U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos:	50-325 and 50-324
License Nos:	DPR-71 and DPR-62
Report Nos:	50-325 and 50-324/96-17
Licensee:	Carolina Power & Light Company
Facility:	Brunswick Nuclear Station
Location:	8470 River Road SE Southport, NC 35611
Date:	November 13-15, 1996
Inspector:	D.H. Thompson, Safeguards Inspector
Approved by:	A.F. Gibson, Director Division of Reactor Safety

ENCLOSURE 2

EXECUTIVE SUMMARY

On November 8, 1996, the licensee found at 1:00 a.m., that exterior Unit 1 railroad door RB-10 had wire protruding from the security lock core. At 1:10 a.m., the licensee determined that Unit 2 exterior railroad door RB-09 could not be opened and subsequently the licensee determined that the lock also had a wire inserted into the core.

On November 8, 1996, at 10:18 p.m., the licensee discovered a lock at Unit 2 Reactor Building door RB-16 with a thin gauge wire inserted into the security lock. The lock had been checked at 8:44 p.m., same date and found to be operational. The wire that was inserted into the locks at the three doors was determined to be the same type wire. As a result of the event at RB-16 the licensee conducted another search of the area and discovered a piece of wire similar to the other wire lying on the floor in the vicinity of the switch-gear room door. There was not any evidence of tampering with the switch-gear room door.

A chronological Sequence of Events was established by the inspector for the November 8, 1996, security lock tampering at Unit 1 and Unit 2 railroad airlock doors, and at Unit 2 reactor building door. The Sequence of Events is documented in Attachment A to this report.

Overall the licensee's response to the November 8, 1996, lock tampering events, was excellent. However, the licensee's reporting of the events to the NRC was not in accordance with regulatory requirements. In addition, the control room was not notified of the tampering events in a timely manner. The licensee's evaluation concluded that the lock tampering events were perpetrated by individual or individuals who had authorized, unescorted access to the site.

The inspector concluded that site management appropriately pursued identification of the individual or individuals who may have placed the wire into the lock cores.

Following extensive reviews by the licensee and independent verification by NRC, the inspector concluded that tampering occurred; however, to date no suspect has been identified.

The investigative staff of the corporate, assisted by a consulting firm, Risk Management Associates, adequately reviewed the event and other previous events to ensure that any potential tampering events had been fully evaluated. They concluded that the wire was most probably inserted as an act of vandalism.

The licensee restored the doors to operational status immediately after the events were discovered.

The inspector concluded that the licensee adequately evaluated other systems for signs of tampering.

The inspector concluded that there was no evidence of additional tampering and that the licensee had adequately evaluated plant condition reports and other documentation for additional examples of potential tampering.

The licensee appropriately identified actions to be taken to enhance detection of additional tampering.

The licensee was in compliance with the Physical Security Plan (PSP) with respect to fitness for duty, personnel access authorization, criminal history checks, and access control of protected and vital areas. However, the licensee failed to meet the one hour event reporting requirements of the regulations, 10 CFR 73.71, and Security Instruction OSI-20, "Reporting of Safeguards Events," Revision 15, dated September 12, 1996. This is a violation of Regulatory Requirements (96-17-08).

Attachment C contains information provided to Brunswick site management by NRC to assist in the licensee's response to the events. The attachment contains NRC Information Notice (IN) 83-27 concerning deliberate acts directed against plant equipment and internal NRC guidance for plant system check-out following suspected sabotage.

Attachment D contains a representation of the wire and copies of photographs of the doors.

Report Details

O2 Operational Status of Facilities and Equipment

O2.1 Tampering Event

On November 8, 1996, at 1:00 a.m., a security officer, while conducting the seven day functional test of security equipment, discovered a small gauge wire protruding from the security lock core in Unit 1 railroad door RB-10. Continuing the equipment check, at 1:10 a.m., the officer discovered that he was unable to open the security lock on Unit 2 railroad door RB-09 because of an obstruction. Subsequently, the RB-09 lock was found to have a small gauge wire jammed in the lock core (Attachment D). The licensee initiated Condition Report (CR) 96-03723 for these two events.

On November 8, 1996, at 10:18 p.m., a third event of tampering with security locks was discovered when an officer, on increased security patrol, discovered a small gauge wire similar to those previously discovered inserted in the security lock at Unit 2 Reactor Building Door RB-16. Also at 4:50 a.m., a wire similar to the other wires was discovered on the floor outside the cable spread-room near Door CS-02. There was not any evidence of tampering with the door lock at the cable spread-room. The licensee initiated CR-96-03730 for this event.

O2.1.1 Evaluation and Correction of Damaged Components

a. Inspection Scope

The inspector reviewed the licensee's evaluation of the damaged locks to determine if the as-found conditions represented tampering and to determine if the damaged components were replaced and whether operability was satisfactorily demonstrated.

b. Observation and Findings

The inspector reviewed the licensee's actions as a result of the lock tampering event.

The inspector noted that the licensee event team concluded that there were no apparent safety implications from the act of tampering. Five factors were considered in determining the probability of a malevolent act:

- The wire was discovered protruding from the cylinder of two of the three locks, which indicated the person who inserted the wire was not trying to hide the tampering act. A thorough search of the interior of the area did not disclose evidence of deliberate manipulation of any equipment within the areas.

- There was no communicated threat received toward the plant or plant equipment.

- There were no other events of this nature.

- The events involved a low level of sophistication. The wire used for the tampering events were readily available on various types of equipment tags throughout the plant area, and the wire was too fine and pliable to be used as a lock picking device.

- The target selection indicated that the individual possessed a poor knowledge of the plant parameters. In the first event, the railroad airlock doors are infrequently used. They are used for equipment ingress/egress only. Also, there are vital locked and alarmed doors interior to the railroad doors. In the second event, the door leading from the Turbine Building to the Reactor Building is between two turnstiles used for personnel access. The door and adjacent turnstiles are alarmed and controlled by card readers. The door is mainly used for equipment and infrequently for visitors and handicapped access. As the door is unlocked electronically via card reader and electric door strike, disabling the mechanical lock by tampering would not prevent the opening of the door.

c. Conclusion

The acts of tampering with the security locks did not compromise security or continued safe operation of plant systems.

O2.1.2 Evaluation of Plant Systems for Additional Tampering

a. Inspection Scope

The inspector verified that plant safety systems have been sufficiently evaluated for potential tampering to assure they could perform their intended functions.

b. Observation and Findings

In response to the security locks being tampered with, the licensee performed an inspection of additional systems, including safety related systems and non-safety related systems that could have an impact on the safe operation of the plant, to assure that the systems were intact, with no signs of potential tampering. The Operations and Engineering departments conducted independent walk-downs of the systems. Acceptance criteria for these system walk-downs were conducted using the NRC Draft Information Notice, "Guidelines for Assessing Indications of Equipment Tampering/Sabotage," (Attachment C) and Standing Instruction (SI) 96-154.

On November 8, 1996, a condition was identified that warranted additional review. While performing scram time testing on Hydraulic Control Unit (HCU) 26-23, a metal valve tag for the scram inlet valve was found positioned between an extension of the stem and a fixed nut above it (attached to the valve body). The metal tag was positioned in a way that it may have caused the valve to bind when stroked. It was removed prior to the HCU being scrammed without incident. All Unit 1 HCUs were checked for the same condition and none were found. The valve tag that presented the concern was long enough for the tag to be in that position which was unique only

to that HCU, presenting the possibility the tag may have become lodged in that position. The licensee concluded that the tag was not intentionally placed in that position. Additionally, the licensee, considering the placement of the tag and the material of the tag, concluded that the rod would have inserted into the core if a reactor scram had occurred. The Resident Inspector reviewed the event and concurred with the licensee's analysis.

On November 9, 1996, the licensee found two cut locking tabs in the Standby Liquid Control area. However, all valves that should have been locked were found to be locked. The licensee concluded that the locking tabs had been cut off as part of maintenance, and when replaced, the old locking tabs were discarded on the floor. The licensee considered this event as an example of poor housekeeping practices.

On November 12, 1996, at approximately 7:15 p.m., a security officer was unable to operate a security padlock on the diesel generator roll-up door. The lock core was removed and replaced. A subsequent inspection of the faulty core revealed a piece of paper in the core. The piece of paper was turned over to the investigative team who concluded that the paper appeared to be old and may have been in the core for a long period of time. They concluded that the paper in the core was not part of the lock tampering events.

c. <u>Review of Previous CRs for Evidence of Tampering</u>

The licensee reviewed the CRs in an effort to determine if any other suspected issues existed that had the potential to have been caused by tampering. The events are as follows:

1. On October 26, 1996, at approximately 6:00 a.m., two toggle switches (load/unload and audible alarm) at the top of the panel of the 1D air compressor in the Unit 1 Turbine Building, 20 foot elevation, were found to have been changed from their normal positions. The condition was found by an operator who checks the gauges on the compressor during his normal rounds. The plant process computer data was reviewed and confirmed that the toggle switches were changed at about 5:53 a.m. The switches were placed in the correct positions, and the event was reported to the Control Room.

   The licensee reviewed the event and determined that a fluorescent light fixture located approximately 13 inches above the top of the compressor cabinet and about 24 inches directly above the toggle switches had fresh hand prints on both bulbs. The hand prints ran the entire length of the bulbs. The top of the cabinet was uniformly covered with dust except for the area directly over the switches where the dust had been disturbed. The panel on which the switches are located had dust covering it except for an area approximately 2 feet wide which was wiped clean. The switches are just off center of the wiped clean area.

The licensee, as part of the event review, interviewed personnel who would normally be responsible for changing or adjusting lights and reviewed the applicable work orders. No work orders were found for lighting in this area. Loss Prevention Unit (LPU) personnel questioned had no knowledge of any lighting repairs in this area. No housekeeping or decon personnel had any knowledge of lighting work in that area. Environmental and Radiation Control personnel noted that two people wearing CP&L hard hats were seen carrying two fluorescent bulbs in that area in the early morning of October 26, 1996.

2. On October 26, at about 9:00 p.m., a chemistry technician found and reported an eyewash and shower unit located on the 20 foot elevation of the Unit 1 Turbine Building was leaking and that a puddle of water about 3 feet in diameter was on the floor in the area. The LPUs were called and secured the shower unit.

   The chemistry technician who found the leaking shower attempted to secure it but couldn't get the arm to lift to the fully closed position. When LPU attempted to secure the unit, they had to manipulate it several times to get the arm to fully close. The valve was not functioning properly. When the unit was tested on October 27, it was found to be faulty and a Work Request Job Order (96-AIENI) was submitted to have it repaired.

   Discussions with LPU indicate that similar failures have resulted in leakage on other shower stations. Surveillance Procedure OPT 34.21.3.0 requires a monthly functional test of these stations. The last test performed on the station found to be leaking on October 26 was conducted on October 7, 1996. The station was found to be working properly at that time.

