SAN ONOFRE NUCLEAR GENERATING STATION

SEMI-ANNUAL OPERATING REPORT NO. 16

FOR THE PERIOD INCLUDING

JANUARY 1, 1975, TO JUNE 30, 1975

Submitted in Accordance With:

Operating License No. DPR-13

Submitted by:

Southern California Edison Company

San Diego Gas & Electric Company

SAN ONOFRE NUCLEAR GENERATING STATION

SEMI-ANNUAL OPERATING REPORT

UNIT 1

The following report is submitted in compliance with Section 6.5 of the Technical Specifications for the San Onofre Nuclear Generating Station, Unit 1.

A. OPERATIONS SUMMARY

Except for a few power reductions to perform routine tests, heat treatment operations and condenser cleaning, the unit operated at full power (450 MWe) from the start of the reporting period until February 19, 1975, when a unit trip occurred from full load as explained in Station Incident Report 75-5 below (Item 8). The unit resumed full load operation at 8:40 PM on February 19, 1975, and continued at full load until March 14, 1975, at which time the unit was removed from service in preparation for the refueling outage:

On March 14, 1975, the unit was manually tripped from 360 MWe for a reheater steam dump test and the refueling outage began. The unit continued out of service for the refueling, condenser retubing and reheater tube replacement.

On April 23, 1975, the unit was returned to service. Low power physics testing and axial offset system correlations were completed and the unit reached full load (450 MWe) on April 28, 1975.

Except for power reductions to perform stop valve tests, heat treatment and condenser cleaning, the unit operated at full load until May 21, 1975, at which time the unit was manually tripped due to circulating water system problems (high Δp across north bar rake). The unit returned to service later the same day and reached full load on May 22, 1975. Full load operation continued except for stop valve tests until June 11, 1975, at which time the plant was shutdown for pressurizer safety valve maintenance. The unit returned to full power on June 17, 1975.

Except for routine load reductions for heat treatment and condenser cleaning, the unit remained at full load through the end of the reporting period.

1. Changes in Facility Design

No.	Title	Description
73-36	Replace the High Efficiency Filters on Fan Units A-22 and A-24	Replaced the high efficiency filters on Fan Units A-22 and A-24 with high efficiency particulate air filters sealed with elastomers to meet the requirements of Regulatory Guide 1.52.

No.	Title	Description
74-18	Modify Power Range Channels, Dropped Rod Circuit	Modified the four power range channels dropped rod sensing circuits to substitute an equivalent circuit which provides more accurate calibration and therefore greater reliability.
74-20	Containment Sphere Lighting Panel Wiring be Modified	Rewired containment sphere lighting panels to move dehumidifiers and aeroball recorder circuits from normal lighting panel No. 4 to normal lighting panel No. 3.
74-22	The San Onofre-Trabuco 138 KV Line 13831 be Rerouted through San Mateo Substation and the Electrical Fault Protection be Revised	The line protection relay scheme was modified as follows: (1) the existing directional impedence relays were relocated to the line section between San Mateo and Trabuco, and (2) the line section between San Mateo and San Onofre was equipped with a HCB pilot wire protection scheme and backed up with directional power and an overload relay scheme.
74-25	"Pipe Whip" Modifications	Implemented the recommendations contained in the report, "Effects of a Piping System Break Outside the Containment".
74-27	Diesel Air Start Filter be Modified	Modified the air start filter units on each of the emergency diesels by installing larger disposable wire mesh air filters and their associated cartridge holders on the compressed air line to the air start system.
74-32	A Stronger Ceiling Mounting Bracket for the Solid Pipe Hanger on the Loop B Safety Injection System Piping be Installed	Installed a stronger ceiling mounting bracket for the solid pipe hanger (1-R-1501R-15) on the Loop B safety injection system piping (line 6006-6").
74-35 74-36	Construction, Operation and Connections, Sewage Treatment Plant, Units 1, 2 & 3	Replaced the existing sewage treatment facilities with a sewage treatment plant designed to perform primary and secondary sewage treatment supplemented by chlorination as required.
75-01	Marine Fouling Test Facility	Installed a microorganism fouling test facility consisting of pumps, holding tanks, troughs, utility trailer and heat treatment building.

No.	Title	Description
75-02	Relocation of Temporary Warehouse & Shop for San Onofre Unit 1	Provided a 60' x 60' pre-fabricated building to be used as a temporary shop during the construction phase of the AWS building and trailers for personnel facilities.
75-03	Region 7 Fuel Assemblies be Modified	Allowed for prepressurization of fuel rods, addition of new secondary source rods, and modified end plugs and hold down springs.
75-04	Six Auxiliary System Pipes in Areas 2, 5 & 6 of SONGS Unit 1 be Relocated to Allow Pipe Whip Modifications	Fire Protection System, Service Water System, Turbine Plant Cooling Water System & turbine gland seal spillover lines in Areas 2, 5 & 6 were relocated.
75-07	Reservoir Parking Area & Removal of Specimen Trees from Unit 1 Site	Graded, paved, planted and installed an irrigation system as part of the landscape maintenance for the Reservoir Parking Area. Boxed and removed existing specimen trees located within the Unit 1 site.
75-08	Relocation of Existing Control & Communication Cable Serving San Onofre Unit 1 Switchyard, Site A	Relocated portions of two existing duct banks and their contents into a single new duct bank system to provide adequate clearances for the proposed AWS Building.
75-09	The Manipulator Crane Circuitry be Revised to Allow Bridge & Trolley Operation Without Full Up Hoist When No Fuel Assemblies are Being Moved	Modified the manipulator crane circuitry via installation of Micro 21EN9-6 limit switch, a Westinghouse OT3PF push to test light, a Westinghouse BF22F relay and interconnecting wiring.

No.	Title	Description
75-10	The Nitrogen Test Connection Be Removed From the SIS Vent Piping Penetration Cannister	Removed the nitrogen test connection from the SIS vent piping penetration cannister and seal welded the opening.
75-12	Steam Generator Feedwater Valve Control Scheme Be Modified to Close all Feedwater Regulating Valves and MOV's on SIS Actuation	The six Feedwater Regulator Valves and the three motor operated valves (MOV's 20, 21, 22) move to the closed position 20 seconds following SIS actuation.
75-13	Installation of a Plankton Sampling Device on the Intake Velocity Cap	Removed the manhole cover on velocity cap, modified the manhole cover and re-installed the modified cover.
75-17	A Water Separator be Placed in the Gas Line to the Cryogenic Waste Gas Treatment System	Installed an Anderson Water Separator in the Radwaste Disposal System on the inlet of the Cryogenic Waste Gas System to remove excess water from the waste gas stream.
75-18	A Blank Flange be Installed at POV 9 & 10 and Either POV 9 & 10 or Manual Valves 9A or 10A be removed.	Installed a blind flange on the sphere side of ventilation control valves POV 9 & 10 to permit either POV 9 & 10 or manual valves 9A & 10A to be removed for maintenance.
75-19	The Valve Seats, Shaft Seals & Bushings Be Replaced in CV-116 and CV-10 to Avoid Radiation Embrittlement & Failure Due to Temperature	Replaced valve seats, shaft seals, and bushings of CV-116 & CV-10 with material which is radiation resistant as identified in Amendment 30 to the FSAR.
75-22	The Electric Power Cables For the Recirculation Pumps (G45A & B) be Replaced to Avoid Failure in a High Humidity Environment	The electric power cables for recirculation pumps were replaced with cabling qualified to operate in the projected environment following a Loss-of-Coolant Accident.
75-23	The Packing for FCV-1115 A, B, C, D, E, F, Be Replaced to Avoid Failure	Replaced the stem packing for FCV-1115 A, B, C, D, E, F with packing which is radiation resistant in the projected environment subsequent to a LOCA as identified in Amendment 30 to the FSAR.

No.	Title	Description
75-28	A Filter With Bypass Be Installed in RMS 1211 & 1212 Discharge to the Sphere and a Drain Trap be Installed in the Suction From the Vent Stack	Installed a filter with isolation valve & a bypass valve in ORMS R-1211 & R-1212 discharging tubing to the containment sphere. Installed a drain trap in ORMS R-1211 & R-1212 suction tubing from the vent stack and drained to the vent stack drain header.
75-29	An Instrument Air Supply Be Added to the Reheat Steam Line and Drain Valves be Added to the Isolation Valves on the Reheat Steam Dump	An instrument air supply was added to the reheater steam supply line to provide a source of reseating pressure to the dump valves for use during testing. Drain valves were added above the discs of the MOV's to enable draining of the condensate that can form in this area prior to opening the MOV's.
75-31	Modify Sewage Treatment Plant Drain Pipe	Installed a new sewage treatment drain pipe in the discharge conduit tsunami gate structure.
75-32	Additional Modifications For "Pipe Whip" Considerations be Incorporated (Covering Addendum 2 to the "Pipe Whip" report)	Installed jet impingement barriers near main steam relief/headers, main steam lines & main feedwater lines.
75-35	Fire Barriers be Installed in Cable Tray Access Windows and on Trays 60V60 and 60V61	Installed fire barriers at cable tray penetrations through the walls of the 480 Volt, battery and 4 KV rooms and on vertical trays 60V60 and 60V61 The barriers used transite and Flamemastic No. 71A Mastic materials.
75-36	The Existing Pry-A-Larm Smoke Detection System be Extended in the Lube Oil-Chemical Feed & the Controlled Area Handling Facility	Added four model DIS-3/5A Pry-A-Larm detectors to Zone #8 in the lube oil chemical feed area and three model DIS-3/5A Pry-A-Larm detectors and a Model RAL-2 indicating light to Zone #11 in the controlled area handling facility.

2. Performance Characteristics

The reactor and turbine plants were routinely monitored during the six-month reporting period. No significant deviations in performance from expected values were noted with the exception of the continual degraded performance of the east reheaters prior to the refueling. During the refueling, the east reheater tube bundles were replaced. Reheater performance returned to normal following the refueling. The final Cycle 4 burnup value of the core was 10549.28 MWD/MTM. Average burnup of the core for Cycle 4 for the reporting period was 1673.25 MWD/MTM. Average burnup of the core for Cycle 5 for the reporting period was 1375.06.

3. Changes in Operating Methods

The following is a summary of those operating methods that were required due to changes in facility design or performance characteristics.

Design Change		Affected Procedures
74-25	Pipe Whip Modifications	a) Temporary Operating Memorandum 113 - Valve Alignment of Redundant Auxiliary Feedwater Line
		b) Temporary Operating Memorandum 118 - Operation of Redundant Auxiliary Feedwater Line
		c) Temporary Operating Memorandum 117 - Valve Alignment of Backup Instrument Air Header
74-35	Install Sewage Treatment Plant for Units 1, 2 & 3	a) Operating Instruction S-12-3 Sewage Treatment
75-12	Steam Generator Feedwater Valve Control Scheme be Modified to Close all Feedwater Regulating Valves and MOV's on SIS Actuation	a) Operating Instruction S-3-5.5: Loss of Coolant
		b) Operating Instruction S-3-5.20: Steam Generator High Energy Pipe Break
		c) Operating Instruction S-3-5.31: Steam Generator Tube Failure

75-15	Install Auto Contact in Turbine Plant Cooling Water & Salt Water Coolant Pump Control	a) Operating Instruction S-2-7: Salt Water Cooling Pump and Backup Operation b) Operating Instruction S-5-5: Turbine Plant Cooling Water Pump Auto Start Test

4. Surveillance Tests and Inspections

All surveillance tests, checks and calibrations required by the Technical Specifications were performed at the frequencies stipulated. All results are within required limits. Minor difficulties encountered are noted in Attachment I.

5. Periodic Containment Leak Rate Tests

3/13/75 Test following a shutdown

Location	Leakage (% of Allowable)
CV-10, CV-40, CV-116	40.87
CV-147, SV-1212-9	0.01
CV-948, CV-949	3.60
Equipment Door	0.04
South Air Lock	0.0
North Air Lock	1.18
Flg. to Flg. & W. 4KV	0.18
East Elect. Penet.	0.78
West Elect. Penet.	2.42
SIS Loops B & C Vent System	0.02

3/15/75 Test following a shutdown

Location	Leakage (% of Allowable)
CV-146, SV-1212-8	0.52
CV-102, CV-103	0.73
CV-104, CV-105	1.20
CV-106, CV-107	1.25
Main Steam "A" & "B"	1.30
Main Steam "A" only	0.06

3/16/75 Test following a shutdown

Location	Leakage (% of Allowable)
POV-9, POV-9A	0.05
POV-10, POV-10A	0.07

4/16/75 Test following a shutdown

Location	Leakage (% of Allowable)
Fuel Trans. Tube Seal	0.0

4/17/75 Test following a shutdown

Location	Leakage (% of Allowable)
Fuel Trans. Tube Blind Flg.	0.08

4/18/75 Test following a shutdown

Location	Leakage (% of Allowable)
CV-146, SV-1212-8	0.26
CV-147, SV-1212-9	0.04
East Elect. Penet.	1.06
West Elect. Penet.	1.45
CV-102, CV-103	6.98
CV-104, CV-105	2.35
CV-106, CV-107	6.20
Main Steam "A" & "B"	1.54
Main Steam "A" only	0.05

4/19/75 Test following a shutdown

Location	Leakage (% of Allowable)
CV-10, CV-40, CV-116	0.30
CV-948, CV-949	0.04
POV-9	0.05
POV-10	0.03
Flg. to Flg. & W. 4 KV	0.10
CV-102, CV-103	0.10
CV-106, CV-107	0.14

4/20/75 Test following a shutdown

Location	Leakage (% of Allowable)
Equipment Door	0.05

4/21/75 Test following a shutdown

Location	Leakage (% of Allowable)
South Air Lock	2.31
North Air Lock	0.71

4/25/75 Test during load increase

Location	Leakage (% of Allowable)
South Air Lock	3.38
North Air Lock	1.62

5/1/75 Test at Full Power

Location	Leakage (% of Allowable)
South Air Lock	0.84

5/22/75 Test During Power Ascent

Location	Leakage (% of Allowable)
South Air Lock	0.0

6/3/75 Test at Full Power

Location	Leakage (% of Allowable)
South Air Lock	0.0
North Air Lock	0.0

6/9/75 Test at Full Power

Location	Leakage (% of Allowable)
South Air Lock	0.0
North Air Lock	0.0

6/13/75 Test Following a Shutdown

Location	Leakage (% of Allowable)
CV-948, CV-949	0.0
Equipment Door	0.4
Flg. to Flg & W. 4 KV	0.07
East Elect. Penet.	1.06
West Elect. Penet.	1.67
Main Steam "A" & "B"	0.76
Main Steam "A" only	0.0

6/14/75 Test following a shutdown

Location	Leakage (% of Allowable)
CV-10, CV-40, CV-116	0.18
CV-146, SV-1212-8	0.01
CV-147, SV-1212-9	0.02
CV-102, CV-103	0.11
CV-104, CV-105	1.04
CV-106, CV-107	0.11

6/15/75 Test following a shutdown

Location	Leakage (% of Allowable)
POV-9	0.0
POV-10	0.56

6/17/75 Test at Full Power

Location	Leakage (% of Allowable)
South Air Lock	1.68
North Air Lock	0.0

A periodic containment integrated leak rate test was performed on San Onofre Unit 1 during March 16-18, 1975. The test was performed in accordance with the requirements of the Technical Specifications and 10 CFR 50, Appendix J. The measured leak rate and verification test meet the acceptance criteria set forth by both documents. A summary technical report of the test was forwarded to NRC on June 16, 1975.

All results were within Technical Specification requirements.

6. Changes, Tests and Experiments Requiring Commission Authorization

Technical Specification Changes Nos. 18, 19, 20, 21 and 22 were approved during the reporting period by the Commission pursuant to 10 CFR Part 50, Section 50.59 (a).

Technical Specification Changes

Change No. 18

This change revised Technical Specification Sections 3.10 (Incore Instrumentation) and 3.11 (Continuous Power Distribution Monitoring) (1) increasing the surveillance interval for power distribution measurements and for the correlation checks of the axial offset monitoring system for the remaining period of operation with the Cycle 4 core and (2) increasing the specified three percent excore axial offset error allowance to six percent.

Change No. 19

This change revised the Environmental Technical Specifications (Appendix B to the facility license) Section 5.3.3 to change the position of the Manager of Power Supply to Vice President (Power Supply).

Change No. 20

This change revised Technical Specification Section 3.9 (Core Average Burnup) authorizing an increase of the core average burnup for Cycle 4 and succeeding cores from 19,000 MWD/MTM to 21,000 MWD/MTM.

Change No. 21

This change revised Technical Specification Sections 3.5.2 (Control Group Insertion Limits) and 3.11 (Continuous Power Distribution Monitoring) providing new control rod group insertion limits and new functional relationships for the incore axial offset limits for operating with the Cycle 5 core.

Change No. 22

This change incorporates into the Technical Specifications a revised Section 6, "Administrative Controls", except for that portion relating to the reporting requirements which are still under review. This change has reissued the former reporting requirements with only minor, editorial changes.

7. Plant Operating Staff Changes

There were no changes in the key supervisory or technical personnel in the plant operating staff during the reporting period.

8. Station Incidents

75-1

On January 13, 1975, at 1:50 PM, operating personnel noticed reactor coolant loop A variable low pressure trip set point was drifting high.

The variable low pressure set point for loop A is normally recorded on the pressurizer pressure recorder PR-430. Operating personnel reported the recorder trace was drifting up scale. An investigation revealed the source of the drifting recorder trace was due to a malfunction of the variable low pressure set point computer TC-400B. The set point computer was replaced with a spare unit and calibrated.

The malfunctioning computer was bench tested to determine the cause of the drifting output. Testing revealed a transistor in the computer output amplifier had failed.

In that this failure was the first of its type in this device and in the conservative direction, no further action was considered necessary.

75-2

During the routine weekly diesel generator testing conducted on January 14, 1975, the No. 1 diesel-generator was air started. The operator in attendance during the starting operation noted that the air start motor did not stop after the diesel-generator had started. Subsequently, the No. 1 diesel-generator tripped on "Overcrank".

Investigation revealed that the pulley used to drive the diesel's auxiliary generator had separated from its drive shaft. Due to the failure of the auxiliary generator, a signal was not provided to the diesel's starting circuitry to indicate the diesel-generator had started; thus, the air starting motor continued to operate until it timed out and tripped the diesel-generator on "Overcrank".

Repairs consisted of rewelding the pulley to its drive shaft. The No. 1 diesel-generator was subsequently tested satisfactorily on January 14, 1975.

In accordance with Technical Specification requirements, the No. 2 diesel-generator remained operable during the period the No. 1 diesel-generator was out of service. Additionally, the auxiliary generator drive pulley on the No. 2 diesel-generator was inspected and found in satisfactory condition.

This matter was discussed in a letter to the Commission dated January 22, 1975

75-3

On January 22, 1975, at 3:05 PM, the ΔT portion of circulating water system temperature monitoring system failed. It was determined that this incident did not precisely fit the definition of an unusual environmental event since the primary measurement of inlet and outlet temperature remained operable. The failed ΔT circuit was replaced and the system returned to service on January 24, 1975.

75-4

On February 12, 1975, during the semiannual test of both diesel generators, the No. 1 diesel generator tripped from loss of fuel after 45 minutes of operation.

The diesel fuel system consists of an underground fuel storage tank, a small 50 gallon day tank at an elevation above the engine, an engine driven fuel transfer pump to lift fuel from the storage tank to maintain a constant level in the day tank and two engine driven injection pumps taking suction from the day tank and supplying the cylinders. The day tank is equipped with a low level alarm, which is received at a local panel along with other generator alarms, i.e., overspeed, overtemperature, etc., and with a common master alarm in the Control Room.

During the course of the investigation, it was determined that the transfer pump originally provided with the No. 1 diesel generator was of lower capacity than the one provided with the No. 2 diesel generator. The No. 1 diesel transfer pump did not have sufficient capacity to keep the day tank full at rated load. Since both diesels are identical, the transfer pumps should be the same capacity. The difference in capacities of the two transfer pumps had not been apparent previously because the exterior shape and dimensions of the two pumps are identical.

Additionally, the No. 1 diesel generator had been operated at 600 KW for one hour on a number of previous occasions without loss of fuel.

Despite a thorough investigation, it was not conclusively determined why the No. 1 diesel tripped on this occasion from loss of fuel after only 45 minutes of operation. It is felt, however, that (1) a series of other periodic tests which were performed prior to the full load test resulted in excessive fuel usage and lowered the fuel level in the day tank prior to the start of the semi-annual full load test, (2) the capacity of the transfer pump was not sufficient to maintain level in the day tank with the diesel operating at full load (600 KW), and (3) alarms from the previous testing prevented reinitiation of the master alarm in the control room when a low fuel level occurred in the day tank.

A transfer pump of the size used on No. 2 diesel generator was obtained and installed on the No. 1 diesel generator. Testing at full load indicated that the new transfer pump has adequate capacity for extended full load operation.

In accordance with the Technical Specifications requirements, the No. 2 Diesel-generator remained operable during the period the No. 1 Diesel Generator was out of service. The fuel pump on No. 2 Diesel Generator was checked and found to be of the proper size and adequate capacity.

This matter was discussed in a letter to the Commission dated March 12, 1975.

75-5

On February 19, 1975, the unit was operating normally at 450 MWe gross. An Instrument Technician was performing the routine biweekly test of pressurizer instrumentation. Pressurizer level channel 1 was in the trip mode for testing when No. 2 inverter failed, causing No. 2 vital bus to transfer to its alternate power supply. This resulted in pressurizer level channel II momentarily generating a trip signal which tripped the reactor. A telecommunications crew was working in the D.C. switchgear room adjacent to the inverters. The Crew Foreman reported that the No. 2 inverter tripped when one of his workmen bumped the front of the inverter cabinet with the foot of an extension ladder.

Testing subsequent to the trip verified that a vital bus transfer operation would result in a trip if a level channel powered from a different bus was in the trip mode.

The No. 2 inverter would not return to service after the failure. An investigation indicated that there was a failed component in the undervoltage logic circuit board that should have caused the inverter to trip through an undervoltage shunt trip device attachment on one of three circuit breakers contained in the inverter package. Testing of the circuit breaker verified that the undervoltage trip device was sticking. Apparently bumping the cabinet was all that was required to cause the circuit breaker to operate since the logic circuit board has failed at some prior time.

The unit was returned to service at 2:22 PM on the same day and resumed full load operation at 8:40 PM. The inverter circuit board and circuit breaker trip mechanism were repaired the following day.

75-6

The Southern California Edison Company and the Westinghouse Electric Corporation have recently been engaged in an extensive design review of the existing Unit 1 Safety Injection System. During the course of this review, Westinghouse determined and notified SCE on February 28, 1975, that there existed a possible second order mechanical failure which could prevent the Safety Injection System from fulfilling its design requirements under certain accident conditions. Specifically, failure of one of the two feedwater pump discharge valves (MOV 852A or B) to close may result in a portion of the safety injection water intended for injection into the reactor vessel being diverted to the steam generators. This would be particularly applicable to accident conditions under which steam generator pressure is less than reactor coolant pressure (e.g. steam line break accidents).

Following identification of the possible problem on February 28, 1975, meetings of the safety committees were convened. The ramifications of the postulated failure were discussed. The safety committees concluded that reason for concern did exist. Administrative controls for immediate use were approved and utilized until the unit was removed from service March 14, 1975, for refueling.

This matter was discussed in a letter to the Commission dated March 31, 1975.

75-7

On Saturday, March 15, 1975, leak rate testing of ORMS channels 1211 and 1212 sample return line isolation valves was conducted prior to a scheduled sphere integrated leak rate test. The isolation valves on this line consist of SV-1212-8, a solenoid valve located outside the sphere in the penetration "doghouse", and CV-146, an air operated control valve located inside the sphere. Both valves fail closed on loss of air and power.

