

INVESTIGATIVE REPORT

MATTER INVESTIGATED BY:

The allegations indicated in this report were investigated at Oyster Creek by TMI Nuclear Security Agent, Brian R. Frantz, Security Analyst III, Francis Coppinger, and TMI Site Protection Supervisor, Jonathan F. Steiner.

George Hicks, Oyster Creek Engineering Assistant III, Operations Quality Assurance, and Robin Brown, Radwaste Operations Manager provided technical expertise to the investigators. Site Protection Supervisor, Rocco Pezella and Senior Site Protection Supervisor, Richard Ewart provided security computer keycard data. Richard Nash, Technical Analyst Senior I, provided radiation work permit (RWP) data.

ALLEGATIONS:

- 1) Condensate Demineralizer Log sheets were not completed as required. The following specific allegations were made regarding these logs:
  - a) On February 24, 1992, the 1200 (noon) readings were not recorded as of 1615 hours that day.
  - b) On February 25, 1992, the 0800 readings were not recorded as of 1205 hours that same day. A review of this log on February 26, 1992, showed all readings had been completed.
  - c) On February 26, 1992, the 1200 hours and 1600 hours readings were

not recorded as of 1630 hours that same day.

- 2) One operator on one intake area tour recorded information on the Intake Area Tour Sheet which reflected actions not actually performed or conditions not actually observed. The following specific allegations were made regarding one individual's intake area tour:
  - a) At the breathing air purifier, the nuclear plant operator assigned to the tour recorded readings for the purifier filter differential pressure, and the purifier particulate filter differential pressure, but had not been observed climbing on the piping and behind the purifier to position himself such that the gauges could be read.
  - b) Also, at the breathing air receiver, the nuclear plant operator assigned to the tour recorded his initials in the space which indicated that he performed a blowdown on the air receiver, when in fact he had not performed the required task.
  - c) The nuclear plant operator failed to perform annunciator tests on three of the four circulating water pumps as required by the Intake Area Tour Sheet, but the operator indicated that all four annunciator tests were performed by writing "SAT" (satisfactory) in the space provided.
  - d) The nuclear plant operator did not perform an inspection of the chlorination pumps and piping area for leaks in the chlorination building as required by the Intake Area Tour Sheet, however the operator placed his initials in the space provided on the tour sheet

indicating that an inspection was performed.

- e) The nuclear plant operator did not perform an operability test of the intake screen trash rake, but indicated that a test was performed by placing a "Y" in the space where the tour report asks, "Trash rake operable (Y/N)."

SOURCE:

The allegations were brought to the attention of Oyster Creek Operations management by members of Company 1, who were at Oyster Creek conducting an evaluation of nuclear plant operations from February 24, through March 06, 1992. The allegations were brought to the attention of GPUN Security on March 06, 1992, by Oyster Creek Vice President/Director, John J. Barton.

Specific Company 1 personnel who made the observations which led to the allegations were not available for interview. In lieu of conducting interviews with Company 1 personnel, Company 1 provided typed observation outlining the observations and allegations. The observations did not provide the names of employees for which observations were made and problems noted, or the dates of observations. On March 30, 1992, near the conclusion of the initial phase of the investigation, three Company 1 personnel, (C3), (C4), and (C2) were interviewed in an attempt to confirm dates and names gleaned from the investigative process. The Company 1 personnel confirmed the dates for the observations of the condensate demineralizer logs, but did not confirm or verify the names of any Company 1, JCP&L or GPUN personnel involved with the allegations. When questioned about any other concerns which may not have been indicated in the observation, (C3) spoke for the group and stated that all the Company 1 concerns were addressed in the observations. Sander Levin, Oyster Creek Operations and Maintenance Director was present during this discussion with the Company 1 team leaders.

SCOPE OF THE INVESTIGATION:

• Applicable Laws/Rules/Regulations/Procedures and Other Requirements:

- 1) Oyster Creek Nuclear Generating Station Procedure, Number 106, "Conduct of Operations", Revision No. 62
- 2) Plant Operations Department Work Performance Standard, signed by Robert Barrett 12/19/91,
- 3) Oyster Creek Operator Concern Program Statistical Data (Exhibit 1)

• Persons Interviewed:

A total of (41) personnel were interviewed during the investigation.

Those employees interviewed who are employed by Jersey Central Power and Light (JCP&L) are members of the International Brotherhood of Electrical Workers (IBEW) Union local 1289. During the interviews, the IBEW members were afforded the opportunity to have a union steward present, and all but one nuclear plant operator, (NPO11), elected to have union steward representation. (U1) or (U2) provided this representation during these interviews. (U3), IBEW local 1289 president was present for the interview of (NPO15).

In addition to the interviews, daily debriefings were held with John Barton and/or Sander Levin. NRC Region I Management was also debriefed on the progress and findings of the investigation on Wednesday, March 18, 1992, and Thursday, March 26, 1992.

• Other Relevant Documents Reviewed:

- 1) Operations Shift Schedule for 1992
- 2) Quality Assurance Monitoring Reports of Equipment Operators, (Nuclear Plant Operators) for 1988, 1989, and 1991.
- 3) Security Computer Keycard listing for (NPO3) on February 25, 1992.
- 4) Security computer keycard listing for (C1) (SIC) (C1) February 25, 1992.
- 5) Radiation Work Permit List for RWP 920096, for February 25, 1992.
- 6) Radiation Work Permit List for Company 1 personnel. RWP 920184, for February 25, 1992.
- 7) Training Content Records for the following training programs:
  - Lesson Title: Job Description and Job Related Documents, 6231-PGM-2620-01
  - Lesson Title: Admin. Proc. 108 and 108.1, "Equipment Control", 6231-PGM-2620-02
  - Lesson Title: Logs and Logkeeping Practices 6231-PGM-2620-03
  - Lesson Title: Tours 6231-PGM-2620-04
  - Lesson Title: Turnover 6231-PGM-2620-05
  - Lesson Title: Modification Overview, 6231-PGD-2612-02
  - Lesson Title: Administrative Procedure 106, 6231-PGD-2619-.0007
  - Lesson Title: Administrative Procedure Review, 6231-PGD-2621-.0005
- 8) Intake Area Tour Sheets (Winter) from January 01, - March 08, 1992.
- 9) Condensate Demineralizer Logs from February 01, - March 08, 1992.
- 10) Employee Performance Reviews for (NPO5) dated 2/22/89, and 04/08/90.
- 11) Employee Performance Reviews for (NPO10) dated 03/08/89, 02/19/90, and 08/13/90.
- 12) Control Room log for the 0800-1600 shift on February 25, 1992.
- 13) Training Summary Records for Equipment Operators (Nuclear Plant

Operators) during the 89-91 Training Cycle, which covered the periods of 07-03-89 through 12-20-91.

- 14) Memorandum dated March 9, 1992, RE: "Compliance to Policies Standards and Procedures" from J. J. Barton to all Oyster Creek personnel.
- 15) Action Plan to Address Allegations Regarding Falsification of Operator Tours, received from Robert Barrett on 03/27/92.
- 16) Job Description for Nuclear Plant Equipment Operator, JoB No. 162, dated 4/16/86.
- 17) Job Description for Nuclear Plant Operator, Job No. 160, dated 09/10/90.

- Physical Evidence:

None

- Other:

On March 09, 1992, George Hickey provided a guided tour for Brian Frantz, of the areas addressed by the Company's allegations and explained the operation of each specific system.

- Investigation Results:

On March 09, 1992, the GPUN Security Department was requested to conduct an investigation at the Oyster Creek Nuclear Generating Station regarding alleged falsification of nuclear plant operator log and tour reports. This request was initiated by John J. Barton, Oyster Creek Vice President/Director, who requested a formal meeting on Monday, March 09, 1992.

On March 09, 1992, B. Frantz met with J. Barton to discuss the allegations. J. Barton stated that during the weeks of February 24-29, and March 01-06, 1992, Company 1 conducted an evaluation of nuclear plant operations at the Oyster Creek facility. Company 1's purpose is to review the current operating practices of a facility, identify problem practices and make recommendations for improvement. During this meeting, J. Barton provided a draft c . . . Company 1's observations, dated March 1992. The Company 1 observations identified anomalies which require response by cognizant operations management. In addition, several anomalies identified by Company 1 suggested the potential falsification of nuclear plant operator logs and/or reports which document of required operator plant tours. The specific information relative to Company 1's perception of document falsification is identified below.

Some equipment operator logs were not completed as required. For example the condensate demineralizer logs are required to be taken every four hours. It was noted for four consecutive days these logs were not completed as required. Some logs entries were not accurately taken, such as:

- blowdown of the breathing air receiver tank
- breathing air purifier filter delta P
- breathing air purifier particulate filter delta P
- annunciator alarm test on the number 2, 3, and 4 circulating water pumps
- operability test of the intake screen trash rake
- inspection of the chlorination system for leaks and housekeeping

Although these observations identified specific logs, tour reports, and plant systems in which the potential falsification was directed, they did not identify the names of personnel or dates on which these allegations were based. In addition,

there was no indication of which Company 1 personnel observed the questionable activities. J. Barton indicated he would attempt to determine if the security investigators could interview Company 1 personnel who made the observations.

Prior to the termination of this meeting, J. Barton was requested to provide an individual from the Quality Assurance Department (QA) to assist with the technical aspects and understanding of the plant systems in question. In response to this request, George Hicks, Engineering Assistant III was assigned to provide the necessary assistance.