3. On October 26, at about 10:00 a.m., an auxiliary operator (AO) found the tower outlet valve on the B cooling tower of the supplemental spent fuel cooling system in a throttled condition. The towers are located on the roof area at the 50 foot elevation of the Unit 1 Turbine Building. The valve is normally kept in the full open position The valve was placed in the open position and the event was reported to the Control Room.

   The B cooling tower was found to be losing a considerable amount of water through the overflow. The amount of water exceeded the capability of the catch container, and water was flowing onto the roof of the building. An AO arrived on the scene and secured the flow of water by adjusting the position of the A tower outlet valve. On October 26, an AO confirmed that the valves were correctly positioned at about 2:00 p.m. He also found the water levels of the two towers to be normal during rounds at about 4:00 p.m. Another AO found the B tower valve throttled at about 10:00 p.m. He found that the locking device on the valve handle was stuck in the open position allowing the handle to move freely. During this period, the temperature of the water in the fuel pool may have increased by as much as two tenths of a degree. Prior to 10:00 p.m., water was spilling off the roof of the Unit 1 Turbine Building in this area at a rate great enough to require grating be laid down to traverse the

puddle created on the ground. Also, just prior to the AO securing the valve, Projects personnel noted that water was collecting in the area of the storm drain.

The licensee concluded that the three events appeared to be distinct and unrelated. The air compressor appeared to be an example of someone affecting operating equipment while performing a housekeeping task. The eyewash/shower event appeared to be an example of equipment failure. It was noted by LPU personnel that these units periodically have valve failures which result in conditions like those found at this shower. The investigation of the supplemental spent fuel pool cooling system has not yet yielded a viable conclusion. With the handle stuck open, an inadvertent misposition of the valve is a possibility as is operator error.

d. Conclusion

Based on independent review of the documentation of the licensee's inspections and walk-down of the plant, the inspector concluded that there did not appear to be any other examples of tampering related to the three security lock events.

O2.1.3 Site Management's Response to the Event

a. Inspection Scope

The inspector reviewed the actions taken by site management in responding to the tampering with security locks to determine if management's response was appropriate for the circumstances.

b. Observation and Findings

The inspector reviewed the licensee's actions for recovery from the event. Prompt action was taken to investigate the event and a recovery action plan was quickly started. The action plan included the following:

- ensure integrity/operability of required security equipment;
- initiate/conduct an independent investigation;
- develop a plan for recovery from the event; and
- communication and event documentation.

Management initiated the following immediate measures: (1) compensatory security measures to prevent against any continued acts of tampering; (2) detailed walk-down inspections by Operations and Engineering to ensure there was no evidence of tampering with plant equipment; and (3) an independent investigation to determine who may have tampered with the locks and the extent of any tampering.

Management met frequently with plant personnel to discuss the status of the recovery effort. In addition, management kept NRC (site personnel, Regional NRC management, and NRR management) informed of the actions being taken and the status of the recovery plan.

c. Conclusion

The inspector concluded that site management appropriately pursued identification of the individual or individuals who tampered with the security locks and sought identification of any additional potential tampering with plant equipment.

The inspector concluded that tampering with the security locks had occurred and that the most likely individual or individuals involved had authorized access to the protected area and potentially had access to the vital areas.

O2.1.4 Implementation of Interim Action to Detect New Tampering

a. Inspection Scope

Determine if adequate interim actions to detect new tampering had been implemented.

b. Observation and Findings

After the second lock tampering event, the licensee took the following actions to detect new tampering:

- checked all security locks for tampering;
- established one hour patrols of RB-09 and RB-10;
- inspected Control Room back panels;
- had operations perform an inspection of the Turbine Building and Diesel Generator Building; and
- had operations conduct an inspection of all Unit 1 and 2 vital areas.

After the third lock tampering event, the licensee took the following additional actions to detect new tampering:

- Additional security surveillance was established for selected plant areas (two-man patrols in the Diesel Generator Building, south side of the protected area, and the Unit 1 and Unit 2 Reactor Buildings).
- Access to the protected area was limited.
- A "two-man rule" was implemented for all personnel inside the protected area.

- Plant walk-downs were performed by Operations and Engineering using NRC's Draft 1989 Information Notice, "Guidance For Assessing Indications of Equipment Tampering/Sabotage," as guidance.

- The Emergency Response Facility Information System and plant processing computer were reviewed for changes or transients.

- Target areas for enhanced protection were defined.

- Additional surveillance cameras to monitor known target areas were installed.

- Personnel and equipment were searched when departing protected area.

c. Conclusion

The licensee expedited the implementation of actions to enhance detection of additional tampering through the use of patrols and surveillance equipment. The licensee intends to maintain some of the surveillance equipment to detect or deter future tampering.

S1 Conduct of Security and Safeguards Activities

S1.2.5 Security Investigation of the Event

a. Inspection Scope

The inspector determined if Security and Investigation staffs adequately reviewed the event.

b. Observations and Findings

The corporate investigators responded to the site on November 9, 1996, to determine independently when and how the wire was inserted into the security locks. The investigative team employed personnel from "Risk Management Associates" to assist with the investigation.

The site Security and Investigative staffs researched files to determine if any workers were recently at other sites where tampering events had occurred, obtained a list of outage workers terminated after November 8, 1996, obtained a list of personnel within the protected area since 4:00 p.m., on November 8, 1996, cross-referenced the list of personnel within the protected area against those in the protected area during a valve mispositioning on October 26, 1996, and interviewed selected personnel who were within the protected area after 4:00 p.m., on November 8, 1996. Additionally, the investigators forwarded selected statements for verbiage analysis to the Federal Bureau of Investigation. The investigators administered a polygraph to selected individuals, with negative results.

c. Conclusion

The investigative staff thoroughly reviewed the event and concluded that there is evidence to support the conclusion that an unknown individual or individuals had inserted a foreign object into two security locks at the railroad doors and one lock at a door in the Reactor Building. The investigation is continuing. The Region II Physical Security staff is continuing to monitor the investigation.

S1.2.7 Evaluation of Compliance with the Physical Security Plan (PSP)

a. Inspection Scope

The inspector determined if the licensee was in compliance with the PSP and procedures.

b. Observations and Findings

To preclude individuals from being authorized access to the facility who may engage in tampering, the licensee established a screening program in accordance with 10 CFR 73.56 requirements. The PSP states that "...at Carolina Power & Light's Nuclear Plants, all elements of Regulatory Guide 5.66 have been implemented to satisfy the requirements of 10 CFR 73.56." The PSP further requires that, "Identification and access authorization is controlled by an automated security system." Portals for granting access to the protected area are locked and alarmed.

The inspector while reviewing the lock tampering events noted that the licensee had discovered the first event of lock tampering at the Unit 1 railroad door on November 8, 1996, at 1:00 a.m., and the second event at the Unit 2 railroad door at 1:10 a.m. The inspector determined that the licensee failed to report the events to the NRC until 5:46 a.m., 5 hours and 46 minutes after discovery. The third lock tampering event was discovered on November 8, 1996, at 10:18 p.m., at the Unit 2 Reactor Building door. The licensee reported this event to the NRC at 11:40 p.m., 1 hour and 20 minutes after discovery. All three the events were not reported to the NRC within one hour. The inspector also noted that security did not notify the Control Room of the event until approximately 3:25 a.m., 2 hours and 25 minutes after documenting. The Control Room staff is responsible for operations of the plant and should be notified immediately of any event that may impact the safe operation of the plant.

Paragraph 2.0 of the PSP, Revision O, dated March 15, 1996, requires that, "...plant security procedures are established to provide detailed information to the security force on implementation of plan performance objectives and commitments."

Appendix G to 10 CFR Part 73(I)(3), Reportable Safeguards Events, requires that events that cause "Interruption of normal operation of a licensee's nuclear power reactor through the unauthorized use of or tampering with its machinery, components, or controls including the security system," be reported to the NRC within one hour.

The licensee's Security Instruction OSI-20, Reporting of Safeguards Events, Revision 15, dated September 12, 1996, Paragraph 4.17, defines tampering as "when used in connection with Appendix G to 10 CFR Part 73, altering for improper purpose or in an improper manner."

Paragraph 6.2.9 of Security Instruction, OSI-20, Reporting of Safeguards Events, requires that events of confirmed tampering of suspicious origin or unauthorized use of safety or security equipment be reported to the NRC within one hour.

On November 8, 1996, the licensee failed to report the lock tampering events to the NRC within one hour. The first event was not reported for 5 hours and 46 minutes and the second event was not reported for 1 hour and 20 minutes. This is a violation of regulatory requirement (96-17-01).

c. Conclusion

The licensee was in compliance with the PSP with respect to fitness for duty, personnel access authorization, criminal history checks, and access control of vital areas. The licensee failed to report the lock tampering events to the NRC within one hour of discovery and did not notify the control room of the lock tamperings in a timely manner.

INSPECTION PROCEDURES USED

IP	71707:	Plant Operations
IP	71750:	Plant Support Activities
IP	81601:	Safeguards Contingency Plan Implementing Review
IP	81700:	Physical Security Program for Power Reactors
IP	92901:	Followup - Plant Operations
IP	92902:	Followup - Maintenance and Surveillance

X1 Exit Meeting Summary

The inspection scope and findings were summarized to licensee management at the conclusion of the inspection on November 15, 1996. The inspector described the areas inspected and discussed the inspection results. The inspector discussed the licensee's failure to report the events to the NRC within the required time. The licensee acknowledged the inspector's findings. Proprietary information is not contained in this report. Dissenting comments were not received from the licensee.

PARTIAL LIST OF PERSONS CONTAC ED

Licensee

K. Ahern, Performance Evaluation Section
A. Brittain, Supervisor Security
W. Campbell, Vice President
J. Corcetti, Security

B. Deacy, Supervisor Outage Maintenance
M. Denton, Corporate Security Investigator
C. Gannon, Manager Maintenance
T. Hackler, Operations
M. Harris, Site Communications Manager
S. Holth-Nguyen, Security
B. Lindgren, Site Support Services Manager
W. Levis, Director Site Operations
W. Murray, Licensing

NRC

R. Hannah, Public Affairs, Region II
C. Patterson, Senior Resident Inspector
D. Verrelli, Acting Branch Chief, Region II

Other licensee employees contacted included Operations, Engineering, Licensing, and Maintenance personnel.

