During the December 23, 1987, incident, a Health Physics Technician observed the contract employee's unauthorized entry into the "B" D-Ring, a posted high radiation area, but did not take immediate steps to remove the employee from the area. The decision not to remove the employee from the area was based on the technician's knowledge of the posted high radiation area. The technician was aware that the area posted was larger than necessary in order to facilitate access control activities to the D-Rings and to maintain dose control. Therefore, the technician knew from experience that only specific components within the posted area were of concern from a high radiation standpoint. The technician watched the employee's progress through the "B" D-Ring to assure he did not tarry in known high radiation areas. At no time during the incident was the contract employee at risk from a dose control standpoint. Upon exiting the Reactor Building, the Health Physics Technician generated a Radiation Safety Incident Report to report and document the incident. Nevertheless, Health Physics Technicians are obligated to strictly enforce the requirements for entry into a posted high radiation area regardless of the conditions known to exist at the time or location of entry. This obligation has been clearly restated in a procedure governing the responsibilities of Health Physics Technicians.

In these circumstances, a civil penalty against the licensee would be essentially punitive and would not further any of the goals of the Enforcement Policy. Specifically, the civil penalty against the licensee cannot deter such individual acts or ensure licensee compliance when compliance was already achieved but was compromised by the unauthorized acts of an individual. As detailed in Attachment II, voluntary improvements have already been adopted in the form of additional guidelines and requirements for Health Physics personnel. Florida Power Corporation therefore believes that mitigation of the civil penalty is warranted.

III. MITIGATION FACTORS

The two basic events identified in the Notice of Violation are discussed below in light of the five mitigation factors identified in Title 10 Code of Federal Regulations, Part 2, Appendix C.

A. Prompt Identification and Reporting

1. Reactor Cavity Access Event

With respect to the reactor cavity shielding removal event, it appears that the NRC did not give appropriate credit for Florida Power Corporation's prompt identification and voluntary reporting. The ANO's unauthorized removal of a portion of the lead brick shielding was promptly identified by the Health Physics Technician. Ten minutes after the ANO was relieved, Health Physics secured the reactor cavity access area. Management was promptly informed of the situation, and the Reactor Building was evacuated and work activities halted. Florida Power Corporation's reporting of the event was also prompt and complete.

- the event was voluntarily reported to the NRC by telephone conference on the following morning, with FPC and Region II management involved
- a voluntary IER was submitted within 30 days and provided a detailed preliminary assessment of root causes and showed extensive actions

The NRC has previously recognized that unplanned exposures below regulatory limits are not required to be reported and that a licensee's prompt and voluntary reporting of such an event is a factor warranting mitigation of any civil penalty. See Carolina Power and Light Company, EA 84-13, Letter dated August 28, 1984 (proposed civil penalty completely mitigated in part because of licensee's voluntary reporting of unplanned exposure); Florida Power and Light Company, EA 86-38, Order Imposing Civil Monetary Penalty, issued October 14, 1986, App. at 6 (licensee's voluntary report a factor supporting mitigation):

Identification by Health Physics was as prompt as reasonably possible, given the ANO's unauthorized actions.

FPC's willingness to go above and beyond NRC reporting requirements and its openness in involving the NRC deserve substantial credit. Otherwise, from a policy standpoint, the NRC would discourage voluntary reporting and openness. Therefore, FPC deserves consideration of full mitigation for Violation I.

2. Unauthorized Entries

The incidents were identified and documented on a Radiation Safety Incident Report and a Nonconformance Operating Report. In addition, appropriate NRC staff were notified of the events. On December 31, 1987, licensee representatives contacted Region II Facilities Radiation Protection Staff by phone to report the second incident despite the fact that it, too, was not reportable.

Conclusion: Prompt documentation and voluntary reporting of the event deserves mitigation for the Unauthorized Entries violations.

B. Corrective Action To Prevent Recurrence

1. Reactor Cavity Access Event

Immediately upon discovery of the reactor cavity access event, Health Physics took decisive action including the following:

- Secured the area, evacuated the reactor building, monitored exposure of all personnel in RB, performed necessary surveys
- Verified the Auxiliary Nuclear Operators' dose for the event by reading his Thermoluminescent Dosimeter (TLD)
- Replaced the lead bricks
- Began investigation; obtained statements from all involved
- Notified management of incident.

