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SUBJECT: TRIP REPORT FOR PEACH BOTTOM SITE VISIT REGARDING WRONG UNIT/WRONG TRAIN EVENTS

Members of a NRC team visited the Peach Bottom site on July 23-26, 1985 as part of a short-term effort to determine whether simple, low cost improvements can be identified and implemented to reduce the frequency of wrong unit/wrong train events occurring at nuclear power reactor facilities. The following is a summary of the staff's visit.

Site Visit Agenda

The discussions and in-plant observations centered around two wrong unit/wrong train events that occurred at Peach Bottom between 1981 and 1985. The LER numbers for Peach Bottom are 278-81-008 and 85-008. During this site visit, the NRC team inspected the locations of the reported wrong unit/wrong train events to the extent possible, and discussed the events with plant management as well as many of the individuals directly involved with the event. Enclosure 1 provides the sequence of events resulting in the LERs at Peach Bottom, the licensee's conclusions regarding the event, and NRC staff observations. During the visit the licensee's staff was asked to provide any available information on events that were not reportable but that involved the wrong unit or the wrong train. This information is also discussed in the enclosures.

General Observations At Peach Bottom

Critical Equipment Monitoring System (CEMS)

Discussions with the licensee's staff revealed that the Peach Bottom facility is in the process of implementing the CEMS to address the needs of operations personnel. The CEMS labels use a unique code description for each component and a computer-readable bar code. To this point, implementation of the system has been limited to the assignment and installation of component labels, primarily on valves. Of approximately 40,000 manual valves, 13,000 have been labeled. When fully implemented, the CEMS will include breakers using the existing breaker numbers but adding unit and system designations. A plant operator will be able to verify that he has located the proper piece of equipment in the plant by utilizing a hand-held computer terminal capable of reading bar codes. The

CEMS will be used during surveillance and permits and blocking activities. It will also be utilized in monitoring system status because the hand-held terminal will have the capability of receiving input on component positions (e.g., valve open or breaker closed) from the plant operator as he varies component status in the plant. The status of automatic systems will have to be manually fed into the CEMS upon actuation. The CEMS will also eventually be used to generate permits for blocking tasks.

The licensee's staff indicated that the implementation of the CEMS is very involved and time consuming because the assignment of unique identifiers to components requires that associated plant documentation be modified as well. Such documentation includes procedures, check-off lists, prints and drawings, and training materials. The plant drawings and prints present a special problem because changes on one print may affect as many as 400 associated documents. The licensee's staff indicated that two solutions seem feasible for addressing this problem: (1) develop a cross-reference of numbering systems, and/or (2) develop separate CEMS drawings for use by operators.

Another difficulty impeding full implementation of the CEMS is the computer hardware and software currently being used at Peach Bottom. The computer hardware and software being used with the CEMS is a few years old and is relatively slow in processing data. The licensee's staff indicated that the time lag between the data being sent via the hand-held terminal and receiving a response from the computer is as much as 15 to 30 seconds. The staff went on to say that this delay would increase the time to complete tagging and surveillance activities by two to three times. The hand-held terminal is bulky and because communications between the computer and hand-held terminal utilize radio transmissions, "dead" spots in the plant and interference from other transmissions are worrisome.

The licensee's staff indicated that operator satisfaction with the system could be expected to be poor unless these problems are ameliorated. Work is underway to improve the hand-held terminal and to acquire a more "state-of-the-art" data management system. When these concerns are corrected, the CEMS could provide an efficient operations and management tool.

Incident Investigations

According to information provided by the licensee's personnel, no investigation into root cause is conducted beyond identification that a personnel error was made. The licensee's personnel indicated that more thorough investigations are conducted during industrial accident reviews.

Color Coding

Peach Bottom Units 2 and 3 are not physically differentiated by a color code. However, the licensee's staff indicated that some procedures are color coded to differentiate between the Units, with Unit 2 procedures

being yellow and Unit 3 being green. In addition, locked valve keys are different for each Unit. Color coding is also applied to valve stems on safety systems. The stems are painted green if their normal position is locked closed and red if normally locked open. Such painting makes surveillance activities easier.

Labeling

Component labeling at Peach Bottom currently employs plastic-type engraved labels, hung from a metal chain for valves, that provide unit, system, and item designation. The licensee's staff indicated that these labels do tend to get brittle and dirty (see Figure 3). Peach Bottom is currently in the process of installing CEMS labels (discussed above) which are expected to rectify these concerns (see Figure 4). However, the currently used CEMS labels are susceptible to high temperature degradation, a problem the licensee is working to address. The NRC staff's limited tour of the Peach Bottom facility found most valves and open components labeled with the exception of a group of valves (see Figure 3).