LIST OF ACRONYMS USED

AO	Auxiliary Operator
CR	Condition Report
IN	Information Notice
NRC	Nuclear Regulatory Commission
NRR	Nuclear Reactor Regulation
PSP	Physical Security Plan
SOM	Shift Outage Manager
SI	Security Instruction
SRO	Senior Reactor Operator
SS	Shift Supervisor

CHRONOLOGICAL SEQUENCE OF EVENTS

DATE	TIME	EVENT
11/8/96	1:00 a.m.	Officer on duty conducting an operational check of security equipment found a wire protruding from the Unit 1 railroad door.
11/8/96	1:10 a.m.	Officer reported that the lock on Unit 2 railroad door would not open. Subsequently the lock was found to have wire in the core which prevented the lock from working.
11/8/96	1:30 a.m.	Security supervision determined that the last time security closed RB-10 was 4:19 p.m. on November 7, 1996. The last time RB-09 was closed and locked was at 9:00 p.m. on November 4, 1996.
11/8/96	1:45 a.m.	Security management was notified of the event.
11/8/96	2:35 a.m.	Security management on-site.
11/8/96	3:25 a.m.	Shift Supervisor notified Control Room of the two events.
11/8/96	4:55 a.m.	Security management went to the Control Room and reported the tampering event.
11/8/96	5:00 a.m.	Security management directed security patrols to check all security locks and equipment for tampering.
11/8/96	5:10 a.m.	Operations supervisor notified senior management of events.
11/8/96	5:37 a.m.	Inspected Control Room back panel area for security concerns. Nothing found.
11/8/96	5:46 a.m.	One hour notification to NRC made due to confirmed tampering of security locks.
11/8/96	5:59 a.m.	Security completed inspection of all security equipment. No other tampering noted.
11/8/96	6:00 a.m.	Earlier in shift it was discovered by Security that certain key locks had foreign material stuffed into them, specifically metal wire. As a result of this, checked the following areas for evidence of tampering: Turbine Building and Diesel Building.
11/8/96	6:00 a.m.	Operations checked the Turbine Building and Diesel Building and other vital equipment for possible tampering.

ATTACHMENT A

DATE	TIME	EVENT
11/8/96	6:06 a.m.	Performed walk-down of building checked locking devices to vital areas. No problems noted.
11/8/96	6:15 a.m.	RB-09 and RB-10 placed under increased patrol (1 hour).
11/8/96	6:24 a.m.	Building AOs inspected all vital areas for security abnormalities. Nothing noted.
11/8/96	7:10 a.m.	Protected and vital areas searched for wire from equipment tags. The wire was suspected of coming from that source.
11/8/96	9:32 a.m.	Operators inspected selected key locks and door locks in Unit 2 Reactor Building, Turbine Building, Control Building (including back panels), and outside areas (Diesel Building, Service Building, and 4-Day Tank room). No discrepancies or unusual conditions found.
11/8/96	9:52 a.m.	Completed tour of outside vital areas as directed by SS to check all locked areas to ensure there was no lock tampering. The following locks and key lock switches were checked: Diesel Building: door 113 north, dr 103 south, panels 1A-HA7, 1A-DG-H32, 1B-HA8, 1B-DG-H33, 2A-DG-HQ6, 2A-HC1, and 2B-HC2, E4 to E2 SBO SS-B, E4 ASSD keylocks components: AL1, AL0, AK9, AK8, AK7, AK4, AK3, AK1, AK0, E3 to E1 SBO SS-B, E3 ASSD keylocks components: AJ4, AJ3, AJ2, AJ0, AI4, AI3, E2 to E4 SBO SS-B, E2 to E1 ASSD X-TIE SS-B, E2 ASSD keylocks components: AH6, AH5, AH4, AH3, AH2, AH1, AG9, AG8, AG6, and AG5. E1 to E2 ASSD X-TIE SS-B, E1 to E3 SBO SS-B, E1 ASSD keylocks components: AF9, AF8, AF3, AE8, AE7. E5, E6, E7, and E8 RSD and ASSD keylocks. DG1, 2, 3, and 4 ASSK keylocks. Four-Day Fuel Oil Tank Room: door 001 Service Water Building: door 4 north - door 3 south
11/8/96	10:15 a.m.	Completed inspection as directed by the SS of ke switches and keylocks for signs of tampering (Ref CR 96-[illegible] Items inspected included doors and MCCs located in the Unit 1 Reactor Building and Turbine Building; the Control Building including the 70' HVAC area. Cable Spread, and back panels; the Radwaste Building; and the outside areas including the Diesel Generator Building, SW Building, and the 4-Day Tank room. No discrepancies noted.
11/8/96	1:35 p.m.	Entered AOP-13. Verified doors on attachment 3 closed.

DATE	TIME	EVENT
11/8/96	2:35 p.m.	Completed OSAO portion of OSAP-13.0, severe weather door check and walk-down of outside areas. Various equipment throughout plant site needs securing. SOM informed.
11/8/96	5:02 p.m.	Service water piping in the radwaste pipe tunnels had been walked down during rounds IAW 001-03.5, page 24, items 8-11. Service water lineup was found to be satisfactory.
11/8/96	5:12 p.m.	Completed tour of all outside tank areas as directed by the Unit 1 SRO to check for tampering of valve positions and locking devices. The following tanks were checked: - U-1 CST HPCI/RCIC/CRD and condensate transfer lines - U-2 CST HPC1/RCIC/CRD and condensate transfer lines - 7-day fuel oil tank aux boiler, diesel fire tank, and aux boiler lines - MUD tank demin water lines and diesel fire pump aux line - Fire protection tank lines to diesel fire pump and motor driven fire pump There were no valves out of their normal position and all locking devices were in good condition and intact.
11/8/96	5:15 p.m.	Completed a visual lineup verification of all outside Tank areas as directed by the SS. Inspection was performed to check for signs of tampering (Ref CR 96-3723). Areas inspected included both Units' CSTs, 7-Day Fuel Oil Storage Tank, Diesel Fire Pump Fuel Tank, the Fire Protection Tank, and the MUD Tank. No valves were noted to be out of position and all applicable locking devices were intact.
11/8/96	5:46 p.m.	Performed safety/security walk-down of the following Unit 1 components: 1XA, 1XB, 1XC, 1XD, RSDP, RCIC inverter, 1XA-2, 1XB-2, 1A-RX, 1B-RX, 1AB-RX. No abnormalities or discrepancies noted. Keys were physically inserted into all ASSD and remote shutdown key lock switches.
11/8/96	6:00 p.m.	Performed safety/security walk-down of the following Unit 2 components: 2XA, 2XB, 2XC, 2XD, RSDP, RCIC inverter, 2XA-2, 2XB-2, 2A-RX, 2B-RX, 2AB-RX. No abnormalities or discrepancies were noted. Keys physically inserted into all ASSD and remote shutdown key lock switches.

DATE	TIME	EVENT
11/8/96	6:05 p.m.	Performed security walk-down of the following Unit 2 components: 2E7, 2E8, 32A, 2A, 2B, 2C, 2D, 2AB, RPS and UPS distribution panels, UAT backfeed keylocks, 2A-TB, 2B-TB, 2AB-TB, 2C-TB1, 2D-TB1, 2E-TB, 2F-TB, 2D-TB2, 2C-TB2, circulating water backwash valves and panel 10A. All locks were physically challenged and inspected for obstructions with no abnormalities noted.
11/8/96	6:14 p.m.	Performed security walk-down of the following Unit 1 components: 1E7, 1E8, 31A, 1A, 1B, 1C, 1D, 1AB, RPS and UPS distribution panels, UAT backfeed keylocks, 1A-TB, 1B-TB, 1AB-TB, 1C-TB1, 1D-TB1, 1E-TB, 1F-TB, 1D-TB2, 1C-TB2, 9A, and circulating water backwash valves. All locks were physically challenged and inspected for tampering/operability.
11/8/96	9:55 p.m.	Performed safety/security walk-down of the following equipment: All 480V MCCs with ASSD keylocks, all locked 120V panels, RSDP, LEP tool boxes, all high radiation doors and miscellaneous doors within the RX Building. A key was inserted in all locks and no abnormalities were found.
11/8/96	10:18 p.m.	A security officer on patrol discovers a wire inserted into the security lock at the Unit 2 Reactor Building door (RB-16).
11/9/96	12:45 p.m.	Performed walk-down of north and south HCU banks on Unit 2. Inspected for proper valve configuration, amphenols properly connected and for possible interference with the operation of the 126 and 127 valves. All HCUs found to be in satisfactory condition.
11/9/96	1:00 a.m.	Completed walk-down of Unit 2 HCU north and south banks. Checked valve positions, amphenol connections, and for interference with proper operation of the -V126 and -V127 valves on each HCU. No discrepancies were noted.
11/9/96	2:15 a.m	Two-man rule implemented.
11/9/96	4:50 a.m.	A wire similar to the other wires used in the tampering events was discovered outside the cable spread room.
11/10/96	6:00 p.m.	Two-man rule terminated.
11/13/96	11:00 a.m.	NRC safeguards inspector on site.
11/15/96	12:00 p.m.	Investigation and additional security will continue pending the licensee providing the NRC with a recover plan.

LIST OF LICENSEE DOCUMENTS REVIEWED

Physical Security Plan

Security Instruction, OSI 20, Reporting of Safeguards Events

Event Notification Worksheet, dated 11/8/96

Condition Report #96-03723

Operations Logs

Event Notification Worksheet, dated 11/9/96

Condition Report #96-03730

Security Shift Report 6:00 a.m. to 6:00 p.m., dated 11/8-9/96

Evaluation of the Tampering Events, dated November 8, 1996

Standing Instruction SI-96-154

Historical Access Control Reports

Radiation Control Shift Turnover, dated 11/09/96

Operability Test/Inspection, dated 10/01 to 11/01/96

Security Incident Reports

ATTACHMENT B

INFORMATION PROVIDED TO LICENSEE BY NRC ON NOVEMBER 8, 1996

(1) NRC IN 83-27

(2) NRC Internal memo, dated December 12, 1985

(3) NRC Internal memo, dated July 14, 1982

(4) Draft Document 89-XX, Guidelines For Assessing Indications of Equipment Tampering/Sabotage

ATTACHMENT C

SSINS No.: 6835
IN 83-27

UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT
WASHINGTON, D.C. 20555

May 4, 1983

IE INFORMATION NOTICE NO. 83-27: OPERATIONAL RESPONSE TO EVENTS CONCERNING DELIBERATE ACTS DIRECTED AGAINST PLANT EQUIPMENT

Addressees:

All nuclear reactor facilities holding an operating license (OL) or construction permit (CP).

Purpose:

This information notice is provided as a notification of events which may have involved deliberate acts directed against plant equipment and a lack of station procedures concerning response by operating personnel. It is expected that recipients will review the information for applicability to their station procedures. No specific action or response is required at this time.

Description of Circumstances:

A review of recent operating reactor events indicates that some improper valve positioning and instrumentation irregularities may have involved deliberate acts directed against plant equipment in vital areas. The following is a brief account of these events.

At the first facility, during routine operation, the Control Room Operator received a steam generator feedwater pump (SGFP) high vibration alarm. Subsequently the SGFP tripped and the operator immediately reduced turbine load to prevent the unit from tripping. The instrument valves on the low vacuum trip sensing line located outside vital areas were apparently deliberately repositioned resulting in the pump trip. The licensee concluded that this deliberate act could have been a result of a labor dispute.