Licensee Management also took immediate actions including the following:

- Management Review/Response Team was formed to investigate and coordinate appropriate actions with regard to the incident.
- All Reactor Building (RB) work was terminated until the area was secured and personnel monitored.
- The lead bricks shielding the reactor cavity access were posted to preclude inadvertent removal.
- The shielded access opening was checked every 15 minutes until the locked cover plate could be installed
- Signs posted to prohibit removal of any shielding without HP or ALARA specialist concurrence
- RWPs were revised to state: "Advise HP when job scope changes"
- Training and briefings were conducted on the use of dosimetry, the event, and shielding removal restrictions.
- Conservative estimates of the dose to the ANO were calculated.

Additional follow-up actions were taken including the following:

- A Memo from the Director, Nuclear Plant Operations was issued regarding temporary or permanent shielding, and its review was acknowledged by plant personnel.
- The operators involved were counseled (all operators received a briefing on the event)
- A review of Field Problem Reports was initiated and a plant walkdown conducted to evaluate present barriers to high radiation areas
- The ANO involved in the incident was given specific instructions on use and limitations of survey instruments
- General Employee Training was revised to include a discussion of the failure modes of radiation survey instruments
- A locked steel enclosure was installed across the reactor cavity access lead brick shielding within one week of the event
- The Operating Procedure for filling the fuel transfer canal was reviewed and revised to include seal plate leakage information
- A leak detection mechanism is to be installed prior to the next filling of the fuel transfer canal.

The NRC acknowledges that the corrective actions were comprehensive and effective but believes that two factors indicate that the actions were not sufficiently prompt: (1) that a work order to install a strongback on the lead bricks had been outstanding since 1985, and (2) that several workers observed the ANO removing the lead bricks but "did not recognize or report the problem" Both of these points are addressed.

First, there may be a misunderstanding regarding the outstanding "work order" issue. FPC routinely evaluates industry experience including NRC Information Notices (IN) and INPO's Significant Operating Event Reports (SOER) to determine applicability and appropriate actions. A variety of actions were taken over the years in response to the referenced IN's and SOER including the generation of a Field Problem Report (FPR) to evaluate the installation of a lockable barrier in front of the existing lead brick shielding at the reactor cavity access. Field Problem Reports are requests for Engineering to evaluate whether or not a modification to the plant is warranted. With respect to the lockable barrier issue, it was determined that the brick shielding wall was at least as effective as a lockable gate. This was based on the method of installation of the lead bricks which existed until 1985. It was the understanding of all involved that it would require a significant coordination of manpower and equipment to remove the bricks for access based on previous removal work. The implication of the NOV statement "... outstanding since 1985 ..." implies a lack of attention to the issue. This was not the case, it was a conscious, valid decision based on stated conditions. It appears that following the 1985 outage the lead brick barrier was not replaced in as substantial a manner as before, and did not present as formidable an obstacle to prevent access as was originally intended. The lead bricks

continued, however, to function as a fully adequate shield wall. A Work Request (RPC work order) was generated to install a locked barrier in 1985 as an additional means of assuring more literal compliance. It, too, was prioritized based on the presumed adequacy of the lead bricks as a barrier.

Second, personnel who observed the ANO had reason to believe by virtue of the ANO's position (and some were given actual assurances by the ANO) that he was authorized to remove the lead bricks. Thus there was no reason for them to report any apparent improper radiological activities. None of the personnel, including the craft foreman, had authority to order the ANO to stop work or had reason to question his authorization. It is not reasonable to cite this as an example of earlier opportunities to correct the problem.

Conclusion: The corrective actions taken were as prompt as reasonably possible, were decisive and extensive, with a high degree of management involvement.

In similar cases involving unplanned exposures below regulatory limits, the NRC has allowed mitigation of the proposed civil penalty on the basis of the prompt and extensive corrective actions taken by the licensee. See, e.g., Carolina Power and Light Company, EA 84-13, Letter dated August 28, 1984 (complete mitigation on basis of corrective actions which included discipline against the personnel involved, training sessions for personnel, and long-range improvement program for radiation protection); Florida Power and Light Company, EA 86-38, Order Imposing Civil Monetary Penalty, issued October 14, 1986 (50% mitigation on basis of corrective actions which included instructions to plant staff on radiation control procedures, discipline against individuals involved, procedural changes to ensure Health Physics oversight of radiation work). As in previous cases, Florida Power Corporation's corrective actions should warrant mitigation of the proposed civil penalty. Accordingly, full mitigation should be allowed.