On the afternoon of March 09, 1992, B. Frantz met with George Hicks and began a discussion of the allegations and systems identified by Company 1. George Hicks has an extensive background in both fossil and nuclear plant operations. Hicks started his career with Jersey Central Power & Light during January 1958. Hicks spent seven years as an equipment operator at a fossil fueled plant, and began working at Oyster Creek in 1966 as a lead control room operator "A". Hicks remained in this position until 1974 when he became a Group Shift Supervisor (GSS) in the Operations Department. Hicks remained a GSS until April 1986, when he moved into the Quality Assurance Department. Hicks has been assigned to Operations QA from April 1986 until the present time. G. Hicks provided a tour and explanation of the following systems: Joy breathing air system, condensate demineralizer system, chlorination system, circulating water pumps, and the intake area trash rake. G. Hicks indicated that all the systems identified above except the condensate demineralizer system are part of the intake area tour, performed by the nuclear plant operators. The condensate demineralizer system is a part of the turbine building tour also performed by the nuclear plant operators. NOTE: The nuclear plant operators are not licensed by the Nuclear Regulatory Commission.



G. Hicks provided the following information regarding nuclear plant operator duties and tours. There are a minimum of three NPO's to a shift who are assigned to a specific tour on a rotating basis. The three tours an NPO may be assigned to are the intake area tour, the turbine building tour, and the reactor building tour. Each tour requires that an operator enter specific areas, make observations, and record readings on their assigned tour reports. An operator assigned to the tour is required to make one complete tour of all areas, and a second tour which is used for comparative purposes, in order to determine if a system's status has changed. During and between tours, the NPO's may be assigned to other tasks such as resin transfers, tagging, raking the intake area grates for grass or debris and numerous other duties.

Based upon a review of the Oyster Creek operations shift schedule, the operations department is divided into six shifts. Each shift is comprised of one Group Shift Supervisor (GSS), at least one Group Operating Supervisor, a minimum of three control room operators and a minimum of three nuclear plant operators. Each shift is designated by letter, "A" through "F", and some shifts have more personnel than other shifts. Shifts A, B, C, and E, each have two Group Operating Supervisors. All but "B" shift has four control room operators, and all the shifts except "E" shift contain four nuclear plant operators. "E" shift has five nuclear plant operators. There are also three shifts, (A, B, and D) which each have a control room operator step 2, assigned to them. The work schedule provides for three daily shifts, 8-4, 4-12, and 12-8.

According to Oyster Creek Procedure 106, "Conduct of Operations," the following duties are outlined for each of the aforementioned positions. Section 3.6.1 indicates that the "Group Shift Supervisor shall be in charge of the operating personnel assigned to his shift, and, while on duty, is directly responsible for station operation and safety." Section 3.7.1, states the "Group Operating Supervisor shall be

responsible, under the direction of the Group Shift Supervisor, to perform those duties assigned to him. He is also responsible to the Manager Plant Operations for safe and efficient operation of the Oyster Creek Nuclear Generating Station." Section 3.8.1, shows the control room operators shall be responsible for the safe and efficient operation of the facility in accordance with Reference 2.2, (Oyster Creek Operating License and Technical Specifications) and station procedures. All three of the classifications are licensed by the Nuclear Regulatory Commission (NRC) to perform their duties. The Group Shift Supervisors and Group Operating Supervisors maintain senior reactor operator licenses, and the control room operators maintain reactor operator licenses. Section 3.9.1 states the "equipment operators (nuclear plant operators) shall be responsible to operate, monitor, and control all plant auxiliary equipment under the cognizance of the Manager Plant Operations in a safe and efficient manner." Equipment operators are not required to be licensed in order to perform their duties. Although these job descriptions are not all encompassing, they provide a basic understanding of each position responsibilities.

During the remainder of the week ending on Friday, March 13, 1992, intake area tour reports for the period of January 01, 1992 through March 08, 1992, were gathered and examined. In addition, condensate demineralizer logs from February 01 - March 08, 1992, were also reviewed. Also obtained and reviewed were Oyster Creek Nuclear Generating station Procedure 106, "Conduct of Operations", and Plant Operations Department Work Performance Standard signed by Robert Barrett on 12/19/91.

On Thursday, March 12, 1992, J. Barton provided an updated version of the Company 1 observations which provided more specific information than previously identified in the first set of observations. Although this information was more

specific, the updated observations still did not identify the personnel involved in the activities or the dates on which the incidents were alleged to have occurred. These updated observations were the basis for the allegations indicated at the beginning of this report.

After a careful review of the discussion in the observations concerning the condensate demineralizer logs, and comparison to the completed condensate demineralizer logs, it was determined that the three days that were referenced by Company 1 are February 24, 25, and 26, 1992. Because the dates could be established, the personnel who were responsible for the condensate demineralizer readings on these dates and shifts were also identified as follows:

February 24 0800-1600	(NPO12)
February 25 0800-1600	(NPO3)
February 26 0800-1600	(NPO10)
1600-2400	(NPO17)

In addition, during informal discussions with (M7), and (M6) it was learned that the one operator whom Company 1 accompanied on an intake area tour, and identified anomalies in the performance of his tour, was (NPO10).

After a review of all of the aforementioned logs, tour reports and procedures, the investigative approach taken was to interview those personnel previously identified, in addition to taking a random sampling of nuclear plant operators with varied levels of experience. The experience levels of qualified nuclear plant operators varied from three weeks to twelve years of experience in the position. All Group Operating Supervisors (GOS) and a random sampling of Group Shift Supervisors (GSS) were also selected to be interviewed. The group operating

supervisors have direct responsibility for the supervision of the nuclear plant operators. The group shift supervisors have overall responsibility for the shift operation and indirectly supervise the nuclear plant operators.

Specific questions were asked of the personnel interviewed, which had both a direct and indirect reflection on the allegations presented by Company 1. Each question asked of the interviewees is identified below in addition to the responses for the questions posed.

The nuclear plant operators were asked to provide a brief description of their job responsibilities. Overall, the NPO's provided the same job description during each interview, which identified them as the eyes and ears of the control room. In essence, they observe plant systems outside of the control room for any problems or readings which are out of specification. The NPO's are responsible for reporting to the group operating supervisor (GOS) or group shift supervisor, any problems encountered such as leaks, alarms, or unusual conditions. The NPO's also indicated that they rotate tour assignments on a daily basis. This means that during a typical seven day work cycle, each NPO will normally be assigned two tours of the intake area, turbine building and reactor building, but in any event, each operator would be responsible for a least one tour of each area during the week. The NPO's also indicated they were responsible for housekeeping of the areas they enter during a tour, ensuring that the areas are free of debris which may hinder their job or the job of another person who enters the same area.

The NPO's were questioned about the number of tours of a specific area (intake area, turbine building, or reactor building) per eight hour shift they performed. All (16) NPO's stated that they performed two tours with the following individuals adding qualifying remarks. (NPO5) said he performs a minimum of two

tours, while (NPO9) said he performs two tours unless problems arise which restrict him from completing two tours. (NPO9) added that he sometimes performs more than two tours of some areas. (NPO10) also said he performs two tours unless something comes up. (NPO12) stated he performs a minimum of two tours and (NPO14) stated he performs two complete tours.

All the NPO's were asked when they record readings (first tour, second tour, or both tours) and what the difference was between the two tours. All of the NPO's interviewed stated that they record their readings during the first tour of their assigned area. (NPO5) stated that the majority of readings are taken during his first tour of the area, but he may record readings during a second tour. (NPO12) stated he records readings on the first tour for all areas, and for the reactor building tour he is required to take a second set of readings and record them for the sumps.

The nuclear plant operators were queried concerning whether any other NPO had ever performed a portion of their respective assigned tour and supplied the information to them. Nine of the personnel ([NPO2], [NPO3], [NPO4], [NPO6], [NPO9], [NPO10], [NPO11], [NPO14] and [NPO15]) indicated that this had occurred while six personnel ([NPO1], [NPO7], [NPO8], [NPO12], [NPO13], and [NPO16]) said it had never occurred with them. One individual, (NPO5), indicated that it may have occurred, but they could not recall any instances. All the NPO's who indicated that someone else had performed portions of their tour, were asked who recorded the results on the tour paperwork and whether the second NPO signed the paperwork. All but one of the NPO's indicated that the person who assumes the tour duties would complete those portions of the tour paperwork which that second individual actually performed. In addition, the second NPO would also be responsible for signing the tour sheet on the last page of the tour packet. One operator,

(NPO10), said that other operators have supplied him the results of the fire pond portion of the intake area tour and he (NPO10) has recorded his initials (NPO10's) in the applicable spaces on the intake area tour sheet.

The nuclear plant operators were questioned about what they do if they are unable to perform a task or evolution, and why they take the action that they do when incidents of this nature occur. All (16) of the NPO's stated that they would notify their group operating supervisor. Eight of the personnel ([NPO1], [NPO2],[NPO6], [NPO9], [NPO11], [NPO13], [NPO14] and [NPO15]) stated they would also make a note of the nonperformance on their respective tour sheets. The other eight personnel did not make any mention of noting the nonperformance of a task on their tour sheet. Nine of the personnel ([NPO1], [NPO5], [NPO6], [NPO7], [NPO9], [NPO12], [NPO14] and [NPO15]) stated they knew to do this based upon the training they received. Three personnel ([NPO2], [NPO11] and [NPO13]) indicated that Procedure 106, has provided them the direction necessary to handle such situations. (NPO3) and (NPO10) related that the proper way to handle these type of situations was dictated by common sense. The remaining two individuals, ([NPO8] and [NPO16]) did not provide any specific reason why they notify their supervisor if they cannot perform a task or evolution.