At the second facility, during a routine operator tour at approximately 1:00 a.m., a manual valve was found shut in the common suction piping to the high head safety injection (HHSI) pumps. The valve was immediately reopened. This valve, which is checked by operators each shift, had been verified open at about 4:30 p.m. the previous day. The chain and padlock which secured this valve in the open position were missing. Additionally, on the previous day the manual suction isolation valves of the three auxiliary feed-water pumps had been found unchained and unlocked in violation of technical specifications requirements. These valves were found in their normally open position. The motive behind the actions was not proven, but the actions resulted in the HHSI system being inoperable.

These events, and events at other plants, demonstrate that the potential for deliberate acts directed against plant equipment must be recognized. In the two above events the licensees were not totally prepared for operational followup actions. Other licensees may or may not be prepared to assess the situation and take necessary steps to assure operability of systems important to safety or make decisions concerning continued operation. Guidelines or procedures prepared by the licensee outlining a process for followup of both deliberate and inadvertent acts with respect to plant operation should be available.

The guidelines and procedures should include a verification of the affected system(s) alignment, the system(s) control logic, and the availability of the system(s) main power supply. In addition interrelated systems should be inspected and selected safety-related electrical panels and cabinets, both in the plant and in the control room, may require a detailed inspection. If additional tampering is detected, the licensee should be prepared to make a decision on whether or not continued operation is justified and whether or not systems necessary for a safe shutdown are operable.

Operational and security procedures to cope with radiological sabotage and other threats to safety must be developed in accordance with 10 CFR 73.55(h)(1) and Appendix C of Part 73. The potential impact of any deliberate act directed against plant equipment must be evaluated, and actions taken to mitigate the anticipated safety consequences.

No written response to this notice is required. If you have any questions regarding this matter, please contact the Regional Administrator of the appropriate NRC Regional Office, or this office.

E. L. Jordan

Edward L. Jordan, Director
Division of Emergency Preparedness
and Engineering Response
Office of Inspection and Enforcement

Technical Contact: Paul R. Farron, IE
(301) 492-4766

Attachment:
List of Recently Issued IE Information Notices

December 12, 1985

MEMORANDUM FOR: DRS&P Staff

FROM: A. E. Chaffee, Chief
Reactor Projects Branch

ENCLOSURE: 1 Memorandum from ED Jordan to Brian Grimes entitled "Plant Systems Checkout Following Suspected Sabotage"

SUBJECT: POTENTIAL SABOTAGE: GUIDANCE FOR FOLLOW-UP

Enclosure 1 provides guidance for NRC and licensee actions when potential sabotage has been identified. This guidance is provided for your review and use. Please also review the licensee's program for dealing with potential sabotage from an operations standpoint. Enclosure 1 is a good guide to use in evaluating the licensee's program. You will note that this guidance is not included in any formal document. Please find a method to file this document so it is available when needed.

A E Chaffee

A. E. Chaffee, Chief
Reactor Projects Branch

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555

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Conf. 27

JUL 14 1982

MEMORANDUM FOR: Brian K. Grimes, Director, Division of Emergency Preparedness, IE

FROM: Edward L. Jordan, Director, Division of Engineering and Quality Assurance, IE

SUBJECT: PLANT SYSTEMS CHECKOUT FOLLOWING SUSPECTED SABOTAGE

The enclosed procedure provides guidance for actions to be taken following instances of suspected sabotage. We request that you make this guidance available to IE Management-on-call and the IE Operations Center Duty Officer. We are issuing the procedure as a Temporary Instruction for use by the Regional Offices.

E. L. Jordan
Edward L. Jordan, Director
Division of Engineering and
Quality Assurance, IE

Enclosure: Procedure for Assessing Indicated Sabotage

Based on mtg w/ Partlow & Allison on 8/2, I understand that the TI will not be issued.

cc/w enclosure:
W. J. Dircks, EDO
H. R. Denton, NRR
J. G. Davis, NMSS
R. C. DeYoung, IE
J. L. Blaha, IE
R. C. Haynes, RI
J. P. O'Reilly, RII
J. G. Keppler, RIII
J. T. Collins, RIV
R. H. Engelken, RV
J. M. Taylor, IE
J. Partlow, IE

PROCEDURE FOR ASSESSING SIGNIFICANCE OF INDICATION OF SABOTAGE PRIOR TO CONTINUED OPERATION

INTRODUCTION

In view of recent events involving indication of potential sabotage at the Salem and Brunswick facilities, a procedure has been prepared for use in future instances of this kind. The purpose of the procedure is to determine if sabotage has been committed and to check out the plant to ensure continued safe conditions. The procedure is intended to provide guidance for IE, both operations center duty officer and management-on-call, and regional personnel involved with response to such events.

OBJECTIVE

The primary objective in dealing with an event indicative of potential sabotage is to ensure continued safe facility conditions. When an event occurs, accidently or intentionally initiated, judgments must be made regarding potential consequences of the event and the corrective actions to be taken to eliminate the initiating conditions and minimize the consequences.

PROCEDURES

After potential or actual sabotage has been identified, it is necessary to gather sufficient facts to enable a clear understanding of the significance of the identified sabotage. Gaining such understanding is the first action to be taken in responding to the identified sabotage. Information that may assist in this first action is referred to in item A below. With an understanding of the identified sabotage, it is then appropriate to establish an initial prioritized search of the associated or suspect systems. The resulting information is then the basis for determining subsequent action. Clearly, the extent to which the plant is checked (i.e., items B and C or D below) depends on judgment regarding indications of further sabotage found during the checkout.

A. Sabotage Event Evaluation

The enclosure to the memorandum dated November 6, 1981 to Commissioner Bradford from W. Dircks consists of a procedure for this evaluation. A copy is enclosed. It is to be used for general guidance on implementation of this procedure.

B. Overall Inspection of Plant

As set forth on page 3 of the enclosed "Sabotage Event Evaluation," the conduct of search and equipment check should include a check of the overall plant and then a system by system inspection, as appropriate.

The overall plant and system by system listings reflects a "hands-on" approach that would enable an inspector to verify the licensee's

- 2 -

action in checking out a nuclear power plant in instances of suspected sabotage. To repeat, it is the licensee, not NRC, that checks out the plant. The assumption is made that the FSAR would be available for overall guidance to plant system requirements and that the plant Technical Specifications would be satisfied before justification of continued operation or restart.

Prior to a systems checkout based on the listing in items C and D below, a broad-brush inspection of the plant should be made by the licensee. This inspection should be largely by visual means and consist of four main categories. These are:

1. control room inspection,

2. plant structures inspection,

3. piping and valve walkdown, and

4. electrical power integrity confirmation.

This broad inspection should be initially performed to spot any major abnormality such as a damaged pipeline or a planted explosive. It should not be programmed to detect all potentially faulted systems.

In the control room, visual inspection should be made of all panels, boards and inside cabinets with an eye to spotting any obvious fault. One should be alert to spotting jumpers, and certainly to any strange "packages."

In the visual checkout of plant structures, the same general attitude should be appropriate. Look for abnormalities and foreign materials. This category should include the main plant buildings, that is, containment, reactor building, turbine building and of course, the intake structure or connection to ultimate heat sink.

The piping and valve walkdown should use the same perspective. It should not seek to distinguish between system piping which is safety-grade and that which is not. This inspection should simply consist of a routine patrol of all accessible piping runs being alert to the more obvious type of faulting. For example, one should be expected to be able to "find" a cut chain of a "chain and padlocked" valve handle. On the other hand, one should not expect to confirm valve alignment during this initial check.

Finally, the initial check of the electrical system should be made with the same general approach. It should seek to verify that the vital power supplies were not "altered" in a significant way. The purpose of this check should be to make sure it was safe to turn power on for further systems checking.

When prelimin-ry determination of sabotage has been made and further investigation indicates that specific systems might be affected, it may be necessary to perform a complete walkdown of certain systems, checking

[redacted] [redacted]

all accessible manual and motor operated valve positions, circuit breaker and electrical switch positions, etc. Actual system walkdowns are especially pertinent with respect to standby systems whose operability cannot be completely demonstrated during normal plant operations. Checks in high radiation areas may be required depending on detailed consideration of the evidence of sabotage in these areas and a possible ALARA consideration.

When evidence of sabotage is found and specific components and systems are identified, consideration of the consequences of corrective actions should be taken. A thorough determination of possible system response to corrective actions should be made and contingency plans to address these responses should be determined prior to taking corrective actions.

Detailed examination of systems including those associated with the identified sabotage may be necessary to establish the basis for continued operation.* The systems to be examined are listed in item C or D as applicable. Following such a checkout, it then would be appropriate to confirm systems operability throughout the plant using the Technical Specification requirements as the measure of safe operability. This conformance with Technical Specification requirements represents the overall criteria on which decisions may be made regarding changing the mode of reactor operations.

C. <u>BWR Plant Systems</u>

1. Reactor System

   a. Vessel - check for obvious abnormal condition
   b. Vessel Level Instrumentation - condensing chambers, piping, dp racks, wiring

2. Reactor Recirculation System

   a. Piping
   b. Valves, discharge and suction
   c. Motor, pump, and controls
   d. Power supply MG Set, cables, modules, breakers
   e. Control cabinets, wiring, boards, breakers

*If the plant is operating, continued operation should and must be permitted until sufficient checks have been made to assure that the plant can be shut down safely.

