

U. S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

REGION V

Report No. 50-361/84-14, 50-362/84-14

Docket No. 50-361, 50-362

License No. NPF-10, NPF-15

Licensee: Southern California Edison Company
P. O. Box 800, 2244 Walnut Grove Avenue
Rosemead, California 91770

Facility Name: San Onofre Units 2 and 3

Inspection at: San Clemente, California

Inspection Conducted: May 6 and 7, 1984

Inspectors: GP Yuhas 5/25/84
G. P. Yuhas, Chief, Reactor Radiation
Protection Section Date Signed

Approved by: F. A. Wenslawski 5/25/84
F. A. Wenslawski, Chief, Radiological
Safety Branch Date Signed

Summary: Inspection on May 6-7, 1984 (Report Nos. 50-361/84-14,
50-362/84-14)

Areas Inspected: Special unannounced reactive inspection in response to the unplanned release of gaseous airborne activity which resulted in the licensee's declaration of an Unusual Event at 1840 PDT on May 5, 1984. The inspection involved 12 hours onsite by one regionally-based inspector.

Results: Of the areas inspected, one apparent violation was identified; failure to promptly classify and declare an Unusual Event as required by Emergency Plan Implementing Procedure (EPIP) SO23-VIII-1, Paragraph 2.

DETAILS

1. Persons Contacted

- *J. G. Haynes, Station Manager
- *W. C. Moody, Deputy Station Manager
- *H. E. Morgan, Manager Operations
- *V. B. Fisher, Assistant Plant Superintendent
- *D. Brevig, Chemistry Supervisor
 - K. Eckman, Shift Superintendent/Shift Supervisor
 - M. Hyman, Control Room Supervisor/Operating Foreman
 - W. Kingsley, Control Room Supervisor/Operating Foreman
 - M. Pell, Common Control Operator
 - K. Helm, Effluent Engineer
 - J. Reilly, Supervising Computer Engineer
 - R. Waldo, Station Nuclear Engineer
- *R. Reiss, Quality Assurance Engineer
 - D. Stickney, Station Instrument and Control Engineer

*Denotes those individuals attending the exit interview on May 7, 1984.

In addition to the above individuals, the inspector met with other members of the licensee's staff.

2. Review of May 5, 1984, Declaration of Unusual Event

A. Introduction

On May 5, 1984, at 1840 PDT, the licensee declared an "Unusual Event" based on an unplanned release of gaseous radioactivity from the Unit 2/3 plant vent stack. The release was quickly reduced to within Technical Specifications (TS) limits by isolation of the Waste Gas Decay Tank (WGDT) hydrogen/oxygen sample system. At 1845 PDT the licensee terminated the "Unusual Event." The licensee notified the NRC Headquarters Operations Officer pursuant to 10 CFR 50.72(a)(1) at 1930 PDT, May 5, 1984.

Based on this release and other recent releases of lesser magnitude, Region V dispatched a radiation specialist to conduct an onsite review of the licensee's actions.

B. Scope of Inspection

The inspector arrived on site at about 2130 PDT, Sunday, May 6, 1984. After consultation with the Senior Resident Inspector, the radiation specialist proceeded to the Unit 2/3 Control Room to observe the status of the process and effluent radiation monitoring equipment, and to review operational log books and procedures associated with the release. After shift change at approximately 2330 PDT, the inspector interviewed the Common Control Operator and Operating Foremen that had been on shift the afternoon and evening of May 5, 1984. The Shift Supervisor, Assistant Plant Superintendent, and other individuals involved in the release and

declaration of the Unusual Event were interviewed on May 7, 1984. The following documentation associated with the release was reviewed:

(1.) Effluent Records

-Unit 2 Wide Range Gas Monitor (2RE7865) recorder traces, 2RR7867 and 2RR7868

-Unit 3 Wide Range Gas Monitor (3RE7865) recorder traces, 3RR7861 and 3RR7868

-Unit 2/3 Plant Vent Stack Gas (2/3 RE7808) recorder trace, 2RdR7830

Unit 2/3 Health Physics/Chemistry computer printout (6685)

-Plant Monitoring System (PMS) printout

-Unit 3 Reactor Coolant Activity taken at 1535 PDT, May 5, 1984

-Plant Vent Stack, particulate and iodine sample activity taken at 1700 PDT, May 5, 1984