At 8:30 AM, Saturday morning, an initial leak rate test was conducted. Normal testing pressure for this test is greater than or equal to 46.4 psig. At the time of the testing, due to the 1/4 inch nitrogen supply tubing to this line section, and the leaking isolation valves, the maximum nitrogen gas testing pressure that could be attained in the line section between the two isolation valves was 36 psig. Upon isolation of the nitrogen gas supply, this pressure decayed to 0 psig over a period of 10 seconds. Although this leakage extrapolated to an initial testing pressure of 46.4 psig was only 9.81% of allowable, it was decided to conduct further testing to determine which of the isolation valves was leaking.

In accord with this decision, a plug was installed on the outlet side of CV-146 and another leak rate test was initiated at 9:10 AM. The results of this test were identical to those of the first test. In light of these results, SV-1212-8 was subsequently removed from the line; the valve was disassembled, cleaned and the seat was lapped. Thereafter the valve was reassembled and placed back in the line.

CV-146 was also removed from the line and repaired. The valve was cleaned, the seat lapped and CV-146 was placed back on the line and stroked. A leak rate test was conducted at 8:00 PM on Saturday, March 15, 1975. Results of this test indicated 0.52% of allowable leakage from this line segment.

This matter was discussed in the Integrated Leak Rate Test Report transmitted to the Commission on June 16,1975.

75-8

At approximately 2:00 AM on April 2, 1975, the fuel transfer system was damaged.

A remote inspection by television revealed the west pivot pin of the upender frame had separated from its journal bearing. Additionally, the upender frame and the fuel transfer basket were twisted toward the east, and the transfer carriage was approximately 10" from the "home" position. The wheel under the transfer basket pivot point on the west side was revealed to be off its track.

On April 3, 1975, a diver disassembled and removed the upending frame, fuel transfer basket and carriage. Repairs were made and the components reassembled and tested satisfactorily on April 4, 1975.

75-9

At 6:12 PM on Tuesday, April 22, 1975, the No. 2 inverter was returned to service and No. 2 vital bus was transferred to the No. 2 inverter, which is the normal power supply. During the transfer it was noted that No. 4 vital bus had transferred to the backup power supply. At 6:25 PM the No. 4 vital bus was transferred back to its normal power supply, tripping the reactor. During the subsequent investigation, it was determined that permissive circuit P-7 was momentarily de-energized during the transfer putting the "at power" trips (power >10%) in service. As the turbine was tripped at the time, this caused a reactor trip. The reactor was returned to criticality at 8:08 PM.

75-10

During testing of the Nuclear Instrumentation system on April 25, 1975, Channel N-1207 overpower trip set point was found at 95% full power. Instrument personnel investigated the cause of the low set point and re-established the set point at 108% full power. On May 2, 1975, Channel N-1207 overpower trip set point was found at 111% full power. An investigation revealed the locking fixture on the setpoint device was ineffective, allowing the set point to mechanically change position. The setpoint device was repaired.

75-11

Following extensive Eddy Current Testing in San Onofre Unit 1 Steam Generator A, B and C during the April, 1975, refueling outage, a 800 psig hydrostatic pressure was established at 3:50 AM, April 13, 1975, on the secondary side of all three steam generators to determine the existence of any leaking tubes.

No leaking tubes were observed in steam generators B and C. However, one leaking tube was observed in steam generator A inlet at the following location: Row 1 Column 83. Discovery of the leaking tube prompted an additional inspection in the form of manual eddy current tests and plug gauging in the area surrounding the leaker. The additional inspection revealed that two tubes were restricted at the first support as was the leaker.

The three tubes were plugged and the hydro was re-established with no leakers observed.

75-12

On April 18, 1975, during the execution of the transformer and generator trip test (Procedure S-II-2.4, Section 5T, loss of 138 KV), 4 KV buses 1C and 2C were de-energized when the technician attempted to jumper relay contacts. The technician was attempting to simulate a loss of 138 KV power by opening a D.C. knife switch and installing a jumper. The jumper was placed in error and simulated a station loss of voltage auto transfer, tripping auxiliary transformer "C".

75-13

On May 21, 1975, at 5:35 AM, load was reduced from 450 MW to 380 MW to facilitate underwater repairs to the north bar rake. The repairs were required to correct damage resulting from a heavy influx of sea grass and kelp to the circulating water system. At 10:30 AM, it became necessary to stop the north bar rake to remove the divers light cord which had become entangled in it. At 10:47 AM, the unit was manually tripped when it became evident the north circulating water pump might lose suction because of the restricted flow through the north bar rake and traveling screen.

The amount of debris entering the circulating water system overwhelmed the removal apparatus (i.e., bar rakes, traveling screens and screen wash pumps). Tripping the unit manually was proper under the circumstances since it was evident the north circulating water pump was losing suction and no means were at hand for correcting the situation.

The circulating water system had been operating on one pump for approximately 5 hours prior to the trip. This is defined as "abnormal operation" for the purposes of the Environmental Technical Specification and a maximum ΔT of 38°F is allowed for a period not to exceed 72 hours. During this period, the ΔT ranged from 30.7 to 37.0°F with the recorder stamping once at 40.1°F at 10:45 AM. Due to the unstable operation of the system in the last minute before the unit was tripped, this ΔT is considered transient in nature.

75-14

A review conducted on June 19, 1975, of the sample collection record for section 3.2.1 through 3.2.11 of the San Onofre Nuclear Generating Station Unit 1 Environmental Technical Specifications disclosed that the required number of air and drinking water samples was not collected. Samples missed include: drinking water samples from a local well in San Clemente during February and May, 1975; a drinking water sample from Huntington Beach during March 1975; and fewer than the minimum of ten air samples from the Camp San Onofre Fire Station during the second quarter of 1975.

The May 1975 drinking water sample from San Clemente was not collected because the well being sampled was permanently capped. An equipment failure accounted for the loss of air samples at Camp San Onofre.

A more stringent system for assuring timely sample collection and notification of equipment malfunctions has been initiated. This includes increased sampling duties for station personnel and regular surveys to determine that samples have been collected.

This matter was discussed in a letter to the Commission dated July 7, 1975.

75-15

On June 11, 1975, San Onofre was shut down to repair Safety Valves RV-532 and RV-533. Prior to the shutdown, the possibility of a small primary to secondary tube leak in steam generator "C" had been detected through steam generator secondary side water samples. During the shutdown to repair the Safety Valves, the primary side was opened on steam generators A and C to check the tube sheets for tube leaks with a hydro established on the secondary side. No tube leaks were observed in steam generator A. One leaky tube was observed in steam generator "C" at position Row 5 Column 61. The leak was approximately one drop per 30 seconds.

On June 13, 1975, go-no-go gauging was performed on approximately 35 tubes in the area of the leaker. A 0.500 inch plug passed through all of the tubes but several tubes failed to pass a 0.600 inch plug in the area of the first support. Eddy current testing was done on approximately 56 tubes in the area of the leaker. Preliminary inspection of the eddy current testing traces did not reveal any new defects of significant size. EC testing results in the leaker at R5 C61 was masked on the scope by the restriction in the tube. The leaker at R5 C61 passed all plugs during go-no-go gauging except for the 0.600 inch which indicated a restriction at the first support. The leaker passed a 0.550 inch plug to the U bend.

On June 13, 1975, the leaker at R5 C61 in steam generator "C" was explosively plugged.

B. POWER GENERATION

1.	Gross Thermal Power Generated (MWH)	4,198,437
2.	Gross Electrical Power Generator (MWH)	1,426,800
3.	Net Electrical Power Generated (MWH)	1,356,129
4.	Hours Reactor Critical	3284.49
5.	Hours Generator On-Line	3242.80
6.	Histogram of Thermal Power Vs. Time	(See Attachment II)
7.	Maximum Dependable Capacity	450 MWe Gross
8.	Reserve Shutdown Hours	0

C. SHUTDOWNS

75-01

1.	Cause:	On February 19, 1975, the Unit tripped while at full load as a result of No. 2 inverter failing while the pressurizer level channel 1 was in the trip mode for testing. (See Station Incident Report 75-5 summary for details.)
2.	Shutdown method:	Automatic trip
3.	Duration:	5.67 hrs. from 10:42 AM, February 19, 1975, to 2:22 PM, February 19, 1975

4. Unit status: Hot shutdown

5. Corrective Action: The No. 2 inverter would not return to service after the failure. An investigation indicated that there was a failed component in the undervoltage logic circuit board that should have caused the inverter to trip through an undervoltage shunt trip device attachment on one of three circuit breakers contained in the inverter package. Testing of the circuit breaker verified that the undervoltage trip device was sticking. The inverter circuit board and circuit breaker trip mechanism (overload monitor and overload breaker) were repaired.

75-02

1. Cause: On March 14, 1975, at 11:45 AM, the Unit was manually tripped for the reheater steam dump test and refueling outage.

2. Shutdown method: Manual trip

3. Duration: 971.22 hrs. from 11:45 AM, March 14, 1975, to 1:55 AM, April 23, 1975. From 2:40 PM to 10:58 PM, April 23, 1975.

4. Unit status: Cold shutdown, refueling.

5. Corrective action: Refueling Maintenance and Inservice Inspection

A. Inservice Inspection

1. Ultrasonic testing of approximately 133 primary system welds and 116 main steam, feedwater and extraction steam line welds was completed. The inspection revealed two small primary system socket welds and four secondary side welds with possible defects. These welds were repaired by grinding and rewelding.

Secondary side welds were inspected in connection with commitments made regarding the pipe whip modifications.

5. Corrective action: (Cont'd.)

2. Visual, dye penetrant and ultrasonic tests on all coolant loop outlet line safe end welds were completed. All welds were satisfactory.

3. Ultrasonic tests on all coolant loop outlet nozzle welds were completed using a Remote Examining Device. All welds were satisfactory. Some of the problems incurred using the RED are summarized as follows:

   a. It was necessary to readjust the guide pin locators in order to clear the guide pins when rotating the RED.

   b. Failure of the T.V. camera prevented visual monitoring of RED entry into nozzles.

   c. The RED was removed from the vessel midway through the inspection to repair two transducer cable connectors and the rotary readout device.

B. Reactor Plant

1. The containment sphere integrated leak rate test was successfully completed.

2. The fuel shuffle including installation of 52 new fuel assemblies was completed. This operation was suspended for four days when problems occurred with the spent fuel transfer basket and carriage. A TV inspection showed a pivot pin on the upending frame had pulled out resulting in twisting and bowing of the carriage and transfer basket. A hard hat diver was used in the upender area of the spent fuel pit to remove the damaged components and reinstall them.

5. Corrective action:

2. (Cont'd.)

Upon completion of the repairs, the system was checked out, functionally tested and the fuel shuffle completed with no additional problems. The reactor vessel head was off a total of 14 days, including three days for the internal nozzle inspection and the four days of delay mentioned earlier.

3. The following 400 KHZ steam generator eddy current testing was accomplished.

a. In "A" steam generator, approximately 800 tubes were tested from the inlet side and less than one thousand were tested from the outlet side. Less than ten tubes had indications greater than 20% wall thinning.

b. In "B" steam generator approximately 1800 tubes were tested from the outlet side. Approximately 30 tubes had indications greater than 20% wall thinning.

c. In "C" steam generator approximately one thousand tubes were tested from the inlet side and less than 400 were tested from the outlet side. Approximately 30 tubes had indications greater than 20% wall thinning.

In summary, eighteen tubes were plugged using the explosive plugging method. This included one leaker and four tubes with greater than 50% wall thinning. Individually, four tubes were plugged in "A" steam generator; two tubes in "B"; and twelve tubes in "C".

In general, most indications were in the antivibration bar area.

5. Corrective action:

4. BOL Physics testing was accomplished at startup to verify Westinghouse cycle 5 design calculations.

C. Turbine Plant

1. The No. 1 L.P. turbine rotor was removed, cleaned and inspected for blade root and tenon cracking. Several minor tenor cracks were ground out but no root cracks were found.

   The shrouds on both ends of the L-4 stage (seventh stage) were welded into a seven segment harmonic shroud.

   The No. 2 L.P. turbine was inspected in place. One blade in the last stage generator end was found to have a cracked root. The four blade group containing this blade was replaced.

2. As a result of excessive tube inlet end erosion, 5754 tubes each in the Nos. 1 and 3 condenser water boxes were replaced with titanium tubes. In the No. 2 condenser waterbox, 5504 tubes were replaced with 90-10 Cu-Ni alloy tubes and 250 were replaced with 70-30 Cu-Ni alloy. The new tubes in the No. 2 waterbox extended six inches beyond the inlet side tube sheet in an attempt to mitigate the problem of inlet end erosion. The titanium tubes are flush with the tube sheets. The No. 4 waterbox was previously retubed in 1973 with Cu-Ni and has performed satisfactorily.

3. Due to excessive tube failures, both east reheater tube bundles were removed and replaced with new bundles. The new tubes are 90-10 Cu-Ni material.

D. Pipe Whip Modifications

Modifications to piping systems outside the containment to mitigate the consequences of high energy pipeline rupture were accomplished.

75-03

1.	Cause:	On May 21, 1975, at 10:47 AM, the unit was manually tripped when it became evident the north circulating water pump might lose suction because of the restricted flow through the north bar rake and traveling screen.
2.	Shutdown method:	Manual trip
3.	Duration:	10.14 hrs. from 10:47 AM, May 21, 1975, to 8:55 PM, May 21, 1975
4.	Unit status:	Hot shutdown
5.	Corrective action:	Cleaned and repaired damage to the bar rake and traveling screen. Cleaned the traveling bar rake and screen of sea weed. Repaired damage to the rake and screens by replacing links in the bar rake chain, tightening the sprocket on rakes and putting the chain back on the sprocket.

75-04

1.	Cause:	On June 11, 1975, decreased unit load to off-line because of excessive pressurizer safety valve (RV-532 and RV-533) leakage (valve seat distortion).
2.	Shutdown method:	Manual load decrease
3.	Duration:	127.35 hrs. from 11:47 AM, June 11, 1975, to 7:08 PM, June 16, 1975.
4.	Unit status:	Cold shutdown
5.	Corrective Action:	a) Lapped pressurizer safety valve seats and retested the valves satisfactorily. b) Steam Generator work conducted during the outage is discussed under Item 8, Station Incidents, No. 75-15.

D. CORRECTIVE MAINTENANCE ON SAFETY RELATED AND ENVIRONMENTAL EQUIPMENT

EQUIPMENT	MALFUNCTION		EFFECT ON SAFE OPERATION	CORRECTIVE ACTION	SPECIAL PRECAUTIONS FOR ENVIRONMENTAL PROTECTION AND/OR REACTOR SAFETY
	CAUSE	RESULT			
Intrusion System	Alarm relay failed	Alarmed	None	Replaced relay	None
North Charging Pump Cooling Water Low Flow Alarm	Float stuck	Alarm inoperative	None	Replaced float	None
Reactor Protection System Loop A Variable Low Pressure Setpoint Computer	Output transistor failed	Increasing set point	None	Replaced computer with spare unit. Calibrated.	None
Area Radiation Monitoring System	NA	NA	None	Routine calibration	None
Reactor Control and Protection System	NA	NA	None	Tested	None
Fans A-22 - 24	NA	NA	None	Installed new HEPA elements and tested	None
No. 1 Diesel Generator Aux. Gen. Drive Pulley	Cracked weld	Loss control current	None	Rewelded and returned to service	None

D. CORRECTIVE MAINTENANCE ON SAFETY RELATED AND ENVIRONMENTAL EQUIPMENT

EQUIPMENT	MALFUNCTION		EFFECT ON SAFE OPERATION	CORRECTIVE ACTION	SPECIAL PRECAUTIONS FOR ENVIRONMENTAL PROTECTION AND/OR REACTOR SAFETY
	CAUSE	RESULT			
Control Rod Drive System	Half power contactor cycled with slave cycler cam switch operation	Improper operation of rod drive system	None	Replaced time delay relay 6TD2	None
Reactor coolant Pump Seal Water High Flow Alarm	Float tube separated from meter body	Alarm inoperative	None	Repaired fitting on meter body and tested alarm	None
No. 2 Inverter	Failed overload monitor and overload breaker	Inverter tripped	None	Repaired overload monitor and breaker Returned to service	None
New Fuel	NA	NA	None	Received, inspected and stored	None
Switchyard Area Monitor	Moisture	Failed compressor	None	Installed spare unit	None
No. 1 and 2 Diesel Generators	NA	NA	None	Performed overspeed test	None
No. 1 Diesel	Inadequate design capacity	Marginal capacity	None	Replaced transfer pump	None
Perform LVDT Control Rod Operational Test	NA	NA	None	Refueling test	None
Operational Radiation Monitoring System	NA	NA	None	Performed 6 month calibration	None

D. CORRECTIVE MAINTENANCE ON SAFETY RELATED AND ENVIRONMENTAL EQUIPMENT

EQUIPMENT	MALFUNCTION		EFFECT ON SAFE OPERATION	CORRECTIVE ACTION	SPECIAL PRECAUTIONS FOR ENVIRONMENTAL PROTECTION AND/OR REACTOR SAFETY
	CAUSE	RESULT			
Safety Injection System Flow Comparator	NA	NA	None	Refueling test	None
Source Range Channel N-1201	Failed detector	Channel erratic	None	Replaced detector	None
Control Rod Drive System	NA	NA	None	Serviced all 1/2 power time delay relays	None
Control Rod Position System	NA	NA	None	Refueling calibration	None
Volume Control Tank Level Control System	NA	NA	None	Refueling calibration	None
Reactor Coolant Temperature Control System	NA	NA	None	Refueling calibration	None
Unit Protective Relaying	NA	NA	None	Refueling servicing and trip testing	None
Reactor Coolant System RTD's 400B; 401B; 410A; 410C and 420B	Failed open	Inoperative	None	Replaced with new units	None
Containment Sphere Pressure Indication System	NA	NA	None	Refueling calibration	None

D. CORRECTIVE MAINTENANCE ON SAFETY RELATED AND ENVIRONMENTAL EQUIPMENT

EQUIPMENT	MALFUNCTION		EFFECT ON SAFE OPERATION	CORRECTIVE ACTION	SPECIAL PRECAUTIONS FOR ENVIRONMENTAL PROTECTION AND/OR REACTOR SAFETY
	CAUSE	RESULT			
Pressurizer Pressure Control System	NA	NA	None	Refueling calibration	None
Reactor Coolant Flow System	NA	NA	None	Refueling calibration	None
Steam Generator Level Control System	NA	NA	None	Refueling calibration	None
Vital Area Annunciator System	NA	NA	None	Completed alarm circuit wiring	None
Boron Analyzer	Read out indicator failed	System inoperative	None	Repaired read out indicator	None
Reheater Steam Dump Valves	Rust deposits	Leaking valve	None	Dismantled - cleaned installed new seal ring	None
Monitor 1211-1212	Failed motor bearings	Loss of pumping capacity	None	Replaced motor	None
Main Steam Relief Valves	NA	NA	None	Tested & serviced	None
Pressurizer RV-532 & 533	NA	NA	None	Routine seat polishing & leak and pressure tested	None

D. CORRECTIVE MAINTENANCE ON SAFETY RELATED AND ENVIRONMENTAL EQUIPMENT

EQUIPMENT	MALFUNCTION		EFFECT ON SAFE OPERATION	CORRECTIVE ACTION	SPECIAL PRECAUTIONS FOR ENVIRONMENTAL PROTECTION AND/OR REACTOR SAFETY
	CAUSE	RESULT			
NIS Power Range Channels Dropped Rod Circuit	NA	NA	None	Circuit revision Design Change 74-18	None
Aero-ball System	Various	Loss of several channels	None	Repaired system	None
Nuclear Instrumentation System	NA	NA	None	Replaced detector cables	None
No. 2 Inverter	Failed integrated circuit	Output voltage swinging	None	Replaced integrated circuit	None
Nuclear Instrumentation System Power Range Channel N-1206	Detector B failed	1/2 Channel inoperative	None	Replaced detector	None
"B" Steam Generator Steam Flow Meter	Range spring failed	Non-linear signal	None	Replaced range spring assembly - calibrated	None
Fuel Transfer Carriage	Bent carriage	Bound carriage	None	Removed upender & carriage - Straightened carriage - returned to service	None
Component Cooling Heat Exchanger	NA	NA	None	Replaced pipe section tube side	None
Rod Control Contactors	NA	NA	None	Inspected - cleaned - returned to service	None

D. CORRECTIVE MAINTENANCE ON SAFETY RELATED AND ENVIRONMENTAL EQUIPMENT

EQUIPMENT	MALFUNCTION		EFFECT ON SAFE OPERATION	CORRECTIVE ACTION	SPECIAL PRECAUTIONS FOR ENVIRONMENTAL PROTECTION AND/OR REACTOR SAFETY
	CAUSE	RESULT			
Flame & Smoke Detectors	NA	NA	None	Inspected, serviced Flame & Smoke Detectors	None
CV 875 A & B	Wire Drawing	Minor leakage	None	Lapped seating surfaces	None
POV 9 & 10	NA	NA	None	Installed blank flanges	None
Primary Valves 45 Units	NA	NA	None	Inspected, cleaned, repacked	None
Reactor Coolant Pumps A, B & C	NA	NA	None	Installed vibration probes and monitor	None
Boron Analyzer	Failed integrated circuit	Inoperative	None	Replaced integrated circuit	None
Nuclear Instrumentation Channel N-1202	Failed detector	Inoperative	None	Replaced detector	None
Boric Acid Injection Pump	Failed pump head gasket	Head leakage	None	Replaced head gasket	None

E. CHANGES IN FACILITY DESIGN CARRIED OUT WITHOUT PRIOR COMMISSION APPROVAL

NO.	TITLE	DESCRIPTION	SAFETY ANALYSIS AND ENVIRONMENTAL IMPACT SUMMARY
73-36	The High Efficiency Filters on Fan Units A-22 and A-24 Be Replaced	Replaced the High Efficiency Filters on Fan Units A-22 and A-24 with High Efficiency Particulate Air filters sealed with elastomers to meet the requirements of AEC Regulatory Guide 1.52.	The new filters improve performance of the filter banks while leaving unmodified the functioning of fans A-22 and A-24. The new filters do not involve a change in any safety related equipment. This change improves the station's impact on the environment.
74-18	Modify Power Range Channels, Dropped Rod Circuit	Modified the four power range channels dropped rod sensing circuits to substitute an equivalent circuit which provides more accurate calibration and therefore greater reliability.	The modification of the dropped rod sensing circuit is not a functional change of the circuit but is an equivalent circuit which is evaluated as providing more accurate calibration and therefore greater reliability. This change does not impact the environment.
74-20	Containment Sphere Lighting Panel Wiring Be Modified	Rewire containment sphere lighting panels to move de-humidifiers and aeroball recorder circuits from normal lighting panel No. 4 to normal lighting panel No. 3.	This modification simply shifts the power source of sphere de-humidifiers and aeroball recorders from one lighting panel to another. This change does not impact the environment.
74-22	The San Onofre-Trabuco 138 KV Line 13831 Be Rerouted Through San Mateo Substation & the Electrical Fault Protection Be Revised	The line protection relay scheme was modified as follows: (1) the existing directional impedance relays were relocated to the line section between San Mateo & Trabuco and (2) the line section between San Mateo & San Onofre was equipped with a HCB pilot wire protection scheme & backed up with directional power & overload relay scheme.	The SDG&E tieline 13831 modification does not effect the availablity of auxiliary power to San Onofre via the 138 KV switchyard. The same criteria have been designed into the new modification as presently exists. This change does not impact the environment.