In a follow-up to the last question, the NPO's were asked if they had ever forgotten to perform a task, and what they did if this had occurred. Seven of the operators ([NPO3], [NPO5], [NPO11], [NPO13], [NPO15] and [NPO16]) indicated that they may have forgotten or did forget to perform a task in the past. During these incidents, the individual realized the error and performed the task, or it was pointed out by the GOS or GSS and the NPO subsequently performed the task after this was identified to them. Six of the operators ([NPO1], [NPO2], [NPO6], [NPO7], [NPO8] and [NPO12]) said that they had not forgotten to perform a task. The

following individuals provided answers which were not absolute denials, but left open the possibility that they may have forgotten to perform a task or evolution. (NPO4's) response was "not to my recollection." (NPO9) stated, "Not that I recall." (NPO10) replied, "Not consciously, I don't think so."

The nuclear plant operators were also asked if they had ever not performed a task because they did not feel it was necessary or because they did not want to do it. Fifteen of the sixteen operators replied, No! One operator, (NPO7) stated that he was pretty thorough and to the best of his knowledge, he had not missed anything.

The NPO's were also questioned about their observations of the performance of other nuclear plant operators. Specifically, were they aware of any other nuclear plant operators who had not fully performed their job. All responses to this question were, "No!" The NPO's were also asked if they had a concern for the way other nuclear plant operators perform their jobs. All the operators replied, "No," to this question except (NPO9) and (NPO11). (NPO9) said he did not know what the other nuclear plant operators did because he did not supervise them. (NPO11) said there were some nuclear plant operators on other shifts who were not as thorough as his shift's NPO's. (NPO11) explained that these other operators do only what is required of them. (NPO11) did not identify who these "other operators" were. The NPO's on (NPO11) shift are (NPO7), (NPO15), and (NPO3). In order to determine if personnel felt comfortable with their abilities to perform their job, the NPO's were asked about their confidence level in their job performance. All (16) nuclear plant operators indicated they were confident in their ability to perform their job. (NPO3), who only had four weeks experience as a qualified nuclear plant operator indicated that there were some systems he did not feel as proficient on as others, but he did feel confident performing those duties listed on the three tour sheets. (NPO16), another recently qualified nuclear plant operator with three weeks of qualified

operator experience; several were still learning about several of the plant systems which are not a normal part of his everyday duties.

In follow-up to this last question, the nuclear plant operators were also questioned about their perception of the adequacy of training that GPUN provided them prior to assuming their duties and/or subsequent requalification training. The initial training that operators received varied with the time that they entered the nuclear plant operator (formerly known as equipment operator) program. The senior NPO's ([NPO5], [NPO10], [NPO12], and [NPO13]) indicated they entered the program when their training consisted of on-the-job training (OJT) provided by other qualified equipment operators and a final check-out by the group operating supervisor or group shift supervisor. This "check-out" consisted of each equipment operator demonstrating his/her understanding and operation of the individual systems for which he had responsibility. The nuclear plant operators who recently completed initial training, indicated their training consisted of approximately (18) months of classroom and on-shift training, coupled with a check-out by seven other nuclear plant operators for each of the three tour sheets and a final check-out by the group operating supervisor or group shift supervisor. All (16) nuclear plant operators said the training they received during initial and requalification training was adequate. Several of the operators rated the training good to excellent. (NPO5) said he would like to see more training on the background of plant systems, and (NPO13) stated that the NPO's should receive more training on new plant systems that the operators become responsible for checking. Overall, the nuclear plant operators were satisfied with the training they received.

One of the anomalies identified by Company 1 were the recording of readings for the condensate demineralizer logs not within the time parameters identified by the log. The condensate demineralizer log shows that the nuclear plant operators are



required to observe and record readings during the following time periods: 0400, 0800, 1200, 1600, 2000, and 2400 hours. Company 1 personnel reviewed these logs over a three day period (February 24-26) and noted that on February 24, the 1200 hour readings were not recorded as of 1205 hours, but these readings were recorded when the condensate demineralizer log was checked the following day, February 26. In addition, the February 26, 1200 and 1600 hour readings were not recorded as of 1630 hours.

The condensate demineralizer log is a one page document that permits the recording of readings for three shifts. A total of (22) readings are required to be recorded on the log unless a demineralizer is out of service. The log also contains spaces for the signature of the nuclear plant operator assigned to take the readings and are considered part of the turbine building tour. During a plant tour of the condensate demineralizer area on March 09, 1992, by B. Frantz and G. Hicks, the condensate demineralizer logs were observed to be located on the top of one of the condensate demineralizer panels. The condensate demineralizers are located in a radiologically controlled area (RCA) and require an employee to sign-in on a radiation work permit (RWP) in order to gain access to the area.

George Hicks explained the operation of the condensate demineralizer as a system that removes impurities from the secondary side water. By doing this, the water quality is maintained at a high standard and allows proper operation of the plant.

After review of the condensate demineralizer log for February 24, 1992, and comparison to the anomaly identified by Company 1, the Company 1 statement appears to be correct. The NPO on the 0800-1600 shift, (NPO12), did not record any readings for the 1200 hour time parameter. The 1600-2400 hour shift NPO, (NPO1),

mistakenly placed his first set of readings in the spaces provided for the 1200 hour readings, but realized his error, and lined out the readings and initialed at the top of the column for the 1200 hour readings. (NPO1) subsequently placed the readings in the correct column (1600 hours) on the log. Neither (NPO12) or (NPO1) were questioned during their interviews about this log because there was no indication of falsification.

Upon review of the condensate demineralizer log for February 25, 1992, and comparison to the anomaly identified by Company 1, several questions were raised concerning the issue. The nuclear plant operator assigned to take the readings on the 0800-1600 shift for the condensate demineralizers was (NPO3). (NPO3) was initially interviewed on March 16, 1992. During this interview, (NPO3) was asked what time he took and recorded the readings for the 0800 required check. (NPO3) strongly believed that he observed and recorded his readings for the 0800, check shortly after receiving his turnover from the NPO assigned to the midnight to 0800 shift. (NPO3) qualified this by stating that his relief informed him of a low temperature reading on the cooler outlet turbine oil system. (NPO3) said he wanted to be able to tell his Group Operating Supervisor at the shift briefing whether or not the temperature of the cooler outlet turbine oil system was still low, and therefore went to check this temperature reading. (NPO3) believed he took the condensate demineralizer readings between this time and his briefing with the GOS.

Since (NPO3) had to sign-in on an RWP in order to gain access to the condensate demineralizer panels, the computer records for RWP #920096, for February 25, 1992, were obtained and reviewed in order to determine what time (NPO3) signed-on the RWP. This RWP revealed (NPO3) signed-on at 0759 hours, which provided an initial indication to (NPO3) truthfulness about the previously indicated statements. Furthermore, the turbine building tour sheet for February 25,

1992, confirmed a low (108°F) cooler outlet turbine oil system temperature on page 8, section 33 (c), which was recorded by the midnight to 0800 shift nuclear plant operator adding credibility to (NPO3's) contention of observing the readings close to the 0800 time frame.

Because the information supplied by Company 1 appeared to be in question based upon (NPO3's) responses, and the follow-up review of the RWP and the turbine building log; a copy of the computer records of RWP #920184, for February 25, 1992, were obtained and reviewed. This was the RWP which was used by Company 1 personnel during their tours and observations of radiologically controlled areas of Oyster Creek. The review of this RWP showed the opportunity for one Company 1 individual, (C5), to observe the condensate demineralizer log at 1205 hours as indicated in their allegation. (C5) was unavailable for interview.

In an effort to further determine the reliability of (NPO3's) statements, (NPO3) was reinterviewed on March 25, 1992. During this interview, (NPO3) was asked again if he believed he performed the checks prior to the dayshift briefing by the group operating supervisor. (NPO3) said that he still believed he made the check and recorded the readings required for the condensate demineralizer log, but he did not appear as sure of himself as he was during his initial interview on March 16, 1992. (NPO3) stated he still believed he observed and recorded the readings prior to 1205 hours. (NPO3) again said he checked the cooler outlet turbine oil system temperature, which the present the person he relieved informed him read 108 F, and after this, adjusted the bypass valve for the closed cooling water heat exchangers because the barrel at that location was full of water. (NPO3) said on a normal routine, when assigned to the turbine building tour, he first checks the mux room and then the new cable spreading room, followed by the roof fans. After this, he travels down the steps to the condensate demineralizer area, arriving between

0920-0930 hours. (NPO3) said this would be the normal time he would take these readings. (NPO3) was asked if it was possible that he recorded the readings on a scratch paper and actually transcribed the readings on the condensate demineralizer log at sometime after 1205 hours. (NPO3) said, "No," this was not possible. (NPO3) said he has also taken the condensate demineralizer readings after conducting his checks of the 4160 switchgear room. This is a security door with access controlled by a keycard reader. The 4160 switchgear room is located on the same floor as the condensate demineralizer panels, and would only take approximately one minute to reach by foot.

Because of this new information supplied by (NPO3), Security Supervisor Rocco Pezella was requested to provide a copy of (NPO3's) security keycard activity via the security computer for February 25, 1992. This report (Exhibit 3) indicates that (NPO3) entered the protected area through the main gate at 0739 hours followed by an entry into the control room at 0809 hours, and an exit at 0812 hours.