-Plant Vent Stack gaseous activity sample taken at 1715 PDT

-Gaseous dose calculation

(2.) Operating Logs

-Watch Engineer's Log, sheet Nos. 239055-239060

-Unit 2 Generating Station Log, sheet Nos. 849223-849227
(Control Operator's Log)

-Unit 3 Generating Station Log, sheet Nos. 837430-837436
(Control Operator's Log)

-Common Generating Station Log, sheet Nos. 849109-849112
(Common Operator's Log)

-Communicator's Generating Station Log, sheet Nos. 820404-820406

Chemistry Log, sheet Nos. 465733-465735

Generic LOCAR Index, sheet Nos. C-84-235 - C-84-313

(3.) Procedures and Documents

-Technical Specification, sections 3.3.3.9, 3.4.6, 3.11.2.1, 3.11.2.2, 3.11.2.3, and 6.8

-San Onofre Nuclear Generating Station Emergency Plan, sections 4.1 and 4.1.1.

-EPIP S023-VIII-1, Recognition and Classification of Emergencies, Revision 1 and TCN No. 1-1

-S023-5-2.24, Miscellaneous Utilities 61-A Alarm Response Procedure, Revision 3, section 61A09 and TCN No. 3-6

-S023-5-2.7, Ventilation 60A Alarm Response Procedure, Revision 4 and TCN No. 4-6

-S023-0-25, Telephone Notification of the NKC for Significant Events, Revision 4 and TCN 4-5

-S023-8-14, Radwaste Gas Collection System Operation, Revision 5 and TCN 5-12

-Offsite Dose Calculation Manual (ODCM) section 2.0, Revision 12

-Memorandum dated March 23, 1984, Subject: "Mixing and Distribution of Activity up the Unit 2 and 3 Plant Vent Stacks"

C. Findings

On May 5, 1984, Unit 2 was operating at full power and Unit 3 was at 35% power. Typical reactor coolant activities at Unit 2 had been averaging 0.05 uCi/gram dose equivalent I-131 and 1 uCi/gram gross activity. Unit 3 reactor coolant activity had been running 0.45 uCi/gram dose equivalent I-131 and 14-15 uCi/gram gross activity. Unit 3 tripped (shut down) at 0102 PDT May 5, 1984. Following the shutdown, the dose equivalent I-131 activity spiked to 5.08 uCi/gram at 0730 PDT May 5, 1984 and had decreased to 3.7 uCi/gram at 1535 PDT.

Observation: Due to the Unit 3 reactor coolant activity, operational occurrences associated with the common radioactive waste management systems, and problems with the process and effluent monitoring system, the licensee has experienced numerous small unplanned releases of gaseous activity and effluent monitor alarms.

On May 5, the Unit 3 Wide Range Gas Monitor, 3RE7865 and the Plant Vent Stack Monitor 2/3 RE7808 A and B (particulate and iodine channels) were logged out of service. 3RE7865 was out of service and the alarm function was not operable due to incomplete processing of maintenance paper work; however, the unit was calibrated and indicated true activity on the meter face and recorder.

The Plant Vent Stack Monitor 2/3 RE7808 C (gaseous activity channel) was operable and set to alarm at 1400 counts per minute (cpm). The alarm could have been set up to 1659 cpm per section 2.1.1.1 of the ODCM.

The inspector was informed by the operators that 2/3 RE7808 frequently alarms but that they do not typically record when the alarm occurs or when it clears.

Data from PMS printout indicates that 2/3 RE7808C alarmed eight times between 1430 and 1530 PDT on May 5. The PMS alarm signal set point for 2/3 RE7808C was 2150 cpm rather than the meter alarm set point of 1400 cpm. This inconsistency means that the PMS printout does not necessarily indicate that the Common Operator would have acknowledged or cleared the panel alarm (61A09).

Observation: The present alarm set point for 2/3 RE7808 results in many alarms. The set point although consistent with the ODCM, is at least a factor of 5 more restrictive than TS 3.11.2.1.

Observation: No record indicates when the Common Operator actually acknowledged receipt, or cleared 2/3 RE7808 alarms on May 5, 1984.