E. CHANGES IN FACILITY DESIGN CARRIED OUT WITHOUT PRIOR COMMISSION APPROVAL

NO.	TITLE	DESCRIPTION	SAFETY ANALYSIS AND ENVIRONMENTAL IMPACT SUMMARY
74-25	"Pipe Whip" Modifications	Implemented the recommendations contained in the report "Effects of a Piping System Break Outside the Containment".	The changes and modifications are preventive measures necessary to assure that the reactor can be placed in a cold shutdown condition after a high energy pipe failure outside the containment, and have no effect on the provisions of the FSA or the Technical Specifications. Installation of the modifications will not result in a condition more adverse to the environment than previously described in the Unit 1 Environmental Report.
74-27	Diesel Air Start Filter Units Be Modified	Modified the air start filter units on each of the emergency diesels by installing larger disposable wire mesh air filters & their associated cartridge holders on the compressed air line to the air start system.	This modification merely improves the ability of diesel air start filter units to perform their function in a trouble free manner and provides for simplified maintenance. The function of the unit remains the same, i.e., provide a clean filtered air supply to the air start system. This change does not impact the environment.
74-32	A Stronger Ceiling Mounting Bracket for the Solid Pipe Hanger on the Loop B Safety Injection System Piping Be Installed	Installed a stronger ceiling mounting bracket for the solid pipe hanger (1-R-1501R-15) on the Loop B safety injection system piping (line 6006-6").	The new bracket provides stronger mounting because the width of the base plate has been doubled and two additional Phillips Anchor Bolts have been added. The use of a stronger mounting bracket provides greater assurance that the bracket will not be overstressed from combined normal and seismic loads. This change does not impact the environment.

E. CHANGES IN FACILITY DESIGN CARRIED OUT WITHOUT PRIOR COMMISSION APPROVAL

NO.	TITLE	DESCRIPTION	SAFETY ANALYSIS AND ENVIRONMENTAL IMPACT SUMMARY
74-35 74-36	Construction, Operation & Connections, Sewage Treatment Plant, Units 1, 2 & 3	Replaced the existing sewage treatment facilities with a sewage treatment plant designed to perform primary & secondary sewage treatment supplemented by chlorination treatment as required.	The nature of this change is not safety related and this change will not degrade or impact the operation of Unit 1. This change upgrades the Unit 1 discharge effluent & thus will not result in a condition more adverse to the environment than previously described in the Unit 1 & Units 2 & 3 Environmental Report.
75-01	Marine Fouling Organism Test Facility	Installed a micro-organism fouling test facility consisting of pumps, holding tanks, troughs, utility trailer and heat treatment building.	This test facility is constructed in an area presently used for storage in the plant yard. The only interfaces with the operating plant are connections with the circulating water system, the plant drainage system and the plant power supply. The nature of this installation does not impact the environment. Installation of this facility does not result in a condition more adverse to the environment than previously described in the Unit 1 Environmental Report.
75-02	Relocation of Temporary Warehouse & Shop For San Onofre Unit 1	Provided a 60' x 60' prefabricated building to be used as a temporary shop during the construction phase of the AWS building and trailers for engineering & personnel facilities.	The nature of this work is not safety related and does not impact the operation of Unit 1. The nature of this installation does not impact the environment. Installation of this facility does not result in a condition more adverse to the environment than previously described in the Unit 1 Environmental Report.

E. CHANGES IN FACILITY DESIGN CARRIED OUT WITHOUT PRIOR COMMISSION APPROVAL

NO.	TITLE	DESCRIPTION	SAFETY ANALYSIS AND ENVIRONMENTAL IMPACT SUMMARY
75-03	Region 7 Fuel Assemblies Be Modified	Allowed for prepressurization of fuel rods, addition of new secondary source rods, and modified end plugs and hold down springs. Region 7 fuel rods have been redesigned where they no longer rest on the bottom nozzle of the assembly.	The use of prepressurized fuel rods will reduce the amount of possible fuel-clad interaction and the stresses and strains to which the cladding will be subjected. Consequently, reliability is improved. No nuclear design, thermal-hydraulic, structural or safety analysis problems are foreseen in introducing this design change into the San Onofre Unit 1 core. The nature of this installation does not impact the environment. Installation of this facility will not result in a condition more adverse to the environment than previously described in the Unit 1 Environmental Report.
75-04	Six Auxiliary System Pipes in Areas 2, 5 & 6 of SONGS-1 Be Relocated to Allow Pipe Whip Modifications	Fire Protection System, Service Water System, Turbine Plant Cooling Water System & Turbine gland seal spillover lines in Areas 2, 5 & 6 were relocated.	The pipes being relocated are not part of the Safety Injection System or similar reactor safety systems. Relocation of the pipes does not modify any system functions or degrade system functions. The pipe relocations have no effect on the provisions of the FSA or the Technical Specifications. The nature of this installation does not impact the environment. Installation of this facility will not result in a condition more adverse to the environment than previously described in the Unit 1 Environmental Report.

E. CHANGES IN FACILITY DESIGN CARRIED OUT WITHOUT PRIOR COMMISSION APPROVAL

NO.	TITLE	DESCRIPTION	SAFETY ANALYSIS AND ENVIRONMENTAL IMPACT SUMMARY
75-07	Reservoir Parking Area & Removal of Specimen Trees from Unit 1 Site	Graded, paved, planted and installed an irrigation system as part of a two-year landscape maintenance for the Reservoir Parking Area. Boxed & removed existing specimen trees located within the Unit 1 site.	The nature of this work is not safety related and will not impact the operation of Unit 1. The completed work will result in landscaping which will be an aesthetic improvement compared to the present status. Installation of the subject asphalt paving & landscaping will not result in a condition more adverse to the environment than previously described in the Unit 1 Environmental Report.
75-08	Relocation of Existing Control & Communication Cable Serving San Onofre Unit 1 Switchyard, Site A	Relocated portions of two existing duct banks & their contents into a single new duct bank system to provide adequate clearance for the proposed AWS Building.	This modification was accomplished while the unit was in the cold shutdown condition. The availability of auxiliary power is such that a primary & backup source is available for normal and emergency uses. This modification results in a switchyard control system functionally identical to that which formerly existed. The ultimate installation results in duct work which is essentially hidden from view. Installation of the subject duct work will not result in a condition more adverse to the environment than previously described in the Unit 1 Environment Report.
75-09	The Manipulator Crane Circuitry Be Revised to Allow Bridge & Trolley Operation Without Full Up Hoist When No Fuel Assemblies Are Being Moved	Modified the manipulator crane circuitry via installation of a Micro 21EN9-6 limit switch, a Westinghouse OT3PF push to test light, a Westinghouse BF22F relay and interconnecting wiring.	This modification eliminates unnecessary movement without affecting existing safety circuits. It will not be possible to move the bridge & trolley until the gripper tube is fully withdrawn with a fuel assembly attached. This change does not involve an unreviewed environmental question & will not adversely affect the environment as described in the Unit 1 Environmental Report.

E. CHANGES IN FACILITY DESIGN CARRIED OUT WITHOUT PRIOR COMMISSION APPROVAL

NO.	TITLE	DESCRIPTION	SAFETY ANALYSIS AND ENVIRONMENTAL IMPACT SUMMARY
75-10	The Nitrogen Test Connection Be Removed From the SIS Vent Piping Penetration Cannister	Removed the nitrogen test connection from the SIS vent piping penetration cannister & seal welded the opening.	The leak tightness of the entire containment, including the subject cannister, was subsequently verified by a containment building integrated leak rate test. This change will not adversely affect the environment as described in the Unit 1 Environment Report & does not involve an unreviewed environmental or safety question.
75-12	Steam Generator Feedwater Valve Control Scheme Be Modified to Close All Feedwater Regulating Valves and MOV's on SIS Actuation	The six Feedwater Regulator Valves and the three motor operated valves (MOV's 20, 21, 22) move to the closed position 20 seconds following SIS actuation.	This design change prevents diversion of SIS borated water into the steam generators while leaving unaffected the operating performance of the system. This design change does not affect the Safety Injection System or any other System required for emergency operation. The design change provides an additional assurance that SIS borated water will reach the reactor pressure vessel. This change will not adversely affect the environment as described in the Unit 1 Environment Report & does not involve an unreviewed environmental or safety question.

E. CHANGES IN FACILITY DESIGN CARRIED OUT WITHOUT PRIOR COMMISSION APPROVAL

NO.	TITLE	DESCRIPTION	SAFETY ANALYSIS AND ENVIRONMENTAL IMPACT SUMMARY
75-13	Installation of a Plankton Sampling Device on the Chlorinator System	Removed the manhole cover on velocity cap, modified the manhole cover and re-installed the modified cover.	The nature of this work is not safety related and this change does not degrade or impact the operation of Unit 1. The installation of this sampling device does not result in discharge of any materials into navigable waters and will not result in violations of requirements established by the Federal Water Pollution Act Amendments of 1972, or by the State of California Water Quality Control Plan for ocean waters of California adopted July 6, 1972. Installation of the plankton sampling device will not result in a condition more adverse to the environment than previously described in the Unit 1 Environmental Report.
75-17	A Water Separator Be Placed in the Gas Line to the Cryogenic Waste Treatment System	Installed an Anderson Water Separator in the Radioactive Waste Disposal System on the inlet of the Cryogenic Waste Gas System to remove excess water from the waste gas stream	This design change reduces the amount of water entering the CVI system. This modification results in improved operation of the CVI system thereby reducing the amounts of radioactive gases discharged. This change decreases the amount of gaseous radioactive nuclides released to the environment and will not result in a condition more adverse to the environment than previously described in the Unit's Environmental Report.

E. CHANGES IN FACILITY DESIGN CARRIED OUT WITHOUT PRIOR COMMISSION APPROVAL

NO.	TITLE	DESCRIPTION	SAFETY ANALYSIS AND ENVIRONMENTAL IMPACT SUMMARY
75-18	A Blind Flange Be Installed at POV 9 & 10 and Either POV 9 & 10 or Manual Valves 9A or 10A Be Removed	Installed a blind flange on the sphere side of ventilation control valves POV 9 & 10 to permit either POV 9 & 10 or manual valves 9A & 10A to be removed for maintenance.	The installation of a blind flange at POV 9 & 10 will comply with all requirements of the Technical Specifications. These changes do not alter the performance of the system as described in the FSA. The nature of this installation does not impact the environment. Installation of this facility will not result in a condition more adverse to the environment than previously described in the Unit 1 Environmental Report.
75-19	The Valve Seats, Shaft Seals & Bushings Be Replaced on CV-116 and CV-10 to Avoid Radiation Embrittlement & Failure Due to Temperature	Replaced valve seats, shaft seals and bushings of CV-116 & CV-10 with material which is radiation resistant as identified in Amendment 30 to the FSA.	The replacement of the specified constituent parts is required in order that the valves will perform the required function & retain structural integrity for one year past a hypothetical accident. The nature of this installation does not impact the environment. Installation of this equipment will not result in a condition more adverse to the environment than previously described in the Unit 1 Environmental Report.

E. CHANGES IN FACILITY DESIGN CARRIED OUT WITHOUT PRIOR COMMISSION APPROVAL

NO.	TITLE	DESCRIPTION	SAFETY ANALYSIS AND ENVIRONMENTAL IMPACT SUMMARY
75-22	The Electric Power Cable For the Recirculation Pumps (G45A & B) Be Replaced to Avoid Failure in a High Humidity Environment	The electric power cables for the recirculation pumps were replaced with cabling qualified to operate in the projected environment following a Loss-of-Coolant Accident.	The modified electrical cabling to Recirculation Pumps G-45A and B is qualified to remain undergraded in the projected post accident environment for up to one year. The nature of this installation does not impact the environment. Installation of this facility will not result in a condition more adverse to the environment than previously described in the Unit 1 Environmental Report.
75-23	The Packing for FCV-1115 A, B C, D, E, F Be Replaced to Avoid Failure	Replaced the stem packing for FCV-1115, A, B, C, D, E, F with packing which is radiation resistent in the projected environment subsequent to a LOCA as identified in Amendment 30 to the FSAR.	The replacement of the specified constituent parts is required in order that the valves will perform the required function & retain structural integrity for one year past hypothetical accident. The nature of this installation does not impact the environment. Installation of this facility will not result in a condition more adverse to the environment than previously described in the Unit 1 Environmental Report.

E. CHANGES IN FACILITY DESIGN CARRIED OUT WITHOUT PRIOR COMMISSION APPROVAL

NO.	TITLE	DESCRIPTION	SAFETY ANALYSIS AND ENVIRONMENTAL IMPACT SUMMARY
75-28	A Filter With Bypass Be Installed in RMS 1211 & 1212 Discharge to the Sphere and a Drain Trap be Installed in the Suction From the Vent Stack	Installed a filter with isolation valve & a bypass valve in ORMS R-1211 & R-1212 discharging tubing to the containment sphere. Installed a drain trap in ORMS R-1211 & R-1212 suction tubing from the vent stack and drained to the vent stack drain header.	The addition of a filter with a bypass will not effect the operation of the monitor or reliability of the monitor to provide a signal to isolate the containment. The service pressure rating of the new filter and valves is equal to or greater than the present piping. The new arrangement will not effect the flow of air & particulate to the monitor. The service pressure rating of the drain trap is greater than the present piping. The nature of this installation does not impact the environment. Installation of this facility will not result in a condition more adverse to the environment than previously described in the Unit 1 Environmental Report.
75-29	An Instrument Air Supply Be Added to the Reheat Steam Line & Drain Valves Be Added to the Isolation Valves on the Reheat Steam Dump	An instrument air supply was added to the reheat steam supply line to provide a source of reseating pressure to the dump valves for use during testing. Drain valves were added above the discs of the MOV's to enable draining of the condensate that can form in this area prior to opening the MOV's.	This design change permits more complete testing of the system. It only affects system testing and not normal performance of the system. The nature of this installation does not impact the environment. Installation of this facility will not result in a condition more adverse to the environment than previously described in the Unit 1 Environmental Report.

E. CHANGES IN FACILITY DESIGN CARRIED OUT WITHOUT PRIOR COMMISSION APPROVAL

NO.	TITLE	DESCRIPTION	SAFETY ANALYSIS AND ENVIRONMENTAL IMPACT SUMMARY
75-31	Modify Sewage Treatment Plant Drain Pipe	Installed a new sewage treatment drain pipe in the discharge conduit tsunami gate structure.	The new pipe is located inside the existing drain pipe. There will be no new interface with plant operations. The pipe extends into the circulating water flow just as the existing pipe did before it failed. This pipe, however, will be securely anchored to prevent failure. The nature of this installation does not impact the environment. Installation of this facility will not result in a condition more adverse to the environment than previously described in the Unit 1 Environmental Report.
75-32	Additional Modifications for "Pipe Whip" Considerations Be Incorporated (Covering Addendum 2 to the "Pipe Whip" report)	Installed jet impingement barriers near main steam relief headers, main steam lines & main feedwater lines.	This modification protects cable trays containing safety related electrical circuits and electrical penetrations from jet impingement loadings resulting from critical cracks in the steam relief headers and the main steam lines. This modification also protects electrical cable trays and the instrument air line supplying the sphere from jet impingement loadings due to cracks in the main feedwater lines. The nature of this installation does not impact the environment. Installation of this facility will not result in a condition more adverse to the environment than previously described in the Unit 1 Environmental Report.

E. CHANGES IN FACILITY DESIGN CARRIED OUT WITHOUT PRIOR COMMISSION APPROVAL

NO.	TITLE	DESCRIPTION	SAFETY ANALYSIS AND ENVIRONMENTAL IMPACT SUMMARY
75-35	Fire Barriers Be Installed in Cable Tray Access Windows and on Trays 60V60 & 60V61.	Installed fire barriers at cable tray penetrations through the walls of the 480 Volt, battery and 4 KV rooms & on vertical trays 60V60 & 60V61. The barriers used transite & Flamemastic No. 71A Mastic materials.	The Flamemastic material forming the barriers is a water base compound which will not react with the cable insulation or create a fire hazard during or after installation. A sample of the Flamemastic material was tested to verify its non-flammable qualities. Installation of these barriers improves the station fire protection capabilities and will not create a hazard during installation. This change does not adversely affect the environment as described in the Unit 1 Environment Report & does not involve an unreviewed environmental question.
75-36	The Existing Pry-A-Larm Smoke Detection System Be Extended in the Lube Oil-Chemical Feed & the Controlled Area Handling Facility	Added four model DIS-315A Pry-A-Larm detectors to Zone #8 in the lube oil chemical feed area and three model DIS-315A Pry-A-Larm detectors and a Model RAL-2 indicating light to Zone #11 in the controlled area handling facility.	This modification improves detection capability and does not create a hazard during installation. This change does not adversely affect the environment as described in the Unit 1 Environment Report & does not involve an unreviewed environmental question.

F. RADIOACTIVE EFFLUENT RELEASES

Attached are tables which summarize radioactive releases from the plant for the subject reporting period. An independent laboratory performs some of the analyses on monthly liquid composite samples. As a consequence, the May and June data do not contain strontium 89 or 90 values. These data will be included in a future report as they become available.

1. Gaseous Effluents

   a. Gross Radioactivity Releases

      1) Total gross radioactivity releases were 1.07 E + 3 curies

      2) The maximum gross radioactivity release rate for a one hour period was 1.30 E + 7 μCi/hr

      3) Total gross radioactivity data by nuclide released are shown in Table 1

      4) The percent of technical specification limit for noble gases is 1.24 E - 1 percent

   b. Iodine Releases

      1) Iodine radioactivity released during this period is shown by isotope in Table 1.

      2) The percent of technical specification limit for iodine-131 is 1.53 E - 3 percent.

   c. Particulate Releases

      1) Total gross radioactivity released was 3.58 E - 2 curies.

      2) No alpha activity other than background was observed.

      3) The total gross radioactivity for nuclides with half lives greater than eight days was 3.58 E - 2 curies.

      4) The percent of technical specification limit for particulate activity with half-lives greater than eight days is 2.74 E - 4 percent.

2. Liquid Effluents

   a. Total gross radioactivity released, excluding tritium and noble gases, was 1.06 curies. The average concentration released to unrestricted areas was 3.94 E - 9 μCi/ml.

b. The maximum concentration of gross radioactivity released to the unrestricted area was 6.35 E - 7 μCi/ml.

c. The total tritium released to the unrestricted area was 1.89 E + 3 curies. The average tritium concentration released to the unrestricted area was 8.48 E - 6 μCi/ml. Alpha radioactivity released to the unrestricted area was 3 E - 5 curies through April 1975. The average alpha concentration released to the unrestricted area was 1.3 E - 19 μCi/ml (based on total dilution water volume for period).

d. The total dissolved gas radioactivity released to the unrestricted area was 4.74 curies. This quantity yielded an average concentration of 2.13 E - 8 μCi/ml released to the unrestricted area.

e. The volume of liquid waste released was 8.76 E + 6 liters.

f. The total volume of dilution water was 2.23 E + 11 liters.

g. Total gross radioactivity by nuclide is shown in Table II.

h. The percent of the technical specification limit for liquid releases is 3.11 E - 1.

G. SOLID WASTE

1. A total of 2.81 E + 3 cubic feet of solid waste was shipped off site during the six month reporting period.

2. A total of 2.6 E + 1 curies was estimated to have been shipped during the past six months.

3. Waste shipments were made on February 20, 21, 24, 25; March 22 and June 10, 1975. The February and March shipments were made under a burial contract with Nuclear Engineering Co., Inc. The June shipment was performed by Southwest Nuclear Co. The burial site is in Beatty, Nevada.

4. Twenty-one spent fuel assemblies were shipped off site during the reporting period. They were shipped to the General Electric Reprocessing Center, Morris, Ill.

H. ENVIRONMENTAL MONITORING

1. Media sampled, analyzed and reported to SCE for the fourth quarter of 1974 are summarized below. Data for January-June 1975 samples will be supplied in a supplementary report.

Radiation Levels

a. A diagram showing the location of twelve combination film badge/TLD packs is shown in Figure 1.

b. Twelve film badge/TLD packs were evaluated during the reporting period.

c. One location was found to be slightly above local background levels.

d. A film badge on the Access Road registered 28 mr gamma greater than the detection limit of 10 mrem gamma. The corresponding TLD showed 29 mrem greater than the detection limit of 25 mrem. All other sample points showed less than the detection limit for film badge/TLD packs.

Marine Specimens

a. Two locations were sampled during this reporting period.

b. Two lobsters, two mussels, two sea hares and four fish were analyzed and reported during this period.

c. All radioactivity levels were within the previously observed ranges.

d. A sea hare collected at Newport Beach showed the highest radioactivity level. Data are shown below for flesh and are reported as nCi/Kg dry weight.

	β-^{40}K
Highest	15
Lowest	<2
Average	5.8

Kelp, Marine Grass and Algae

a. Five locations were sampled during this reporting period.

b. Five samples were analyzed and reported during this period.

c. All radioactivity levels were within the previously observed range.

d. The sample of surface kelp collected from the Barn Kelp Bed showed the highest radioactivity level. Data are shown below and are reported as nCi/Kg dry weight.

	$\beta - {}^{40}K$
Highest	18
Lowest	<3
Average	10

Vegetable Samples

a. Two locations were sampled during this reporting period.

b. One type of vegetable was collected and analyzed.

c. Levels of radioactivity were within the previously observed range.

d. A tomato collected at the Highland Farm showed the highest radioactivity content of the vegetables analyzed. Data are shown below and are reported as nCi/Kg dry weight.

	$\beta - {}^{40}K$
Highest	13
Lowest	<4
Average	8.5

Air Samples

a. Samples were collected from four stations.

b. A total of 28 samples were counted during this period.

c. No sample showed radioactivity levels above normal background. Some airborne radioactivity due to atmospheric weapons testing is believed present.

d. A sample collected from the Camp Pendleton site showed the highest activity level for this period. Data are shown below and are reported in pCi/m^3 for total β and in fCi/m^3 for gross α.

	Total β	Gross α
Highest	0.27	17
Lowest	0.04	<0.5
Average	0.12	5

Drinking Water Samples

a. Samples were collected from two sites.

b. Two samples were collected during this period.

c. No sample location showed activity levels above normal background.

d. A sample collected from the Capistrano Beach reservoir showed the highest activity level for this period. Data are shown below and are reported in pCi/l.

	Filtrate plus Suspended Solids	
	Gross β	Gross α
Highest	25.8	< 4.2
Lowest	24.5	< 4.2
Average	25.1	< 4.2

Beach Sand Samples

a. Samples were collected from four locations.

b. Four samples were collected during this period.

c. Activity levels were within those previously observed.

d. Data are shown below and are reported in nCi/Kg dry weight.

	Total γ (from isotopic)
Highest	1.01
Lowest	0.38
Average	0.66

Ocean Bottom Sediment Samples

a. Samples were collected from two sites.

b. Two samples were collected and analyzed during this period.

c. Activity levels were within those previously observed.

d. Data are shown below and are reported in nCi/Kg dry weight.

	Total γ (from isotopic)
Highest	1.94
Lowest	1.78
Average	1.86

Secondary Coolant Water Samples (Ocean Water)

a. Samples were collected from two locations.

b. Four samples were collected during this period.

c. The activity levels were within the previously observed range.

d. Data are shown below and are reported in pCi/l.

	Gross β
Highest	990
Lowest	670
Average	890

2. Levels of radioactive materials in the environmental media as determined by our environmental monitoring program did not indicate the likelihood of public intakes in excess of 1% of those that could result from continous exposure to the concentration values listed in Appendix B, Table II of Part 20.

3. No statistically significant variations of offsite environmental concentrations were observed.

I. OPERATIONAL PERSONNEL RADIATION EXPOSURE

All persons required to wear film badges while on site during the reporting period are included in this report. Exposures are grouped according to the following levels:

<100 mrem
100-500 mrem
501-1250 mrem
1251-2500 mrem
>2500 mrem

Individuals with exposures greater than 500 mrem for the reporting period are classified according to the following six job categories:

Administrative and Engineering - This category includes Station and general office administrative and engineering personnel.

Chemical-Radiation Technicians - These individuals perform all radiation monitoring and other health physics functions.

Contractors - The major portion of exposure accumulated by these persons occurs while working on steam generators and/or performing the required in-service inspections during refuelings.

