

VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

W. L. STEWART
VICE PRESIDENT
NUCLEAR OPERATIONS

June 24, 1983

Mr. James P. O'Reilly
Regional Administrator
Region II
U. S. Nuclear Regulatory Commission
101 Marietta Street, Suite 2900
Atlanta, Georgia 30303

Serial No. 364
NO/WDC:acm
Docket Nos. 50-280
50 181
License Nos. DPR-32
DPR-37

Dear Mr. O'Reilly:

SPECIAL REPORT OF RADIATION EXPOSURE
SURRY POWER STATION

This report is being filed pursuant to the requirements of 10 CFR 20.403(a)(1) and concerns the exposure of five (5) individuals to radiation in excess of the limits specified in 10 CFR 20.101(a) without proper documentation as required by 10 CFR 20.102.

In response to a request for exposure information, the radiation exposure record of a former radiation worker was examined. The record revealed that the individual received a dose of 2.361 rem during the second quarter of 1983 while assigned to Surry Power Station. Contrary to the requirements of 10 CFR 20.102(b), a form NRC-4 was not completed and signed by the individual nor was the individual's previously accumulated occupational dose and the additional dose allowed properly documented. Although other documentation in the individual's record contained the total occupational dose previously received by the individual, this documentation did not ensure full compliance with § 20.102(b). Therefore, the individual's exposure of 2.361 rem (whole body) exceeded the applicable limit of § 20.101(a). The above discovery prompted a review of the exposure records of all individuals terminating work assignments during the current calendar quarter. Four additional records were found to contain identical deficiencies in required prior dose documentation. These four individuals had received second quarter doses of 1.558 rem, 2.067 rem, 2.033 rem, and 2.151 rem. Therefore, the exposure of the four additional individuals also exceeded the applicable limit of § 20.101(a).

The limit of 1.25 rem per quarter was exceeded without proper documentation due to a feature of the computer-based system which controls additional exposure authorization. This feature allowed the use of outdated information resulting in improper authorization for additional exposure. The failure of shift personnel to thoroughly review the personnel records also contributed to this discrepancy.

The subject individuals had worked at Surry Power Station during the first quarter of 1983. The computer-based exposure records created during that period contained an entry which indicated that a form NRC-4 was on file. When

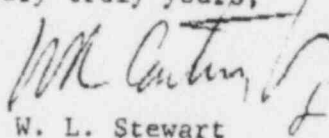
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VIRGINIA ELECTRIC AND POWER COMPANY TO James P. O'Reilly

these individuals terminated their work assignments, their records were placed in an inactive status within the computer. Upon their return during the second quarter of 1983, it was possible to return their records to an active status since these records had not been purged from the computer memory. The computer entry which indicated that a form NRC-4 was on file remained, thus, an authorization for exposure in excess of the limits specified in § 20.101(a) was allowed. Had an entry to indicate that a form NRC-4 was not on file been made at the time of termination, the authorization could not have been produced until an updated form NRC-4 had been completed. A change to the termination procedure has been implemented which requires, as a final step, an entry into each individual's computer-based record that a form NRC-4 is not on file. This will require that a current form NRC-4 be completed each time an individual returns to the station for work assignment.

Pursuant to 10 CFR 20.405(b), Attachment 1 provides information for each individual exposed. Attachment 1 is a separate part of the report and is to be withheld from public disclosure. In accordance with 10 CFR 20.409, this letter notifies each individual of their exposure concurrent with notification to the Nuclear Regulatory Commission.

Very truly yours,


W. L. Stewart

Attachment (to be withheld)

cc: Mr. Richard C. DeYoung, Director
Office of Inspection and Enforcement

Mr. D. J. Burke
NRC Resident Inspector
Surry Power Station

ATTACHMENT 1

Information Subject to Withholding from Public Disclosure

As required by 10 CFR 20.405(b) the following information is provided as a separate part of this report.