2. Unauthorized Entries

In response to the unauthorized entries, Florida Power Corporation management took decisive corrective action. The individual responsible for the unauthorized entries was a contract employee who served as one of the Reactor Building Coordinators during the 1987 refueling outage. Following the first incident, in which the individual briefly entered a radiographer's controlled area with a survey instrument but without the permission of the radiographer in charge, the individual was counseled and informed that failures to observe radiation protection requirements could result in further disciplinary action. Other Reactor Building Coordinators were also given additional instructions on radiography related procedural requirements.

Following the second incident, in which the same individual entered a posted high radiation area without a dose rate instrument, an investigation and management review took place promptly and within four working days, the individual's employment was terminated and he was excluded from the site.

This prompt and decisive action demonstrates Florida Power Corporation's commitment to its radiation protection program and emphasizes to employees that failures to observe the requirements of the program will not be tolerated. The NRC has previously given substantial credit for such strong disciplinary action against individuals responsible for ignoring radiation protection requirements. See Carolina Power and Light Company, EA 84-13, letter dated August 28, 1984 (civil penalty mitigated completely in part because of strong discipline against personnel who performed inadequately).

The NOV suggests, however, that the NRC may not consider the corrective actions for the second incident sufficiently prompt in that the individual was allowed to remain in the posted high radiation area "for approximately thirty minutes" As noted in Inspection Report 88-03, however, the facts did not necessarily warrant a more immediate response. The individual first entered the area in the vicinity of the reactor coolant pump motors. While this area was conservatively posted as a high radiation area, the actual dose rate was 5 mrem per hour -- well below the defined level for a high radiation area. The Health Physics Technician who observed the individual was aware of the low dose in the area. The individual then descended to a lower platform where two Instrumentation and Control employees were working. These employees had a dose rate meter with them, and the maximum dose rate in this area was approximately 10 mrem per hour, again well below the defined level for a high radiation area. The Health Physics Technician was aware of the low dose rate and the fact that the other workers were equipped with a dose rate meter. He did not initiate steps to have the individual removed because he reasonably concluded that the individual was not in danger. Promptly upon leaving the Reactor Building, however, he initiated a Radiological Safety Incident Report; and appropriate actions, including termination of the individual responsible and notification of the NRC, were taken thereafter. In addition, procedure changes have been made to specifically delineate the responsibilities of Health Physics personnel in response to these types of situations.

Conclusion: Prompt and decisive corrective action was taken in response to the unauthorized entries, and therefore mitigation of the proposed civil penalty is warranted.

C. Past Performance

1. Reactor Cavity Access Event

The Enforcement Policy, in 10 CFR Part 2, Appendix C, Section V.B.3, provides for reduction of the base civil penalty by as much as 100% for "prior good performance in the general area of concern." Among the relevant factors to be considered are overall performance such as SALP evaluations and prior enforcement history. Florida Power Corporation believes that its prior good performance in the area of radiation protection warrants mitigation of the proposed civil penalty, as demonstrated by the following:

1. Since Crystal River 3 was licensed in 1976, there have been no cases of over-exposures of personnel.
2. The trend in the SALP rating for radiological controls has improved over the last two evaluation periods. In the most recent SALP evaluation for 1987 (Inspection Report 87-27), the rating for radiological controls was a 2, reversing an adverse trend noted in the previous SALP.

This prior good performance highlights Florida Power Corporation's commitment to radiation protection and warrants mitigation of the proposed civil penalty.

2. Unauthorized Entries

As noted in the proposed imposition of Civil penalty, two 1986 violations were cited for individuals entering a high radiation area without a radiation monitoring device. Although the 1986 events were marginally similar to the cited events, individuals in the 1986 events did not consciously disregard procedural and training requirements. In the January 1986 incident the individual mistakenly left the dose rate monitoring device at the entrance to the high radiation area. In the February 18, 1986, incident the individuals were well aware of the need for a monitor, but when requesting a monitor were told a Health Physics Technician on the same job had a monitor. When they arrived at the job site, the Technician was not there and they immediately left the area.

In the cited incident, the individual was told he was entering a high radiation area, needed a monitoring device and still several minutes later proceeded into the area without the device. The causes of the 1986 events were simple error and miscommunication. The cited events were the results of unauthorized acts of an individual, neither of which were foreseeable or preventable. In all events, the individuals were well aware of the requirements.