Maintenance - Major exposures to these persons occur during refuelings while working on steam generators, reactor coolant pumps and other equipment within the containment. Routine jobs which result in above average exposures include baling of radioactive trash and changing of reactor coolant or radioactive waste system filters and ion exchange resin beds.

Nuclear Instrument Technicians - These persons perform all instrument calibrations, repairs and tests.

Operations - These individuals are responsible for performing all plant equipment and reactor operational functions.

Personnel occupational radiation exposures for January through June, 1975, are shown below.

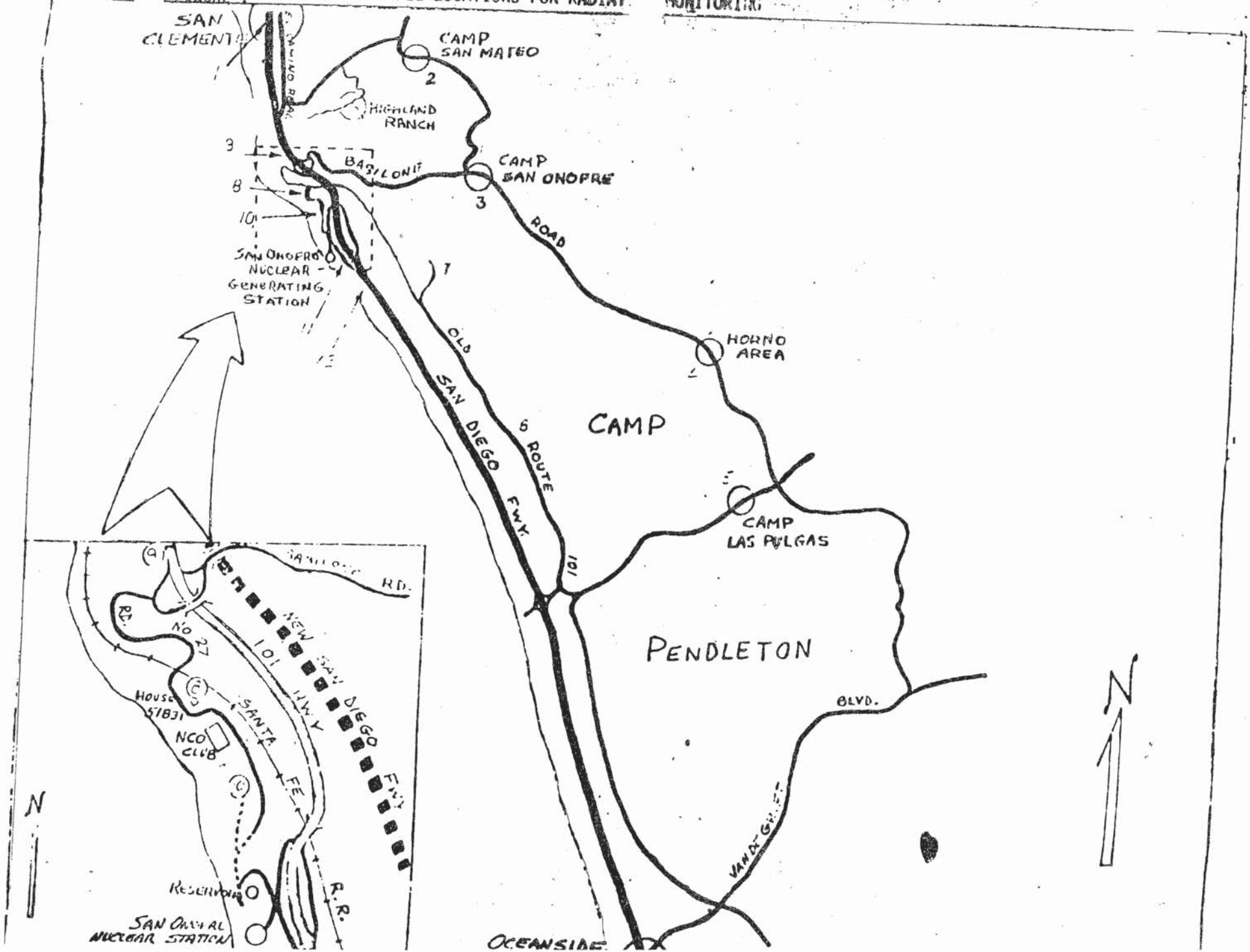
Exposure (mrem)	No. Persons
<100	403
100-500	141
501-1250	75
1251-2500	41
>2500	21

ATTACHMENT I

TEST DEFICIENCIES

TEST	MINIMUM FREQUENCY	RESULTS	CAUSE	CORRECTIVE ACTION REQUIRED
ERMS	Once/day	1/14/75 Channel 1250 did not respond to check source	Design deficiency	Redesigned by manufacturer
ERMS	Once/day	1/16/75 Channel 1250 did not respond to check source	Design deficiency	Redesigned by manufacturer
ERMS	Once/day	1/31/75 Channel 1250 and 1252 did not respond to check source	Design deficiency	Redesigned by manufacturer
ERMS	Once/day	3/17/75 Channel 1251 did not respond to check source	Design deficiency	Redesigned by manufacturer
Power Range NIS Channel	Once/week	4/11/75 All channel deviation alarms out of tolerance	Circuit drift	Calibrated circuits
Diesel Generator	Once/week	1/14/75 #1 Diesel generator tripped on overcrank	Auxiliary generator pulley separated from drive shaft	Welded pulley to drive shaft
Diesel Generator	Bi-annual	2/12/75 #1 Diesel generator tripped after 45 min. of operation during rated load test	Ran out of fuel in day tank	Replaced fuel transfer pump with pump of greater capacity
ORMS	Once/week	1/3/75 Channels 1211, 1214, 1218 read too high in test	Deterioration of oscillator circuit	Replaced neon bulbs in relaxation oscillator circuit
ORMS	Once/week	2/21/75 Channel 1214 high voltage out of limits	Circuit drift	High voltage was adjusted

FIGURE 1 SAMPLE LOCATIONS FOR RADIAT MONITORING



ADDITIONS

Table II, Liquid Radioactive Releases, of the July-December 1974 report should be updated for October, November and December as shown below.

	UNITS	OCT.	NOV.	DEC.	TOTAL
1. Gross Radioactivity (β,γ)					
a) Total Release	Curies	1.13(-1)	1.01(-1)	3.08(-1)	1.52
b) Avg. Concentration Released	µCi/ml	2.38(-9)	2.08(-9)	6.07(-1)	5.12(-9)
c) Max. Concentration Released	µCi/ml	9.31(-8)	7.61(-8)	2.68(-7)	1.01(-6)
2. Tritium					
a) Total Release	Curies	4.32(2)	3.94(2)	2.61(2)	2.38(3)
b) Avg. Concentration Released	µCi/ml	9.19(-6)	8.11(-6)	5.15(-6)	8.01(-6)
3. Dissolved Noble Gases					
a) Total Release	Curies	5.19(-2)	8.54(-1)	NDA	1.75
b) Avg. Concentration Released	µCi/ml	1.10(-9)	1.76(-8)	-	5.89(-9)
4. Gross Alpha Radioactivity					
a) Total Release	Curies	<4(-6)	< 6(-6)	<1(-5)	<4(-5)
b) Avg. Concentration Released	µCi/ml	<8(-14)	< 1(-13)	<1(-13)	<1.3(-13)
5. Volume of liquid waste to discharge canal	Liters	3.77(5)	5.75(5)	8.84(5)	3.17(6)
6. Volume of Dilution Water	Liters	4.70(10)	4.86(10)	5.07(10)	2.97(11)
7. Isotopes Released	Curies				
La-140		NDA	NDA	NDA	5.25(-3)
Sr-89		1.5(-4)	8.1(-5)	5.3(-5)	1.5(-3)
I-131		2.35(-3)	NDA	NDA	2.89(-3)
Xe-133		5.93(-3)	3.69(-4)	NDA	7.02(-1)
Xe-135		2.23(-3)	NDA	NDA	3.04(-3)
Cs-137) Combined Cs-134)		1.17(-1)	6.85(-2)	8.00(-3)	9.93(-1)
Co-60		3.43(-4)	2.88(-4)	2.97(-4)	1.05(-2)
Co-58		NDA	1.36(-2)	NDA	1.76(-1)
Cr-51		NDA	NDA	NDA	NDA
Mn-54		3.6(-4)	NDA	NDA	3.7(-3)
Zn-65		NDA	NDA	NDA	NDA
Sr-90		6.0(-5)	5.2(-5)	4.4(-5)	1.3(-3)
I-133		NDA	NDA	NDA	NDA
Xe-131m		4.38(-2)	8.54(-1)	NDA	1.04
C-14		<3(-4)	< 5 (-4)	<7(-4)	<2(-3)
Fe-59		NDA	NDA	NDA	NDA
Ag-110m		NDA	NDA	NDA	NDA
Sb-124		NDA	NDA	NDA	1.6(-2)
Na-24		NDA	NDA	3.00(-1)	3.00(-1)
Ba-140		NDA	NDA	NDA	5.49(-3)
Unidentified		NDA	1.86 (-2)	NDA	1.86(-2)
8. Percent of Tech. Spec. Limit For Total Activity Released	%	4.52 (-2)	3.99(-1)	2.25(-2)	1.09(-1)

NDA - No Detectable Activity

II. LIQUID RELEASES

	UNITS	JAN.	FEB.	MAR.	APR.	MAY	JUNE	TOTAL
1. Gross Radioactivity (β,γ)								
a) Total Release	Curies	2.15E-2	2.06E-2	7.42 E-2	1.22 E-1	2.77 E-1	5.42 E-1	1.06 EO
b) Avg. Concentration Released	µCi/ml	4.27E-10	4.81E-10	3.36 E-9	8.29 E-9	5.64 E-9	6.92 E-9	3.94 E-9
c) Max. Concentration Released	µCi/ml	2.35E-9	9.39E-9	1.66 E-7	3.57 E-7	6.28 E-7	6.35 E-7	6.35 E-7
2. Tritium								
a) Total Release	Curies	6.48E+2	5.91E+2	7.50 E+1	9.61 E+1	8.03 E+1	4.01 E+2	1.89 E+3
b) Avg. Concentration Released	µCi/ml	1.29E-5	1.29E-5	3.39 E-6	6.58 E-6	1.87 E-6	9.82 E-6	8.48 E-6
3. Dissolved Noble Gases								
a) Total Release	Curies	6.83E-2	4.29	9.93 E-3	5.27 D-3	NDA	3.83 E-1	4.74 EO
b) Avg. Concentration Released	µCi/ml	1.36E-9	9.39E-8	4.49 E-10	3.61E-10	-	9.39 E-9	2.13 E-8
4. Gross Alpha Radioactivity								
a) Total Release	Curies	<1E-5	2 E-5	NDA	NDA	IA	IA	3 E-5
b) Avg. Concentration Released	µCi/ml	<2 E-13	4 E-13	-	-	-	-	
5. Volume of liquid waste to discharge canal	Liters	7.23E+5	7.57E+5	3.56 E+5	4.61 E+5	5.72 E+6	2.51E+6	1.05E+7
6. Volume of Dilution Water	Liters	5.03E+10	4.57E+10	2.21 E+10	1.46E+10	4.91E+10	4.08E+10	2.23 E+11
7. Isotopes Released	Curies							
C-14		4 E-4	9.8 E-4	NDA	1.3 E-3	IA	IA	2.7 E-3
Cr-51		NDA	8.89E-3	NDA	1.49 E-2	NDA	NDA	2.38 E-2
Mn-54		5.7 E-4	NDA	NDA	6.97E-4	1.58 E-4	2.12 E-3	3.54 E-3
Fe-59		<6 E-5	NDA	NDA	NDA	NDA	NDA	6E-5
Co-58		NDA	NDA	3.31 E-3	5.40E-2	4.99 E-2	1.33 E-1	2.40 E-1
Co-60		NDA	2.75E-3	1.21 E-3	8.73 E-4	4.30 E-3	1.32 E-2	2.24 E-2
Zn-65		NDA	NDA	NDA	NDA	NDA	NDA	NDA
Sr-89		3.2 E-4	7.6 E-6	NDA	3.7 E-5	IA	IA	3.7 E-4
Sr-90		3.2 E-5	5.3 E-5	1.4 E-5	7.4 E-5	IA	IA	1.7 E-4
Ag-110m		4 E-5	NDA	NDA	1.38 E-2	NDA	NDA	1.38 E-2
Sb-124		NDA	NDA	NDA	NDA	NDA	NDA	NDA
I-131		NDA	NDA	NDA	NDA	NDA	NDA	NDA
I-133		NDA	NDA	NDA	NDA	NDA	NDA	NDA
Xe-131m		6.61E-2	4.27	NDA	NDA	NDA	NDA	4.34 EO
Xe-133		1.84E-3	2.47E-2	9.93 E-3	NDA	NDA	3.83 E-1	4.20 E-1
Xe-133m		NDA	NDA	NDA	NDA	NDA	NDA	NDA
Xe-135		3.83E-4	1.09E-3	NDA	NDA	NDA	NDA	1.47 E-3
Cs-134		1.00 E-2	3.91E-3	2.14 E-2	1.27 E-2	6.95 E-2	1.16 E-1	2.34 E-1
Cs-137		1.00 E-2	3.91E-3	3.74 E-2	2.42 E-2	1.52 E-1	2.78 E-1	5.06 E-1
Ba-140		NDA	NDA	NDA	NDA	NDA	NDA	NDA
La-140		NDA	NDA	NDA	NDA	NDA	NDA	NDA
Ce-144		2 E-5	NDA	NDA	NDA	NDA	NDA	2 E-5
Unidentified		NDA	NDA	NDA	NDA	NDA	NDA	NDA
8. Percent of Tech. Spec. Limit For Total Activity Released	%	4.36 E-1	4.35 E-1	1.35 E-1	3.18 E-1	9.49 E-2	3.98 E-1	3.11 E-1

NDA=No Detectable Activity

IA=Independent Analyst

TABLE I REPORT OF RADIOACTIVE EFFLUENTS SAN ONOFRE NUCLEAR GENERATING STATION
DOCKET January-June, 1975

I. GASEOUS RELEASES

	UNITS	JAN.	FEB.	MAR.	APR.	MAY	JUNE	TOTAL
1. Total Noble Gases	Curies	2.44E+1	3.05E+1	1.01 E+3	2.44E-1	1.91 E-1	5.59 EO	1.07E+3
2. Total Halogens	Curies	NDA	NDA	5.39 E-3	1.41E-3	NDA	2.39 E-1	2.46E-1
3. Total Particulate Gross Radioactivity (β,γ)	Curies	NDA	NDA	1.03 E-3	2.62E-2	NDA	8.36 E-3	3.56E-2
4. Total Tritium	Curies	NDA	NDA	1.64 E+1	1.45E+1	NDA	3.37 EO	3.43E+1
5. Total Particulate Gross Alpha Radioactivity	Curies	NDA	NDA	NDA	NDA	NDA	NDA	NDA
6. Max. Noble Gas Release Rate	µCi/sec	1.04E+3	1.08E+3	3.60 E+3	1.25E+1	5.80 EO	3.47 E+2	3.60E+3
7. Percent of Applicable Limit For:								
a. Noble Gases	%	1.67E-2	2.21E-2	6.81 E-1	1.71E-4	1.29 E-4	5.09 E-3	1.24E-1
b. Halogens	%	-	-	5.30 E-7	2.64E-7	-	1.69 E-2	2.89E-3
c. Particulates	%	-	-	1.00 E-4	5.82E-7	-	1.50 E-3	2.74E-4
8. Isotope Released:								
Particulates	Curies	NDA	NDA			NDA		
Cr-51				2.06 E-4	4.33E-3		3.31 E-4	4.87E-3
Mn-54				4.98 E-5	9.94E-4		2.92 E-4	1.34E-3
Fe-59				8.92 E-6	3.28E-4		NDA	3.37E-4
Co-58				4.61 E-4	1.73E-2		6.52 E-3	2.43E-2
Co-60				1.04 E-4	2.72E-3		1.21 E-3	4.03E-3
Sr-89				NDA	NDA		NDA	
Sr-90				NDA	NDA		NDA	NDA
Cs-134				1.45 E-4	9.27E-5		NDA	2.38E-4
Cs-137				5.03 E-5	2.47E-4		NDA	2.97E-4
Ba,La-140				NDA	NDA		NDA	
Co-57					3.99E-5		9.34 E-6	4.92 E-5
Nb-95					1.02E-4		NDA	1.02 E-4
Ru-103					2.55E-4		NDA	2.55 E-4
Halogens		NDA	NDA			NDA		
I-131				2.63 E-3	1.29E-3		5.79 E-4	4.50E-3
I-133				2.76 E-3			1.05 E-5	2.77E-3
I-135								
I-132					1.16 E-4		2.38 E-1	2.38E-1
Gases								
Ar-41		NDA	NDA	NDA	NDA	NDA	NDA	NDA
Kr-85		NDA	NDA	NDA	NDA	NDA	NDA	NDA
Kr-85m		NDA	1.35E-2	3.21 E-2	NDA"	NDA	1.93 E-2	6.49E-2
Kr-87		NDA	NDA	NDA	NDA	NDA	NDA	NDA
Kr-88		NDA	4.44E-3	1.72 E-2	NDA	NDA	NDA	2.16E-2
Xe-131m		3.11E 0	1.06EO	NDA	NDA	NDA	NDA	4.17EO
Xe-133		1.35E+1	2.56E+1	1.01 E+3	2.40E-1	1.89 E-1	4.45 EO	1.05E+3
Xe-133m		6.93E 0	3.81EO	3.22 E-1	NDA	NDA	7.63 E-2	1.11E+1
Xe-135		8.59E-1	1.00EO	6.85 EO	3.57E-3	1.78 E-3	1.04 EO	9.75EO
Xe-135m		NDA	NDA	NDA	NDA	NDA	NDA	NDA
Xe-138		NDA	NDA	NDA	NDA	NDA	NDA	NDA
Kr-83m		NDA	NDA	7.76 E-5	NDA	NDA	NDA	7.76 E-5

III. SOLID RELEASES

1. Total solid waste packaged
2. Total est. radioactivity
3. Dates of shipment and Disposition if shipped Offsite.

UNITS	JAN.	FEB.	MAR.	APR.	MAY	JUNE	TOTAL
Ft^3	0	3.36E+2	5 E0	0	0	2.47 E+3	2.81 E+3
Curies	0	8.1E0	1.7 E+1	0	0	8.4 E-1	2.6 E+1

JANUARY
No shipments

FEBRUARY 20, 21, 24, 25
Nucl. Engr. Co.

MARCH 22
Nucl. Engr. Co., Inc.

APRIL
No shipments

MAY
No shipments

JUNE 10
Southwest Nuclear Co.

JULY

AUGUST

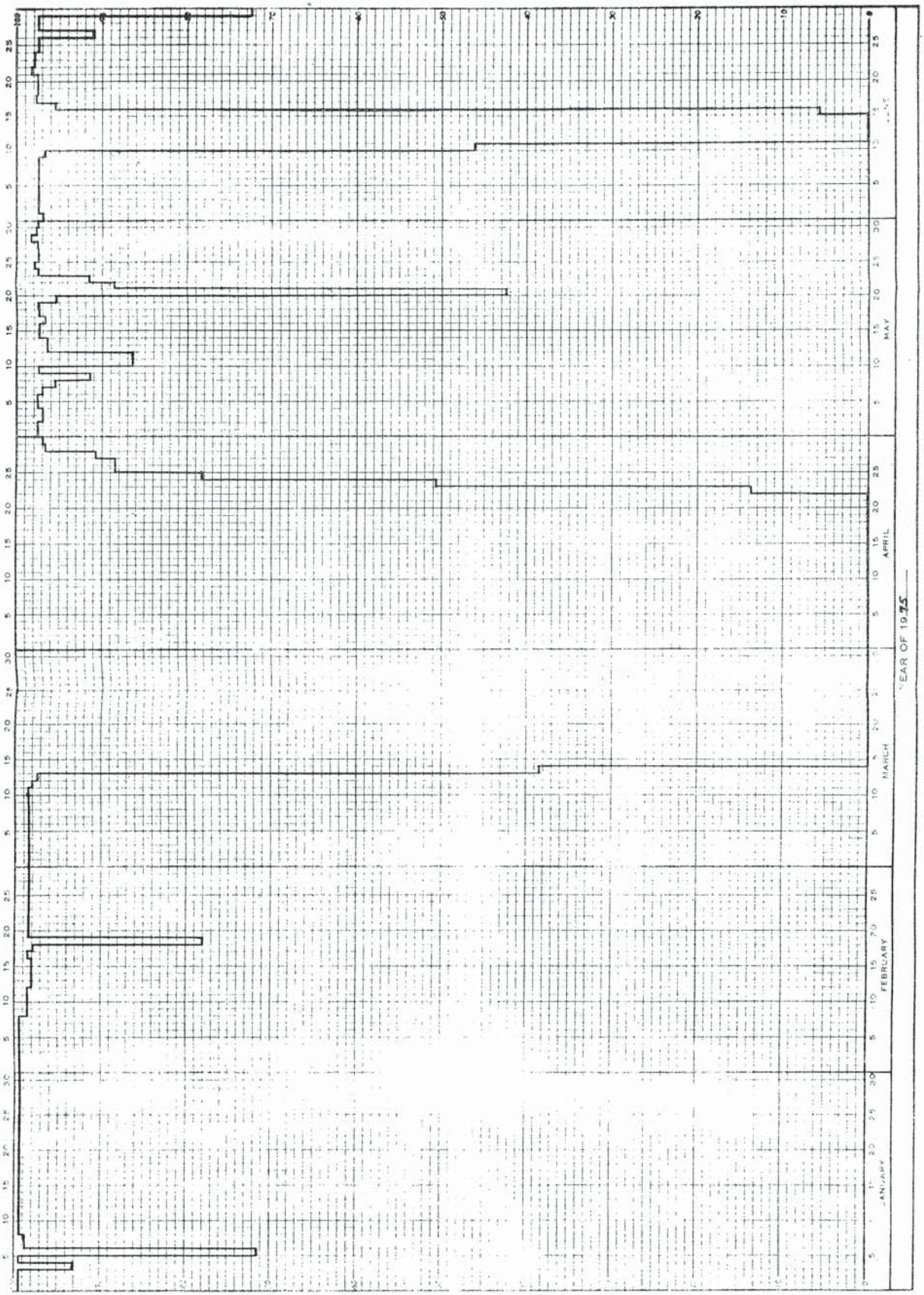
SEPTEMBER

OCTOBER

NOVEMBER

DECEMBER

ATTACHMENT II



1-PR

Southern California Edison Company

P. O. BOX 800

2244 WALNUT GROVE AVENUE

ROSEMEAD, CALIFORNIA 91770

September 30, 1975

Director
U. S. Nuclear Regulatory Commission
Region V
Suite 202, Walnut Creek Plaza
1990 North California Boulevard
Walnut Creek, California 94596

Docket 50-206

Dear Sir:

In accordance with Section 5.6 of Appendix B to the Provisional Operating License No. DPR-13 for the San Onofre Nuclear Generating Station, we are submitting a supplemental report to our Semi-Annual Operating Report No. 16.

This report covers the period January 1, 1975 through June 30, 1975 and consists of attachments (1) and (2) to this letter. The following information is tendered:

(1) There are no changes or additions to permits and certificates required by Federal, state, local and regional authorities for the protection of the environment. Any changes would be reported under the provisions of paragraph 2, section 5.6.1.b of Appendix B to the Provisional Operating License.

(2) Attachment 1 provides information meeting the requirements of section 5.6.1.e, Appendix B to the Provisional Operating License and section 6.9.1.h, Appendix A to the Provisional Operating License.