Individuals' Name:
Social Security No:
Date of Birth:
Second Quarter Dose:

Ridley, Timothy
227-98-4990
07-07-58
2.151 Rem

Individuals' Name:
Social Security No:
Date of Birth:
Second Quarter Dose:

Bentfeld, William T., Jr.
226-06-7371
06-08-61
2.067 Rem

Individuals' Name:
Social Security No:
Date of Birth:
Second Quarter Dose:

Barnes, Warnett
227-86-5636
11-11-58
2.361 Rem

Individuals' Name:
Social Security No:
Date of Birth:
Second Quarter Dose:

Harris, Christopher A.
104-58-4594
08-12-60
2.035 Rem

Individuals' Name:
Social Security No:
Date of Birth:
Second Quarter Dose:

Anderson, David L.
225-74-5120
04-19-59
1.558 Rem

END OF TRANSMISSION
TO JENISON
FROM SURRY



FLORIDA POWER & LIGHT COMPANY

INTER-OFFICE CORRESPONDENCE

RECEIVED

NOV 8 1983

FLA. POWER & LIGHT CO.
OPHS SUPT.-N-PT

TO D.W. Haase
FROM P.W. Hughes
SUBJECT: CORRECTIVE ACTION-UNAUTHORIZED
REACTOR SUMP ENTRY

LOCATION Turkey Point-Nuclear
DATE November 1, 1983
COPIES TO J.L. Danek
R.M. Brown
T.A. Coleman
J.R. Bates

*sent up to
CGB 11/14/83*

The Health Physics Department is in the process of implementing the following corrective action to prevent recurrence of the recent unauthorized reactor sump entry and to prevent any future unauthorized entries into potential dangerous, lethal radiation fields. Some actions will require management resolution. I respectfully request review and advice towards these corrective actions.

- 1.0 A specific training class on reactor in core detector systems will be developed for Health Physics Technicians and Supervisors. This refresher training class will be conducted the week of November 28, 1983.
- 2.0 The Health Physics Department will consult with corporate Health Physics on the need to define an "exclusion" area in our Health Physics manual and procedures. This will be co-ordinated with PSL. Completion date 11-4-83.
- 3.0 We will define the following areas as exclusion areas. Access to these areas shall be controlled by one site specific lock. Actual key control and overall management philosophy needs to be resolved.
 - 3.1 #3 Reactor Sump
 - 3.2 #4 Reactor Sump
 - 3.3 #3 Pressurizer at power
 - 3.4 #4 Pressurizer at power
 - 3.5 #3 14' elevation bio-wall entrances (2) at power
 - 3.6 #4 14' elevation bio-wall entrances (2) at power

pg. 2 of 2

11/18/83

SUPPLEMENTAL INFORMATION ON ACTIONS TAKEN
RELATED TO UNAUTHORIZED REACTOR SUMP ENTRY

Prior to Enforcement Conference (Wed. 11/9/83) the following evaluations/actions were taken:

- (1). Health physics verified that all other high radiation areas (HRA) and locked high radiation areas (LHRA) had active RWP's. (i.e. H.P. coverage in lieu of an RWP is not abused).
- (2). Other areas including the reactor cavity sump were identified for engineering evaluation to further restrict access (see memo from Hughes to Haase).

One Day After the Enforcement Conference (Thurs. 11/10/83) the following evaluation/actions were taken:

- (1). Health Physics Supervisor held meeting with H.P. techs on no more H.P. coverage in lieu of an RWP for HRA and LHRA.
- (2). Plant Manager initiated a review by technical department of existing procedures that allow HP coverage in lieu of an RWP for HRA and LHRA. Procedures identified were changed and submitted to PNSC for review and approved on 11/17/83 (first PNSC meeting since enforcement conference).

Note: All HRA and LHRA at the plant have an active RWP for entrance (except for reactor cavity sump which is locked and HPS has only key). As stated above this was in place prior to enforcement conference.

CORRECTIVE ACTION-UNAUTHORIZED

REACTOR SUMP ENTRY (CONT.)