Conclusion: Past cases, therefore, do not support the conclusion of general "poor performance" to warrant escalation.

D. Prior Notice of Similar Events

1. Reactor Cavity Access Event

This factor is only applicable to the shielding removal event. NRC stresses that prior notice was provided in three previous Information Notices and an INPO report. As noted earlier FPC did take appropriate actions in response to the prior similar events. Without repeating that discussion, the fundamental task is for licensees to evaluate each cited event for applicability to their sites. FPC accomplished this task. Workers were made aware of the hazard through communication of previous similar events, and the barrier was evaluated for adequacy. No action taken by management can prevent individual actions which are outside the bounds of preestablished programs.

Conclusion: No significant escalation should result from this factor.

E. Multiple Occurrences

The Enforcement Policy, 10 CFR Part 2, Appendix C, Section V.B.5, provides that the "base civil penalty may be increased as much as 50% where multiple examples of a particular violation are identified during the inspection period." This factor should only be applied, if at all, to the alleged violations for unauthorized entries. It appears that the NRC did not consider this factor to warrant escalation of the base civil penalty, since it is not listed in the NOV. Nevertheless, we address this factor in the interest of completeness.

Even assuming that the two incidents of unauthorized entries could have been treated as "multiple occurrences," escalation of the civil penalty would not have been appropriate. The NRC appears to have recognized this. Rather than escalating the civil penalty based on these two incidents, the NRC aggregated all the alleged violations in determining the Severity Level. Once this was done, any further escalation for multiple occurrences would essentially have been double-counting. With respect to the cases of unauthorized entries in 1986, these cases should not be considered along with the incidents in question here in the determination of multiple occurrences for a particular violation. First of all, the 1986 cases were outside the inspection period of concern. Moreover, they were fundamentally different from the present case. Unlike the 1986 incidents, the present violations resulted from the conscious decision of a single individual to disregard established procedures and controls. Because the root causes of the 1986 incidents and those in question here were fundamentally different, the incidents should not be treated as multiple examples of the same violation.

ATTACHMENT II
FLORIDA POWER CORPORATION
INSPECTION REPORT 87-35/88-03
ENFORCEMENT ACTION EA 87-216
REPLY TO NOTICE OF VIOLATION

VIOLATION 87-35

I. Violations Involving the Reactor Cavity Access Event

- A. Technical Specification 6.12.1 requires that a high radiation area in which the intensity of the radiation is greater than 1,000 millirem per hour be barricaded and conspicuously posted as a high radiation area and entrance thereto controlled by issuance of a Radiation Work Permit. In addition, locked doors are required to be provided to prevent unauthorized entry into such area.

Contrary to the above, the licensee failed to adequately control access to high radiation areas in that:

1. Between 1985 and October 9, 1987, a locked door was not provided to control access to the reactor cavity located on the 95 foot elevation of the Reactor Building.
2. On October 9, 1987, the licensee failed to barricade, post as a high radiation area, and control by issuance of a Radiation Work Permit access to such a high radiation area on the 95 foot elevation of the Unit 3 Reactor Building in the vicinity of the reactor cavity access. The intensity of radiation in the area was up to 40 Rem/hour at 18 inches from the opening to the reactor cavity.

Response

Florida Power Corporation admits the violation. With respect to example 1, it should be noted that the intent of Technical Specification 6.12.1 is to adequately control access to high radiation areas. Florida Power Corporation believes that the intent of this requirement was met in that three of the four means of access control for the reactor cavity were in fact provided for the reactor cavity, i.e., the area was barricaded, the "D" ring area was conspicuously posted and controlled by issuance of a Radiation Work Permit (RWP). The use of the lead brick shield as a permanent barricade was considered a means of control at least equivalent to a locked door.

The requirements to barricade, post, and control the high radiation area created by the removal of the lead bricks were fulfilled at the time of discovery of the incident. The unauthorized actions of the Auxiliary Nuclear Operator created the condition by violating the established controls (the RWP), removing the barricade (the lead bricks), and creating, by removal of the shielding, an area requiring posting. The high radiation area that resulted was controlled, posted and barricaded immediately following the discovery of the condition. The second example of the violation was created as a result of unauthorized and improper actions, and could have been prevented only by actions that would have precluded the removal of the lead bricks. The second example is actually the very occurrence that gave rise to the violation as a whole; it is the

immediate result of the ANO's improper action and could not reasonably have been foreseen by the licensee.