(3) Attachment 2 provides information required by section 5.6.1.f, Appendix B to the Provisional Operating License. Information submitted in accordance with section 5.6.1.f satisfies the reporting requirements stipulated in sections 3.1 and 4.0, Appendix B to the Provisional Operating License.

Yours truly,

R. V. Knapp

R. V. Knapp
Manager of Steam Generation

Attachments

ATTACHMENT 1

RADIOLOGICAL ENVIRONMENTAL MONITORING

(1) Media sampled and analyzed during the first and second quarters of 1975 are shown below.

Radiation Levels

a. Fourteen locations were sampled.
b. Twenty-three TLD sets were analyzed during this reporting period.
c. No locations were found to be above normal local background levels. All values were within the previously observed range.
d. The Visitor's Viewing Center showed the highest mean radiation level of the locations measured. This area is located 0.1 mile from the plant at 015° magnetic north.

	mr/qtr
highest	26.6
mean	21.2
lowest	15.8

Air Particulate

a. Four locations were sampled.
b. Ninety-three weekly air particulate and 95 weekly iodine samples were analyzed during this reporting period. Eight air particulate quarterly composite samples were analyzed for alpha, gamma and strontium-90 activities.
c. No locations were above local background levels.
d. Camp San Onofre showed the highest airborne radioactivity levels of the locations measured. This area is located 2.3 miles from the plant at 043° magnetic north.

	Beta pCi/m^3	I-131 pCi/m^3
highest	0.62	<LLD
mean	0.20	
lowest	0.004	

	Alpha pCi/m^3	Sr-90 pCi/m^3
highest	0.0017	0.005
mean	0.0017	0.005
lowest	0.0017	0.005

Drinking Water

a. Four locations were sampled.
b. Sixteen monthly and six quarterly composite samples were analyzed during this reporting period.
c. No locations were found to be above normal background levels. Gross β data were within the preoperational range. Other data were within the previously observed ranges.
d. Water from Tri-Cities Water District showed the highest gross beta radioactivity levels in the filtrate for the quarterly composite samples analyzed. Both gross alpha and tritium levels were below LLD.

Beta pCi/l

highest 21
mean 20.5
lowest 20

Ocean Water

a. Two locations were sampled.
b. Eight bimonthly and two semiannual composite samples were analyzed during this reporting period.
c. No locations were found to be above normal local background levels. All values were within previously observed ranges.
d. Newport Beach, the control location, showed the highest mean beta radioactivity level measured. Tritium and gamma radioactivity levels were below LLD for both sampling locations. Newport Beach is 30 miles from the station at 305° magnetic north.

Beta pCi/l

highest 900
mean 850
lowest 740

Beach Sand

a. Four locations were sampled.
b. Eight samples were analyzed during this reporting period.
c. No locations were found to be above normal local backgrounds.
d. A surfing beach which is 1.4 miles from the plant at 300° magnetic north showed the highest radioactivity level measured.

Cs-137 $^{nCi}/_{kg}$

highest 0.028
mean 0.025
lowest 0.021

Local Crops

a. Two locations were sampled.
b. Four vegetable samples were analyzed during this reporting period.
c. No locations were found to be above normal local background levels.
d. The control location (23 miles at 135° magnetic north) showed the highest radioactivity levels measured. Iodine-131 was below LLD at all locations.

H-3 nCi/kg		Sr-90 nCi/kg	
highest	32	highest	0.077
mean	26	mean	0.077
lowest	19	lowest	0.077

Cs-137 nCi/kg	
highest	0.099
mean	0.099
lowest	0.099

Non-migratory Marine Animals

a. Two locations were sampled.
b. Sixteen marine animals were analyzed during this reporting period.
c. No samples approached reporting level values for any isotope. All values were within previously observed ranges.
d. Samples collected near the station discharge generally showed higher radioactivity levels than samples collected from Newport Beach. This observation is based on the detection of any given isotope in only one or two of the eight samples collected near the station discharge. The discharge is 0.5 mile at 215° magnetic north from the station. Total gamma data shown below represent a summation of isotopic data for all naturally present and other isotopes detected in individual samples.

Total gamma	dry weight pCi/g	wet weight pCi/g
highest	2.71	0.34
mean	0.81	0.14
lowest	0.076	0.009

Tritium	dry weight pCi/g	wet weight pCi/g
highest	114	33
mean	114	33
lowest	114	33

Kelp

a. Four locations were sampled.
b. Four samples were analyzed during this reporting period.
c. Two locations showed individual isotopic levels greater than observed for the control location. All levels observed were within previously observed ranges.
d. A sample collected from the San Mateo Kelp Bed showed the highest total gamma activity level of the samples analyzed. No tritium was observed for any sample. The San Mateo Kelp Bed is 6 miles at 145° magnetic north from the station.

Total gamma	dry weight pCi/g	wet weight pCi/g
highest	0.178	0.0187
mean	0.178	0.0187
lowest	0.178	0.0187

Ocean Bottom Sediments

a. Three locations were sampled.
b. Three samples were analyzed during this reporting period.

c. No locations were above normal local background levels. All values measured were within previously observed levels.
d. A sample collected 0.5 mile north of the station discharge at 215° magnetic north generally showed the highest radioactivity level. Total gamma data shown below represent a summation of isotopic data for all naturally present and other isotope detected.

Total gamma	dry weight pCi/g	wet weight pCi/g
highest	1.44	0.77
mean	1.44	0.77
lowest	1.44	0.77

Rabbits

a. One location was sampled.
b. One sample was analyzed during this reporting period.
c. No locations were found to be above local background levels.
d. Iodine-131 in the thyroid and gamma emitters in the flesh were all below LLD. Strontium-90 was detected in bone structure and was within the previously observed range

	Sr-90 pCi/gCa
observed	5.0

(2) Levels of radioactive material in environmental media reported here do not indicate a likelihood of public intakes in excess of 1% of those that could result from continuous exposure to the concentration values listed in Appendix B, Table II, 10 CFR 20.

(3) Environmental data are too limited to permit correlation with effluent release data at this time.

(4) Noted below are locations and times for direct radiation levels observed to be greater than 25% above the control station at Hungtington Beach.

Location	Quarter
Visitors Center	2

Noted below are locations and collection times for samples with radionuclide contents greater than twice background levels. Background levels are taken to be those values determined from samples collected from control or background points during January-June 1975. Background locations are defined within the ETS.

Sample Type	Location	Collection Date
Air particulate-weekly	San Clemente	1-20-75
"	"	1-27-75
"	Camp San Onofre	1-27-75
"	Visitor Center	1-27-75
"	Camp San Onofre	2-17-75
"	Visitor Center	5-28-75
" -quarterly	Camp San Onofre	January-March
"	Visitor Center	April-June

Sample Type	Location	Collection Date
Drinking water-monthly	Tri-Cities Water Dist.	January
"	San Clemente Well	January
"	Tri-Cities Water Dist.	February
"	Tri-Cities Water Dist.	March
"	San Clemente Well	March
Drinking water-quarterly	Tri-Cities Water Dist.	January-March
"	San Clemente Well	January-March
Drinking water-monthly	Tri-Cities Water Dist.	April
"	San Clemente Well	April
"	Tri-Cities Water Dist.	May
"	Tri-Cities Water Dist.	June
Drinking water-quarterly	Tri Cities Water Dist.	April-June
Beach Sand	Surfing Beach	January
Marine Animals	Station Discharge	March
Marine Animals	Station Discharge	June
Kelp	New Kelp Bed	June
Kelp	San Mateo Kelp Bed	June
Ocean Bottom Sediment	North of Discharge	June

(5) Results of all radiological samples are summarized on a quarterly basis in Tables 1 & 2.

Table 1

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY
SAN ONOFRE NUCLEAR GENERATING STATION DOCKET NO. 50-206
SAN DIEGO, CALIFORNIA

January-March, 1975

Medium Sampled	Analysis and Total Number Analyses Performed	Lower Limit of Detection (LLD)	All Indicator Locations, Mean, Range	Location with Highest Annual Mean (1) Name, Distance Direction	Mean, Range	Control Location Mean, Range	Number of Non-routine Reported Measurements
Air Particulate (pCi/m^3)	β, 48	0.003	0.17 (48/48) (0.025-0.62)	Camp San Onofre 2.3mi,043°MAG	0.28(11/11) (0.063-0.62)	Huntington Beach 0.14(13/13) (0.028-0.38)	0
	I-131, 50	0.04	<LLD	-	-	-	
Air Particulate Quarterly Composite (pCi/m^3)	α, 4	0.0001	0.00075(4/4) (0.00036-0.0017)	Camp San Onofre 2.3mi,043°MAG	0.0017(1/1) -	Huntington Beach 0.00044(1/1)	0
	Sr-90,4	0.001	0.00025(4/4) 0.001-0.005)	Camp San Onofre 2.3mi,043°MAG	0.005(1/1) -	Huntington Beach 0.001(1/1) -	
	γ isotopic, 4	0.0$\Delta\gamma$/min/m^3					
	510Kev peak		0.018(4/4) (0.009-0.034)	Camp San Onofre 2.3mi,043°MAG	0.034(1/1) -	Huntington Beach 0.014(1/1)	
	Zr-95/Nb-95		0.037(4/4) (0.026-0.054)	Camp San Onofre 2.3mi, 043°MAG	0.054(1/1) -	Huntington Bch 0.026(1/1)	
Direct Radiation (mr/qtr)	γ, 12	1	16.6 (12/12) (13.4-26.6)	Visitor Center(2) 0.1 mi, 015°MAG	26.6 (1/1) -	Huntington Bch 18.2 (1/1) -	0

(1) These columns treated on a calendar year basis.
(2) Located on access road during Visitor Center relocation.

Table 1

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY
SAN ONOFRE NUCLEAR GENERATING STATION DOCKET NO. 50-206
SAN DIEGO, CALIFORNIA

January-March, 1975

Medium Sampled	Analysis and Total Number Analyses Performed	Lower Limit of Detection (LLD)	All Indicator Locations, Mean, Range	Location with Highest Annual Mean (1) Name, Distance Direction	Location with Highest Annual Mean (1) Mean, Range	Control Location Mean, Range	Number of Non-routine Reported Measurements
Drinking Water Filtrate (pCi/l)	β, 8	0.5	14 (8/8) (5.2-21)	Tri Cities Water District 8.7mi, 320°MAG	20 (3/3) (19-21)	Huntington Bch 7.0 (3/3) (5.2-9.7)	1
	α, 8	3	5 (4/8) (3-7)	Tri Cities Water District 8.7 mi, 320°MAG	6 (2/3) (5-7)	Huntington Bch 3 (1/3) -	
Drinking Water, Solids (pCi/l)	β, 8	0.1	2.0 (8/8) (0.8-4.7)	Tri Cities Water District 8.7 mi,320°MAG	2.6(3/3) (1.4-4.7)	Huntington Bch 1.1 (3/3) (0.8-1.4)	
	α, 8	0.3	0.52 (1/8) (<LLD-0.52)	San Clemente Well 3.5 mi, 320°MAG	0.52 (1/3) (<LLD-0.52)	Huntington Bch (<LLD)	
Drinking Water Quarterly Filtrate Composite (pCi/l)	β, 3	0.5	13.2 (3/3) (5.7-20)	Tri Cities Water District 8.7mi, 320°MAG	20(1/1) -	Huntington Bch 5.7 (1/1) -	0
	α, 3	3.0	<LLD	-	-	-	
	H-3, 3	200	300 (2/3) (300-300)	Tri Cities Water District 8.7 mi, 320°MAG	300 (1/1) -	Huntington Bch <LLD	

Table 1

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY
SAN ONOFRE NUCLEAR GENERATING STATION DOCKET NO. 50-206
SAN DIEGO, CALIFORNIA

January-March, 1975

Medium Sampled	Analysis and Total Number Analyses Performed	Lower Limit of Detection (LLD)	All Indicator Locations, Mean, Range	Location with Highest Annual Mean (1)		Control Location Mean, Range	Number of Non-routine Reported Measurements
				Name, Distance Direction	Mean, Range		
Drinking Water Quarterly Solids Composite (pCi/l)	β, 3	0.1	2.4 (3/3) (1.4-4.3)	San Clemente Well 3.5 mi, 320°MAG	4.3 (1/1) -	Huntington Bch 1.5 (1/1) -	
	α, 3	0.3	1.0 (1/3) -	San Clemente Well 3.5 mi, 320°MAG	1.0 (1/1) -	Huntington Bch <LLD	
Ocean Water (pCi/l)	β, 4	0.5	915 (4/4) (740-990)	Discharge 0.6 mi, 215°MAG	985 (2/2) (980-990)	Newport Beach 845 (2/2) (740-950)	0
	γ isotopic, 4	6 for Cs-137	<LLD	-	-	-	
Beach Sand (nCi/Kg) (dry wt.)	γ, 4						
	Cs-137	0.01	0.019 (3/4) (0.016-0.08)	Newport Beach 30 mi, 305°MAG	<0.08 (1/1) -	Newport Beach <0.08 (1/1) -	
	Ra-226 chain	0.02	0.28 (4/4) (0.19-0.45)	Surfing Beach 1.4 mi, 300°MAG	0.45 (1/1) -	Newport Beach 0.19 (1/1) -	
	Th-232 chain	0.04	0.38 (4/4) (0.20-0.64)	Surfing Beach 1.4 mi, 300°MAG	0.64 (1/1) -	Newport Beach 0.40 (1/1) -	
Local Crops (nCi/Kg, dry wt.)	H-3, 2	11.0	19 (1/2) -	Yamasaki Farm 23 mi, 135°MAG	19 (1/1) -	Yamasaki Farm 19 (1/1) -	0

Table 1

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY
SAN ONOFRE NUCLEAR GENERATING STATION DOCKET NO. 50-206
SAN DIEGO, CALIFORNIA

January-March, 1975

Medium Sampled	Analysis and Total Number Analyses Performed	Lower Limit of Detection (LLD)	All Indicator Locations, Mean, Range	Location with Highest Annual Mean (1) Name, Distance Direction	Location with Highest Annual Mean (1) Mean, Range	Control Location Mean, Range	Number of Non-routine Reported Measurements
Marine Animals, Flesh (pCi/g, dry wt)	γ isotopic, 2 Cs-137	0.03	<LLD	-	-	-	0
	I-131	0.03	<LLD	-	-	-	
	Sr-90, 2	0.04	0.016(2/2) (0.013-0.019)	Yamasaki Farm 23 mi, 135°MAG	0.019(1/1)	Yamasaki Farm 0.019 (1/1) -	
	H-3, 8	11.0	<LLD	-	-	-	
	γ isotopic, 8						
	Ra-226	0.05	0.15 (1/8)	Station Discharge 0.5 mi, 215°MAG	0.15 (1/4)	Newport Beach <LLD	
	Co-58	0.1	<LLD	-	-	-	
	Co-60	0.2	<LLD	-	-	-	
	Ag-110m	0.04	0.34(1/8)	Station Discharge 0.5 mi, 215°MAG	0.34(1/4) -	Newport Beach <LLD	
	Cs-137	0.03	0.041(3/8)	Newport Beach 30 mi, 305°MAG	0.041(3/4) (0.038-0.043)	Newport Beach 0.041(3/4) (0.038-0.043)	
	Zr-95/Nb-95	0.1	0.23 (1/8)	Newport Beach 30 mi, 305°MAG	0.23 (1/4) -	Newport Beach 0.23 (1/4)	

Table 2

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY
SAN ONOFRE NUCLEAR GENERATING STATION DOCKET NO. 50-206
SAN DIEGO, CALIFORNIA

April-June, 1975

Medium Sampled	Analysis and Total Number Analyses Performed	Lower Limit of Detection (LLD)	All Indicator Locations, Mean, Range	Location with Highest Annual Mean (1)		Control Location Mean, Range	Number of Non-routine Reported Measurements
				Name, Distance Direction	Mean, Range		
Air Particulate (pCi/m^3)	β, 45	0.003	0.084 (45/45) (0.004-0.30)	Camp San Onofre 2.3 mi, 043°MAG	0.20 (18/18) (0.004-0.62)	Huntington Bch 0.098 (13/13)	1
	I-131, 45	0.04	<LLD	-	-	-	
Air Particulate Quarterly Composite (pCi/m^3)	α, 4	0.0001	<LLD	Camp San Onofre 2.3 mi, 043°MAG	0.0017(1/2) -	Huntington Bch <LLD	
	Sr-90, 4	0.001	0.002 (2/4) (0.002-0.002)	Camp San Onofre 2.3 mi, 043°MAG	0.005 (1/2) -	Huntington Bch 0.002 (1/1) -	
	γ isotopic, 4 510 Kev peak	0.04γ/min.	0.006 (4/4) (0.003-0.011)	Camp San Onofre 2.3 mi, 043°MAG	0.020 (2/2) (0.005-0.034)	Huntington Bch 0.003 (1/1) -	
	Zr-95/Nb-95		0.0088 (4/4) 0.005-0.012)	Camp San Onofre 2.3 mi, 043°MAG	0.032 (2/2) (0.010-0.054)	Huntington Bch 0.012 (1/1) -	
Direct Radiation (mr/qtr)	γ, 11	1	16.0 (11/11) (12.4-18.5)	Visitors Center 0.1 mi, 015°MAG	21.2 (2/2) (15.8-26.6)	Huntington Bch 18.5 (1/1) -	0
Drinking Water, Filtrate (pCi/l)	β, 8	0.5	16 (8/8) (6.0-26)	Tri Cities Water District, 8.7 mi, 320° MAG	21.5 (6/6) (19-26)	Huntington Bch 6.5 (3/3) (6.0-7.4)	1

Table 2

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY
SAN ONOFRE NUCLEAR GENERATING STATION DOCKET NO. 50-206
SAN DIEGO, CALIFORNIA

April-June, 1975

Medium Sampled	Analysis and Total Number Analyses Performed	Lower Limit of Detection (LLD)	All Indicator Locations, Mean, Range	Location with Highest Annual Mean (1)		Control Location Mean, Range	Number of Non-routine Reported Measurements
				Name, Distance Direction	Mean, Range		
Drinking Water Solids (pCi/l)	α, 8	3	<LLD	Tri Cities Water District 8.7 mi, 320°MAG	6 (2/6) (5-7)	Huntington Bch <LLD	
	β, 8	0.1	1.5 (8/8) (0.6-3.9)	San Clemente Well 3.5 mi, 320°MAG	2.3 (4/4) (0.6-3.9)	Huntington Bch 1.2 (3/3) (1.0-1.7)	
	α, 8	0.3	0.54 (2/8) (0.31-0.77)	Huntington Beach 37 mi, 300°MAG	0.77 (1/6) -	0.77 (1/3) -	
Drinking Water Quarterly Filtrate Composite (pCi/l)	β, 3	0.5	12.5 (3/3) (5.4-21)	Tri Cities Water District 8.7 mi, 320°MAG	20.5 (2/2) (20-21)	Huntington Bch 5.4 (1/1) -	
	α, 3	3.0	<LLD	-	-	Huntington Bch <LLD	
	H-3, 3	200	<LLD	-	-	Huntington Bch <LLD	
Drinking Water Quarterly Solids Composite (pCi/l)	β, 3	0.1	1.1 (3/3) (0.7-1.8)	San Clemente Well 3.5 mi, 320°MAG	2.5 (2/2) (0.7-4.3)	Huntington Bch 1.8 (1/1) -	0
	α, 3	0.3	0.19 (2/3) (0.12-0.26)	San Clemente Well 3.5 mi, 320°MAG	0.56 (0.12-1.0)	Huntington Bch 0.26 (1/1) -	

Table 2

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY
SAN ONOFRE NUCLEAR GENERATING STATION DOCKET NO. 50-206
SAN DIEGO, CALIFORNIA

April-June, 1975

Medium Sampled	Analysis and Total Number Analyses Performed	Lower Limit of Detection (LLD)	All Indicator Locations, Mean, Range	Location with Highest Annual Mean (1)		Control Location Mean, Range	Number of Non-routine Reported Measurements
				Name, Distance Direction	Mean, Range		
Ocean Water (pCi/l)	β, 4	0.5	780 (4/4) (660-900)	Newport Beach 30 mi, 305°MAG	850 (4/4) (740-900)	Newport Beach 850 (2/2) (800-900)	
	γ isotopic, 4	6 for Cs-137	<LLD	-	-	-	
Ocean Water Semiannual Composite (pCi/l)	H-3, 2	200	<LLD	-	-	Newport Beach <LLD	0
Beach Sand (nCi/Kg, dry wt)	γ, 4						
	Cs-137	0.01	0.028 (1/4) -	Surfing Beach 1.4 mi, 300°MAG	0.025 (2/2) (0.021-0.028)	Newport Beach <LLD	0
	Ra-226 chain	0.02	0.15 (4/4) (0.054-0.23)	Surfing Beach 1.4 mi, 300°MAG	0.34 (2/2) (0.23-0.45)	Newport Beach 0.054 (1/1) -	
	Th-232 chain	0.04	0.20 (4/4) (0.12-0.36)	Surfing Beach 1.4 mi, 300°MAG	0.50 (2/2) (0.36-0.64)	Newport Beach 0.12 (1/1) -	
Local Crops (nCi/Kg, dry wt)	H-3, 2	11.0	32 (1/2) -	Yamasaki Farm 23 mi, 135°MAG	26 (2/2) (19-32)	Yamasaki Farm 32 (1/1)	0
	γ isotopic, 2 Cs-137	0.03	0.099 (1/2)	Yamasaki Farm 23 mi, 135°MAG	0.099 (1/2) -	Yamasaki Farm 0.099 (1/1)	

Table 2

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY
SAN ONOFRE NUCLEAR GENERATING STATION DOCKET NO. 50-206
SAN DIEGO, CALIFORNIA

April-June, 1975

Medium Sampled	Analysis and Total Number Analyses Performed	Lower Limit of Detection (LLD)	All Indicator Locations, Mean, Range	Location with Highest Annual Mean (1) Name, Distance Direction	Location with Highest Annual Mean (1) Mean, Range	Control Location Mean, Range	Number of Non-routine Reported Measurements
Marine Animals Flesh (pCi/g, dry wt)	I-131	0.03	<LLD	-	-	Yamasaki Farm <LLD	
	Co-60	0.03	0.06 (1/2) -	Yamasaki Farm 23 mi, 135°MAG	0.06 (1/2)	Yamasaki Farm 0.06 (1/2)	
	Co-58	0.03	0.24 (1/2)	Yamasaki Farm 23 mi, 135°MAG	0.24 (1/2)	Yamasaki Farm 0.24 (1/1)	
	Sr-90	0.04	0.072 (2/2) (0.066-0.077)	Yamasaki Farm 23 mi, 135°MAG		Yamasaki Farm 0.077 (1/1)	
	H-3, 8	11.0	68 (2/8) (22-1/4)	Station Discharge 0.5 mi, 215°MAG	114 (1/8)	Newport Beach 22 (1/4)	0
	γ isotopic, 8						
	Co-58	0.1	0.83 (2/8) (0.16-1.5)	Station Discharge 0.5 mi, 215°MAG	0.83 (2/8) (0.16-1.5)	Newport Beach <LLD	
	Co-60	0.2	0.3 (1/8) -	Station Discharge 0.5 mi, 215°MAG	0.3 (1/8) -	Newport Beach <LLD	
	Ag 110m	0.04	0.72 (2/8) (0.59-0.84)	Station Discharge 0.5 mi, 215°MAG	0.59 (3/8) (0.34-0.84)	Newport Beach <LLD	
	Cs-137	0.03	0.057 (3/8) (0.046-0.076)	Station Discharge 0.5 mi, 215°MAG	0.076 (1/8) -	Newport Beach 0.048 (2/4) (0.046-0.050)	
	Ce-144	0.1	0.15 (1/8) -	Newport Beach 30 mi, 305°MAG	0.15 (1/8) -	Newport Beach 0.15 (1/8)	