At 1430 PDT the Watch Engineers Log indicates that a Plant Vent Stack Hi Hi alarm was received at the California Office of Emergency Services (OES). Neither Unit Control Operator or Common Operator's log mentions this alarm. The alarm originated from Unit 2 RE7865 and is considered reportable to NRC pursuant to 10 CFR 50.72 b.2.VI since the State of California called and confirmed that an actual unplanned release had taken place. The log states: "Cause initially reported as swapping O2/H2 monitors but more detailed review since that evolution had not yet occurred." At 1445, the Shift Supervisor called the Compliance Division Duty Manager (CDDM) pursuant to SO23-0-25 to inform him that a report to NRC would be required within four hours. He characterized the release as lasting about ten minutes and that they would attempt to locate the cause prior to making the report to NRC.

The operating crew shift change took place at about 1530 PDT. Prior to the shift change, the oncoming Shift Supervisor toured the control rooms and recalled that he did not observe 2/3 RE-7808 to be in the alarm mode (i.e., panel alarm window 61A09 illuminated). The oncoming Common Operator recalled seeing that 2/3 RE-7808C (window 61A09) was in alarm just after shift change. The Common Operator verified the meter indication of 2/3 RE-7808C and discussed the alarm with the Shift Foreman. He recalled that 2/3 RE-7808C read about 10,000 cpm. All operators were aware of the previous 2RE-7865 alarm and continued to search for the cause of that release. Chemistry, Health Physics, and the Nuclear Engineer were also aware of what appeared to be a continuing problem. The Shift Supervisor did not recall being informed of the 2/3 RE-7808C alarm. The PMS printout indicated that at 1517:09 PDT 2/3 RE-7808C had cleared at 1779 cpm. At 1526:29 PDT the PMS indicated 2/3 RE-7808C alarmed at 7348 cpm and stayed in the alarm mode until at least 1848 PDT.

Observation: EPIP SO23-VIII-1, Attachment 1, TCN No. 1-1 TAB A1 calls for the declaration of an Unusual Event when 2/3 RE-7808C reads greater than 4.2 E3 cpm with two fans in operation and the

release path is not isolated within 15 minutes. S023-VIII-1 states in section 1.0 "Activation" under: "Time Requirements."

"WITHIN 15 minutes of recognition of off normal conditions:

REVIEW as necessary the Event Category Tabs (Attachment 1)

CLASSIFY the emergency in accordance with 5.0 below

DECLARE the emergency in accordance with EPIP S0123-VIII-10, 'Emergency Coordinator Duties''

Therefore, the Unusual Event should have been declared no later than 1600 PDT. Failure to declare the Unusual Event in accordance with the EPIP represents an apparent violation of T.S.6.8 (50-361/84-14-01, 50-362/84-14-01).

The Common Operator has copies of the panel Alarm Response Procedures (ARP) at each panel. ARP S023-5-2.24, Revision 3, TCN 3-6 for window 61A09, "Plant Vent Stack Discharge Airborne Radiation High" in step 4.7 causes the operator to refer to S023-0-25, Attachment 8.1 "Effluent Reporting Requirement Guidelines."

Observation: ARP S023-5-2.24 section 61A09 does not tell the operator to record the alarm, compare the meter count rate or recorder output to the EPIP values, or to inform the Shift Supervisor that an emergency classification should be considered. S023-0-25 Attachment 8.1 specifically addresses effluent guidelines for 10 CFR 50.72 reportability but does not lead the operator to review EPIP S023-VIII-1 when the effluent instruments indicate a release rate in excess of the Table 1 values. Rather, this procedure tends to place responsibility for evaluation and action on instrument control and chemistry personnel.

The 2/3 RE-7808 alarm came in at shift change. It is not clear who acknowledged the alarm or accepted responsibility to proceed with followup actions. Specifically, the Shift Supervisor was not informed. Although the previous Shift Supervisor suspected operation of the oxygen/hydrogen monitor to be a potential release source, no one apparently observed the effluent monitor response when the hydrogen and oxygen monitors were aligned to the waste gas decay and surge tanks at 1530 PDT.