During an interview with George Hicks, he was asked what length of time is required to observe and record the (22) readings required by the condensate demineralizer log. Hicks estimated the time period to be five to ten minutes. Hicks was also asked if it would be possible for an individual to sign-in on an RWP at 0759 hours, check the cooler outlet turbine oil system temperature, observe and record the readings required by the condensate demineralizer log, and return to the control room by 0809 hours. Hicks said this would be extremely difficult, unless (NPO3) violated radiological control procedures by returning to the control room at an uncontrolled radiological point of exit. Hicks explained, (NPO3) could have had to exit at a location where there was no radiological frisker, but he still would have had to rush in order to return to the control room within ten minutes. NOTE: The security computer, and the computer used by radiological personnel to sign in

employees on RWP's do not have a common link, and therefore the times indicated may not be in synchronization.

A further review of the security keycard records for (NPO3) on February 25, 1992, indicated that (NPO3) entered the 4160 switchgear room at 0910 hours, exiting at 0914 hours and reentering the room at 0915 hours, with another exit of the room at 0920 hours. Between 0920 and 1107 hours, (NPO3) was not logged into any vital area and the opportunity existed for (NPO3) to complete the observation and recording of the condensate demineralizer readings. There was one additional opportunity for (NPO3) to take the condensate demineralizer readings prior to 1205 hours. This opportunity occurred between the time that (NPO3) exited the new cable spreading room at 1122 hours and 1313 hours when (NPO3) reentered the control room.

On March 25, 1992, the control room log for February 25, 1992, for the 0800-1600 shift was obtained. This log indicated the reactor power level at 99.8% with a reduction in power to 95% at 1454 hours. According to Robin Brown, Radwaste Operations Manager, and a former Operations Manager, the readings recorded on the condensate demineralizer log for February 25, 1992, were within the expected parameters considering the power levels, and the reduction in power that occurred at 1454 hours.

During the March 16, and March 25, 1992, interviews of (NPO3), there were no indications that (NPO3) was attempting to mislead the investigators or provide false information. (NPO3), being a newly qualified nuclear plant operator, appeared to be conscientious about his job. During an interview with (NPO3) immediate supervisor, (GOS2), a Group Operating Supervisor, (GOS2) described (NPO3) as "very book smart." (GOS2) said (NPO3) initially spent too much time on the tours

to which he was assigned and he (NPO3) had to be directed toward narrowing the time required to perform a typical tout. (GOS2) added that (NPO3) is very honest.

The condensate demineralizer log that was completed on February 26, 1992, showed that the noon readings were not taken. The nuclear plant operator assigned to the 0800-1600 shift, (NPO10), was questioned about why he did not take the second set of readings for the demineralizer system. (NPO10) replied that he simply forgot to take the second set of readings. A review of procedure 106, "Conduct of Operations", section 4.4.1, states "Logs are legal records and shall be kept in a neat legible manner. All entries shall be made at the time indicated on the log." Section 4.4.7, of this procedure also states, "Periodic log readings shall be taken at the frequency and time designated on the log unless otherwise designated in writing by the Manager Plant Operations."

The "Plant Operations Department Standards for Oyster Creek," which were signed by Robert Barrett, Plant Operations Director, on December 19, 1991, provides more specific direction regarding logkeeping. Section 5.7 the "Logkeeping" section states, "Periodic log entries shall be made as specified on the log with allowances in accordance with the following table:" These standards are not considered in effect at this time because not all personnel have had an opportunity to review them.

<u>Frequency</u>	<u>Allowed deviation from specified time</u>
a. <u>time specified</u>	
hourly to every	+ 10 minutes - 15 minutes

The nuclear plant operators were questioned about their ability to meet the time parameters established on the condensate demineralizer log. All the operators stated they were unable to meet the first set of time commitments (0800, 1600, and

2400) established by this log. All NPO's provided the same reasons for failing to meet these time commitments, which was because they (the NPO's) were in their shift turnover meetings with their relief (off-going NPO), in addition to a follow-up turnover meeting with the group operating supervisor which begins between (15) and (30) minutes after shift change.

Many of the nuclear plant operators indicated they would get to the condensate demineralizer area between (45) minutes and (75) minutes after the beginning of their shift. All (16) NPO's believed that their respective Group Operating Supervisors and Group Shift Supervisors were aware they (the NPOs) were unable to meet the time parameters established by the condensate demineralizer logs. Several operators stated they would take the second set of readings required by the log, approximately four hours after the first set of readings were taken. Other NPO's said they would meet the mid-shift time commitment required by the log.

During interviews with the group shift supervisors and group operating supervisors, the question was posed to them, whether they believed the time parameters established on the condensate demineralizer log were realistic. All but two of the supervisors said they were aware the nuclear plant operators could not meet the time commitments established for the first readings on each shift, due to shift turnover briefings.

(GOS4), a GOS, stated that the NPOs could make the time commitments established for the first set of readings, but it would be difficult due to shift turnover. (GSS3), a GSS, said he was not aware the nuclear plant operators were not meeting the time parameters established, and he expected the NPOs to conduct the check within (15) minutes of the established times. The supervisors emphasized that the important part of taking the condensate demineralizer readings was to trend any

changes in status in order to provide a prewarning to the control room of potential problems.

Company 1 personnel also identified anomalies in the performance of one nuclear plant operator (NPO10) regarding an intake area tour which reflected actions taken, but not actually performed (falsification). One of the systems on which this is alleged to have occurred was the Joy air system. Specifically, (NPO10) recorded readings for the purifier filter differential pressure and purifier particulate filter differential pressure, but he was not observed actually looking at the gauges.

George Hicks explained the Joy air system as breathing air that is used by Radiological Waste (Radwaste) personnel and as a backup system to provide air to Radwaste Systems. The air supplied by this system is not for use in immediately dangerous to life and health (IDLH) atmospheres. Hicks further explained that if this system failed, the personnel wearing breathing apparatus attached to this system would have to remove their respirator and depart the area where work was being performed. Hicks said only self contained breathing apparatus (SCBA) are permitted in IDLH atmospheres. During a tour of the Joy air system on March 09, 1992, G. Hicks pointed out the aforementioned gauges which are located on top of the "A" and "F" compressors facing a side wall which are approximately twelve inches from the wall. In order to read the gauges, a nuclear plant operator must stand on some pipes and a chair in order to take the reading from one compressor, and the second set of readings is best taken by leaving the building, and subsequently looking through a set of louvered vents into the building. Looking through these vents requires standing on another pipe in order to obtain a clear view of the gauges. Both of these gauges provide an indicator which points to either a green or red area.

During interviews with (NPO10) on March 19, and April 08, 1992, (NPO10)



was questioned about the Company 1 allegation. (NPO10) said he knows where the purifier filter differential pressure and purifier particulate filter differential gauges are located and knew their location on the day the Company 1 individual accompanied him on the intake area tour. (NPO10) explained that he uses a silver clipboard to reflect the gauge readings, which alleviates having to bend and stretch to read the gauges. (NPO10) said he had no reason not to check the gauges.

(NPO10) added that an employee from Company 2 was working around the Joy air system when they ((NPO10) & the Company 1 individual) entered the building to check the system. According to (NPO10), the Company 1 individual spent time looking at a red and white drum located inside the building which contains waste oil. The Company 1 individual also looked at some manufacture nomenclature tags on the drums while (NPO10) was performing his duties. (NPO10) indicated that the Company 1 individual may not have observed (NPO10) taking the readings for the gauges.

Since (NPO10) indicated that a Company 2 employee was working in the Joy air system building on the day that the Company 1 individual accompanied him (February 25, 1992); a check was made with the Oyster Creek Security Department to determine if anyone from Company 2 had unescorted access to the protected and vital areas of Oyster Creek. This check revealed that an individual named (C1) was employed by Company 2 and badged for unescorted access. A further check of (C1's) keycard use for February 25, 1992, (Exhibit 4) showed him entering the protected area through the North gate at 0738 hours, and exiting the north gate at 1125 hours. In order to further confirm that (C1) worked on the Joy air system on February 25, 1992, (M5) was contacted. (M5) coordinates work on various plant systems, and he confirmed that (C1) did work on the "A" Joy air compressor on February 25, 1992. (M5) provided a Services Received Document (SRD) for

February 25, 1992, which indicated (C1) worked on the system for eight hours. Although the total amount of hours did not correspond with the time in the protected area for (C1) (approx. 4 hours), (M5) indicated that the contract with Company 2 is a fixed rate contract and GPU is not billed by hours of work performed.

The other (15) nuclear plant operators interviewed were questioned about how they perform their checks of the purifier filter differential pressure and purifier particulate filter differential pressure. All but one of the personnel said they had to stand on the pipes in order to obtain the readings. Upon a review of the intake area tour log, Joy air compressor readings, it was observed that (NPO6) consistently wrote "yellow" in the spaces required for these readings. (NPO6) was questioned why he wrote "yellow" for this reading. (NPO6) replied, "Because that's what it is." (NPO6) was then asked where the gauges are located. (NPO6) incorrectly described the location as "right in the front, at hip level." After the completion of (NPO6's) interview on March 17, 1992, (GOS11), (NPO6's) supervisor was notified that (NPO6) apparently did not know where the gauges were located and the investigators were informing him so he could take corrective action. According to (GOS1), the gauge that (NPO6) was apparently looking at was actually a desiccant gauge. (GOS1) said this gauge will show a yellow indication depending upon the moisture level of the air compressor. (NPO8) said that if he could not obtain the reading that is taken from the outside of the building, he places a dash (--) in the space. (NPO8) was asked if his supervisor knew what the dash indicated. (NPO8) said he believed his supervisor would interpret the dash to mean he could not take the reading. (NPO9) said he obtained a telescoping mirror from the instrument and control (I&C) shop and uses it to obtain the readings. According to the NPO's the Joy air compressor system was turned over to the operations department during or after the 13th refueling outage. Prior to this time, the maintenance department recorded the readings.