Exit Meetings

Prior to leaving the site the NRC team expressed its appreciation to the Peach Bottom staff for their cooperation.

One additional point needs to be stated. The Peach Bottom plant management did not appear to be prepared for the staff's visit. The staff, fortunately, was able to obtain needed information on the second day of the visit from two training coordinators. The meeting with the training coordinators had not been planned by the licensee prior to the staff's arrival although we believe that we indicted our desire to meet with such personnel prior to this visit (Letter to S. Daltroff (PECo) from G. Gears (NRC) dated May 29, 1985 and Letter to W. Alden (PECo) from G. Gears (NRC) dated June 26, 1985).

If you have any questions concerning this trip report please contact me at 301-492-8362. This letter is for your information only and no response is expected.

Sincerely,
Original signed by

Gerald E. Gears, Project Manager
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Enclosures: As stated

cc w/enclosures: See next page

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ENCLOSURE

WRONG UNIT/WRONG TRAIN EVENTS AT PEACH BOTTOM

1. LER-278-81-008 -- CAD Line (Wrong Train)

The following event information was provided by the licensee in the LER:

"During the installation of a new penetration test connection to a 1" containment atmospheric dilution line (CAD), primary containment integrity was breached for a short time. With the unit at full load, a safety block was applied to a portion of the CAD system to install a new test connection. A section of the 'A' loop CAD system piping to be modified should have been isolated by closing the manual valve between containment and the location where the pipe was to be cut. Due to an incorrect location identification for the manual valve on a system check-off list, the manual isolation valve was closed on the 'B' CAD loop instead of the isolation valve on the 'A' loop. The construction work force then proceeded to cut the 'A' loop piping and to install a new welded tee connection. The slight differential pressure which existed between primary containment and secondary contrainment alerted the craftsmen to the problem...

"The occurrence was due to improper designation of valve location on a system procedure which resulted in an operator being directed to close a manual isolation valve on the incorrect loop. The isolation valves in the location did not have identification tags...

"Operability of the 'B' CAD system was re-established within one hour. The equipment locations on the incorrect system check-off list have been corrected and identification tags have been installed on the manual isolation valves."

The licensee's staff that were interviewed indicated that they were unaware of any investigation, additional to the LER process, conducted to identify the possible contributors to the event. The involved personnel were not available for an interview. However, the licensee's staff indicated that possible contributors to this event include the lack of labels on valves, an incorrect system check-off list providing wrong location identification for the manual valve, and a confusing CAD system design. On Unit 3 the "B" CAD system injects into the "A" loop of the RHR system, which enters containment through the "B" penetration. The same logic applies to the "A" CAD system. However, on Unit 2 the "A" CAD system injects into the "A" loop of the RHR system, which enters containment through the "B" penetration (Unit 3 was the "A" penetration). When working on Unit 3, the operator closed the manual isolation valve on the "B" loop instead of the isolation valve on the "A" loop.

2. LER-278-85-008 -- Torus Test Bypass Valve (Wrong Component)

The following event information was provided by the licensee in the LER:

a. "On March 13, 1985, at 9:45 a.m., with Unit 3 operating at 90% power, System Procedure S.3.3.L., "High Pressure Coolant Injection (HPCI) Turbine Test Slow Start", was being used to operate the HPCI turbine. The procedure requires that the HPCI pump take suction from the Condensate Storage Tank (CST) and discharge back to the CST. During the valve lineup, the control room operator mistakenly opened the torus test bypass valve (MO-3-23-31) rather than the CST test return valve. This resulted in approximately 37,000 gallons of water from the CST being pumped into the torus. The torus water level increased from 14.8 feet to 15.3 feet, 0.4 feet above the technical specification limit. When the valving error was discovered, the operator closed the discharge to the torus and shut off the HPCI turbine. The torus filter water pump was used to return the suppression pool water inventory to the proper level within 6 hours...

"This event was caused by failure to follow procedures. The procedure (S.3.3.L) requires the CST test bypass valve MO-3-23-24 to be opened, but the licensed operator mistakenly opened the torus test bypass valve MO-3-23-31...

"The HPCI turbine was shut down and the torus filter water pump was used to reduce the torus level to a value within the technical specifications limit within six hours. The operator received prompt disciplinary action following the event."