In the period between 1530 and 1800 PDT, operators were involved in preparing Unit 3 for startup and attempting to locate the source of the release. Chemistry personnel were taking samples of the gaseous effluent and the Nuclear Engineer was evaluating the 1400 PDT release. Operators reviewed the multipoint recorder for 2/3 RE-7808C but found the trace to be of little value since the pens on this recorder 2RJR7830 were not inking properly. The pens were again not printing properly on May 6, 1984 when observed by the inspector.

Observation: Lack of formality regarding the status of 2/3 RE-7808C at shift change contributed to the lack of timely recognition that an emergency should have been declared.

Observation: The NRC has on several previous occasions expressed concern that the process and effluent monitoring multipoint recorders were not functioning properly. The lack of a clearly indicated trend also impacted the licensee's recognition of the need to declare an emergency.

The operators observed the response of 2RE-7865 during the period since it was also aligned to the plant vent stack. Because this monitor was not in an alarm mode, it did not re-enforce the importance of 2/3 RE-7808C. In a March 23, 1984 memorandum, the Chemistry Supervisor requested engineering to evaluate the feasibility of installing devices to assure uniform mixing of air leaving the exhaust air plenum.

Observation: The table below is a comparison of the three gaseous activity monitor readings from the exhaust air plenum discharge to either plant vent stack during the release.

<u>Time</u>	<u>2RE-7865</u>	<u>3RE-7865</u>	<u>2/3RE-7808</u>
1600	1.2 E-4 uCi/ml	9.7 E-4 uCi/ml	3.8 E-4 uCi/ml
1700	1.5 E-5 uCi/ml	6.0 E-4 uCi/ml	3.1 E-4 uCi/ml
1800	2.2 E-5 uCi/ml	6.8 E-4 uCi/ml	2.5 E-4 uCi/ml

The operators were not apparently aware of the magnitude the inconsistency in readings as a function of the different monitors. The licensee should either implement the requested design change or assure that Operations personnel understand the effect of nonuniform mixing on the effluent monitor readings.

Between 1700 and 1730 PDT, the chemistry technicians collected particulate, iodine, and gas samples from 2/3 RE-7808 and gas samples from each 7865. About 1730 PDT, the Assistant Plant Superintendent advised the Shift Supervisor that 3RE-7865 indicated a release rate in excess of the Hi Hi alarm and should be believed even though the instrument was officially out of service.

Observation: Recalculation of the release rate measured by 3RE-7865 from 1700 to 1730 PDT indicates about 8.6E4 uCi/sec. EPIP S023-VIII-1 calls for the declaration of an Unusual Event if 2(3) RE-7865 indicates greater than 1.3 E4 uCi/sec. for greater than 15 minutes.

At 1752 PDT, the Nuclear Engineer began to review the results of the gas sample taken from the Unit 3 plant vent stack at 1715 PDT. The following results were recorded:

Kr-85 = 3.81 E-7 uCi/ml

Xe-133 = 5.01 E-4 uCi/ml
 Xe-133M = 1.02 E-5 uCi/ml
 Xe-135 = 2.84 E-5 uCi/ml

This total gaseous activity of 5.4 E-4 uCi/ml (equivalent to 4.18 E4 uCi/sec) caused the engineer to proceed directly to the Control Room and express his observation to the operating staff.

During a telephone call to the Station Manager at about 1800 PDT to discuss operational problems, the Assistant Plant Superintendent realized the potential for the plant to be considered in an Unusual Event classification. The Assistant Plant Superintendent stated that he had been aware that a release had been in progress since 1630 PDT and that Operations was looking for the source and that Chemistry was evaluating a release for 10 CFR 50.72 reporting requirements. The Assistant Plant Superintendent and the Shift Supervisor found a Computer Operator to unlock the PMS printout box so that they could review the 2/3 RE-7808C data to determine when the alarm had come in. At about the same time, the Operating Foreman informed the Shift Supervisor that 2/3 RE-7808C was still indicating a high release rate. At about 1815, the Shift Supervisor stated he opened EPIP S023-VIII-1 and began to review TAB A-1. By about 1830, the operating staff confirmed that the 2/3 RE-7808C alarm had come in at 1526 PDT. The Shift Supervisor declared the Unusual Event at 1840 PDT.