Page 2 of 3

- 3.7 #3 CVCS Letdown demineralizer room
- 3.8 #4 CVCS Letdown demineralizer access gate (inner gate to demineralizer)
- 3.9 #3 & #4 Base Cation demineralizer room
- 3.10 Rad Waste Building South Evaporator Room
- 3.11 10' elevation resin discharge piping area, east pipeway
- 3.12 #3 & #4 VCT rooms at power
- 4.0 Add hold points to appropriate Operational and I & C procedures to ensure reactor sump grating is locked prior to extracting thimbles and stays locked until thimbles are inserted. Completion date 11-11-83.
- 5.0 Develop specific operating instructions concerning reactor sump entries for Health Physics Shift Supervisors and Technicians. These instructions will be reviewed during the November RP Training session.
- 6.0 Review past I & C bulletins to ensure we have satisfactorily satisfied requirements of these bulletins. Completion date 11-30-83.
- 7.0 Design special signs for reactor sump entrance door and inner grating gate to identify conditions in the reactor sump. Completion date 11-11-83.
- 8.0 Consult with Technical Department and implement the following high priority REA's:
 - 8.1 Design/fabricate lockable grating gate and install a spot light over Units #3 and #4 reactor cavity sump entrances. (Already in progress.)
 - 8.2 Design/fabricate lockable gates across Units #3 and #4 14' elevation bio-wall entrances (2 each). To be used during power operation.
 - 8.3 Design/fabricate lockable barriers for Units #3 and #4 reactor cavity and pressurizer entrances during power operation. Consideration should be given to removing reactor cavity ladder prior to power operation.

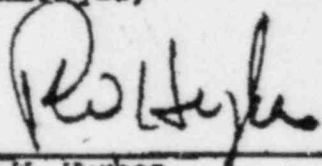
CORRECTIVE ACTION-UNAUTHORIZED

REACTOR SUMP ENTRY (CONT.)

Page 3 of 3

- 8.4 Design/specify proper sign material, paint coatings and installation methods to allow warning signs to be left in containment at power.
- 8.5 Design/fabricate cable barriers to preclude entries across manipulator crane walkway at power. Approved warning sign to be installed on barrier.
- 8.6 Install appropriate warning signs on new reactor cavity handrails. To be used during power operation.
- 8.7 Design/fabricate cable barrier to preclude entrance to flux mapper area at power. Approved warning sign to be installed.
- 8.8 Design/fabricate lockable grating barriers to preclude access to resin discharge piping at east end of 10' elevation pipe chase.
- 8.9 Design/fabricate fencing and lockable gate across high level filter storage area in Rad Waste Building.
- 8.10 Design/fabricate lockable grating gate to Units #3 and #4 Spent Fuel Pit demineralizers.
- 9.0 Ensure this episode is reviewed during operator training class.

Thank-you,


P.W. Hughes

UNAUTHORIZED REACTOR SUMP ENTRY AGENDA

NOVEMBER 9, 1983, MEETING WITH NRC REGION II

I. Description of Event:

Plant Conditions:

- Unit 3: In refueling shutdown with reactor defueled, the in-core detector thimbles retracted from the reactor vessel with Control Room indication of containment sump filling up at greater than 1 gpm.

Unit 4: Off-line

Sump Entry:

The Unit 3 reactor sump area was unlocked and entered by the Shift Technical Advisor (STA) and a health physics technician at approximately 11:30pm on Friday, October 14, 1983, in order for the STA to look for the source of the leakage (making his rounds). The STA received 1300 mrem whole body dose (as determined by processing his TLD) and the H.P. technician received 200 mrem (by self-reading pocket dosimeter) whole body dose from this entry.

Immediate Corrective Action:

The STA was immediately removed from the sump area and the containment and was restricted from the RCA. His TLD was processed to determine his dose. The entrance to the sump area was relocked.

II. Investigations and Findings:

Investigation results:

- 1. The reactor sump area with the in-core thimbles retracted had a general area dose rate of 50 Rem/hour and was locked (at all times) and posted as a high radiation area and an Exclusion area at the time the thimbles were retracted (i.e. prior to the entry by the STA and the H.P. technician).
- 2. The general area dose rate in the sump area depends on whether the in-core detector thimbles are retracted. If retracted, the dose rate is about 50 Rem/hr, if they are inserted about 50-100 mR/hr. The general area dose rate on the 14' elevation (inside the locked enclosure) is approximately 50 mR/hr with the thimbles retracted.
- 3. There was no Radiation Work Permit approved specifically for entrance into the sump area (elevation ~6') nor had the area been surveyed by HP. Health Physics coverage was provided for entry into the enclosure (elevation 14') and the STA had a portable radiation survey instrument.