3. Control Rod Drive Hydraulic System

   a. HCUs (Hydraulic Control Units), directional control valves, isolation valves, scram valves
   b. Piping throughout HCUs, SDV (Scram Discharge Volume)
   c. SDV drain and vent valves, IV Level switches
   d. Control circuitry - cables, boards
   e. Air supply - piping and valves, controls, pilot valves

4. Standby Liquid Control System

   a. SLC tank, level, piping
   b. Pumps and motors, power supplies, controls
   c. Valves, squib, isolation
   d. Control circuitry, panels, cabinets, cables

5. Residual Heat Removal (RHR) System

   a. Heat exchangers, primary side (shell), secondary side (tube) service water
   b. Primary side (LPCI) pumps, motors, piping valves, isolation valves, drywell spray piping and valves, torus spray piping and valves
   c. Other primary side piping and valves, i.e., shutdown cooling, isolation cooling where applicable
   d. Control circuitry, wiring, panels, boards, Logic interconnections, power supplies, control power supplies
   e. RHR Service Water System
      (i) Pumps, motors, water supply structure
      (ii) Piping and valves, isolation and interconnections
      (iii) Control circuitry, wiring, boards, panels
      (iv) Power supply, cable, breakers, controls

6. Core Spray System

   a. Pumps, motors
   b. Piping and valves, isolation valves, check valves
   c. Control circuitry, wiring, panels, logic, control power
   d. Power supplies, cable, breakers, controls

7. High Pressure Coolant Injection System

   a. Pump and turbine driver
   b. Piping, valves, isolation valves, condensate traps
   c. Control circuitry, wiring, logic, control power
   d. Turbine oil system, turbine control valves, speed governor

8. Automatic Depressurization System

   a. Safety relief valves operability
   b. Control circuitry, wiring, timer, logic
   c. Air or pneumatic accumulators, air supply check valves, air supply piping

9. Reactor Core Isolation Cooling System*

   a. Pump and turbine driver
   b. Piping, valves, isolation valves, check moves, condensate traps
   c. Control circuitry, wiring, logic

10. Diesel Generator System

   a. Day tanks and storage tanks
   b. Fuel oil pumps, motors, piping
   c. Control Circuitry, wiring, logic
   d. Diesel air start and lube oil systems
   e. Generator protective devices and output interconnections (See electrical systems)

11. Containment Systems

   a. Primary containment isolation valves including MSIVs and controls
   b. Primary containment inerting system piping, valves, controls, sampling
   c. Suppression chamber water level
   d. Vacuum breakers - DW to torus to reactor building
   e. Standby gas treatment system operability
   f. DW purge and vent valves control

12. Water Systems

   a. RHR service water piping, valves, pumps, motors
   b. Emergency service water (if applicable) piping, valves, pumps, motors
   c. Intake structure integrity
   d. Reactor building closed cooling water, turbine building closed cooling water, fuel pool cooling
   e. Circulating water system
   f. Diesel generator cooling water system
   g. Condensate and feedwater system including storage tanks and demineralizers
   h. Condensate-Feedwater piping, pumps, valves
   i. Feedwater heaters with associated piping and valves

*For earlier BWRs using an isolation condenser for this function, only the above items (9.b.) and (9.c.) are applicable.

13. Instrumentation and Control Systems

    a. Reactor protection system, boards, racks, relays, complete control room check
    b. Neutron monitoring system including TIP piping and valves and SRM, IRM, APRM
    c. Process control interfaces
    d. Engineered safety feature controls, racks
    e. I&C for safe shutdown including control room habitability system
    f. Other I&C - e.g., fuel pool cooling, offgas monitoring, etc

14. Electrical Systems

    a. DC system supply and monitoring on 125 volt and 250 volt batteries and chargers, switchgear and panels
    b. Vital AC equipment including 4kv, 480 volt and 230 volt buses and switchgear
    c. Vital motor control centers
    d. Emergency lighting system
    e. Remote shutdown control system
    f. Cable spreading room

15. Compressed Air System

    a. Compressors, accumulator tanks and motors
    b. Piping and valves
    c. Control circuitry, wiring

16. Main Turbine Generator

    a. Turbine control system including electrohydraulic oil system
    b. Bypass valve controls
    c. Generator protective systems

D. <u>PWR Plant Systems</u>

1. Reactor System

    a. Reactor pressure vessel
    b. Control rod drive mechanism above reactor vessel
    c. Control and instrumentation for the reactor protection system (RPS) and the overpressure protection system

2. Reactor Coolant System (RCS)

    a. Primary and secondary coolant loop; piping, valves (including safety relief), instrumentation and control
    b. Reactor coolant pumps (RCP) and associated component cooling including component cooling of lube oil coolers and component cooling valves and piping out to containment penetration

c. Steam generator external damage, including safety relief valves
d. Pressurizer including PORV's, associated control air (or nitrogen) supply, heater control and heater backup power supply, and valves and piping to pressure relief tank

3. Emergency Core Cooling System (ECCS)

a. Accumulators and piping to RCS vent and isolation valves, nitrogen pressure and supply
b. High head charging pumps, charging lines, boron injection tanks, all other safety injection pumps (i.e., intermediate head pumps if applicable) and related piping and valve alignment (including manual isolation valves) to RCS
c. Residual heat removal (RHR) system: heat exchangers, pumps, valves including manual system isolation valve alignment, and associated control circuitry, wiring, panels, interconnections, power supplies and control power supplies
d. RHR service water system including pumps, motors, piping, valves (especially system isolation valves)
e. Refueling water storage tank, associated isolation valves and piping for ECCS pump suction
f. Instrument and control racks for the entire ECCS system

4. Component Cooling System

a. Component cooling pumps, heat exchangers, spent fuel pool heat exchangers, water seal heat exchangers
b. Special attention should go to component cooling for RCPs, emergency diesel generators, ECCS pumps and associated isolation valves and piping

5. Instrumentation and Control

a. Visual inspection and functional testing of RPS and engineering safeguards systems
b. Visual check of instrument racks and wiring for RHR, auxiliary feedwater system and shutdown systems
c. Preoperational testing of SRMS, IRMS and all other power level instruments
d. Control room and auxiliary room ventilation system
e. Instrument control air (or nitrogen) pressure valves and piping for safety systems
f. Control room panels and cabinets

---END---

6. Waste Disposal and Radition Protection System

   a. Radiation monitors for service water discharge headers and plant vents
   b. Reactor coolant drain tanks, CVCS holdup tanks, and the waste holdup tanks, valves, piping and radiation alarms
   c. Waste gas monitor tanks, valve line up to service water system
   d. Gas decay tanks, analyzer tanks and plant vent valve lineup and associated radiation monitors

7. Containment Systems

   a. Containment isolation valves, CVCS letdown lines, MSIVs
   b. Containment pressure relief valves, purge exhaust valves and all other manually operated containment valves which are accessible
   c. Personnel and equipment access hatches
   d. Containment spray systems, piping, valves, instrumentation and wiring, pumps, heat exchanger and recirculation system sump, pump and controls
   e. Hydrogen recombiner units including the control panels and power supply
   f. Fan coolers with safety cooling functions and ice condensers (if applicable)

8. Electrical Systems

   a. Auxiliary power system, including 4160/480 vital buses, 125 volt DC control buses/battery and 120 VAC vital instrument bus
   b. Emergency diesel generator system controls, fuel oil, lube oil, tanks and piping
   c. Cable spreading room

9. Main Steam System

   a. Associated relief valves
   b. Turbines include lube oil system, bypass valves and generator protection systems
   c. Steam generator feedpumps and valve lineup through FW heaters
   d. Auxiliary feedwater system pumps and manual isolation valves

10. Spent fuel pool and fuel handling systems (i.e., if in refueling outage), including cooling system and level indications

11. Service water system including piping, valves, pumps, and heat exchangers

12. Sampling system for appropriate systems including isolation valves

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR REACTOR REGULATION
WASHINGTON, D.C. 20555

February xx, 1989

NRC INFORMATION NOTICE NO. 89-XX: GUIDELINES FOR ASSESSING INDICATIONS OF EQUIPMENT TAMPERING/SABOTAGE

Addressees:

All holders of operating licenses or construction permits for nuclear power reactors.

Purpose:

This information notice is being provided to assist addressees in planning for events involving indication of possible sabotage. If such an event occurs, whether accidentally or intentionally initiated, judgments must be made regarding potential consequences of the event and the corrective actions necessary to eliminate the initiating conditions and minimize the consequences. It is expected that recipients will review the information for applicability to their facilities. However, suggestions contained in this information notice do not constitute NRC requirements; therefore, no specific action or written response is required.

Description of Circumstances:

Nuclear power reactor licensees personnel have identified several instances of equipment tampering, for example, misaligned breakers or valves, cut wires or cables, or the placement of foreign objects in a piece of machinery or contaminating liquids in reservoirs or tanks.

Discussion:

In determining what actions are appropriate following an indication of sabotage or tampering at a nuclear power plant, the governing principle is to avoid undue risk to the public health and safety. In implementing this principle, all pertinent factors must be carefully examined to determine whether the condition resulted from an accident or from a deliberate act of vandalism, malicious mischief, or sabotage. If judged to be an attempted act of radiological sabotage, factors such as sophistication, intent, and the possibility of other acts by the same person must be considered, as well as the event history of the plant.

In formulating any response action, the licensee should consider potential safety consequences of such actions and the condition of the plant. Before making any change in the operating status of the facility, the licensee should consider the basis for the change and its potential for mitigating or compounding the situation. As a general rule, the public health and safety are probably best served by initially maintaining a stable mode of plant operation as the transients caused by changes in plant status could contribute to a reduction in plant safety. In addition, contingency plans and other measures need to be initiated to correct the condition and prevent further acts while the facts of the matter are being fully assessed.

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Because each plant situation is unique, hard and fast rules for dealing with attempted sabotage do not seem practical. However, some general guidelines appear appropriate in most circumstances.

A. Evaluation of a Tampering/Sabotage Event

After potential or actual sabotage or tampering has been identified, it is necessary to gather sufficient facts to permit a clear understanding of the significance of the identified sabotage or tampering.

Some of the factors that should be considered in gathering this information are as follows:

- The event may prevent a safety system from performing its intended function.
- The event may prevent a system designed to prevent or mitigate the consequence of malfunction from performing its intended function, resulting in a possible release of radioactive material.
- The event may cause a safety system failure only if multiple other events occur.
- The event may prevent a system designed to support a safety system, from performing its intended function.
- There are no apparent safety implications.

Three factors should be considered in determining the probability of a malevolent act, as opposed to an accidental occurrence:

1. OVERTNESS - Sometimes by the act itself, it is obvious that an act of sabotage has been perpetrated; but more often than not the cause of an event is not obvious. The cause could be misaligned valves, for example. In such cases, the following criteria should be used in determinine whether sabotage occurred.

   a. Physical evidence clearly related to the event, for example, the lock to a valve is cut and the valve misaligned; or the actuator to the motor control valve is shorted.

   b. Physical evidence tangentially related to the event, for example, the door to the vital areas (VA) is forced open and the valve is misaligned.

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c. Circumstantial evidence clearly related to the event, for example, the lock and chain are missing and the valve is misaligned.

d. Circumstantial evidence tangentially related to the event, for example, the key to the VA door is missing and the valve is misaligned.

e. No evidence of deliberate manipulation of equipment.

2. INTENT - Some inferences concerning the intent of the adversary can be drawn from analyzing the safety significance and the overtness of the act. In addition, intent can be determined by other means, the most obvious being a communicated threat.

a. A communicated threat is received before the event.

b. A communicated threat is received, and circumstantial evidence relating to the event exists.

c. A communicated threat is received, but no other evidence (physical or circumstantial) exists. No event occurs.

d. No communicated threat is received.

3. HISTORY - The historical significance of an event should be evaluated using the following criteria:

a. History of recent similar events escalating in safety significance.

b. History of random events with no escalation in safety significance.

c. History of vandalism relating to labor/management problems.

d. No previous events.

An analysis of the above factors may lead to a conclusion about whether the act was willful or accidental. When overtness is judged to be low, and history is found to be low, the event may be less likely to involve sabotage. If the evidence is not conclusive or if the event is determined to be accidental, the appropriate corrective action to prevent recurrence and to mitigate the consequences should be taken.