With declaration of the Unusual Event, word was passed to identify what might have occurred at about 1530 PDT which could have resulted in a release. Very quickly, the operator who had made the hydrogen/oxygen sampling system alignment at 1530, concluded that the action may have been the source of the release. The system was isolated and the release rate decreased very quickly. By 1845 PDT the release rate had decreased to acceptable levels and the Shift Supervisor terminated the Unusual Event.

Observation: Once the licensee implemented the Emergency Plan, the release was quickly identified and isolated.

The particulate and iodine samples taken at 1715 PDT were analyzed and the results listed below were available at about 1800 PDT.

<u>Nuclide</u>	<u>Normalized Activity</u>
Rb-88	2.5 E-11 uCi/ml
I-131	5.1 E-12 uCi/ml
I-133	3.0 E-12 uCi/ml

The licensee placed the waste gas decay tank system back on the line for a few moments and confirmed the oxygen analyzer to be the source. At the time of the inspection, the licensee had not specifically identified what subcomponent was leaking; therefore, the analyzer was left isolated.

At 1930 the licensee notified the NRC Headquarters Operations Officer of the Unusual Event. They reported the release and stated no significant iodine had been released. The licensee explained that they were calculating the release and would call back later. In a subsequent telephone call, the licensee reported that about 267 Ci had been released and would have resulted in a concentration of 2.08 times the concentration stated in 10 CFR 20 Appendix B Table II.

Recognizing the limitations and complexity of the licensee's effluent monitoring system, the effluent engineer was called in and recalculated the activity released during the period 1530 to 1845 PDT May 5, 1984.

This data was reported to the NRC Region V Chief, Reactor Radiation Protection Section on the morning of May 6, 1984.

Total Activity Released = 424 Ci primarily Xe-133

I-131 Activity Released = 0.0018 Ci

Maximum Permissible Concentration (MPC) at the restricted area boundary during the highest release hour (1710-1800)
= 2.94 MPC

Independent estimation of the activity, concentration and projected dose by the inspector were found to be in agreement with the licensee's calculations.

D. Discussion

Discussions with the Station Manager and other licensee representatives indicated that they had recognized a need to improve their management controls with respect to this event. Specifically, the following actions were initiated prior to the inspector leaving the site:

1. Pre-shift briefings on this event were being given to each operating crew. The following information was provided:

"At 1526 5/5/84 rad monitor count-rate on RI 7808C increased from 1700 cpm to 7300 cpm. Note the alarm is set at 1400 cpm. It is imperative that when rad monitors are in alarm they should (1) be continuously monitored; as in the case of this particular monitor, at 4200 cpm an Unusual Event is entered. (2) Radiation monitor alarms should be noted in the turnover sheets as a reminder for increased awareness on the part of the operators and control room Supervisors. (3) Changes to background levels should be immediately brought to the attention of the CRS and noted in the common log and turnover sheet."

2. Procedure SO23-5-2.24 was being revised to more clearly delineate operator actions in response to the alarm.
3. A technician was being assigned to each shift crew to assist in evaluating process and effluent release parameters and advising the Shift Supervisor on radioactive release information which must be reported to the NRC.
4. Engineering was directed to investigate procurement of a more reliable recorder for 2/3 RE-7808.
5. The Chemistry group will be directed to expedite these review of effluent alarm set points.

This inspection effort concludes the regional review of the onsite radiological aspects of this release and of previous releases which were reported to NRC. The licensee's reports which must be submitted pursuant to 10 CFR 50.73 will be reviewed on receipt at the Region V office.

One apparent violation was identified as noted above (50-361/84-14-01, 50-362/84-14-01).

3. Exit Interview

The inspector met with the licensee representatives (denoted in paragraph 1) at the conclusion of the inspection on May 7, 1984. The inspector summarized the scope and findings of the inspection.

The findings, including:

- excessive effluent alarms,
- inadequate logging and poor turnover of equipment status at shift change,
- lack of operator familiarity with EPIP related to effluent releases
- poor performance of effluent monitoring equipment
- failure to assure operating crew is aware of major deficiencies associated with the wide range gas monitors
- and inadequate alarm response procedures

all contributed to the licensee's failure to quickly recognize that implementation of the Emergency Plan was appropriate.