Apparent Cause of Violation

1. The access path to the reactor cavity was barricaded with lead bricks. The barricade was considered adequate to preclude entry since its construction involved the wedging of the bricks into place with tools to form an essentially permanent wall. No locking device was provided in addition to the lead bricks. Because reinstallation of the lead bricks following the 1985 refueling outage was not done in a manner to ensure that the bricks continued to serve as a permanent wall, the Auxiliary Nuclear Operator (ANO), during activities to locate leaks from the reactor vessel seal plate, was able to remove some of the lead bricks allowing a view port to the reactor cavity area.
2. The unauthorized removal of the lead bricks created the high radiation area which was not properly posted or controlled until discovery by a Health Physics Technician. The cause of the violation was personnel error by the ANO. The lack of specific procedures on inspecting for leaks from the reactor vessel seal plate may also have contributed to the ANOs actions.

Corrective Action

1. Immediately following discovery, a guard was posted to secure the area until the lead bricks were reinstalled. The shielded access opening was checked every fifteen (15) minutes until a locked cover plate was installed.
2. At the time of discovery, the following actions were taken:
 - ° A dose rate survey of the hole into the reactor vessel cavity was performed by the Health Physics Technician.
 - ° Attending personnel were informed of the dose rates at and in front of the reactor cavity access, and were stationed to prevent access by other workers to the area in front of the reactor cavity.
 - ° The Reactor Building was evacuated and an announcement made instructing personnel to avoid the 95' elevation at the reactor cavity access area.
 - ° Reactor Building was checked to assure all personnel were evacuated.
 - ° The lead bricks which had been removed were replaced to provide shielding for the high dose rates.
 - ° The lead bricks were posted with a sign stating contact Health Physics.
 - ° Access to the Reactor Building was restricted until control of the cavity access area was established and personnel exposures checked.

A Radiation Safety Incident Report was generated to report and document the incident.

Date of Full Compliance

1. Full compliance was achieved on October 16, 1987 when a locked cover plate was installed to prevent entry into the reactor cavity area.
2. Full compliance was achieved on October 9, 1987, when the lead bricks were reinstalled into the shield wall at the reactor cavity access.

Action Taken to Prevent Recurrence

1. Previously closed and current open Field Problem Reports regarding radiation hazards and shielding were reviewed to assure adequate corrective measures have been or will be taken. A walkdown was conducted to evaluate current barriers to high radiation areas.
 2. The above corrective actions are considered sufficient to prevent recurrence.
- B. 10 CFR 19.12 requires that all individuals working in or frequenting any portion of a restricted area shall be instructed in the purpose and functions of protective devices employed, shall be instructed of their responsibility to report promptly to the licensee any condition which may lead to or cause a violation of Commission regulations and licenses or unnecessary exposure to radiation or to radioactive material, and shall be instructed in the appropriate response to warnings made in the event of any unusual occurrence or malfunction that may involve exposure to radiation or radioactive material. The extent of these instructions shall be commensurate with potential radiation health protection problems in the restricted area.

Contrary to the above, the licensee failed to adequately provide instruction to an Auxiliary Nuclear Operator working in the restricted area of the Reactor Building on October 9, 1987, on the limitations and possible failure modes of a radiation survey instrument that had been provided for his use in controlling his exposure in the restricted area and on the appropriate response to take when the radiation level present exceeded the maximum scale reading on the radiation survey meter.

Response

Florida Power Corporation denies the violation. The ANO received training on radiation detection instruments during the Radiation Protection lesson provided in the Assistant Nuclear Auxiliary Operator and Auxiliary Nuclear Operating courses for non-licensed operators. This training included information on radiation detection principles, ionization chambers, proportional counters, and Geiger-Mueller (GM) tubes. The radiation detection instrument utilized by the ANO did not respond incorrectly or fail, it indicated an off-scale reading in response to the high radiation field to which it was exposed. Based on the individual's training and work experience history including nuclear navy experience, non-licensed operator training, General Employee Training, and his Crystal River Unit 3 (CR-3) work experience, it is reasonable to assume he knew the correct response to an off-scale radiation detection instrument. It is also clear from the ANO's actions

(i.e., pattern of brick removal, dosimetry positioning, wearing of others, etc.) that additional training was unnecessary. The ANO failed to take the proper actions, not out of lack of training, but due to his decision to perform work that exceeded the authorized scope of activities. The ANO was counselled regarding the incident and provided additional training on radiation protection and the use of radiation survey instruments.