Table 2

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY
SAN ONOFRE NUCLEAR GENERATING STATION DOCKET NO. 50-206
SAN DIEGO, CALIFORNIA

April-June, 1975

Medium Sampled	Analysis and Total Number Analyses Performed	Lower Limit of Detection (LLD)	All Indicator Locations, Mean, Range	Location with Highest Annual Mean (1) Name, Distance Direction	Mean, Range	Control Location Mean, Range	Number of Non-routine Reported Measurements
Kelp (pCi/g, dry wt)	H-3, 4	10	<LLD	-	-	Newport Beach <LLD	0
	Co-58	0.13	<LLD	-	-	Newport Beach <LLD	
	Co-60	0.20	<LLD	-	-	Newport Beach <LLD	
	Zr-95/Nb-95	0.05	0.090 (3/4) (0.058-0.113)	New Kelp Bed 1.0 mi, 180°MAG	0.113 (1/1)	Newport Beach <LLD	
	Ag-110m	0.07	<LLD	-	-	Newport Beach <LLD	
	I-131	0.2	<LLD	-	-	Newport Beach <LLD	
	Cs-137	0.06	0.065 (3/4) (0.061-0.072)	New Kelp Bed 1.0 mi, 180°MAG	0.072 (1/1)	Newport Beach <LLD	
	Ce-144	0.05	0.057 (1/4)	San Mateo Kelp Bed 6 mi, 145°MAG	0.057 (1/1)	Newport Beach <LLD	
Ocean Bottom Sediments (pCi/g, dry wt)	γ isotopic, 3 Mn-54	0.01	0.018 (1/3)	0.5mi North of Discharge 215°MAG	0.018 (1/1)	Newport Beach <LLD	0
	Co-58	0.07	<LLD	-	-	<LLD	

Table 2

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY
SAN ONOFRE NUCLEAR GENERATING STATION DOCKET NO. 50-206
SAN DIEGO, CALIFORNIA

April-June, 1975

Medium Sampled	Analysis and Total Number Analyses Performed	Lower Limit of Detection (LLD)	All Indicator Locations, Mean, Range	Location with Highest Annual Mean (1)		Control Location Mean, Range	Number of Non-routine Reported Measurements
				Name, Distance Direction	Mean, Range		
	Co-60	0.11	<LLD	-	-	<LLD	
	Ag-110m	0.07	<LLD	-	-	<LLD	
	Cs-137	0.01	0.039 (3/3) (0.015-0.077)	0.5 mi North of Discharge, 215° MAG	0.077 (1/1)	0.015 (1/1)	
	Ce-144	0.07	0.10 (1/3)	Newport Beach 30 mi, 305°MAG	0.10 (1/1)	0.10 (1/1)	
	Ra-226	0.02	0.34 (3/3) (0.17-0.43)	0.5mi North of Discharge 215°MAG	0.43 (1/1)	0.17 (1/1)	
	Th-232	0.04	0.36 (3/3) (0.18-0.49)	0.5 mi North of Discharge 215°MAG	0.49 (1/1)	0.18 (1/1)	
Rabbit Thyroid (pCi/g thyroid)	I-131, 1	5.0	<LLD	-	-	None	0
Flesh (pCi/g, dry wt)	γ isotopic, 1 I-131	0.05	<LLD	-	-		
	Cs-137	0.06	<LLD	-	-		
Femur (pCi/gCa)	Sr-89, 1	3.0	<LLD	-	-		
	Sr-90, 1	2.0	5.0 (1/1)	< 2 mi East of of plant, 45°MAG	5.0 (1/1)		

Riley

13.3

July 29, 1976

Director
U. S. Nuclear Regulatory Commission
Region V
Suite 202, Walnut Creek Plaza
1990 North California Boulevard
Walnut Creek, California 94596

Docket 50-206

Dear Sir:

An inspection on June 15-18, 1976 by Region V personnel disclosed that the "calculated error" required to be associated with some radiological environmental measurements had inadvertently been omitted from San Onofre Nuclear Generating Station Unit 1 Semi-Annual Operating Reports 16 and 17. These reports cover the periods January 1, 1975 to June 30, 1975 and July 1, 1975 to December 31, 1975, respectively. The omitted data are provided in the enclosed supplement for the subject reports.

ORIGINAL SIGNED

R. S. Currie
Manager of Steam Generation

HEM:dc

Enclosures

cc: Director, NRC Office of Inspection and Enforcement
Director, NRC Office of Management Information and Program Control

bcc:
J. E. Thomas (SDG&E)
B. W. Colston (SDG&E)
D. L. Couchman (NUS)
SFPD Library (Bechtel)
F. A. McCrackin
K. P. Baskin
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R. S. Currie
R. D. Britt
H. L. Ottoson
S. J. Nola
R. E. Millard
F. P. Riley
H. E. Morgan
J. C. Sorensen

SAN ONOFRE NUCLEAR GENERATING STATION

SEMI-ANNUAL OPERATING REPORT NO. 16

SUPPLEMENT 1

Section H, Radiological Environmental Monitoring, part (d) for each of the following sample categories should be modified to read as shown below. The "calculated error" for the "highest" and "lowest" activity sample is one standard deviation due to counting statistics. A "calculated error" for the "mean" was determined from the square root of the sum of the squares of the individual standard deviations.

Air Particulate

Camp San Onofre showed the highest airborne radioactivity levels of the locations measured. This area is located 2.3 miles from the plant at 043° magnetic north.

	Beta pCi/m^3	I-131 pCi/m^3
highest	0.62 ± 0.03	< LLD
mean	0.20 ± 0.05	
lowest	0.004 ± 0.001	

	Alpha pCi/m^3	Sr-90 pCi/m^3
highest	0.0017 ± 0.0002	0.005 ± 0.002
mean	0.0017 ± 0.0002	0.005 ± 0.002
lowest	0.0017 ± 0.0002	0.005 ± 0.002

Drinking Water

Water from Tri-Cities Water District showed the highest gross beta radioactivity levels in the filtrate for the quarterly composite samples analyzed. Both gross alpha and tritium levels were below LLD.

Beta pCi/l

highest	21 ± 1
mean	20.5 ± 1
lowest	20 ± 1

Ocean Water

Newport Beach, the control location, showed the highest mean beta radioactivity level measured. Tritium and gamma radioactivity levels were below LLD for both sampling locations. Newport Beach is 30 miles from the station at 305° magnetic north.

Beta pCi/l	
highest	900 ± 50
mean	850 ± 65
lowest	740 ± 10

Beach Sand

A surfing beach which is 1.4 miles from the plant at 300° magnetic north showed the highest radioactivity level measured.

Cs-137 nCi/kg	
highest	0.028 ± 0.003
mean	0.025 ± 0.005
lowest	0.21 ± 0.007

Local Crops

The control location (23 miles at 135° magnetic north) showed the highest radioactivity levels measured. Iodine-131 was below LLD at all locations.

H-3 nCi/kg		Sr-90 nCi/kg	
highest	32 ± 6	highest	0.007 ± 0.002
mean	26 ± 11	mean	0.007 ± 0.002
lowest	19 ± 9	lowest	0.007 ± 0.002

Non-migratory Marine Animals

Samples collected near the station discharge generally showed higher radioactivity levels than samples collected from Newport Beach. This observation is based on the detection of any given isotope in only one or two of the eight samples collected near the station discharge. The discharge is 0.5 mile at 215° magnetic north from the station. Total gamma data shown below represent a summation of isotopic data for all naturally present and other isotopes detected in individual samples.

Total gamma	dry weight pCi/g	wet weight pCi/g
highest	2.71 ± 0.25	0.34 ± 0.03
mean	0.81 ± 0.16	0.14 ± 0.03
lowest	0.076 ± 0.004	0.009 ± 0.0009

Tritium	dry weight pCi/g	wet weight pCi/g
highest	114 ± 6	33 ± 2
mean	114 ± 6	33 ± 2
lowest	114 ± 6	33 ± 2

Kelp

A sample collected from the San Mateo Kelp Bed showed the highest total gamma activity level of the samples analyzed. No tritium was observed for any sample. The San Mateo Kelp Bed is 6 miles at 145° magnetic north from the station.

Total gamma	dry weight pCi/g	wet weight pCi/g
highest	0.178 ± 0.012	0.0187 ± 0.0015
mean	0.178 ± 0.012	0.0187 ± 0.0015
lowest	0.178 ± 0.012	0.0187 ± 0.0015

Ocean Bottom Sediment

A sample collected 0.5 mile north of the station discharge at 215° magnetic north generally showed the highest radioactivity level. Total gamma data shown below represent a summation of isotopic data for all naturally present and other isotope detected.

Total gamma	dry weight pCi/g	wet weight pCi/g
highest	1.44 ± 0.08	0.77 ± 0.07
mean	1.44 ± 0.08	0.77 ± 0.07
lowest	1.44 ± 0.08	0.77 ± 0.07

SAN ONOFRE NUCLEAR GENERATING STATION

SEMI-ANNUAL OPERATING REPORT NO. 17

FOR THE PERIOD INCLUDING

JULY 1, 1975, TO DECEMBER 31, 1975

Submitted in Accordance With:

Operating License No. DPR-13

Submitted by:

Southern California Edison Company

San Diego Gas & Electric Company

SAN ONOFRE NUCLEAR GENERATING STATION

UNIT 1

SEMI-ANNUAL OPERATING REPORT

NO. 17

A. OPERATIONS SUMMARY

On January 21, 1976, San Onofre Unit 1 completed 218 consecutive days of on-line operation. This performance is reflected in 1975 availability and capacity factors of 87.44 and 86.15, respectively, despite the unit being shut down five and one-half weeks for refueling.

Since early November, there have been several failures of recently installed titanium condenser tubing. These tubes were installed during the March, 1975 refuling outage. Approximately 11,508 tubes were installed in two of the four condenser halves. Ten tubes have failed in six separate instances.

In addition, nine suspected and/or potentially failed tubes have been plugged, all failures occurring in the same area. Eddy current testing seems to indicate longitudinal failure; however, several tubes will be removed from the condenser at the next outage to allow for inspection, testing and to aid in identifying the failure mode.

A.1. Changes in Facility Design

No.	Title	Description
75-14	Perimeter Public Address System	Installed a complete Perimeter Public Address System to cover all portions of the Exclusion Area.
75-16	Chlorinator Pump Replacement	Replaced existing Chlorinator Injection System with a positive displacement pump.
75-27	Replace Charging Pump Auxiliary Lube Oil Pumps	Replaced charging pump auxiliary lube oil pumps with post LOCA qualified pumps.
75-33	Electrocoalescer	Installed a temporary diesel fuel oil electrocoalescer for testing its fuel oil cleaning capability.

No.	Title	Description
75-34	Counting Room Air Conditioner	Installed additional cooling in counting room for 4096 channel analyzer
75-37	Cathodic Protection System	Modified cathodic protection system to provide proper protection of sphere during Unit 2 & 3 construction
75-38	Site Preparation for Standby Power Addition	Completed excavation and grading for standby power addition.
75-41	Gas Stripper Cooler	Installed a cooler in gas stripper vent line.
75-42	Fire Pump Alarm	Modified fire pump alarm circuits.
75-43	CVI Waste Gas Sample System	Installed check valve in CVI sample system.
75-45	Radiation Monitor for Vent Stack	Installed additional monitoring system for vent stack.
75-48	Control Ventilation System Modifications	Installed high efficiency and charcoal filters in control room ventilation system.
75-52	Upgrade Meteorological Facility	Installed additional meteorological instrumentation.

A.2. Performance Characteristics

The reactor and turbine plants were routinely monitored during the six month reporting period. No significant deviations in performance from expected values were noted with the exception of degraded performance of the west reheaters. Average burnup for the core for Cycle 5 for the reporting period was 5593.09 MWD/MTM.

A.3. Changes in Operating Methods

The following is a summary of those operating methods that were required due to changes in facility design or performance characteristics.

Design Change Number	Design Change Title	Operating Method Changed
75-14	Perimeter Public Address	S-V-2.7 Perimeter Public Address System Quarterly Test

A.4. Surveillance Tests and Inspections

All surveillance tests, checks and calibrations required by the Technical Specifications were performed at the frequency stipulated. All results are within required limits. Minor difficulties encountered are noted in Attachment I.

A.5. Periodic Containment Leak Rate Tests

Date	Reason for Test	Location	Leakage (% of Allowable)
12/12/75	Sphere entry	South air lock	0.83
12/10/75	Regular six month	CV10, CV40, CV116	0.20
		CV146, SV-1212-8	0.37
		CV147, SV-1212-9	0.05
		CV948, CV949	0.0
		North air lock	0.0
12/9/75	Regular six month test	Equipment door	.03
		South air lock	.84
		POV9, POV9A	.03
		POV10, POV10A	.01
		East Elec. Penetrations	.06
		West " "	1.66
12/4/75	Sphere entry	South air lock	0.84
11/21/75	Sphere entry	" " "	0.0
11/06/75	Sphere entry	" " "	0.0
7/14/75	Sphere entry	" " "	0.84

A.6. Changes, Tests and Experiments Requiring Commission Authorization

Technical Specification Change Nos. 23, 24, 25 and 26 were approved during the reporting period by the Commission Pursuant to 10 CFR Part 50, Section 50.59 (a).

Technical Specification Changes

Change No. 23

The change added Section 4.10 describing Augmented Inservice Inspection of High Energy Lines Outside the Containment.

Change No. 24

This change added Section 3.12 and Section 4.11 describing Installation Operation and Testing of the Control Room Emergency Air Treatment System.

Change No. 25

This change modified Sections 6.1, 6.10 and Appendix I Section 4 and included requirements for testing and reporting of sealed sources.

Change No. 26

This change modified Section 6.5.2.2 on the composition of the NARC, Section 6.5.2.7 on the responsibility of the NARC to review items reported within 24 hours to the Commission, deleted Section 6.6 and extensively modified and updated section 6.9 and 6.10 on reporting requirements.

A.7. Plant Operating Staff Changes

There were no changes in the key supervisory or technical personnel in the plant operating staff during the reporting period.

A.8. Station Incidents

75-16

On Tuesday, July 9, 1975, at approximately 1:30 PM, during routine chlorination of the circulating water system, it was noted that the flow meter was still indicating flow even though the chlorination portion of the cycle had been completed.

Investigation of the problem revealed that the microswitch which activates the chlorination cam had failed and that chlorination of the north half of the circulating water supply had continued to the end of the flush cycle or approximately five minutes beyond the normal time period of fifteen minutes. The microswitch was repaired and subsequent chlorination cycles were performed in a normal manner.

75-17

On August 12, 1975, during the semi-annual test of both diesel generators, the No. 1 diesel generator tripped because of high cooling water temperature after 35 minutes of operation.

The diesel cooling system consists of a water to air radiator type heat exchanger, an engine driven water circulating pump and water jackets in the engine block. The water jacket is equipped with thermostats and a high temperature alarm which is received at a local panel and a common master alarm in the control room.

During the course of the investigation, it was determined that the radiator heat exchanger air passages were blocked with corroded portions of the radiator cooling fins. This was unexpected since the radiator was recently cleaned during the fourth refueling outage.

To correct the condition, the radiator was cleaned and the No. 1 diesel generator was operated at rated load for one hour without the cooling water temperature exceeding the alarm set point. To prevent a recurrence of this situation, the radiators on both No. 1 and No. 2 diesels will be inspected and cleaned on more frequent intervals.

To ensure that Technical Specification requirements were satisfied during the period the No. 1 diesel generator was out of service, operability of the No. 2 diesel generator was demonstrated by completion of a partial load test.

75-18

On August 13, 1975, during the semi-annual test of both diesel generators, the No. 2 diesel generator tripped because of high cooling water temperature after 20 minutes of operation.

The ensuing inventigation disclosed that the sealing surface of the cap closure on the coolant system standpipe was allowing leakage. Sufficient pressure and coolant capacity were not maintained in the cooling system, resulting in a reduced cooling capability. The leakage from the cap closure was piped to a drain and the leakage was not visible to operating personnel.

The drain line on both diesel generators was modified to facilitate identification of leakage from the system. The cap sealing surface was repaired and the No. 2 diesel generator was subsequently test operated at its rated load of 600 KW for one hour without difficulty.

To ensure that Technical Specification requirements were satisfied during the period the No. 2 diesel generator was out of service, operability of the No. 1 diesel generator was demonstrated by completion of a partial load test.

75-19

On Wednesday, August 20, 1975, at 11:40 AM, the South Boric Acid Transfer Pump failed to develop the required discharge flow.

During the routine weekly "Boric Acid Flow Verification Test", the South Boric Acid Transfer Pump would not develop the required discharge flow of $\geq$ 60 GPM. After a successful flush of the suction and discharge lines to check for restrictions, it was concluded that a pump internal failure was causing the problem. On Thursday, August 21, 1975, the failed pump was replaced with a spare which was tested satisfactorily. After dismantling and inspection, it was found that a bearing had worn out causing the pump to bind thus reducing discharge flow.

75-20

On Wednesday August 20, 1975, at 11:40 AM, Sub Group 3 Control Rods skipped steps in both the in and out direction.

During the routine weekly "Control Rod Exercise Test" Sub Group 3 Control Rods in Control Bank 1 did not step in sequence with the other sub groups. During the rod insertion portion of the test, Control Bank 1 was inserted 13 steps but Sub Group 3 only went in 9 steps. When the rods were withdrawn 13 steps to their original position, Sub Group 3 only came out 6 steps. After a discussion between the Watch Engineer and Instrument Engineer, it was determined that the problem was caused by the Master Cycler. Rod control was changed to the spare Master Cycler as per Operating Instruction S-3-5.12. A complete "Control Rod Exercise Test" was then run satisfactorily.

The master cycler was removed to investigate the apparent malfunction. The logic circuit that involves rod motion for subgroups 3 and 7 was examined. This logic circuit consists of three NAND gates with inverters and two relays with their drivers (Westinghouse dwg. 942H086). Testing of this logic circuit revealed one of inverter type NAND gates to be malfunctioning.

This is the first failure of this type experienced in this master cycler. Therefore, it is concluded this problem is not of a generic nature.

75-22

On Sunday, October 19, 1975, at 3:55 a.m., an alarm was received from Zone I of the smoke detection system which serves the D.C. switchboard area.

An inspection of the area indicated no evidence of fire, but considerable smoke. As the smoke cleared out, a more detailed inspection disclosed that an oil filled capacitor had failed in the No. 3 inverter. As a precautionary move the inverter was removed from service.

The inverter was subsequently repaired and returned to service on Wednesday, October 22, 1975, at 3:40 pm.

The capacitor, a General Electric Pyranol impregnated unit, failed apparently from an internal short circuit. The failure resulted in an expansion and rupture of the capacitor case. The capacitor and six additional units are bused together to form part of the inverters output wave shaping network. The failure of this component effected mechanical damage to several of the other capacitors on the same bus. All seven components were replaced as a precautionary measure.

The application of this capacitor was discussed with the manufacturer. It is the manufacturer's opinion the failure was random and the voltage rating is more than adequate for the service. Therefore, no modification or upgrading of this component is required.

75-23

On Sunday, November 2, 1975, at 2:40 AM, the indicated feedwater flow to "B" steam generator increased from 1.89 x 10^6 lbm/hr. to 2.225 x 10^6 lbm/hr.

The feedwater control to "B" steam generator was placed on manual and the level stabilized at the normal value. A careful examination of other instrumentation indicated there had been a change in flow indication without a change in actual flow. An Instrument Technician was called in to investigate the problem and it was determined that the differential pressure across the flow metering orifice had increased from ∿435 in. H_2O to 650 in. H_2O.

As an interim measure, the following steps were taken:

a. Continue operation at normal power level.

b. Maintain close surveillance of steam generator instrumentation.

c. Perform a thermal calibration every shift.

d. When performing the thermal calibrations, use the highest differential pressure obtained from either "A" or "C" feedwater flow meter in determining the flow to all 3 steam generators.

On Monday, November 3, 1975, an operating memorandum was issued (OM-126) formalizing the thermal calibration procedure and the flow transmitter span was adjusted to return the indicated and recorded values of feedwater flow to "B" steam generator to their normal values. This had the effect of returning the feedwater/steam flow mismatch protection to normal and reduced the level of surveillance required on the part of the operators.

On Tuesday, November 4, 1975, a graph of the pipe section immediately upstream of "B" flow metering orifice was obtained. It was evident from the film that the flow straightening device installed 15 feet upstream of the orifice had shifted downstream and become lodged against the orifice.

On Wednesday, November 5, 1975, Operating Memorandum 126, Rev. 1 was issued. This revision describes a slightly more conservative method for calculating the feedwater flow to "B" steam generator based on a statistical study of previous thermal calibrations.

No further action was taken until repair of the flow straightening device can be accomplished during an outage.

75-24

Specification 3.2.1 of Appendix B to the San Onofre Unit 1 license requires the weekly collection of airborne particulate and iodine samples from four sampling sites.

A report of airborne sample data received on November 11, 1975, showed that samples collected from Camp San Onofre (USMC) on September 22, 1975, and September 27, 1975, did not include the particulate filters. Iodine sample cartridges were collected and analyzed for each of these dates.

Responsibility for sample collection has previously been placed with Camp San Onofre Fire Station personnel. A discussion with fire station personnel indicated that two major fires were in progress at the time of the subject unusual environmental event and that replacement of the air particulate filters was overlooked.

To preclude a future recurrence of this situation, San Onofre Unit 1 personnel will be directly responsible for collecting and mailing these air particulate samples to the designated laboratory.

B. POWER GENERATION

1.	Gross Thermal Power Generated (MWH)	5,814,190
2.	Gross Electrical Power Generated (MWH)	1,981,200
3.	Net Electrical Power Generated (MWH)	1,888,973
4.	Hours Reactor Critical	4417
5.	Hours Generator On-Line	4417
6.	Histogram of Thermal Power vs Time (See Attachment II)	

C. SHUTDOWNS

There were no plant shutdowns during the reporting period.