Note: Entry specifically into the sump area was NOT AUTHORIZED.

4. The STA assumed since the HP Technician let him enter the sump area that it was okay to do so.
5. The Technical Department training and overall STA requirement in the area of health physics was re-evaluated and considered to be adequate. STA training does include training on in-core-map flux detectors. Also red badge training includes training related to locked High Radiation Areas.

Conclusions:

1. The doses to the STA and the HP Technician did not exceed any allowable limits. The STA received 1300 mrem (for the quarter) and had an allowable limit of 3000 mrem (completed NRC - 4 form). The HP technician's accumulated dose for the quarter (including this entry) was 450 mrem and was also on a 3000 mrem quarterly limit.
2. The STA was aware of the conditions via the posting on the door. He demonstrated poor radiation protection practices while entering the sump area (improper use of radiation survey instrument) and went beyond the bounds of the RWP. He was provided HP coverage when entering the enclosure as allowed by procedure and standard industry practice.

The HP technician was also cognizant of the radiological conditions in the sump and was instructed on the existing conditions. [(1) Instructed by the FPL-HP containment supervisor not to go down the sump but to just look down the shaft with a flashlight because the thimbles were pulled. (2) Posting on locked entrance doorway to the sump area identifies exclusion area and working on in-core detectors.] The HP technician also demonstrated poor radiation protection practices by allowing the STA to enter the sump area first.

III. Corrective Action:

A. Interim:

- (1) Shift meetings were immediately conducted Saturday, October 15, 1983, with all the HP Technicians. The seriousness of such an entry and proper procedure was reviewed with all personnel.
- (2) Reactor sump door was reposted requiring direct approval of the HP Supervisor or the HP Operations Supervisor for entry.
- (3) A new key core ordered prior to the incident was installed in the reactor sump door. Presently the HP Supervisor has the only key.
- (4) The HP technician was terminated.

- (5) As a result of the investigation the STA's annual performance review was lowered and he was removed from his STA duties until released by the Technical Department Supervisor and the Plant Manager. Also the STA's red badge was pulled requiring reattendance and testing in the general employee radiation protection training program.
- (6) An evaluation was initiated for the design and fabrication of a permanent grating gate over the sump entry way.

B. Long Term:

- (1) A specific training class to re-emphasize reactor in-core detector systems will be given for Health Physics Technicians and Supervisors. This refresher training class will be conducted the week of November 28, 1983.
- (2) Reevaluate existing operating instructions concerning entries into locked High Radiation Areas.
- (3) All operators, including the STAs, will review this incident during operator requalification training.
- (4) Design special signs for reactor sump closures to identify conditions in the reactor sump. Completion date scheduled for December 1, 1983.

IV. Background Information:

IE Information Notice 82-51: "Overexposures In PWR Cavities", was distributed to all licensed personnel on 2/7/83, as recommended in the notice. Also the health physics department reviewed existing procedures to ensure positive control would be maintained when the thimbles are retracted. Specifically, operating procedure 1407.21, "Refueling Activities Check-Off List", requires a sign-off that maintenance procedure 12407.1 be followed when retracting and inserting thimbles. Maintenance procedure 12407.1, "Retracting And Inserting Incore Instrumentation Thimbles," requires (by sign-off) that an RWP is required prior to performing this task and that the NPS be notified prior to commencing this job. Also the procedure states (by sign-off) to ensure the containment sump area is clear of all personnel, door locked and HP notified of work to be done. At that time Health Physics also decided to install a new key core in the entrance door to the sump area in order to restrict key access into the area. The key core was ordered in May and due to receiving the incorrect order was not installed until October 17, 1983. Presently the HP Supervisor has the only key.