- C. Technical Specification 6.11 requires that procedures for personnel radiation protection shall be prepared consistent with the requirements of 10 CFR Part 20 and shall be approved, maintained, and adhered to for all operations involving personnel radiation exposure.

Technical Specification 6.8.1.b requires that written procedures shall be established, implemented, and maintained covering refueling operations.

Contrary to the above, the licensee's procedures for personnel radiation protection and refueling operations were inadequate as evidenced by the October 8, 1987 reactor cavity access shielding removal event in that they did not specify that:

1. permanent shielding removed during outage activities is to be reinstalled properly;
2. health physics is to be notified prior to the removal of permanent shielding;
3. health physics is to be notified when unexpected radiological conditions are encountered or scope of previously authorized work changed;
4. high radiation areas in the Reactor Building area are to be posted and controlled following a plant shutdown and prior to allowing general access; and
5. personnel assigned to observe for seal leakage in the Reactor Building while filling the fuel transfer canal are to be instructed in the procedure for observing leaks and the precautions to be observed while performing that task, particularly with regard to entries into the reactor cavity.

Response

Florida Power Corporation admits the violation based on examples 3 and 5 but denies the violation with respect to examples 1, 2, and 4.

1. The original function of the lead bricks placed at the reactor cavity access was two fold. First to function as shielding and second as a barrier to prevent inadvertent access to the cavity area. Since FPC admits the violation A.1 which states the barrier was inadequate to meet the locked gate criteria, the shielding qualities of the barrier is the issue at question here. FPC contends that work instructions are adequate to control the removal and reinstallation of shielding. The lead bricks were installed properly at the end of CR-3's 1985 refueling outage as can be shown by the reduction of radiation levels on radiation surveys taken in the reactor cavity area following the installation of the lead bricks. Shielding installation instructions are routinely included on Radiation Work

Permits in the "Remarks and Special Instructions" section. A review of RWP's 85-550 and 85-551 which covered installation and removal of shielding for the 1985 refuel outage provided the following instructions:

- (a) HP to direct placement of shielding.
- (b) HP to be present at the start of each job.

These RWP's show that it is standard practice at CR-3 for Health Physics to oversee evolutions involving shielding.

FPC concludes that the lead bricks at the reactor cavity access were installed properly after the 1985 refuel outage inasmuch as they provided adequate shielding prior to their unauthorized removal. Therefore, adequate guidance was provided for the control of shielding.

2. All radiation workers at CR-3 are required to comply with Radiation Safety Procedures (RSP's). General Employee Training also specifies to never remove temporary shielding without Health Physics approval. The procedure RSP-101, "Basic Radiological Safety Information and Instructions for Radiation Workers," revision 8, was in effect at the time of the incident and states in Section 3.1.3, "Rules within the RCA," step 3.1.3.7, "notify Health Physics personnel and obtain appropriate approvals prior to breaching any container, containment, system and/or component integrity." Section 2.3.5 defines containment(s)/container(s) as "any device (e.g., bag, box, drum, tent, glove box, etc.) used to control the release of radioactive material or radiation." The lead bricks served as a containment device and a radiological control device in regard to the high radiation area that existed in the cavity area. The ANO proceeded to remove the shielding contrary to radiation protection program instructions and procedure requirements in an effort to discover leakage from the seal plate. If the ANO had followed RSP-101, he would have contacted Health Physics prior to removing the shielding as required.
4. In order for the Reactor Building to be accessed, RWP's must be issued. For an RWP to be issued, surveys must be performed in the designated work areas. When high radiation areas are identified during these surveys, they must be posted and controlled. Therefore, following a plant shutdown, surveys must be performed and high radiation areas posted and controlled prior to allowing general access to the Reactor Building. These actions are covered in HPP-106, "Radiation Work Permit Procedure," and HPP-202, "Scheduled Radiological Surveys and Controls." Therefore procedures are adequate to assure the Reactor Building is posted and controlled following a plant shutdown and prior to allowing general access.

Apparent cause of violation

3. The requirement to notify Health Physics when unexpected conditions are encountered or the scope of work changes is routinely communicated to workers during pre-job planning activities or ALARA meetings, and therefore it was not considered necessary or appropriate to have this type of statement proceduralized. The ANO entered the area under an RWP that allowed him to look for leaks; he did not recognize his actions to be a scope change.