(NPO10) was also questioned about another allegation which Company 1 individuals raised where (NPO10) is alleged to have placed his initials in the space indicating he had performed a blowdown on the air receiver when he was not observed performing this function. According to the intake area tour sheet, the air receiver is required to be blown down at two locations. The Company 1 observations indicated that (NPO10) performed one blowdown, but not the second blowdown. This blowdown consists of opening a valve near the bottom of the air receiver in order to remove moisture from the system. (NPO10) said that after he completed his first tour, the Company 1 individual asked him if he had missed the blowdown at the air receiver. (NPO10) said they both returned to the air receiver and (NPO10) performed the blowdown of the air receiver. (NPO10) said after this was accomplished the Company 1 individual said, "You didn't get it the first time". (NPO10's) reply was "I may have missed it." (NPO10) indicated that the Company 1 individual treated him like he ([NPO10]) had done something wrong. (NPO10) was asked if the Company 1 individual accused him of falsifying the intake tour area sheet. (NPO10) said, "No."

Another area where Company 1 identified an anomaly in the way (NPO10) performed his intake area tour was at the circulating water pumps. According to the Company 1 allegation, (NPO10) failed to perform annunciator tests on three of the four circulating water pumps as required by the intake area tour sheet, but (NPO10) indicated that all four annunciator tests were performed satisfactory by writing "SAT" in the spaces required for each pump. According to George Hicks, the circulating water pumps provide cooling water for the main condensers and it is also used on occasions for the turbine building closed cooling water heat exchangers to keep motor bearings cool.

When (NPO10) was questioned regarding only generating one annunciator

alarm on the circulating water pumps instead of the required four alarms, (NPO10) confirmed that he only generated one alarm when the Company 1 individual was with him. (NPO10) explained that prior to the Company 1 individual making a tour with him, he would only generate an annunciator alarm if there was a light on one of the Field Application Panels (FAP). (NPO10) added that he only pushed the one annunciator alarm button because the Company 1 individual suggested that he do so. (NPO10) said he did not believe it was necessary to generate an alarm unless a problem was indicated.

During questioning of the (15) other nuclear plant operators, they were asked how many alarms they generated on the circulating water pumps. All (15) personnel nuclear plant operators said they generated at least one annunciator alarm for each of the four circulating water pumps. All the group operating supervisors and group shift supervisors also stated they expected at least one annunciator alarm generated per circulating water pump.

The Company 1 allegations also identified an issue with (NPO10) which alleged that he did not enter the chlorination pumps and piping area to inspect for leaks, however (NPO10) placed his initials in the space provided on the tour sheet indicating that an inspection had been performed.

(NPO10) responded to this allegation by saying that the Company 1 individual asked what was in the "chlorination shack". (NPO10) said he followed the Company 1 individual into the chlorination building and informed him what equipment was located in the building. (NPO10) said he ([NPO10]) checked the chlorination system power panel and then the Company 1 individual asked (NPO10) what was behind the opaque plastic curtain. (NPO10) said he was not sure who opened the curtain, but he was sure that he entered the area and inspected the piping for leaks. (NPO10)

said he routinely checks the piping area for leaks, smoke, motor operation and anything out of the ordinary. (NPO10) could not explain why the Company 1 individual would make such an accusation.

According to George Hicks, the original chlorination system utilized a liquid chlorine that was vaporized in order to introduce it to the system. Hicks said operations now uses a chemical which is not pressurized and is diluted into the water, so the danger that was inherent with the former liquid chlorine does not present the same level of danger that existed prior to the chemical switch. The function of the chlorination system is to keep barnacle and mussel growth out of the heat condenser tubes. Hicks said this system is not needed during cold weather because these two organisms are dormant during cold weather. Hicks said in a worse case scenario, if the system were on and a leak or spill occurred, an environmental issue would be the result.

During the review of the intake area tour sheets for January and February 1992, most shifts noted a tank #2 leak alarm under the section entitled "Inspect Area for Leaks, Alarms, Housekeeping etc." Where this leak was noted, the documentation was circled in red ink to indicate an unusual condition. Those operators who did not note a tank #2 leak alarm were questioned about the lack of documentation. Essentially two responses were given. The first response was that the leak alarm may not have existed if the chemistry department equalized the two tanks. The second response was that the tank leak has existed for so long that it seemed foolish to continue listing it shift after shift and day after day. According to all the nuclear plant operators and group operating supervisors, the tank leak has existed for an undetermined period of time.

Company 1 observations also identified the operability of the intake area trash

rake as a concern because of a lack of an operability test. George Hicks was questioned about the purpose of the intake area trash rake. Hicks said the purpose of the rake is to ensure that debris is kept from accumulating on the intake area screens. The rake is used most heavily during the spring and summer months when large amounts of grass from the intake canal float in and accumulate against the intake racks. The rake is then used to remove the grass and debris. Hicks said it is not uncommon to have a nuclear plant operator spend the majority of an eight hour shift using the trash rake. The trash rake is mounted on two narrow gauge type rails which allows it to move north and south. In order to operate it, a person must stand on the platform provided and run the rake up and down the racks. Hicks said a proper operability test would involve moving the rake structure north and south on the rails and lowering the rake into the water, utilizing the clutch to ensure the rake engages into the racks.

(NPO19) was questioned about how he operated the trash rake on February 25, 1997 when the Company 1 individual accompanied him on his intake area tour. (NPO10) said he pushes the buttons to make it go front and back (north and south) and up and down. (NPO10) added that a real operability test would involve opening the security screens and actually running the rake down onto the racks. (NPO10) said he did not feel it had to be tested and he could determine that there was power for the rake by looking at the flood lights located on top of the rake assembly and seeing that they were on.

The other nuclear plant operators and group operating supervisors and groups shift supervisors who were interviewed were surveyed in order to determine how they determined operability of the intake trash rake. Two NPOs indicated they would assume it was operable if the person they relieved on shift informed them that the

previous shift had utilized the rake. The remainder of the NPOs said they run the rake north and south on the rails and up and down on the guides to determine operability. The group operating supervisors and group shift supervisors were evenly split on their decision to operate the rake. Seven supervisors indicated they expected the rake to be operated by the nuclear plant operator in order to determine operability. The other seven supervisors indicated they would not expect an operability test unless the NPO was told it was out of service or if the previous shift used the rake, the NPO would not be expected to operate it.

During informal discussions with Philip Scallon, Manager Plant Operations, and Robert Barrett, Plant Operations Director, they informed B. Frantz of the existence of the Operator Concern Program at Oyster Creek. They explained that the program was set-up to address workplace concerns by employees, and especially operators, which may exist. Prior to interviewing anyone, and during a discussion with William Barton, the investigative team was asked to question the nuclear plant operators about their use and opinions of the program. Although the Operator Concern Program did not have a direct bearing on the allegations, the investigative team felt it would be useful in determining whether the nuclear plant operators relied on the program to resolve working problems that may not be addressed by their supervisors.

Of the sixteen nuclear plant operators interviewed, five individuals had not used the program. None of the five individuals indicated they would not use the program or showed a reluctance to use it. Those personnel who did use it, felt the program had merit and indicated they would use the program again. The only complaint about the program was directed at the time period required to implement a concern after it was approved for implementation. The NPOs felt this time period should be reduced.

During an interview with Robert Barrett on March 27, 1992, Barrett provided the investigators a copy of and explained that the Operator Concern Program was implemented during May, 1989. Barrett provided documentation to show the steady growth of use of the program in addition to a sheet which indicates where concerns were directed. This two page document is included with this report and identified as exhibit 1. One statistic that was obvious was the use of the program by equipment operators (nuclear plant operators) which was less than four percent of the total concerns submitted.

During interviews with the group operating supervisors and group shift supervisors, they were asked how often they accompanied the nuclear plant operators on tours of the reactor building, turbine building, or intake area. Only one supervisor, (GOS3), indicated he tours with the older (most senior) NPOs about once per week. The other supervisors indicated they may accompany an NPO for a portion of the tour, but the majority of their plant tours are performed alone. As noted previously in the report, the group operating supervisors are the personnel responsible for making daily plant tours, and providing supervision of the nuclear plant operators. Several of the group operating supervisors were asked if they have made tours with the nuclear plant operators since the Company 1 allegations were raised. (GOS1) indicated that he recently made a tour with (NPO5). (GOS1) said (NPO5's) tour was performed well and (NPO5) discussed a lot of problems he has observed while on tours. (GOS3) said he made tours with several NPOs and did not observe any problems with their tours. (GOS2) related that he made tours with (NPO1), and (NPO18). During these tours, (GOS2) observed numerous problems with the tour reports which he was not aware of previously. (GOS2) also said he also noted problems "in the way we do business." (GOS2) provided an example of performing a blowdown of an instrument directly onto the floor instead of into a container, which he described as poor engineering. (GOS2) said he was informed