All controls were in place prior to this incident occurring:

- (1) RWP 83-372, "Unit 3 Containment Retract/Insert Flux Mapper Thimbles At Seal Table", was in effect on 10/8/83. Specifically, special instructions on the RWP state, "Verify no one is in reactor sump prior to retracting thimbles-request HP to post reactor sump as "exclusion area".
- (2) The entrance door to the reactor sump area was locked and posted as stated in the RWP. As described by the above procedural steps health physics was aware when the thimbles were retracted and the entrance door was locked and posted accordingly. The health physics technician covering the inspection was notified of the condition in the sump and was aware of this condition when he made entry. Therefore we feel this incident occurred due to the HP technician seriously violating standard HP practices and specific instructions. We also feel that the STA demonstrated poor radiation protection practices while entering the sump area. Failure for him to follow good radiological practices when entering the sump area demonstrate the need for re-emphasizing training in this area.
- (3) The severe personnel action taken against the two employees involved is intended to let the work force know the company's position on following proper radiological controls and procedures.

The health physics technician covering the inspection was a contract technician taking specific instructions from an FPL-HP-Supervisor. The individual had over 6 years experience in commercial nuclear power plants, was a senior technician and was extensively tested by FPL prior to hiring.

Corrective actions to prevent recurrence for this specific case as well as other potentially similar situations are addressed above.

V. Significance of Event

We recognize the significance of this event and the potential for overexposure. In previously reviewing established procedures and the control mechanisms they implemented (including sign-offs) we felt that adequate controls were in place with additionally provided health physics coverage.

Mr. Zambeno and Mr. Roach were wearing respirators and did not talk about ascending to Zambeno. Mr. Roach was standing at the scum tower when this conversation took place. He said Mr. Roach ask him what the sign "exclusion area" meant. Mr. Zambeno was ask by Mr. Roach to open the tower. Mr. Zambeno said that Mr. Roach had an Ro-2 survey instrument. Mr. Zambeno said he opened the tower and surveyed at the top of the ladder ^{and descended the ladder part way} and the free rates were $\sim 20-30 \text{ mL/Hr}$. He started down the ladder to do a survey, when Mr. Roach suggested that he go down and look. Mr. Zambeno concided, and Mr. Roach started down the ladder with the Ro-2. Mr. Zambeno stated the Ro-2 was put on the 0-500 mL/Hr scale before he gave it to Mr. Roach. He said, Mr. Roach descended the ladder slowly, and it appeared that Mr. Roach was checking the instrument reading by shinning the flashlight on it as he descended the ladder.

Mr. Zambeno stated he descended the ladder and $\sim 2 \text{ seconds}$ Mr. Roach was out of his sight (left sight and moved toward vent)

Mr. Zambeno stated that when he reached the bottom of the ladder, Mr. Roach was 6-8 feet away toward the RV.

Mr. Zambeno said Mr. Brack approached him and he asked him what the instrument was reading. Mr. Brack shined the light on the instrument and said it was "off-scale".

Mr. Zambeno said he screamed at Mr. Brack to get out. Both went up the ladder quickly.

Mr. Zambeno stated that he knew that the thrusters were with down (information ~ HP status board) and that the area was a zone with the potential for very high radiation levels (He was at Zim when the entry into the Rx cavity resulted in an overexposure there). However, since Mr. Brack appeared to be checking the instrument frequently and continued down, ^{Mr. Zambeno concluded} that the thrusters must have been in the Cool and not a radiation problem. He also stated he had erred in allowing the STA to enter the scum without him (Mr. Zambeno) performing a survey.

He estimated that they were in the scum area ~ 20 seconds together, and that Mr. Brack may have been in the area ~ 45 seconds from the time he left the top of the ladder til he returned.

10/28/83

Call to Greg Zambino by C.M. / Hrey

Mr. Zambino stated he was providing general HP coverage for containment. At the time he was in containment on 10/14 ~ 2300 two other individuals (he thought they were operators) and a QC inspector watching flooding of refueling cavity. He was ask to make a walk through to look for leaks, particularly in the vicinity of the seal table and reactor coolant drain tanks. He said he first met Mr. Roach (STP) at the RCDT.

Prior to entry into the CTMT, Mr. Zambino said he thought he would have to check the CTMT sump, so he checked out the key from shift HP supervisor. He did not remember the shift HP supervisor saying anything to him about the status of the thimble or any specific prohibition about entering the sump.

Mr. Zambino said he encountered Mr. Roach on the 14' el, when Mr. Roach approached him and ask him if he was the HP for CTMT and if he had the key to the sump. Mr. Zambino said he and