5. The instructions for observing and identifying reactor vessel seal plate leakage were not specifically addressed in procedures because the degree of difficulty associated with this operation was not considered great enough to warrant inclusion into a procedure, and access to the reactor vessel cavity had been thought to remain prohibited by the lead brick barrier.

Corrective Action

3. RSP-101 has been revised to include requirements to stop work and notify the Health Physics Department whenever the scope of work changes or work conditions deviate from those described on the RWP. A requirement for the job supervisor to contact Health Physics for a RWP revision if the original scope of work changes has also been included in RSP-106.

In addition, RSP-106 has been revised to clarify the radiation worker's responsibilities and actions concerning changing work scope and RWP revisions.

5. Operating Procedure OP-406, "Spent Fuel Cooling" was revised on December 10, 1987, to include information on leak detection for the reactor vessel seal plate and cautions on removal of the shielding for the reactor cavity area.

Date of Full Compliance

3. Full compliance was achieved on January 26, 1988.
5. Full compliance was achieved on December 10, 1987.

Action Taken to Prevent Recurrence

3. The procedure changes addressed above are considered sufficient to prevent recurrence.
5. A locked cover plate has been installed over the reactor cavity with key control under Health Physics control. An improved method for detecting leakage around the reactor vessel seal plate will be instated prior to future filling of the fuel transfer canal.

II. Violations Involving Unauthorized Entries

- A. Technical Specification 6.12.1 requires that with respect to a high radiation area in which the radiation intensity is greater than 100 mrem per hour but less than 1,000 mrem per hour and any individual permitted to enter such areas shall be provided with a radiation monitoring device which continuously indicates the radiation dose rate in the area.

Contrary to the above, on December 23, 1987, a radiation worker entered the "B" D-Ring area of the Reactor Building, a posted high radiation area with dose rates up to 350 mrem per hour, without a radiation monitoring device which continuously indicated the radiation dose rate in the area.

- B. Technical Specification 6.11 requires that procedures for personnel radiation protection shall be prepared consistent with the requirements of 10 CFR Part 20 and shall be approved, maintained, and adhered to for all operations involving personnel radiation exposure.

Licensee Procedure MTAPR-7.0, Controlling Access to Radiographic Areas, Revision 5, requires persons entering a radiographer's controlled area to obtain authorization from the radiographer-in-charge of the test.

Contrary to the above, on October 24, 1987, a radiation worker entered the "A" D-Ring area of the reactor building, a radiographer's controlled area without approval from the radiographer-in-charge.

These violations have been evaluated in the aggregate as a Severity Level III problem (Supplement IV).

Response

Florida Power Corporation admits the violation.

Apparent Cause of Violation

The violation was due to personnel error. The two incidents cited above were committed by the same contract employee. In both instances when questioned as to the reason for his actions, the employee stated personnel safety concerns as the driving force behind his actions. The individual violated radiation protection requirements based on his evaluation of each situation and the need to communicate to other workers he believed to be at risk from perceived industrial hazards during the performance of their work functions. In both cases, this individual was responsible for activities within the Reactor Building and felt obligated to take immediate action.

Corrective Actions

The individual was counseled following the October 24, 1987 incident, and his contract was terminated as a result of the December 23, 1987 event. A review of the circumstances revealed that other actions by the employee could have accomplished the same end result without violating radiation protection requirements and therefore the employee was terminated.

A Radiation Safety Incident Report was generated to document and report the incident.

Date of Full Compliance

Full compliance was achieved upon exiting the areas in question a short time following each incident.

Actions to Prevent Recurrence

The violations of the radiological protection program identified in the two examples were acts performed by a single individual. That individual was terminated. Since these acts were performed with full knowledge of the proceduralized restrictions that apply to the cited circumstances, there is little additional requirements that can be incorporated into procedures or training programs that would assure prevention of a similar event. However, additional guidelines and requirements have been incorporated into procedures to assure Health Physics personnel take prompt corrective actions when an individual has violated a requirement of the radiation protection program. These actions include the following:

- (a) Immediately instruct the individual(s) in violation to take those actions necessary to attain a safe radiological condition, while ensuring personnel safety is maintained. This may include removal of the individual(s) from the RCA.
- (b) Notify the appropriate management representatives of the violation and actions taken.
- (c) Restriction of the individual(s) in question from returning to work in the RCA until appropriate management approvals have been obtained.