by (NPO18) that one of the newly qualified operators had a problem with determining the number of battery chargers. (GOS7) said he made a tour with (NPO17) and two tours with (NPO10). (GOS7) said the two operators had different understandings of what they were to do on various systems. (NPO17) checked the 480 volt breaker safety systems by physically looking at the breaker windows. (GOS7) said they can also be determined to be open or closed by the red or green indicator lights, however the tour sheet does not specify the proper method of making that determination. (GOS7) also said he noticed that one operator will take a reading from a digital recorder while another operator will look at an analog gauge. During a reactor building tour with (NPO10) on the midnight to 8:00 am shift, (NPO10) was required to perform a blowdown of the oxygen analyzers for the tours and drywell. (NPO10) used the procedure, but had difficulty locating the valve for the blowdown. (GOS7) said he was surprised by this, since this task is considered a routine evolution. (GOS7) also described several of (NPO10's) activities while on a turbine building tour. While walking under the generators, (NPO10) recorded a reading for the Y-37 and Y-40 stator cooling gauge, which is located approximately (20) feet in the air under the generator. (GOS7) questioned (NPO10) about his ability to see the gauge and (NPO10) allegedly replied that he had been up there (at the gauge) often enough that he knew the big lines on the gauge represent 10 lbs., so he could determine the reading by the location of the arrow between the big lines. (GOS7) said that an operator would normally be required to obtain radiological controls approval prior to entering any area greater than seven feet from the floor, due to contamination levels. Also while on the turbine building tour, (NPO10) performed a blowdown of the plant service system, but only performed 80-85% of the blowdowns necessary. (NPO10) told (GOS7) he was not aware of the other blowdown locations. (GOS10) completed tours with three different operators. (GOS10) made intake area tours with (NPO19) and (NPO16), and both an intake and turbine building tour with (NPO10). (GOS10) said each operator performed

portions of their tour differently. An example (GOS10) provided was at the auxiliary transformer cooling fans. The intake tour sheet asks "Aux. Transformer Cooling Fans Operable." (NPO19) ran the fans and (NPO10) and (NPO16) did not run the fans. (GOS10) also indicated an area where the three operators performed differently was in the A and B battery room. (GOS10) said (NPO16) performed a more thorough check of the items required than did (NPO10) and (NPO19). Overall, (GOS10) said that (NPO10) had the most weaknesses in the performance of his tour. (GOS10) concluded by saying that someone from the "outside" could construe what some of the operators did as falsification, when it is actually a case of not understanding what is expected of them.

The group shift supervisors and group operating supervisors were questioned whether they ever gave instructions to the nuclear plant operators not to perform required portions of their tours. Several supervisors indicated that had occurred, but it was because other higher priority issues existed or because equipment was broken or out of service. In either case, the supervisor noted a comment on the report or instructed the operator to make a note of it on the tour sheet. The most common way this was identified was when the word "busy" was indicated on the tour sheet. The supervisors were also asked if anyone ever told them that a nuclear plant operator was not fully performing their tasks. All the supervisors except (GOS2) said, "No." (GOS2) said there were one or two occasions that his shift's nuclear plant operators ([NPO11], [NPO7], [NPO15] & [NPO3]) complained about the performance of the prior shift not having done a good job. (GOS2) said the complaints were directed toward the prior shift leaving duties for his shift to perform, when the NPO's who lodged the complaints felt the prior shift could have accomplished the tasks. (GOS2) said there were never any occasions when someone complained that a required task was not completed.

The supervisors were also asked if they believed there were any nuclear plant operators who need more guidance or do not measure-up to expected standards. (GOS2) identified (NPO3) as an individual who is new, very thorough and very conscientious, but his initial tours were taking too long to complete. (GOS2) said he has seen improvement in (NPO3) as his confidence level improves. (GOS2) said he considers his other three NPOs ([NPO15], [NPO7] and [NPO11]) the best operators on site. (GOS3) indicated that the level of competency among the nuclear plant operators varies widely. (GOS3) identified (NPO5) as an individual who has shown much improvement, but (NPO5) continues to need a lot of supervision because he lacks attention to detail, and he is not as mechanically inclined as some of the operators. (GOS5) said some of the newly qualified nuclear plant operators need more supervision, but he did not feel this was out of the ordinary. (GOS5) did identify three NPOs ([NPO5], [NPO10] and [NPO15]) who need more guidance in performing some of the more difficult elements of the job. (GOS5) also said (NPO9) seems to ask more questions than the other NPOs. (GOS6) stated that some individuals are not as strong as others and they meet the bare minimum requirements to be a nuclear plant operator. (GOS6) identified two personnel, ([NPO5] and [NPO10]) as fitting into this category. (GOS6) was asked if these two individuals need more training to bring them up to a higher level. (GOS6) replied that training was not the answer, "some people don't have the inborn ability." (GOS7) said (NPO10) performs his job in a satisfactory manner, but he ([NPO10]) needs to pay closer attention to detail. (GOS7) also indicated (NPO10) has made vast strides in this area. (GOS7) also identified two other operators, ([NPO9] and [NPO20]) who he described as needing minimal supervision. (GOS10) also identified two nuclear plant operators ([NPO20] and [NPO10]) as needing more guidance than other NPO's. (GOS10) said the difference between (NPO20) and (NPO10) is that (NPO20) will question what is the right thing to do, while (NPO10) will assume what is the right thing to do. (GSS3) also identified (NPO5) and (NPO10) as lacking sufficient

knowledge of the job. (GSS3) said (NPO5) had a serious problem because of his lack of knowledge, but he has shown improvement, while (NPO10) has a similar problem with lack of job knowledge. (GSS3) said it was his belief that the "job outgrew them." It must be noted that (GOS10) and (GOS7) are the Group Operating Supervisors assigned to (NPO10's) shift.

During the interviews with the nuclear plant operators, they were asked what they did with their tour reports upon completion. All the NPOs indicated they gave them to their respective group operating supervisors for review. In response to this, the group operating supervisors were asked how long they typically spend reviewing the tour reports. Most of the group operating supervisors said they typically spend 20-30 minutes for a review of all three reports. (GOS2) indicated he spends approximately 10-15 minutes conducting his review of the tour reports. The supervisors were also asked what they look for during this review. All the supervisors indicated they were looking for the same things: completeness, accuracy of readings, readings that are out of specification, trends which may indicate a problem and any comments the NPO wrote on the tour report.

During the investigation, the intake area tour sheets for January through March 08, 1992, and the condensate demineralizer logs for February 01, through March 08, 1992, were reviewed. This review was conducted in order to determine if there were any obvious falsifications or errors in the paperwork. While no falsifications were identified, numerous errors were revealed. A number of logs did not contain signatures or initials, out of specification readings were not red-circled or explained in the comments section, and personnel recorded information in the wrong spaces. Procedure #106, Conduct of Operations, section 4.4.1, details the expectations of all operations shift personnel in record and log keeping practices. In addition, section 4.3.5.1, indicates that "the off going GSS or GOS shall review the

equipment operator tour sheets and indicate this review by signing prior to turnover."

Because of the number of supervisors who identified (NPO5) and (NPO10) as needing additional supervision or guidance, (M3) was contacted in order to determine if the personnel files for these individuals could be inspected. The first file reviewed was (NPO10's) which revealed that his last employee performance evaluation which covered the period from January 1990, through June 1990, showed he was rated satisfactory in all performance categories. The signature of the supervisor who wrote the evaluation is illegible, although (M6) approved the performance review on September 18, 1990. The supervisor also indicated in the review under the supervisor comment section, that "(NPO10) is currently deciding on the NPO program options - I recommend him as a future CRO (control room operator)." The evaluation and supervisors comment appear to be contrary to the opinions offered by his present group operating supervisors and those of several supervisors who he does not directly work for. In reviewing (NPO5's) last evaluation, he was also rated as a satisfactory performer except in the job knowledge area, where he was rated as needing improvement. This performance review covered the period from September 11, 1989, through April 08, 1990. Again, the signature of the supervisor could not be determined, however (M6) also signed the performance review on September 18, 1990. This performance review for (NPO5) appears to be in line with what was indicated previously by the present group operating supervisors.

In order to determine the extent of training the nuclear plant operators receive, (M4) was interviewed. (M4) provided copies of training content records, and explained that the initial training an operator receives is divided into five lessons: Job description - Tour reports, Procedure 108 and 108.1 and how they relate to the nuclear plant operators job, logs and log keeping practices, the philosophy behind tours, and shift turnover. (M4) further explained that the initial course is very

extensive and requires both classroom and on-shift training which may take (15) to (18) months to complete. Completion is determined by passing all examinations and the nuclear plant operator completing seven tours with another qualified nuclear plant operator, and a final tour with a group operating supervisor or a group shift supervisor for the reactor building and turbine building tours. The intake area tour requires qualified operators perform five tours with the trainee and a final tour with the group operating supervisor or group shift supervisor.

A requalification examination is administered to the Nuclear Plant Operators every two years. This exam has been in effect for approximately four or five years, and has resulted in two qualifying exams being administered. All Nuclear Plant Operators have successfully passed these exams. Refresher training is also conducted over a two-year period, and covers the same topics as the initial training, but in less detail. This refresher training is conducted every week for a six week rotation. In other words, since there are six shifts, a different shift is in training every week, and over the course of approximately (18) months, all training topics are covered. Each operator takes a written quiz and must score a minimum passing grade of 70%, although failure of a quiz does not disqualify Nuclear Plant Operators from performing their duties. (M4) added that refresher training also covers modifications to existing systems or initial training on any new system for which the operations department has assumed responsibility. (M4) said the operations department also conducts an annual walk-through for each nuclear plant operator for the systems they are responsible for knowing. This walk-through is conducted by the group operating supervisor or group shift supervisor. (M4) was asked what happens if a nuclear plant operator fails a requalification examination or a weekly quiz. (M4) said that he notifies (M1), who has the authority to remove the NPO from shift so remedial training may be administered and a retest given.