If the event is determined to be an act of sabotage or, after evaluation of the previous factors sabotage cannot be ruled out, a judgment must be made regarding the level of sophistication of the event and the consequences intended by the adversary. Some inferences regarding the adversary's capability can be drawn from the safety significance of the target. If the adversary's capability is evaluated as being high, the potential to do significant damage is great; therefore, the level of sophistication of the event is a critical element in the decision. Evaluation of the following factors may provide some insight regarding the level of sophistication.

4. Level of Sophistication

a. Target selection and timing clearly demonstrate an intention to cause consequences to the public health and safety. A high degree of knowledge of the plant, and the sabotage scheme demonstrate a high level of professional capabilities (expert employment and most advantageous location of explosives or installation of a jumper that would nullify the safety function of a vital component).

b. Evidence indicates an intention to cause consequences to the public health and safety and a sophisticated sabotage method is used but target selection and timing demonstrate limited plant knowledge.

c. Target selection and timing indicate poor knowledge of plant; a crude sabotage method is used.

-- After consideration of the above factors, a response action should be taken that is commensurate with the potential safety consequence of the act and the sophistication level of the adversary. The following is a list of possible response actions; one or more of these measures may be needed:

° Contact the FBI to request their assistance in investigating the incident and provide technical assistance to the FBI as requested.

° Ensure that effective coordination and communication exists between plant operations and security personnel during the FBI investigation.

° Identify which tampered/sabotaged equipment has had recent maintenance performed and who performed it.

° Identify by computer check (if feasible) the personnel who had recent access to the areas in which tampering/sabotage occurred.

° Increase security measures for areas of concern to include additional access controls and increase vital area patrols for the rest of the plant until the investigation is completed and the perpetrator removed.

° Designate a senior manager as the point of contact to assist and coordina support and respond to inquiries pertaining to the investigation.

° Review recent personnel problems or issues for indications of disgruntlement.

° Initiate accelerated functional testing.

° Establish limited two-man rule for area in which event occurred.

° Establish total two-man rule for all vital areas in the plant.

° Consider controlled shutdown.

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- Initiate controlled shutdown following the approach in the technical specifications and operating procedures, for example, ensure availability of required systems before proceeding from one operating system to the next.

With an understanding of the identified sabotage, it is then appropriate to establish an initial search of the associated or suspect systems. The resulting information then will be the basis for determining subsequent action. Clearly, the extent to which the plant is checked (i.e., items B and C or D below) depends on judgment regarding indications of further sabotage found during the checkout.

B. Overall Inspection of Plant

As set forth in item A, "Evaluation of Tampering/Sabotage Event," the conduct of search and equipment check should include a check of the overall plant and then a system-by-system inspection, as appropriate.

The overall plant and system-by-system listings reflects a "hands-on" approach in checking out a nuclear power plant in instances of suspected sabotage. The assumption is made that the plant technical specifications would be satisfied before justification of continued operation or restart.

Before a system's checkout based on the listing in items C and D below, a broad inspection of the plant should be made by the licensee. This inspection should be largely visual and consist of the following four main categories:

1. Control room inspection
2. Plant structures inspection
3. Piping and valve walkdown inspection
4. Confirmation of electrical power integrity

This broad inspection should be initially performed to spot any major abnormality such as a damaged pipeline or a planted explosive. It should not be programmed to detect all potentially faulted systems.

In the control room and other areas that contain vital electrical equipment, visual inspection should be made of all panels, boards, and inside cabinets to spot any obvious fault. Unauthorized jumpers and any strange "packages" should be spotted.

In the visual checkout of plant structures, the same general attitude should be appropriate. Abnormalities and foreign materials should be looked for. Plant structures include the main plant buildings, that is, the containment, the reactor building, the auxiliary building, the turbine building, and of course the intake structure or connection to ultimate heat sink.

The piping and valve walkdown inspection should involve the same perspective. This inspection should not seek to distinguish between safety-grade and nonsafety grade system piping. This inspection should simply consist of a routine patrol of all accessible piping runs in which the inspector is alert to the more obvious type of faulting. For example, the inspector should be able to "find" a cut chain of a "chained and padlocked" valve handle. On the other hand, the inspector should not expect to confirm valve alignment during this initial check.

Finally, the initial check of the electrical system should be made with the same general approach. It should seek to verify that the vital power suppliers were not "altered" in a significant way. The purpose of this check should be to make sure it was safe to turn power on for further checking of systems.

If preliminary determination of sabotage has been made and further investigation indicates that specific systems might be affected, it may be necessary to perform a complete walkdown inspection of certain systems, checking all accessible manual and motor-operated valve positions, circuit breaker and electrical switch positions, etc. Actual system walkdown inspections are especially pertinent with respect to standby systems whose operability cannot be completely demonstrated during normal plant operations. Checks in high radiation areas may be required depending on detailed consideration of the evidence of sabotage in these areas and as low as is reasonably achievable (ALARA) consideration.

If evidence of sabotage is found and specific components and systems are identified, consideration of the consequences of corrective actions should be made. A thorough determination of possible system response to corrective actions should be made and contingency plans to address these responses should be determined before corrective actions are taken.

Detailed examination of systems including those associated with the identified sabotage, may be necessary to establish the basis for continued operation.* The systems to be examined are listed in item C or D, as applicable. Following such a checkout, it then would be appropriate to confirm system operability throughout the plant using the technical specification requirements as the measure of safe operability. This conformance with technical specification requirements represents the overall criteria on which decisions may be made regarding changing the mode of reactor operations.

C. Boiling-Water Reactor (BWR) Plant Systems

1. Reactor System

   a. Vessel - check for obvious abnormal condition
   b. Vessel Level Instrumentation - condensing chambers, piping, differential pressure (DP) racks, and wiring

*If the plant is operating, operation should continue until sufficient checks have been made to ensure the plant can be shut down.

2. Reactor Recirculation System

    a. Piping
    b. Valves-discharge and suction
    c. Motor, pump, and controls
    d. Power supply motor generator (MG) set, cables, modules, and breakers
    e. Control cabinets, wiring, boards, and breakers

3. Control Rod Drive Hydraulic System

    a. Hydraulic control units (HCUs), directional control valves, isolation valves, and scram valves
    b. Piping throughout HCUs and scram discharge volume (SDV)
    c. SDV drain and vent valves and instrumented volume (IV) level switches
    d. Control circuitry - cables and boards
    e. Air supply - piping and valves, controls, and pilot valves

4. Standby Liquid Control (SLC) System

    a. SLC tank, level, and piping
    b. Pumps and motors, power supplies, and controls
    c. Valves, squib, and isolation
    d. Control circuitry, panels, cabinets, and cables

5. Residual Heat Removal (RHR) System

    a. Heat exchangers, primary side (shell), secondary side (tube), and service water
    b. Primary side low-pressure core injection (LPCI) pumps, motors, piping valves, isolation valves, drywell spray piping and valves, and torus spray piping and valves
    c. Other primary side piping and valves, that is, shutdown cooling and isolation cooling, where applicable
    d. Control circuitry, wiring, panels, boards, logic interconnections, power supplies, and control power supplies
    e. RHR Service Water System
        (1) Pumps, motors, and water supply structure
        (2) Piping and valves, isolation, and interconnections
        (3) Control circuitry, wiring, boards, and panels
        (4) Power supply, cable, breakers, and controls

6. Core Spray System

    a. Pumps, and motors
    b. Piping and valves, isolation valves, and check valves
    c. Control circuitry, wiring, panels, logic, and control power
    d. Power supplies, cable, breakers, and controls

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7. High Pressure Coolant Injection System

   a. Pump and turbine driver
   b. Piping, valves, isolation valves, and condensate traps
   c. Control circuitry, wiring, logic, and control power
   d. Turbine oil system, turbine control valves, and speed governor

8. Automatic Depressurization System

   a. Safety relief valves operability
   b. Control circuitry, wiring, timer, and logic
   c. Air or pneumatic accumulators, air supply check valves, and air supply piping

9. Reactor Core Isolation Cooling System*

   a. Pump and turbine driver
   b. Piping, valves, isolation valves, check valves and condensate traps
   c. Control circuitry, wiring, and logic

10. Diesel Generator System

   a. Day tanks and storage tanks
   b. Fuel oil pumps, motors, and piping
   c. Control circuitry, wiring, and logic
   d. Diesel air start and lube oil systems
   e. Generator protective devices and output interconnections (see electrical systems)

11. Containment Systems

   a. Primary containment isolation valves, including main steam isolation valves (MSIVs) and controls
   b. Primary containment inerting system piping, valves, controls, and sampling
   c. Suppression chamber water level
   d. Vacuum breakers - drywell (DW) to torus to reactor building
   e. Standby gas treatment system operability
   f. DW purge and vent valves control

12. Water Systems

   a. RHR service water piping, valves, pumps, and motors
   b. Emergency service water (if applicable) piping, valves, pumps, and motors
   c. Intake structure integrity
   d. Reactor building closed cooling water, and turbine building closed cooling water, and fuel pool cooling

*For earlier BWRs using an isolation condenser for this function, only the above items 9.b and 9.c are applicable.

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e. Circulating water system
f. Diesel generator cooling water system
g. Condensate and feedwater system, including storage tanks and demineralizers
h. Condensate-Feedwater piping, pumps, and valves
i. Feedwater heaters with associated piping and valves

13. Instrumentation and Control (I&C) Systems

a. Reactor protection system, boards, racks, relays, and complete control room check
b. Neutron monitoring system, including traveling incore probe (TIP) piping and valves and source range monitor (SRM), intermediate range monitor (IRM), and average power range monitor (APRM)
c. Process control interfaces
d. Engineered safety feature controls, and racks
e. Instrumentation and control (I&C) for safe shutdown, including control room habitability system
f. Other I&C - for example, fuel pool cooling, offgas monitoring, etc.