D. CORRECTIVE MAINTENANCE ON SAFETY RELATED AND ENVIRONMENTAL EQUIPMENT

EQUIPMENT	MALFUNCTION CAUSE	MALFUNCTION RESULT	EFFECT ON SAFE OPERATION	CORRECTIVE ACTION	SPECIAL PRECAUTIONS
South Boric Acid Transfer Pump	Excessive thrust	Seal leakage and by pass flow	None	Installed replacement pump	None
Monitor 1211-1212	Worn rotor vanes	Noisy operation	None	Replaced unit with spare	None
North Charging Pump Cooling Water Flow Meter	Float separated from alarm actuator	Continuous alarm	None	Replaced float assembly	None
Rod Control System Master Cycler	Failed integrated circuit	Skipped subgroup 3	None	Replaced integrated circuit	None
Boric Acid Flowmeter	Grounded terminal block	Low indication	None	Cleared terminal block and calibrated	None
Primary Makeup Water Flow Meter	Worn gears	Slow operation	None	Replaced gears	None
Reactor Plant Annunciators	Faulty Diode	No power	None	Replaced diode	None
Air Sampler at Camp San Onofre Fire Station	Worn motor	Bound motor	None	Replaced motor	None
No. 1 Diesel Generator	Worn gasket	Slight fuel leak	None	Replaced O-ring gasket	None
ORMS Channel 1215	Failed bearings	Excessive noise and motor load	None	Replaced pump with spare unit	None

D. CORRECTIVE MAINTENANCE ON SAFETY RELATED AND ENVIRONMENTAL EQUIPMENT

EQUIPMENT	MALFUNCTION CAUSE	MALFUNCTION RESULT	EFFECT ON SAFE OPERATION	CORRECTIVE ACTION	SPECIAL PRECAUTIONS
No. 1 Diesel Generator	Loose transformer bracket	Excessive vibration	None	Fabricated and installed new bracket	None
Pressurizer Cabinet Heater Controller	Optical relay failed	Heater inoperative	None	Replaced optical relay	None
SDG&E Office Air Monitor	Worn vanes	Loss of capacity	None	Installed spare unit	None
Steam Generator "B" Steam Flow Meter	Leak in sensing line	Eratic flow indication	None	Repaired leak	None
Aeroball System	Diverter Valve inoperative	4 paths inoperative	None	Repaired diverter	None
Data Flux Monitoring System	Open gain adjustment device	No output signal	None	Replaced gain adjustment device	None
Area Monitor	Failed compressor	Loss of pumping capacity	None	Replaced unit with spare	None
Seismic Monitoring System	Offsite brushfire	Shorted south trigger line	None	Replaced line	None
Control Rod Position Recorder	Gear box failed	Inoperative	None	Replaced gear box	None
No. 3 Inverter	Failed capacitor	Removed inverter from service manually	None	Replaced capacitor	None

D. CORRECTIVE MAINTENANCE ON SAFETY RELATED AND ENVIRONMENTAL EQUIPMENT

EQUIPMENT	MALFUNCTION CAUSE	MALFUNCTION RESULT	EFFECT ON SAFE OPERATION	CORRECTIVE ACTION	SPECIAL PRECAUTIONS
Demineralizer Water Flow Integrator Controller	Failed relay	Inoperative totalizer	None	Replaced realy	None
Steam Generator B Feedwater Control	Shift in location of flow straightener	Increase in flow indication	None	Recalibrated flow transmitter	None
Stack Radiation Monitor	Alarm failed	Continuous alarm	None	Repaired alarm system	None
Emergency Radiation Monitor Channel R-1252	Check source inoperative	Could not test	None	Repair source check mechanism	None
Pressurizer Relief Line Temperature Alarm	Optical relay failed	Continous alarm	None	Repair optical relay	None
Reactor Coolant Delta Temperature Recorder	Amplifier failed	Loop B Delta temperature pen drive inoperative	None	Repair amplifier	None
ORMS Channel R-1215 flowmeter	Foreign deposits in meter	Inoperative	None	Service meter	None
South boric acid Transfer Pump	Worn bearings	Tripped on overload	None	Replaced	None

D. CORRECTIVE MAINTENANCE ON SAFETY RELATED AND ENVIRONMENTAL EQUIPMENT

EQUIPMENT	MALFUNCTION		EFFECT ON SAFE OPERATION	CORRECTIVE ACTION	SPECIAL PRECAUTIONS
	CAUSE	RESULT			
Refueling Water Pump	Broken coupling shims	End of life on unit	None	Replaced shims	None
No. 6 Slave Cycler	Motor bearing failure	Noisy operation	None	Replaced bearings	None

E. CHANGES IN FACILITY DESIGN CARRIED OUT WITHOUT PRIOR COMMISSION APPROVAL

NO.	TITLE	DESCRIPTION	SAFETY ANALYSIS AND ENVIRONMENTAL IMPACT SUMMARY
75-14	Perimeter Public Address System	Installed a complete Perimeter Public Address System to cover exclusion area.	The New Perimeter Public Address System greatly extends coverage of the old system and includes the entire exclusion area. It is not connected to or associated with any control or engineering safeguard systems.
75-16	Chlorinator Pump Replacement	Replaced existing Chlorinator Injection System with a positive displacement pump.	The circulating water chlorinator was modified to include a positive displacement pump which provides accurate repeatable chlorine injection. It is not connected to or associated with any safeguard systems.
75-27	Replace Charging Pump Auxiliary Lube Oil Pumps	Replaced Charging Pump Auxiliary Lube oil pumps with post LOCA qualified pumps	The existing oil pumps are replaced with functionally identical units that are capable of operating for one year of post LOCA conditions.
75-33	Electrocoalescer	Install a Temporary Diesel Fuel Oil Electrocoalescer for Testing	The electrocolescer improves the quality of diesel fuel by removing water, oil and foreign material. It does not effect plant safety.
75-34	Counting Room Air Conditioner	Install additional cooling in Counting Room for 4096 Channel Analyzer	The modifications to the Counting Room Ventilating System improves reliability of the 4096 Channel Analyzer by providing sufficient cooling for the Analyzer Electronics. It is not connected to or associated with any safeguard systems and does not effect plant safety.
75-31	Cathodic Protection System	Modify Cathodic Protection System to provide proper protection of sphere during Unit 2 & 3 construction.	The Cathodic Protection System is not connected to or associated with any control or engineering safeguard system. The new modification permits control of current to each anode and insures complete protection of the sphere.

E. CHANGES IN FACILITY DESIGN CARRIED OUT WITHOUT PRIOR COMMISSION APPROVAL

NO.	TITLE	DESCRIPTION	SAFETY ANALYSIS AND ENVIRONMENTAL IMPACT SUMMARY
75-41	Gas Stripper Cooler	Install a cooler in gas stripper vent line.	Addition of this sample cooler will result in improved reliability of the Waste Gas Compressors by preventing steam and entrained water from the gas stripper from entering the compressors.
75-42	Fire Pump Alarm	Modify fire pump alarm circuits	Addition of these alarms will increase the reliability of the fire protection system by alertion of unsatisfactory operations or problems at the earliest possible time.
75-43	CVI Waste Gas Sample System	Install check valve is CVI sample system.	Installation of the check valve results in improved reliability of the CVI sample system. It is not connected to any engineered safeguard system and does not affect plant safety.
75-45	Radiation Monitor for Vent Stack	Install additional monitoring system for vent stack.	Installation of additional monitoring equipment will allow for improved sample of releases and will not affect plant safety.
75-52	Upgrade Meteorological Facility	Install additional meteorological instrumentation.	Installation of additional meterological equipment improves accuracy and scope of meteorological data.

F. RADIOACTIVE EFFLUENT RELEASES

Attached are tables which summarize radioactive releases from the plant for the subject reporting period. An independent laboratory performs some of the analyses on monthly liquid composite samples. As a consequence, the November and December data do not contain strontium 89 or 90 values. These data will be included in a future report as they become available.

1. Gaseous Effluents

   a. Gross Radioactivity Releases

      1) Total gross radioactivity releases were 7.15 E + 2 curies

      2) The maximum gross radioactivity release rate for a one hour period was 2.24 E + 6 μCi/hr

      3) Total gross radioactivity data by nuclide released are shown in Table 1

      4) The percent of technical specification limit for noble gases is 5.86 E - 3 percent

   b. Iodine Releases

      1) Iodine radioactivity released during this period is shown by isotope in Table 1.

      2) The percent of technical specification limit for iodine-131 is 4.73 E - 7 percent.

   c. Particulate Releases

      1) No particulate activity was released during this reporting period.

2. Liquid Effluents

   a. Total gross radioactivity released, excluding tritium and noble gases, was 1.57 E - 1 curies. The average concentration released to unrestricted areas was 6.46 E - 10 μCi/ml.

b. The maximum concentration of gross radioactivity released to the unrestricted area was 3.29 E - 7 μCi/ml.

c. The total tritium released to the unrestricted area was 2.11 E + 3 curies. The average tritium concentration released to the unrestricted area was 8.68 E - 6 μCi/ml. Alpha radioactivity released to the unrestricted area was 8 E - 4 curies. The average alpha concentration released to the unrestricted area was 3 E - 12 μCi/ml.

d. The total dissolved gas radioactivity released to the unrestricted area was 3.50 E - 3 curies. This quantity yielded an average concentration of 1.44 E - 11 μCi/ml released to the unrestricted area.

e. The volume of liquid waste released was 2.60 E + 6 liters.

f. The total volume of dilution water was 2.43 E + 11 liters.

g. Total gross radioactivity by nuclide is shown in Table II.

h. The percent of the technical specification limit for liquid releases is 2.94 E - 1.

G. SOLID WASTE

1. No solid waste was shipped during this reporting period.

H. RADIOLOGICAL ENVIRONMENTAL MONITORING

Media sampled and analyzed during the third and fourth quarters of 1975 are shown below.

Radiation Levels

a. Fourteen locations were sampled.
b. Thirty-six TLD sets were analyzed during this reporting period.
c. No locations were found to be above normal local background levels. All values were within the previously observed range.
d. Camp Las Pulgas showed the highest mean radiation level for this reporting period as measured by the $CaSO_4$:Dy quarterly TLD's. The Visitors Viewing Center showed the highest annual radiation level as measured by the LiF TLD's.

	mr/qtr	mr/hr (LiF)
highest	36.5	160
mean	30.5	106
lowest	24.6	78

Air Particulate

a. Four locations were sampled.
b. One hundred and five weekly air particulate and 105 weekly iodine samples were analyzed during this reporting period. Eight air particulate quarterly composite samples were analyzed for alpha, gamma and strontium-90 activities.
c. No locations were above local background levels.
d. Camp San Onofre showed the highest airborne radioactivity levels of the locations measured. This area is located 2.3 miles from the plant at 043° magnetic north.

	Beta pCi/m^3	I-131 pCi/m^3
highest	0.064	<LLD
mean	0.027	
lowest	0.012	

	Alpha pCi/m^3	Sr-90 pCi/m^3
highest	0.0009	<LLD
mean	0.00086	
lowest	0.00081	

Drinking Water

a. Four locations were sampled.
b. Eighteen monthly and six quarterly composite samples were analyzed during this reporting period.
c. No locations were found to be above normal background levels. Gross β data were within he preoperational range. Other data were within the previously observed range.
d. Water from Tri-Cities Water District showed the highest gross beta radioactivity levels in the filtrate for the quarterly composite samples analyzed. Gross alpha and tritium radioactivity were observed in one quarterly composite sample. The Tri Cities Water District reservoir is 8.7 miles from the plant at 320° magnetic north.

Beta pCi/l		Alpha pCi/l		H-3 pCi/l	
highest	24	observed	3	observed	400
mean	21				
lowest	19				

Ocean Water

a. Two locations were sampled.
b. Six bimonthly and two semi-annual composite samples were analyzed during this reporting period.
c. No locations were found to be above normal local background levels. All values were within previously observed ranges.
d. Newport Beach, the control location, showed the highest mean beta radioactivity level measured. Tritium and gamma radioactivity levels were below LLD for both sampling locations. Newport Beach is 30 miles from the station at 305° magnetic north.

Beta pCi/l	
highest	1250
mean	880
lowest	740

Local Crops

a. Two locations were sampled.
b. Four vegetable samples were analyzed during this reporting period.
c. No locations were found to be above normal local background levels.
d. The Highland Farm (2.2 miles at 315° magnetic north) showed the highest strontium-90 level measured. Iodine-131, cesium-137 and tritium were all below LLD at both locations.

Sr-90 nCi/kg

highest	0.018
mean	0.017
lowest	0.015

Non-migratory Marine Animals

a. Two locations were sampled.
b. Sixteen marine animals were analyzed during this reporting period.
c. No samples approached reporting level values for any isotope. All values were within previously observed ranges.
d. Samples collected near the station discharge generally showed higher radioactivity levels than samples collected from Newport Beach. The discharge is 0.5 mile at 215° magnetic north from the station. Total gamma data shown below represent a summation of isotopic data for all naturally present and other isotopes detected in individual samples.

Total gamma	dry weight pCi/g	wet weight pCi/g
highest	4.58	0.49
mean	0.89	0.13
lowest	0.013	0.0040

Tritium	dry weight pCi/g	wet weight pCi/g
highest	61	16
mean	34	7.9
lowest	9	2.8

Kelp

a. Four locations were sampled.
b. Four samples were analyzed during this reporting period.
c. Two locations showed individual isotopic levels greater than observed for the control location. All levels observed were within previously observed ranges.
d. The sample collected from the San Mateo Kelp Bed showed the highest tritium and gamma activity levels of the samples analyzed. The San Mateo Kelp Bed is 6 miles at 145° magnetic north from the station.

	Total gamma		Tritium	
	dry weight nCi/Kg	wet weight nCi/Kg	dry weight nCi/Kg	wet weight nCi/Kg
Observed	0.35	0.029	24	2.0

Ocean Bottom Sediments

a. Three locations were sampled.
b. Three samples were analyzed during this reporting period.
c. No locations were above normal background levels. All values measured were within previously observed levels.
d. The sample collected 0.5 mile south of the station discharge at 215° magnetic north showed the highest radioactivity level of the areas sampled. Total gamma data shown below represent a summation of isotopic data for all naturally present and other isotopes detected.

Total gamma	dry weight nCi/Kg	wet weight nCi/Kg
Observed	1.31	0.94

Rabbits

a. One location was sampled.
b. Two samples were analyzed during this reporting period.
c. No locations were found to be above local background levels.
d. Iodine-131 levels in the flesh and thyroid were all <LLD. Cesium-137 was detected in the flesh from one sample. Strontium-90 was detected in the bone structure and was within the previously observed range. The samples were collected within two miles to the east of the plant.

	Cs-137 pCi/g dry wt (flesh)	Sr-90 pCi/g Ca (bone)
highest	0.08	5.0
mean	0.08	4.1
lowest	0.08	3.1

Soil

a. Five locations were sampled.
b. Five samples were analyzed during this reporting period.
c. No locations were found to be above local background levels.
d. The Camp San Onofre sample (2.3 miles at 043 degrees magnetic north) showed the highest total radioactivity of the samples analyzed. Nearly all activity observed is from the naturally present Ra-226 and Th-232 decay chains. This probably explains why Camp San Onofre also has the highest measured air particulate levels.

	Total gamma nCi/Kg	Sr-90 nCi/Kg
Observed	3.41	0.03

H.2. Levels of radioactive material in environmental media reported here do not indicate a liklihood of public intakes in excess of 1% of those that could result from continuous exposure to the concentration values in Appendix B, Table II, 10 CFR 20.

H.3. Significant variations of offsite environmental concentrations with time have not been observed to date.

H.4. Noted below are locations and collection times for samples with radionuclide contents greater than twice background levels. Background levels are taken to those values determined from samples collected from control or background points during July - December, 1975. Background locations are defined within the ETS.

Sample Type	Location	Collection Date
Air particulate - weekly	Huntington Beach	October 30
Air particulate - quarterly	San Clemente	July - Sept.
Air particulate - quarterly	Camp San Onofre	July - Sept.
Air particulate - quarterly	Visitor Center	July - Sept.
Drinking water - monthly	Tri-Cities Water Dist.	July
Drinking water - monthly	Tri-Cities Water Dist.	November
Drinking water - quarterly	Tri-Cities Water Dist.	July - Sept.
Marine animals	Station Discharge	September
Marine animals	Station Discharge	December
Kelp	New Kelp Bed	December
Kelp	San Mateo Kelp Bed	December
Ocean bottom sediment	0.5 mi. N of Discharge	December
Ocean bottom sediment	0.5 Mi. S of Discharge	December
Soil	Camp San Onofre	December

Table I

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY
SAN ONOFRE NUCLEAR GENERATING STATION DOCKET NO. 50-206
SAN DIEGO, CALIFORNIA

July-September

Medium Sampled	Analysis and Total Number Analyses Performed	Lower Limit of Detection (LLD)	All Indicator Locations, Mean, Range	Location with Highest Annual Mean (1) Name, Distance Direction	Location with Highest Annual Mean (1) Mean, Range	Control Location Mean, Range	Number of Non-routine Reported Measurements
Air Particulate (pCi/m3)	β, 51	0.003	0.034 (51/51) (0.011-0.064)	Camp San Onofre 2.3 mi, 043°MAG	0.132 (29/29) (0.004-0.62)	Huntington Beach 0.038 (13/13) (0.011-0.061)	1
	I-131, 53	0.04	<LLD	-	-	-	
Air Particulate Quarterly Composite (pCi/m3)	α, 4	0.0001	0.00055(3/4) (0.00038-0.00081)	Camp San Onofre 2.3 mi, 043°MAG	0.0013 (2/3) 0.00081-0.0017	Huntington Beach <LLD	0
	Sr-90, 4	0.001	<LLD	-	-	-	
	γ isotopic, 4 510 Kev peak	0.04 γ/min/m3	0.005 (4/4) (0.003-0.006)	Camp San Onofre 2.3 mi, 043°MAG	0.014(3/3) (0.005-0.043)	0.004 (1/1)	
Direct Radiation (mr/qtr)	, 13	1	29.5 (13/13) (24.6-34.2)	Visitor Center 0.1 mi, 015°MAG	35.4(3/3) (30.8-49)	Huntington Beach 32.9 (1/1)	0

Table 1

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY
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Medium Sampled	Analysis and Total Number Analyses Performed	Lower Limit of Detection (LLD)	All Indicator Locations, Mean, Range	Location with Highest Annual Mean (1)		Control Location Mean, Range	Number of Non-routine Reported Measurements
				Name, Distance Direction	Mean, Range		
Drinking Water, Filtrate (pCi/l)	β, 9	0.5	14 (9/9) (6.2-23)	Tri Cities Water District 8.7 mi. 320° MAG	22 (9/9) (19-26)	Huntington Beach 9.5 (3/3)(6.2-13)	0
	α, 9	3	<LLD	Tri Cities Water District 8.7 mi. 320° MAG	6 (2/9) (5-7)	<LLD	
Drinking Water Solids (pCi/l)	β, 9	0.1	1.6 (9/9) (0.7-2.8)	Tri Cities Water District 8.7 mi. 320° MAG	2.0 (9/9) (0.9-417)	1.9 (3/3) (1.7-2.1)	
	α, 9	0.3	<LLD	Huntington Beach 37 mi. 300° MAG	0.77 (1/19)	<LLD	
Drinking Water Quarterly Filtrate Composite (pCi/l)	β, 3	0.5	16 (3/3) (10-24)	Tri Cities Water District 8.7 mi. 320° MAG	22 (3/3) (20-24)	Huntington Beach 10 (1/1)	0
	α, 3	3	<LLD	-	-	<LLD	
	H-3, 3	200	LLD	-	-	<LLD	

Table 1

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				Name, Distance Direction	Mean, Range		
Drinking Water Quarterly Solids Composite (pCi/l)	β, 3	0.1	1.0 (3/3) (0.4-1.6)	San Clemente Well 3.5 mi. 320°MAG	1.9 (3/3) (0.7-4.3)	1.6 (1/1)	
	α, 3	0.3	0.16(2/3) (0.11-0.20)	San Clemente Well 3.5 mi. 320° MAG	0.44 (3/3) (0.12-1.0)	<LLD	
Ocean Water (pCi/l)	β, 2	0.5	755 (2/2) 750-760)	Newport Beach 30 mi. 305° MAG	830 (5/5) (740-900)	Newport Bch. 760 (1/1)	0
	γ-isotopic, 2 Cs-137	6	<LLD	-	-	<LLD	
Local Crops pCi/g)	H-3, 4	11.0	<LLD	Yamasaki Farm 23 mi, 135° MAG	26 (2/4) (19-32)	Yamasaki Farm <LLD	0
pCi/g dry wt)	γ-isotopic, 4 Cs-137	0.03	LLD	Yamasaki Farm 23 mi, 135° MAG	0.099 (1/4)	<LLD	
	I-131, 4	0.03	<LLD	-	-	<LLD	
	Sr-90	0.04	0.017 (2/4) (0.015-0.018)	Yamasaki Farm 23 mi, 135° MAG	0.067 (3/4) (0.015-0.077)	Yamasaki Farm 0.015 (1/2)	

Table 1

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Marine Animal Flesh (pCi/g dry wt)	H-3, 8	11	37 (8/8) (8-72)	Station Discharge 0.5 mi, 215° MAG	55 (5/12) (8-114)	Newport Beach 34 (4/4) (8-72)	0
	γ-isotopic, 8 Co-58	0.1	1.35 (1/8)	Station Discharge 0.5 mi, 215° MAG	1.00 (3/12) 0.16-15	<LLD	
	Co-60	0.2	0.17 (1/8)	Station Discharge 0.5 mi, 215° MAG	0.24 (2/12) (0.17-0.30)	<LLD	
	Ag-110m	0.04	1.9 (2/8) (1.3-2.4)	Station Discharge 0.5 mi, 215° MAG	1.1 (5/12) (0.34-2.4)	<LLD	
	Cs-137	0.03	0.036 (5/8) (0.013-0.062)	Station Discharge 0.5 mi, 215° MAG	0.45 (4/12) (0.013-0.076)	0.040 (2/4) (0.039-0.040)	
	Ra-226	0.05	0.021 (2/8) 0.008-0.033)	Station Discharge 0.5 mi, 215° MAG	0.074 (3/12) (0.033-0.15)	0.008 (1/4)	
	Th-232	0.1	0.4 (2/8) (0.15-0.6)	Station Discharge 0.5 mi, 215° MAG	0.6 (1/12)	0.15 (1/4)	
abbit hyroid pCi/g dry wt)	I-131, 1	5.0	<LLD	-	-	None	0

Table 1

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SAN DIEGO, CALIFORNIA

July-September

Medium Sampled	Analysis and Total Number Analyses Performed	Lower Limit of Detection (LLD)	All Indicator Locations, Mean, Range	Location with Highest Annual Mean (1)		Control Location Mean, Range	Number of Non-routine Reported Measurements
				Name, Distance Direction	Mean, Range		
Rabbit Flesh (pCi/g dry wt)	γ-isotopic, I-131	0.05	<LLD	-	-	None	
	Cs-137	0.06	0.08 (1/1)	<2 mi East of plant, 45° MAG	0.08 (1/2)	None	
Femur (pCi/g Ca)	Sr-89	3.0	<LLD	-	-	None	
	Sr-90	2.0	5.0 (1/1)	<2 mi East of plant, 45° MAG	5.0 (2/2) (5.0-5.0)	None	

Table 2

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY
SAN ONOFRE NUCLEAR GENERATING STATION DOCKET NO. 50-206
SAN DIEGO, CALIFORNIA

October-December 1975

Medium Sampled	Analysis and Total Number Analyses Performed	Lower Limit of Detection (LLD)	All Indicator Locations, Mean, Range	Location with Highest Annual Mean (1)		Control Location Mean, Range	Number of Non-routine Reported Measurements
				Name, Distance Direction	Mean, Range		
Air Particulate (pCi/m^3)	β, 54	0.003	0.037 (54/54) (0.004-0.16)	Camp San Onofre 2.3 mi. 043° MAG	0.098 (42/42) (0.004-0.62)	Huntington Beach 0.055 (15/15) (0.004-0.16)	0
	I-131, 52	0.04	< LLD	-	-	-	
Air Particulate Quarterly Composite, (pCi/m^3)	α, 4	0.0001	0.0007 (4/4) (0.0005-0.0009)	Camp San Onofre 2.3 mi, 043° MAG	0.0011 (3/4) (0.00081-0.0017	Huntington Beach 0.0008 (1/1)	0
	Sr-90, 4	0.001	< LLD	-	-	-	
	γ isotopic, 4 510 Kev peak	0.04 γ/min/m^3	0.009 (4/4) (0.007-0.011)	Camp San Onofre 2.3 mi, 043° MAG	0.0122 (4/4) (0.003-0.034)	0.010 (1/1)	
Direct Radiation (mr/qtr)	γ, 13	1	31.5 (13/13) (26.2-36.5)	Camp Las Pulgas 8.8 mi, 100°MAG	35.3 (2/2) 34.2-36.3	Huntington Beach 36.5 (1/1)	0

Table 2

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY
SAN ONOFRE NUCLEAR GENERATING STATION DOCKET NO. 50-206
SAN DIEGO, CALIFORNIA