The licensee's staff that were interviewed indicated that they were unaware of any investigation, additional to the LER process, conducted to identify the possible contributors to the event. However, the licensee's staff indicated that the individual involved was a relatively new operator with less than six-months experience at the time, and that his inexperience may have contributed to the error.

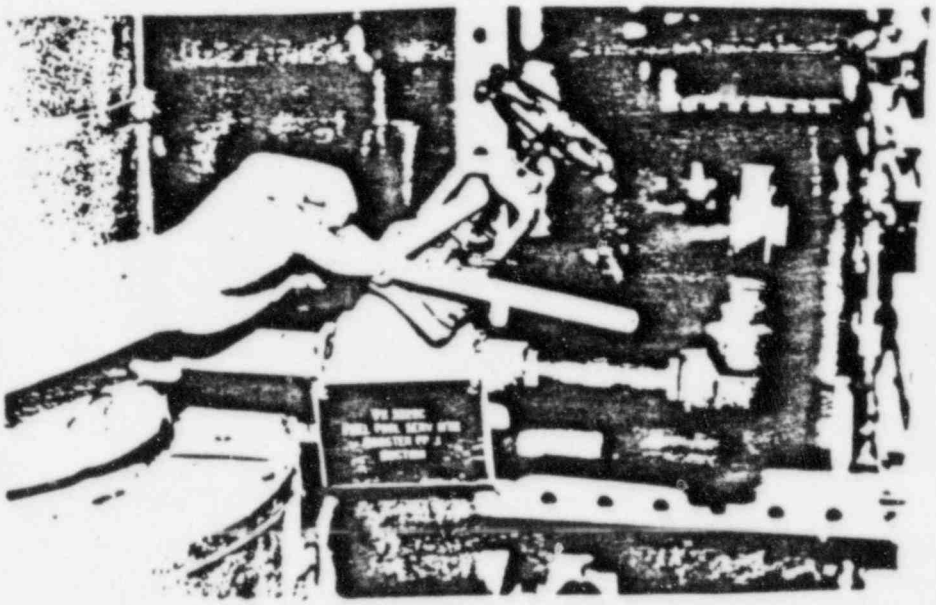

FIGURE 3 ENGRAVED LABELS AT PEACH BOTTOM

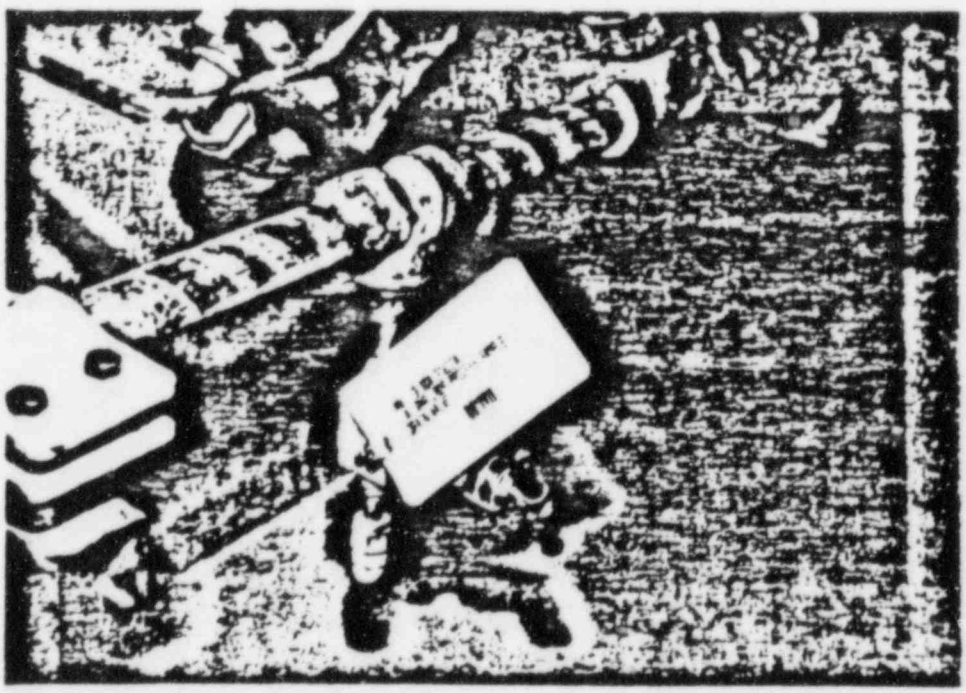

FIGURE 4 CEMS LABELS AT PEACH BOTTOM