14. Electrical Systems

a. DC system supply and monitoring on 125-volt and 250-volt batteries and chargers, switchgear, and panels
b. Vital AC equipment including 4kv, 480-volt and 230-volt buses and switchgear
c. Vital motor control centers
d. Emergency lighting system
e. Remote shutdown control system
f. Cable spreading room

15. Compressed Air System

a. Compressors, accumulator tanks, and motors
b. Piping and valves
c. Control circuitry, and wiring

16. Main Turbine Generator

a. Turbine control system, including electrohydraulic oil system
b. Bypass valve controls
c. Generator protective systems

D. Pressurized-Water Reactor (PWR) Plant Systems

1. Reactor System

a. Reactor pressure vessel
b. Control rod drive mechanism above reactor vessel
c. Control and instrumentation for the reactor protection system (RPS) and the overpressure protection system

2. Reactor Coolant Systems (RCS)

   a. Primary and secondary coolant loop-piping, valves (including safety relief), instrumentation and control
   b. Reactor coolant pumps (RCP) and associated component cooling, including component cooling of lube oil coolers and component cooling valves and piping to containment penetration
   c. External steam generator, including safety relief valves
   d. Pressurizer, including power-operated relief valves (PORVs), associated control air (or nitrogen) supply, heater control and heater backup power supply, and valves and piping to pressure relief tank

3. Emergency Core Cooling System (ECCS)

   a. Accumulators and piping to RCS vent and isolation valves and nitrogen pressure and supply
   b. High head charging pumps, charging lines, boron injection tanks; all other safety injection pumps (i.e., intermediate head pumps, if applicable) and related piping and valve alignment (including manual isolation valves) to RCS
   c. Residual heat removal (RHR) system-heat exchangers, pumps, valves (including manual system isolation valve alignment), associated control circuitry, wiring, panels, interconnections, power supplies, and control power supplies
   d. RHR service water system, including pumps, motors, piping, valves (especially system isolation valves)
   e. Refueling water storage tank, associated isolation valves, and piping for ECCS pump suction
   f. Instrument and control racks for the entire ECCS system

4. Component Cooling System

   a. Component cooling pumps, heat exchangers, spent fuel pool heat exchangers, and water seal heat exchangers
   b. Special attention should be given component cooling for RCPs, emergency diesel generators, ECCS pumps, and associated isolation valves and piping

5. Instrumentation and Control

   a. Visual inspection and functional testing of RPS and engineering safeguards systems
   b. Visual check of instrument racks and wiring for RHR, auxiliary feedwater system, and shutdown systems
   c. Preoperational testing of SRMS, IRMS, and all other power level instruments
   d. Control room and auxiliary room ventilation system
   e. Instrument control air (or nitrogen) pressure valves and piping for safety systems
   f. Control room panels and cabinets

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6. Waste Disposal and Radiation Protection System

   a. Radiation monitors for service water discharge headers and plant vents
   b. Reactor coolant drain tanks, chemical and volume control system (CVCS) holdup tanks, and the waste holdup tanks, valves, piping and radiation alarms
   c. Waste gas monitor tanks, and valve line to service water system
   d. Gas decay tanks, analyzer tanks, plant vent valves lineup, and associated radiation monitors

7. Containment Systems

   a. Containment isolation valves, CVCS letdown lines, and MSIVs
   b. Containment pressure relief valves, purge exhaust valves and all other manually operated containment valves that are accessible
   c. Personnel and equipment access hatches
   d. Containment spray systems, piping, valves, instrumentation and wiring, pumps, heat exchanger and recirculation system sump pump and controls
   e. Hydrogen recombiner units, including the control panels and power supply
   f. Fan coolers with safety cooling functions and ice condensers (if applicable)

8. Electrical Systems

   a. Auxiliary power system, including 4160/480 vital buses, 125 volt DC control buses/battery and 120-VAC vital instrument bus
   b. Emergency diesel generator system controls, fuel oil, lube oil, tanks, and piping
   c. Cable spreading room

9. Main Steam System

   a. Associated relief valves
   b. Turbines, including lube oil system, bypass valves and generator protection systems
   c. Steam generator feedpumps and valve lineup through feedwater (FW) heaters
   d. Auxiliary feedwater system pumps and manual isolation valves

10. Spent fuel pool and fuel handling systems (i.e., if in refueling outage), including cooling system and level indications

11. Service water system, including piping, valves, pumps, and heat exchangers

12. Sampling system for appropriate systems, including isolation valves

No specific action or written response is required by this information notice. If you have any questions about this matter, please contact one of the technical contacts listed below or the Regional Administrator of the appropriate regional office.

Charles E. Rossi, Director
Division of Operational Events
Assessment
Office of Nuclear Reactor Regulation

Safeguards Technical Contact: Eugene W. McPeek, NRR
(301) 492-3210

Operational Technical Contact: Richard Lobel, NRR
(301) 492-1157

Attachment: List of Recently Issued NRC Information Notices

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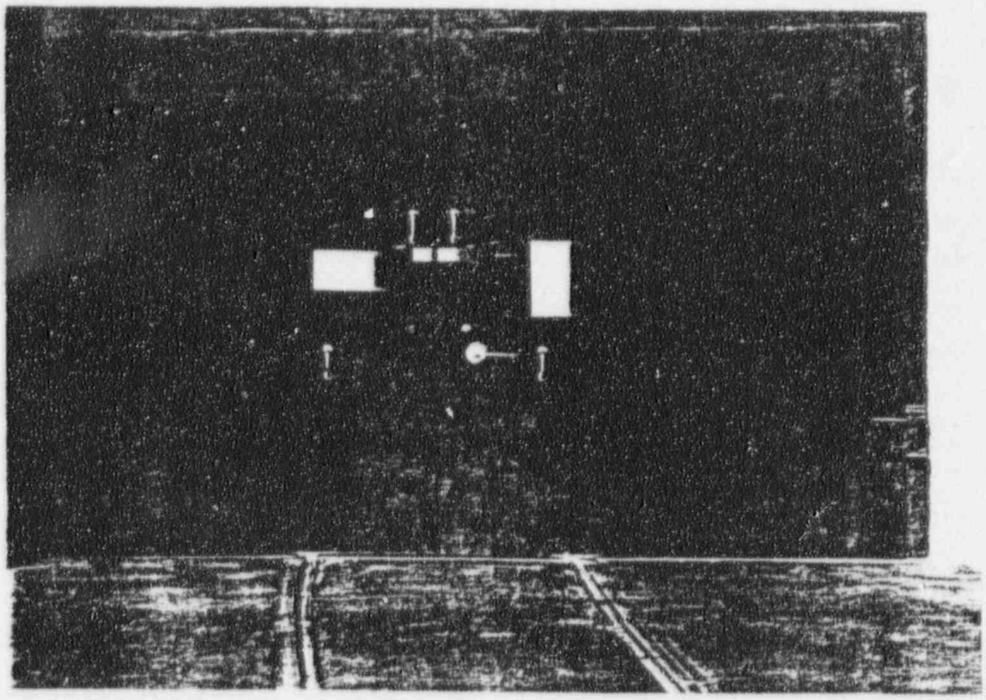
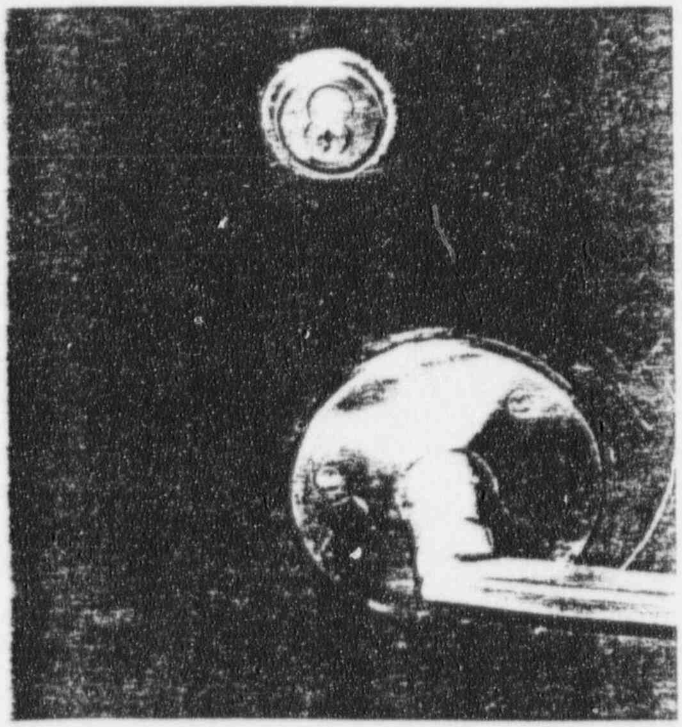


Photograph # 1

Unit Two Railroad Door (RB-69)

Lock Tampering, wire found in lock

FIGURE 1

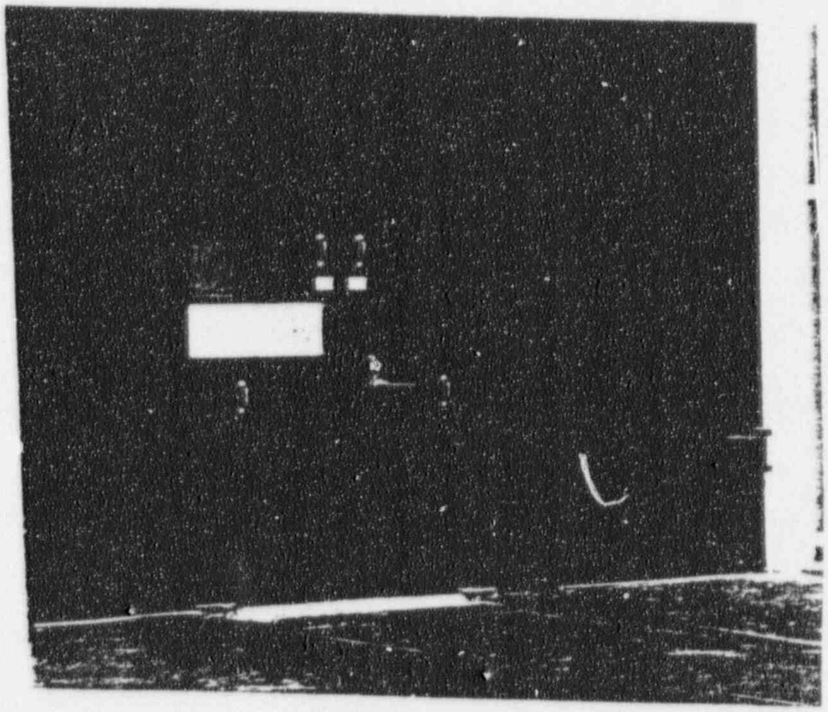


Photograph # 2

Unit Two Railroad Door (RB-09)