(M4) provided us the results of the weekly quizzes for the 89-91, training cycle

which began during July 1989, and was completed during December 1991. The training scores for (NPO10) and (NPO5) were reviewed first and the following information was found. (NPO10) failed the 90-1 weekly quiz on February 02, 1989, with a 51.2%. The quiz was retaken on February 07, 1989, with another failing score of 63.5%, and the test was taken a third time on September 07, 1989, with a passing grade of 76.4%. The period of time from first failure to passing was seven months. (NPO10) also failed the 90-3, weekly quiz which was administered on April 27, 1990, with a score of 61%. (NPO10) passed the quiz on August 29, 1991, with a 73%, a period of sixteen months from initial failure until the quiz was successfully completed. (NPO5) failed six weekly quizzes during this same training cycle. The first failure occurred on the 89-4 weekly quiz with a score of 63% on July 14, 1989. (NPO5) passed the quiz with a 73.8% on March 22, 1990; a period of eight months from initial failure to passing. (NPO5) also failed weekly quizzes for the 89-7, cycle on October 27, 1989, and a passing grade was obtained on March 22, 1990, a period of five months between failure and passing; the 90-01 weekly quiz was failed January 05, 1990, and a passing grade obtained on March 20, 1990, a period of two months between failure and passing; the 90-4 weekly quiz was taken on June 15, 1990, and failed, with a passing grade obtained on December 10, 1991, a period of (18) months between failure and passing; the 90-7 weekly quiz was failed on October 19, 1991, with a passing grade obtained on December 10, 1991, a period of two months, and the 90-8 weekly quiz was failed on November 30, 1990, with a passing grade obtained on November 01, 1991, a period of (11) months. Since it appeared that there may be additional nuclear plant operators who failed weekly quizzes without a make-up quiz within a reasonably short period of time after failure, all weekly quiz scores for all nuclear plant operators were reviewed. The problems noted with (NPO10) and (NPO5) regarding long periods of time between failure of a quiz and passing were prevalent throughout the training records. It was also noted that many of the more experienced nuclear plant operators were the individuals who failed the most weekly

quizzes.

During the investigation, (QA1) provided Operations Quality Assurance (QA) monitoring reports for observations of equipment operator (nuclear plant operator) tours and logkeeping practices. According to the monitoring reports submitted by (QA1), there were three monitorings during 1988; all by (QA1), ten monitorings during 1989; five performed by (QA2), three by (QA1), and one each by (QA3) and (QA4), four monitorings during 1990; two by (QA2) and one each by (QA1) and (QA5), and there was one monitoring during 1991, performed by (QA1).

During an interview with (QA1), he was asked why only one monitoring of equipment operators occurred during 1991, especially since this one monitoring was only a follow-up to a 1990, observation regarding communication repeat back of instructions. (QA1) replied, that (QA6), discouraged the QA monitors from observing equipment operator performance. (QA1) was questioned further about (QA6's) reasons for discouraging monitoring activities. (QA1) said (QA6) did not tell the QA monitors not to perform these activities, but (QA1) believed the Operations Department, specifically (M1), may have given (QA6) the indication the monitoring activities should not be performed. (QA1) could not support this allegation with any other information, and said it was only a feeling that existed.

In order to follow-up the information supplied by (QA1), (M1) was questioned about whether he gave direction or any indication to Operations QA not to perform monitoring activities of equipment operators during 1991. (M1) denied ever making any statement or suggestion that monitoring activities be curtailed or ceased. On March 27, 1992, (QA6) was interviewed to determine the validity of (QA1's) statement regarding discouraging QA monitors from performing monitoring of equipment operators during 1991. (QA6) said that no one told him not to monitor



the equipment operators during 1991. (QA6) said he was requested by (M8) to try something during 1989-1990, which would provide coverage during two shift turnovers, and monitoring activity during a full backshift. Specifically, (QA6) wanted the monitors to cover the midnight to eight shift and the turnover from the 4-12 shift, and turnover to the 8-4 shift. (QA6) indicated that this meant the personnel performing the monitoring activity would be required to work a ten hour day, four days per week. This concept of the four ten hour days met surprising opposition from his staff, and the concept never materialized into actual use. (QA6) further explained that (QA1) is the only employee on his staff with an actual operations background which makes monitoring of operations more difficult. (QA6) concluded by saying that (QA1) would have performed the monitoring activities during 1991, but he had personal problems which prevented this from occurring.

In reviewing the Operations QA monitoring reports that were completed during 1988-1990, there were no indications of equipment operators falsifying any tour logs or reports. There were several discrepancies noted in actual logkeeping practices which were addressed by the monitor and a copy of each monitoring report was submitted to the Plant Operations Manager. Some of the discrepancies noted were the recording of out of specification readings without red circling the reading or providing an explanation, and operator initials on tour sheets appear to resemble a mark rather than letters.

In order to determine the operations department management's perspective on the issues, (M6) and (M1) were interviewed on March 26 and March 27, 1992, respectively. According to (M6), the group shift supervisors report directly to him with the group operating supervisors indirectly reporting to him through the group shift supervisors. (M6) said he is responsible for the operation of the plant in accordance with the technical specifications. The managers of plant operations,

radiological waste, chemistry, radiological waste shipping and operations engineering report directly to (M1).

(M6) and (M1) were both asked if anyone had made them aware that the nuclear plant operators may have been falsifying records. Both replied that they had no personal knowledge or knowledge from anyone else of a falsification issue. (M6) and (M1) were also asked what type of supervision they expected the group operating supervisors to provide to the nuclear plant operators. (M6) said that work was being performed in accordance with the new plant operations department standards which would provide additional direction for the supervisors. In addition, (M6) expected the supervisors to accompany the nuclear plant operators on periodic tours once per week. (M1) said he expected the group operating supervisors to spend 50% of their time in the plant and the other 50% within the control room. (M1) also expected the supervisors to oversee the major evolutions performed by the nuclear plant operators. (M1) also expects the group shift supervisor to spend 10% of his time, or four hours per week in the plant. (M1) said prior to Company 1's arrival, he expected the group operating supervisors to make one tour per week, but it did not surprise him when he was informed that only one supervisor made regular tours with his nuclear plant operators.

Both (M6) and (M1) were asked if their supervisors had ever identified any weak performers to them. (M6) said that no supervisor had ever expressed concern about nuclear plant operators which would have warranted pulling them (the NPOs) off the job. (M1) said he believed the two weakest performers were (NPO10) and (NPO5). (M6) did say that he believed he knew the weaker performers and identified (NPO5) and (NPO10). (M6) added that (NPO12) has problems with training, but he performed his job well. (M6) and (M1) were also asked what was being done to bring the weaker performers up to a higher level of performance.

(M1) listed the following corrective actions: coaching from supervisors, having another qualified nuclear plant operator accompany an NPO on tours, the written examinations given during training, the submission of deviation reports which identify problems with procedures and the use of operator critiques which allow open discussion and resolution of problems. (M1) added that (NPO10) and (NPO5) have not been the subject of any critiques. (M6) listed the following corrective actions: requalification training helps to bring an NPO up to par with the others, the use of on-the-job training also provides good direction although the tour requalification has not yet brought them up to par. (M6) explained this by saying that the present focus of requalification is on the emergency operating procedures and not on the day to day activities of the nuclear plant operators.

Both individuals were asked if they felt the present training program was effective. Both agreed that training was effective but, on-the-job training would have to be built into it because of the findings of this investigation, according to (M1). (M6) was asked if the nuclear plant operators who failed a training weekly quiz were removed from shift operations or restricted from operating the equipment which was covered by the quiz. (M6) said he could not remove them from duties because of the labor agreement that exists (between the IBEW and GPUN).

(M6) was questioned about his knowledge of the condensate demineralizer logs and whether he was aware the time commitments were difficult to meet at 0800, 1600 and 2400 hours, due to shift turnover. (M6) said he was not aware of the problem prior to Company 1's arrival, but he revised the condensate demineralizer log on March 02, 1992, to reflect a requirement to obtain only one reading per shift with no time established for performance. (M6) added that all the tour logs are being reviewed and revised to reflect changes in plant conditions and removal of those items that should not be performed by the operations department.

Prior to the conclusion of (M1's) interview, (M1) provided a copy of the "Action Plan to Address Allegations Regarding Falsification of Operator Tours." This one page document is included in this report and identified as Attachment C.

On the evening of March 26, 1992, while debriefing (M7) about the results of the investigation, (M7) was informed of the problems identified with the training records, which indicated long periods of time between initial failure and successful completion of a weekly quiz. He was also told of (M6's) belief that a nuclear plant operator could not be removed from shift because of the labor agreement. (M7) agreed that (M6) was correct. On the morning of March 27, 1992, (M2) was also informed of the investigative findings regarding training records and the belief that an operator could not be removed from shift. (M2) in turn telephoned (M3) and posed the question to him. (M3) disagreed with the belief that a nuclear plant operator could not be removed from shift for failing an weekly quiz. (M3) said they could not reduce a nuclear plant operators pay, but the operator could be removed for remedial training. (M3) added that prior to this point, no one ever contacted him to ascertain if a nuclear plant operator could be removed for such a cause.

#### "CORRECTIVE RESPONSE TO DATE:

On March 09, 1992, Oyster Creek Vice President/Director John Barton issued a memorandum to all Oyster Creek personnel with a subject heading, "Compliance to Policies, Standards & Procedures." A list of (14) additional corrective actions were initiated by the Oyster Creek Operations Department under the title of "Action Plan to Address Allegations Regarding Falsification of Operator Tours."