Lock Tampering, wire found in lock

Close-up

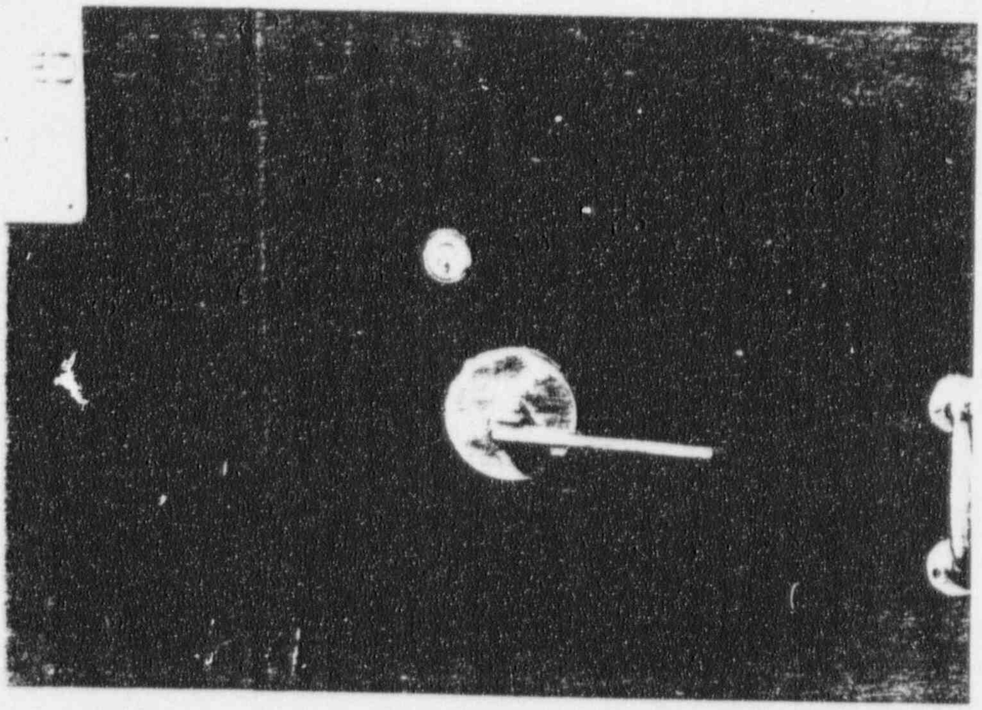


Photograph # 3

Unit One Railroad Door (RB-10)

Lock Tampering, wire found in lock

FIGURE 3



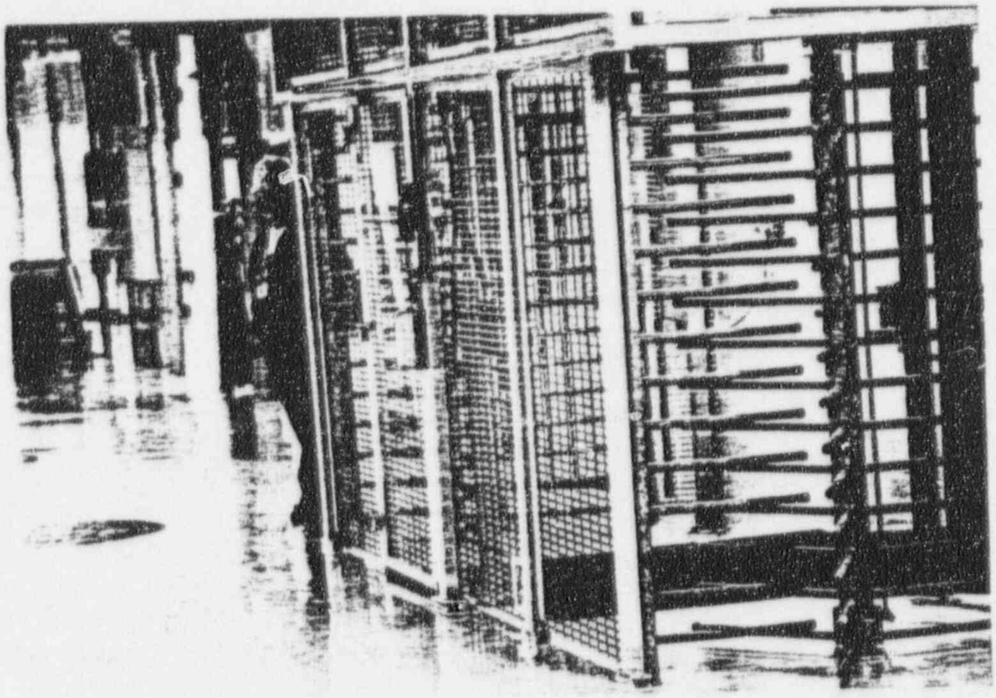
Photograph # 4

Unit One Railroad Door (RB-10)

Lock Tampering, wire found in lock

Close-up

FIGURE 4

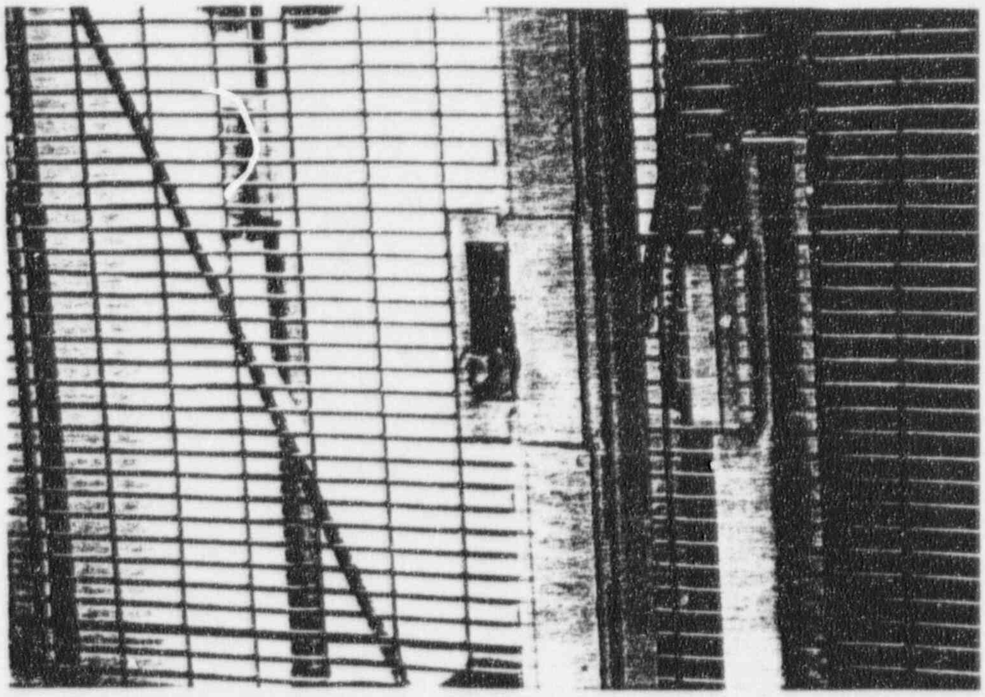


Photograph # 6

Unit One Reactor Building Entrance

RB-14, RB-15, RB-16

FIGURE 5

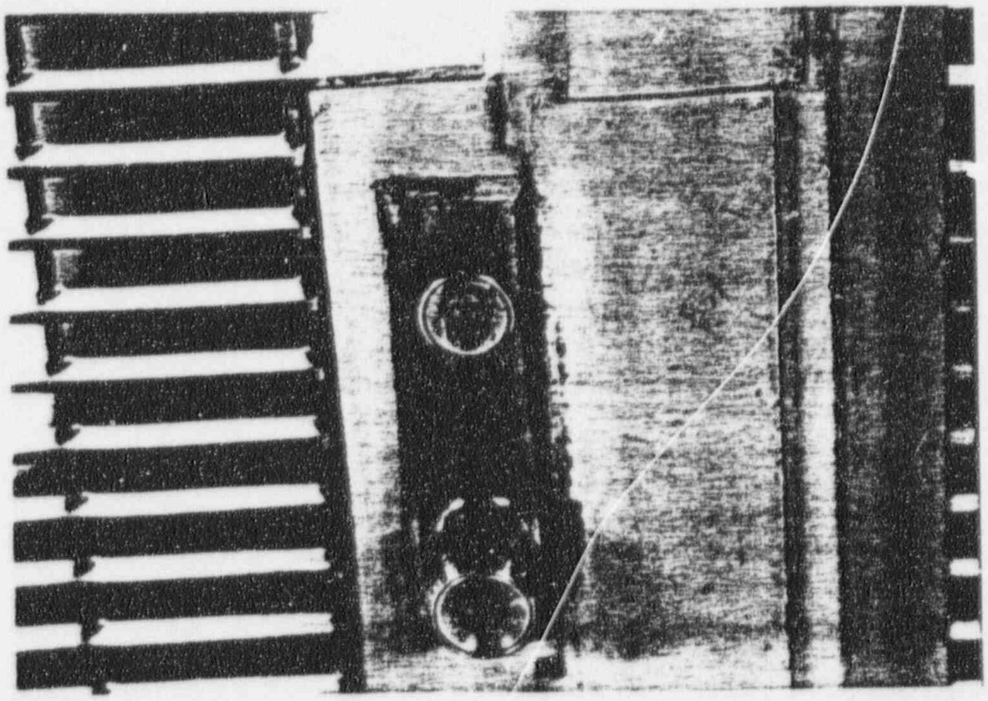


Photograph # 7

Unit One Mantrap Entrance (RB-16)

Wire found in lock

FIGURE 6



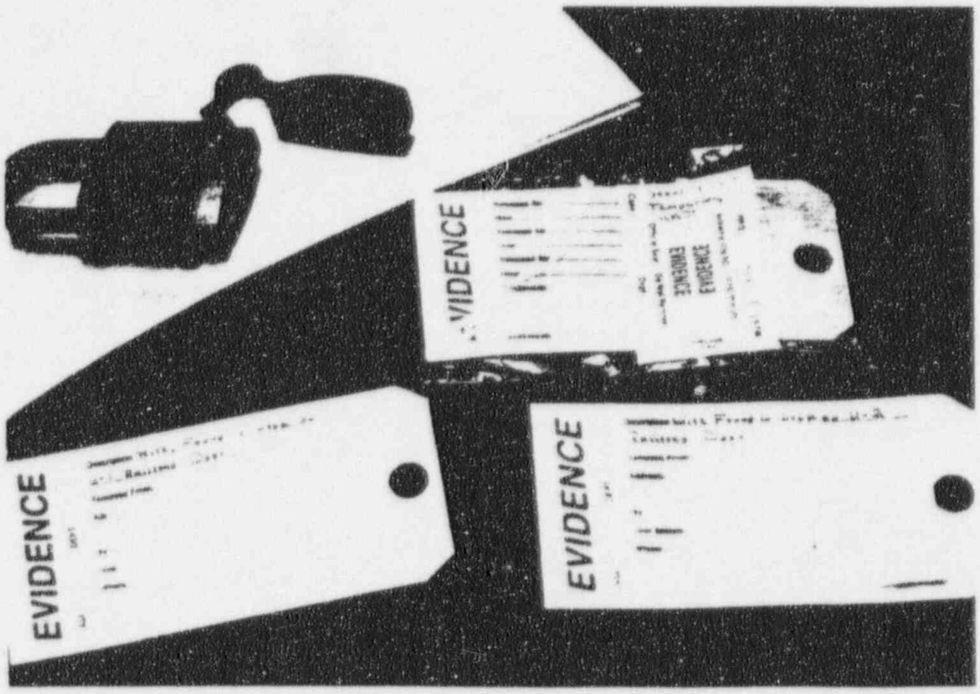
Photograph # 8

Unit One Mantrap Entrance (RB-16)

Wire found in lock

Close-up

FIGURE 7



Photograph # 10

Wire found in locks. Evidence

FIGURE 8