During an informal discussion with Philip Scallon on Thursday, April 09, 1992, Scallon said he had removed (NPO12) from shift duties during December 1991, in order to

have him make up examinations which he had failed to pass.

FINDINGS:

The findings for each of the specific allegations are identified below.

- 1) Condensate Demineralizer Log sheets were not completed as required.
  - a) On February 24, 1992, the 1200 (noon) readings were not recorded as of 1615 hours that day.

This is a true statement. As it turns out, the 1200 hours readings were never recorded because the nuclear plant operator, (NPO12), failed to obtain the readings. The second shift nuclear plant operator, (NPO1), wrote his 1600 hour readings in the 1200 hour spaces, but (NPO1) realized his error and lined out the readings and placed his initials at the top of the 1200 hour column. This identified the correction as his. Oyster Creek procedure #106, section 4.4.1, states, "All entries shall be made at the time indicated on the log. If any log readings are missed, the reason shall be stated on the log." A review of the condensate demineralizer log for February 4, 1992, does not reflect any reason for the missed readings, therefore based upon this procedure, (NPO12) failed to comply with section 4.4.1.

- b) On February 25, 1992, the 0800 readings were not recorded as of 1205 hours that same day. A review of this log on February 26, 1992, showed all readings had been completed.

A review of the condensate demineralizer log for this date does show all readings recorded. Robin Brown was asked to determine if the readings were in line with the plant

operating level of 99.8% and he confirmed the readings were within expected parameters. During his initial interview (NPO3), the NPO responsible believed he obtained the readings at or near the 0800 time period, however the security keycard record for (NPO3) coupled with the radiation work permit sign-in time did not allow (NPO3) sufficient time to obtain these readings. The conclusion of the investigation regarding this allegation is that (NPO3) obtained two sets of condensate demineralizer readings during his shift, but the readings were not taken at the times required by the log which was a violation of the Procedure #106, section 4.4.1, for failing to make the log entry at the time specified. During the interviews of the other (15) nuclear plant operators, they also confirmed that they seldom complied with obtaining the first reading of the shift at the time specified because of shift turnover briefings. In addition, most of the group operating supervisors and group shift supervisors knew of this problem, yet took no action to remedy it. The situation was remedied on March 02, 1992, when Philip Scallon changed the condensate demineralizer log to reflect only one required reading per eight hour shift.

- c) On February 26, 1991, the 1200 hours and 1600 hours readings were not recorded as of 1630 hours that same day.

A review of the condensate demineralizer log for this date (exhibit 10) shows that the readings for the noon time frame were never taken. The nuclear plant operator responsible for taking the readings, (NPO10), said he simply forgot to obtain the readings. The issue of the 1600 hour readings not being taken during the 1600 hour time frame is not surprising, considering the fact that the nuclear plant operator assigned, (NPO17) would have been attending the shift briefing with either the off-going shift's nuclear plant operator or his group operating supervisor. (NPO17) did take the condensate demineralizer readings, however it was after 1630 hours. Again, since the nuclear plant operators routinely did not take the first set of readings for the shift until (45) to (75) minutes from the beginning of the shift, (NPO17) would not have been doing anything out of the ordinary. As was the case

with (NPO3) and (NPO12), both (NPO10) and (NPO17) failed to comply with procedure #106, section 4.4.1.

The second set of allegations was confined to one intake area tour and the activities that the operator performed or reflected that were performed. Although the Company 1 observations did not identify the nuclear plant operator responsible, the name of the NPO ((NPO10)) was provided by Sander Levin and Philip Scallon.

- 2) One operator on one intake area tour recorded information on the Intake Area Tour Sheet which reflected actions not actually performed or conditions not actually observed.
  - a) At the breathing air purifier, the nuclear plant operator assigned to the tour recorded readings for the purifier filter differential pressure, and the purifier particulate filter differential pressure, but had not been observed climbing on the piping and behind the purifier to position himself such that the gauges could be read.

(NPO10) said he knew the location of the gauges and he had no reason not to check the gauges on the day in question, February 25, 1992. (NPO10) believed that the Company 1 individual who accompanied him have been inspecting a red and white drum's manufacture nomenclature tag at the time (NPO10) conducted his inspection of the gauges. (NPO10) also stated that a Company 2 employee was actively working on the Joy air system at the time of (NPO10's) tour. The security keycard record for the Company 2 employee ((C1)) confirmed his existence in the protected area, and the Services Received Document (SRD) further confirmed (C1's) work performed on this day. During two interviews with (NPO10), he presented himself as a credible individual and did not give any indication of

attempting to mislead the investigators when answering the questions.

The finding of the investigation regarding this allegation is that it is unfounded. One of the key phrases in the allegation is that "(NPO10) was not observed." (NPO10) described the way he checked the gauges as using a silver clipboard that reflects the gauge readings which alleviates having to bend and stretch to read the gauges. (NPO10) certainly raised enough doubt as to the Company 1 individuals' attention, to question whether the Company 1 individual was distracted when (NPO10) took the readings.

- b) Also, at the breathing air receiver, the nuclear plant operator assigned to the tour recorded his initials in the space which indicated that he performed a blowdown on the air receiver, when in fact he had not performed the required task.

According to Oyster Creek procedure #106, section 4.2.4, "Signatures (initials) when used in a procedure to perform a step of the procedure, signify the individual has performed the action stated,..." (NPO10) said that the Company 1 individual pointed out the fact that (NPO10) only performed one of the two required blowdowns during his first tour, and (NPO10) admitted, "I may have missed it," referring to the second blowdown. (NPO10's) initials, by procedure, indicate that he performed an action, when in fact he did not perform it. (NPO10's) performance in this case was insufficient as compared to those actions required by the intake area tour sheet. The intake area tour sheet requires two blowdowns on the Joy air system, and the Company 1 individual who observed (NPO10's) work only observed one blowdown. What appears to be the case with (NPO10) is that (NPO10) may not understand all the activities required by the tour sheets. Numerous group operating supervisors and group shift supervisors, including his own supervisors, (GOS10) and (GOS7), indicated he needed more supervision. When (GOS10) and (GOS7) accompanied (NPO10) on tours for the first time after the Company 1 allegations, they found numerous problems



with the way he performed his tour. One of the problems noted by (GOS7) while on a turbine building tour, was that (NPO10) only performed 80-85% of the blowdowns necessary for the plant service air system and (NPO10) stated he was not aware of the other blowdown locations. Since the supervisors did not make any plant tours with (NPO10) prior to this investigation, they would have found it difficult to adequately assess (NPO10's) knowledge.

- c) The nuclear plant operator failed to perform annunciator tests on three of the four circulating water pumps as required by the Intake Area Tour Sheet, but the operator indicated that all four annunciator tests were performed by writing "SAT" (satisfactory) in the space provided.

(NPO10) confirmed this was true and added that he only generated one alarm because the Company 1 individual suggested he do so. (NPO10) also said he only generates an annunciator alarm if one of the Field Application Panel lights are on. (NPO10) believed he was not required to generate an alarm unless a problem was indicated. The finding of this allegation would again support insufficient job knowledge on the part of (NPO10).

- d) The nuclear plant operator did not perform an inspection of the chlorination pumps and piping area for leaks in the chlorination building as required by the Intake Area Tour Sheet, however the operator placed his initials in the space provided on the tour sheet indicating that an inspection was performed.

(NPO10) believed he did conduct the inspection behind the opaque plastic for leaks and he could not offer any explanation for the allegation. The inability to interview the Company 1 individual who made the observation hinders confirmation of the allegation.

Since this allegation is based upon judging one person's opinion against that of another which is unavailable for interview, the determination for this allegation is that it is unfounded. Since (NPO10) was honest in admitting to the facts surrounding allegations (2) "b" and (2) "c", the investigators have determined to believe (NPO10) in this incident.

- e) The nuclear plant operator did not perform an operability test of the intake screen trash rake, but indicated that a test was performed by placing a "Y" in the space where the tour report asks, "Trash rake operable (Y/N)."

(NPO10) gave numerous answers to the question about how operability is determined, including running the rake or determining if the flood lights located on the top of the rake assembly have power to them. Based upon (NPO10's) answers, it is the conclusion of this investigation that (NPO10) did not actually operate the rake on February 25, 1992. In reviewing the question on the report, it does not indicate how an operability check is to be performed, and in fact, two nuclear plant operators and seven of fourteen supervisors did not believe the rake had to be operated. Their belief was that they had to know if it would operate and they used various methods to determine this, short of actual operation. In this case, the intake tour sheet does not provide enough clarity to identify expectations.

During the investigation, two concerns were raised concerning the Operations Department supervision and management which need to be discussed. The first concern is directed toward supervision's involvement in overseeing the activities of the nuclear plant operators. Except for one supervisor, (GOS2), the group operating supervisors did not tour the plant with the NPO's. Also the supervisors indicated that they were aware of the problem with meeting the time parameters established which essentially condoned nuclear plant operators violating procedure 106, yet they did not take the action required to remedy

the situation.

The second concern focused on the nuclear plant operators' failure of weekly quizzes and the time period that passed until successful completion. This was compounded by Operations Department management's mistaken belief that the nuclear plant operators could not be removed from their shift duties if they failed a weekly quiz, because it would have violated the labor agreement. According to (M3), no one from management ever spoke with him about what to do if this occurred. (M3) confirmed that a nuclear plant operator could be removed from shift so long as there was no reduction in pay.