October-December 1975

Medium Sampled	Analysis and Total Number Analyses Performed	Lower Limit of Detection (LLD)	All Indicator Locations, Mean, Range	Location with Highest Annual Mean (1)		Control Location Mean, Range	Number of Non-routine Reported Measurements
				Name, Distance Direction	Mean, Range		
Direct Radiation (mr/yr)	γ, 10	1	106 (10/10) (78-160)	Visitor Center 0.1 mi, 015° MAG	160 (1/1) -	Huntington Beach 126 (1/1)	0
Drinking Water Filtrate (pCi/l)	β, 9	0.5	14 (9/9) 9-25	Tri Cities Water District 8.7 mi, 320° MAG	21 (12/12) (13-26)	Huntington Beach 12 (3/3) (10-14)	0
	α, 9	3	3 (1/9)	Tri Cities Water District 8.7 mi, 320° MAG	5 (3/12) (3-7)	<LLD	
Drinking Water Solids (pCi/l)	β, 9	0.1	1.6 (9/9) (0.8-2.9)	Tri Cities Water District 8.7 mi, 320° MAG	2.0 (12/12) (0.9-4.7)	2.0 (3/3) (1.5-2.8)	
	α, 9	0.3	<LLD	Huntington Beach 37 mi, 300° MAG	0.77 (1/12)	<LLD	
Drinking Water Quarterly Filtrate Composite (pCi/l)	β, 3	0.5	16 (3/3) (13-19)	Tri Cities Water District 8.7 mi. 320° MAG	21 (4/4) (19-24)	Huntington Beach 15 (1/1)	0
	α, 3	3	3 (1/3)	Tri Cities Water District 8.7 mi 320° MAG	3 (1/4)	<LLD	

Table 2

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SAN DIEGO, CALIFORNIA
October-December 1975

Medium Sampled	Analysis and Total Number Analyses Performed	Lower Limit of Detection (LLD)	All Indicator Locations, Mean, Range	Location with Highest Annual Mean (1)		Control Location Mean, Range	Number of Non-routine Reported Measurements
				Name, Distance Direction	Mean, Range		
	H-3, 3	200	400 (1/3)	Tri Cities Water District 8.7 mi, 320° MAG	400 (1/4)	<LLD	
Drinking Water Quarterly Solids Composite (pCi/l)	β, 3	0.1	1.2 (3/3) (0.9-1.4)	San Clemente Well 3.5 mi, 320° MAG	1.7 (4/4) (0.7-4.3)	Huntington Beach 1.4 (1/1)	0
	α, 3	0.3	< LLD	-	-	-	
Ocean Water (pCi/l)	β, 4	0.5	970 (4/4) (750-1250)	Newport Beach 30 mi, 305° MAG	880 (7/7) (740-1250)	Newport Beach 1000 (2/2) (750-1250)	0
	γ isotopic, 4 Cs-137	6	< LLD	-	-	-	
Ocean Water Semi-annual Composite	H-3, 3	200	< LLD	-	-	-	
Marine Animal Flesh (pCi/g dry wt)	H-3, 8	11	31 (8/8) (16-74)	Station Discharge 0.5 mi, 215° MAG	43 (9/12) (8-114)	Newport Beach 35 (4/4) (16-74)	0
	γ isotopic, 8 Co-58	0.1	< LLD	Station Discharge 0.5 mi, 215° MAG	1.00 (3/16) (0.16-1.5)	< LLD	

Table 2

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY
SAN ONOFRE NUCLEAR GENERATING STATION DOCKET NO. 50-206
SAN DIEGO, CALIFORNIA

October-December 1975

Medium Sampled	Analysis and Total Number Analyses Performed	Lower Limit of Detection (LLD)	All Indicator Locations, Mean, Range	Location with Highest Annual Mean (1) Name, Distance Direction	Location with Highest Annual Mean (1) Mean, Range	Control Location Mean, Range	Number of Non-routine Reported Measurements
	Co-60	0.2	< LLD	Station Discharge 0.5 mi, 215° MAG	0.24 (2/16) (0.17-0.30)	< LLD	
	Ag-110m	0.04	0.47(2/8) (0.25-0.68)	Station Discharge 0.5 mi, 215° MAG	0.92 (7/16) (0.25-2.4)	< LLD	
	Cs-137	0.03	0.046 (4/8) 0.036-0.05	Station Discharge 0.5 mi, 215° MAG	0.041(7/16) (0.013-0.076)	0.049 (2/4) (0.048-0.05)	
	Ra-226	0.05	0.16 (2/8) (0.06-0.26)	Newport Beach 30 mi, 305° MAG	0.26 (1/16)	0.26 (1/4)	
	Th-232	0.1	0.12 (1/8)	Station Discharge 0.5 mi, 215° MAG	0.36 (2/16) (0.12-0.6)	< LLD	
elp nCi/Kg dry wt)	H-3, 4	10	21 (4/4) (16-24)	San Mateo Kelp Bed 6 mi, 145° MAG	24 (1/2)	Newport Beach 16 (1/1)	0
	γ isotopic, 4 Co-58	0.13	< LLD	-	-	< LLD	
	Co-60	0.20	< LLD	-	-	< LLD	
	Ag-110m	0.07	< LLD	-	-	< LLD	

Table 2

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SAN DIEGO, CALIFORNIA

October-December 1975

Medium Sampled	Analysis and Total Number Analyses Performed	Lower Limit of Detection (LLD)	All Indicator Locations, Mean, Range	Location with Highest Annual Mean (1)		Control Location Mean, Range	Number of Non-routine Reported Measurements
				Name, Distance Direction	Mean, Range		
Ocean Bottom Sediments (pCi/g dry wt)	I-131	0.2	<LLD	-	-	< LLD	0
	Cs-137	0.06	0.062 (1/4)	New Kelp Bed 1.0 mi, 180° MAG	0.067 (2/2) (0.062-0.072)	<LLD	
	Ra-226 chain	0.05	0.35 (1/4)	San Mateo Kelp 6 mi, 145° MAG	0.35 (1/2)	<LLD	
	γ isotopic, 3 Co-58	0.07	<LLD	-	-	Newport Beach <LLD	
	Co-60	0.11	<LLD	-	-	<LLD	
	Ag-110m	0.07	<LLD	-	-	<LLD	
	Cs-137	0.07	0.045 (3/3) (0.014-0.075)	0.5 mi North of Discharge 215° MAG	0.061 (2/2) (0.045-0.077)	0.014 (1/1)	
	Ra-226 chain	0.02	0.67 (3/3) (0.40-0.87)	0.5 mi south of Discharge, 215° MAG	0.57 (2/2) (0.43-0.70)	0.40 (1/1)	
	Th-232 chain	0.04	0.33 (3/3) (0.30-0.36)	0.5 mi North of Discharge, 215° MAG	0.41 (2/2) (0.32-0.49)	0.30 (1/1)	

Table 2

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY
SAN ONOFRE NUCLEAR GENERATING STATION DOCKET NO. 50-206
SAN DIEGO, CALIFORNIA

October-December 1975

Medium Sampled	Analysis and Total Number Analyses Performed	Lower Limit of Detection (LLD)	All Indicator Locations, Mean, Range	Location with Highest Annual Mean (1)		Control Location Mean, Range	Number of Non-routine Reported Measurements
				Name, Distance Direction	Mean, Range		
Rabbit Thyroid (pCi/g thyroid)	I-131, 1	5.0	<LLD	-	-	None	0
Flesh (pCi/g dry wt)	I-131, 1	0.05	<LLD	-	-	None	
	Cs-137, 1	0.06	<LLD	-	-	None	
Femur (pCi/g CaO	Sr-89	3.0	<LLD	-	-	None	
	Sr-90	2.0	3.1 (1/1)	<2 mi East of plant, 45° MAG	4.4 (3/3) (3.1-5.0)	None	
Soil (nCi/Kg)	Sr-90, 5		0.04 (3/5) (0.022-0.06)	Huntington Beach 37 mi, 300° MAG	0.06 (1/1)	Huntington Beach 0.06 (1/1)	0
	γ isotopic, 5 Cs-137	0.01	0.065 (2/5)	3 mi. South of plant	0.088 (1/1)	0.042 (1/1)	
	Ra-226 chain	0.02	1.42 (5/5) (0.69-2.54)	Camp San Onofre 2.3 mi, 043° MAG	2.54 (1/1)	1.17 (1/1)	
	Th-232 chain	0.04	0.73 (5/5) (0.38-0.89)	Huntington Beach 37 mi, 300° MAG	0.89 (1/1)	0.89 (1/1)	

CORRECTIONS TO 1st SEMI-ANNUAL

Table 3

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY
SAN ONOFRE NUCLEAR GENERATING STATION DOCKET NO. 50-206
SAN DIEGO, CALIFORNIA

Medium Sampled	Analysis and Total Number Analyses Performed	Lower Limit of Detection (LLD)	All Indicator Locations, Mean, Range	Location with Highest Annual Mean (1)		Control Location Mean, Range	Number of Non-routine Reported Measurements
				Name, Distance Direction	Mean, Range		
January-March Direct Radiation (mr/qtr)	γ , 12	1	31 (12/12) (25-49)	Visitor Center 0.1 mi, 015° MAG	49 (1/1)	Huntington Beach 34 (1/1)	0
April-June Direct Radiation (mr/qtr)	γ , 11	1	31.1 (11/11) (24.1-36.0)	Visitor Center 0.1 mi, 015° MAG	39.9 (2/2) (30.8-49)	Huntington 36.0 (1/1)	0

I. OPERATIONAL PERSONNEL RADIATION EXPOSURE

All persons required to wear film badges while on site during the reporting period are included in this report. Exposures are grouped according to the following levels:

< 100 mrem
100-500 mrem
501-1250 mrem
1251-2500 mrem
> 2500 mrem

Individuals with exposures greater than 500 mrem for the reporting period are classified according to the following six job categories:

Administrative and Engineering - This category includes Station and general office administrative and engineering personnel.

Chemical-Radiation Technicians - These individuals perform all radiation monitoring and other health physics functions.

Contractors - The major portion of exposure accumulated by these persons occurs while working on steam generators and/or performing the required in-service inspections during refuelings.

Maintenance - Major exposures to these persons occur during refuelings while working on steam generators, reactor coolant pumps and other equipment within the containment. Routine jobs which result in above average exposures include baling of radioactive trash and changing of reactor coolant or radioactive waste system filters and ion exchange resin beds.

Nuclear Instrument Technicians - These persons perform all instrument calibrations, repairs and tests.

Operations - These individuals are responsible for performing all plant equipment and reactor operational functions.

Personnel occupational radiation exposures for July through December, 1975, are shown below.

Exposure (mrem)	No. Persons
<100	375
100-500	18
501-1250	17
1251-2500	1
>2500	0

A total of 18 individuals received exposures greater than 500 mrem during this reporting period. These exposures are shown below as a function of the job category.

Category	No. Persons
Administrative and Engineering	1
Chemical Radiation Technicians	5
Contractors	5
Maintenance	3
Nuclear Instrument Technicians	0
Operations	4

WGF:dkm

ATTACHMENT I

TEST DEFICIENCIES

TEST	MINIMUM FREQUENCY	RESULTS	CAUSE	CORRECTIVE ACTION REQUIRED
Semi-annual Full Load Diesel Generator Test, No. 1 Diesel Generator	Semi-annual	Engine tripped on over-temperature after 35 minutes	Corrosion and dirt on radiator cooling fins	Radiator fins were cleaned
Semi-annual Full Load Diesel Generator Test, No. 2 Diesel Generator	Semi-annual	Engine tripped on overtemperature after 35 minutes	Defective seating surface on radiator cap allowed coolant to leak out	Replace radiator cap
Weekly Flow Verification Test	Weekly	South boric acid pump failed to develop head	Worn out pump bearing	Replace bearing
Emergency Radiation Monitor Channel Source Test	Daily	Channel R-1252 source check failed	Inoperative source mechanism	Repaired mechanism

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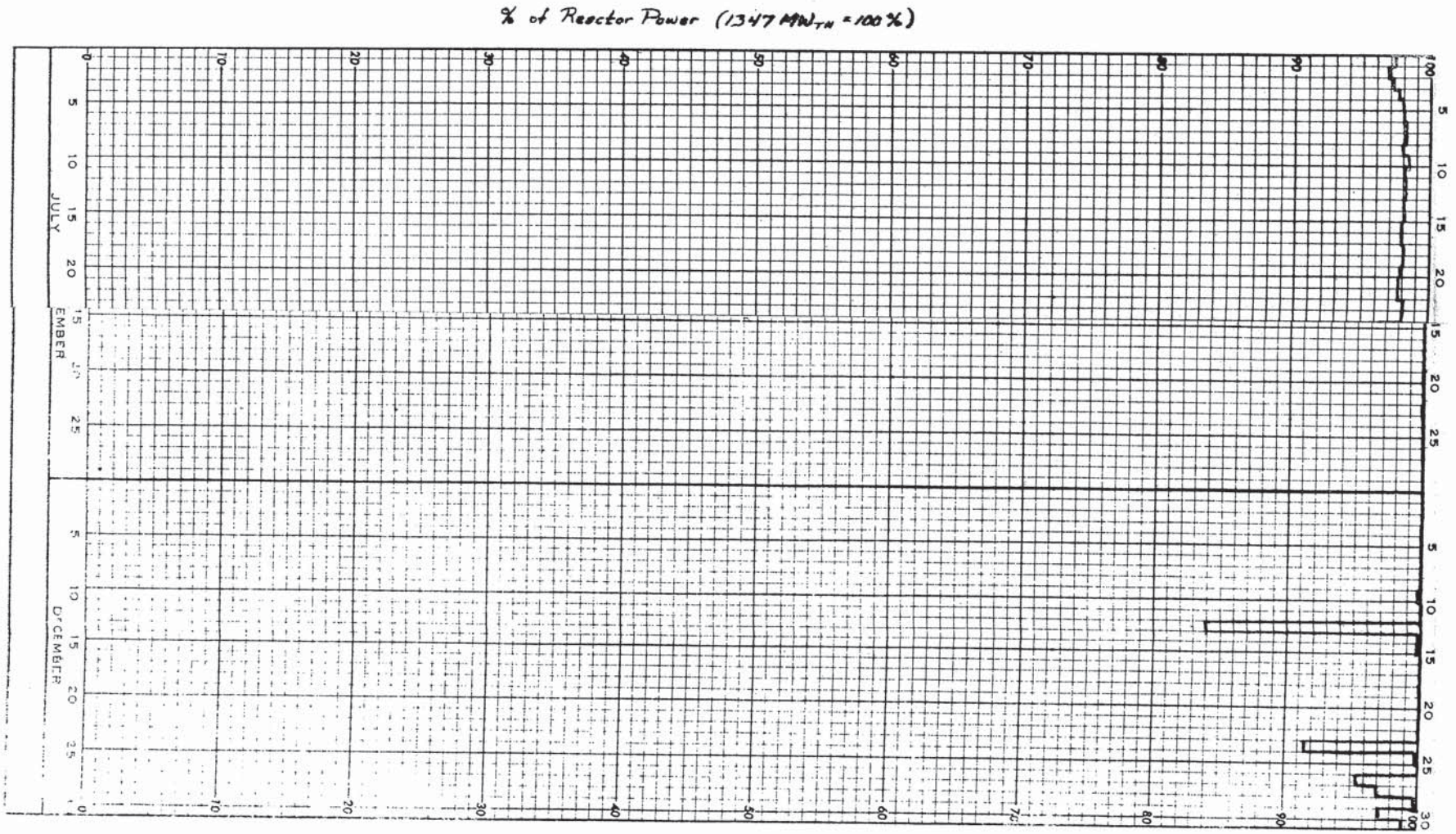

REPORT OF RADIOACTIVE EFFLUENTS

Facility: San Onofre Nuclear Generating Station Docket: 50 - 206

I. AIRBORNE RELEASES

	UNITS	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	TC
1. Total Noble Gases	Curies	1.29 E+1	6.58 EO	1.76 E-4	2.67 E+1	1.68E-2	2.53E+1	7.15E
2. Total Halogens	Curies	NDA	NDA	NDA	NDA	1.42E-6	NDA	1.42E
3. Total Particulate Gross Radioactivity (β,γ)	Curies	NDA	NDA	NDA	NDA	NDA	NDA	NDA
4. Total Tritium	Curies	NDA	NDA	NDA	NDA	NDA	NDA	NDA
5. Total Particulate Gross Alpha Radioactivity	Curies	NDA	NDA	NDA	NDA	NDA	NDA	NDA
6. Max. Noble Gas Release Rate	µCi/sec	4.16 E+2	1.81E+2	1.11 E-2	6.23 E+2	6.53E-1	3.52E+2	6.23E
7. Percent of Applicable Limit For:								
a. Noble Gases	%	1.20 E-2	4.37E-3	1.33 E-7	1.84 E-2	1.18E-5	2.10E-5	5.86E
b. Halogens	%	-		-	-	2.90E-6	-	4.73E
c. Particulates	%	-		-	-	-	-	
8. Isotope Released:	Curies							
Particulates		NDA	NDA	NDA	NDA	NDA	NDA	NDA
Cr-51								
Mn-54								
Fe-59								
Co-58								
Co-60								
Sr-89								
Sr-90								
Cs-134								
Cs-137								
Ba,La-140								
Co-57								
Nb-95								
Ru-103								
Halogens		NDA	NDA	NDA	NDA		NDA	
I-131						1.42E-6		1.42E
I-133								
I-135								
I-132								
Gases								
Ar-41		NDA	NDA	NDA	6.59E-3	NDA	NDA	6.59E
Kr-85		3.07 E-1	2.55EO	NDA	3.03E-1	NDA	4.47E-1	3.61E
Kr-85m		1.01 E-1	NDA	NDA	6.07E-2	NDA	9.20E-3	1.71E
Kr-87		1.83 E-2	NDA	NDA	NDA	NDA	NDA	1.83E
Kr-88		1.05 E-1	NDA	NDA	1.98E-2	NDA	2.13E-3	1.27E
Xe-131m		2.22 E-1	1.84E-2	NDA	8.62E-1	NDA	8.38E-2	1.19E
Xe-133		1.03 E+1	3.96EO	1.66 E-4	2.16E+1	1.66E-2	1.57E+1	5.16E
Xe-133m		1.12 E-1	3.11E-2	NDA	3.24EO	NDA	1.70E-1	3.55E
Xe-135		1.72 EO	2.43E-2	1.02 E-5	5.70E-1	2.45E-4	8.92EO	1.12E
Xe-135m		NDA	NDA	NDA	NDA	NDA	NDA	NDA
Xe-138		NDA	NDA	NDA	NDA	NDA	NDA	NDA
Kr-83m		NDA	NDA	NDA	NDA	NDA	NDA	NDA

II. LIQUID RELEASES

	UNITS	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	TOT
1. Gross Radioactivity (β,γ)								
a) Total Release	Curies	1.21 E-1	NDA	7.54 E-3	NDA	1.62E-2	1.27E-2	1.57
b) Avg. Concentration Released	µCi/ml	2.39 E-9	-	1.34 E-10	-	3.36E-10	2.53E-10	6.46
c) Max. Concentration Released	µCi/ml	3.29 E-7	-	5.75 E-8	-	8.51E-8	2.72E-8	3.29
2. Tritium								
a) Total Release	Curies	1.24 E+2	2.48E+2	2.50 E+2	5.50 E+2	4.90E+2	4.52E+2	2.11
b) Avg. Concentration Released	µCi/ml	2.45 E-6	5.12E-6	5.25 E-6	1.13 E-5	1.02E-5	9.00E-6	8.68
3. Dissolved Noble Gases								
a) Total Release	Curies	NDA	2.28E-3	NDA	8.43E-4	2.35E-4	1.42E-4	3.50
b) Avg. Concentration Released	µCi/ml		4.71E-11	-	1.73E-11	4.88E-12	2.82E-12	1.44
4. Gross Alpha Radioactivity								
a) Total Release	Curies	NDA	NDA	NDA	NDA	8E-4	NDA	8E-4
b) Avg. Concentration Released	µCi/ml	-	-	-	-	<2E-11	-	3E-1
5. Volume of liquid waste to discharge canal	Liters	4.64 E+5	3.29E+5	1.93E+5	6.50E+5	3.94E+5	5.67E+5	2.60
6. Volume of Dilution Water	Liters	5.07 E+10	4.84E+10	4.76E+10	4.86E+10	4.82E+10	5.02E+10	2.43
7. Isotopes Released	Curies							
C-14		NDA	NDA	NDA	1E-4	IA	IA	1E-4
Cr-51		NDA	NDA	NDA	NDA	NDA	NDA	NDA
Mn-54		1.66 E-4	NDA	NDA	NDA	1.86E-4	5.10E-5	4.03
Fe-59		NDA	NDA	NDA	NDA	NDA	NDA	NDA
Co-58		3.00 E-2	NDA	NDA	NDA	NDA	NDA	3.00
Co-60		9.03 E-4	NDA	NDA	NDA	3.20E-4	NDA	1.22
Zn-65		NDA	NDA	NDA	NDA	NDA	NDA	NDA
Sr-89		NDA	NDA	NDA	NDA	IA	IA	NDA
Sr-90		2.5 E-4	NDA	1.18E-3	NDA	IA	IA	1.4E-
Ag-110m		NDA	NDA	NDA	NDA	NDA	NDA	NDA
Sb-124		NDA	NDA	NDA	NDA	NDA	NDA	NDA
I-131		NDA	NDA	NDA	NDA	NDA	5.95E-5	5.95E
I-133		NDA	NDA	NDA	NDA	NDA	NDA	NDA
Xe-131m		NDA	NDA	NDA	NDA	NDA	NDA	NDA
Xe-133		NDA	2.28E-3	NDA	8.43E-4	2.35E-4	1.42E-4	3.50E
Xe-133m		NDA	NDA	NDA	NDA	NDA	NDA	NDA
Xe-135		NDA	NDA	1.38 E-4	NDA	NDA	NDA	1.38E
Cs-134		2.47 E-2	NDA	1.61 E-3	NDA	3.72E-3	2.42E-3	3.25E
Cs-137		6.26 E-2	NDA	4.38 E-3	NDA	1.19E-2	1.02E-2	8.91E
Ba-140		NDA	NDA	NDA	NDA	NDA	NDA	NDA
La-140		NDA	NDA	NDA	NDA	NDA	NDA	NDA
Ce-144		NDA	NDA	NDA	NDA	NDA	NDA	NDA
Sb-122		NDA	NDA	2.30 E-4	NDA	NDA	NDA	2.30E-
Unidentified		NDA	NDA	NDA	NDA	NDA	NDA	NDA
8. Percent of Tech. Spec. Limit For Total Activity Released	%	9.60 E-2	1.71E-1	1.77 E-1	3.77E-1	3.41E-1	3.02E-1	2.94E-

NDA=No Detectable Activity IA=Independent Analyst

ADDITIONS

Table II, Liquid Radioactive Releases of the January-June 1975 report should be updated for May and June as shown below.

I. LIQUID RELEASES

	UNITS	JAN.	FEB.	MAR.	APR.	MAY	JUNE	TOTA
1. Gross Radioactivity (β,γ)								
a) Total Release	Curies	2.15E-2	2.06E-2	7.42 E-2	1.22 E-1	2.77 E-1	5.43E-1	1.06
b) Avg. Concentration Released	µCi/ml	4.27E-10	4.51E-10	3.36 E-9	8.29 E-9	5.64 E-9	6.92 E-9	3.94
c) Max. Concentration Released	µCi/ml	2.35E-9	9.39E-9	1.66 E-7	3.57 E-7	6.28 E-7	6.35 E-7	6.35
2. Tritium								
a) Total Release	Curies	6.48E+2	5.91E+2	7.50 E+1	9.61 E+1	8.03 E+1	4.01 E+2	1.89
b) Avg. Concentration Released	µCi/ml	1.29E-5	1.29E-5	3.39 E-6	6.58 E-6	1.87 E-6	9.82 E-6	8.48
3. Dissolved Noble Gases								
a) Total Release	Curies	6.83E-2	4.29	9.93 E-3	5.27 E-3	NDA	3.83 E-1	4.74
b) Avg. Concentration Released	µCi/ml	1.36E-9	9.39E-8	4.49 E-10	3.61E-10	-	9.39 E-9	2.13
4. Gross Alpha Radioactivity								
a) Total Release	Curies	<1E-5	2 E-5	NDA	NDA	NDA	NDA	3E-5
b) Avg. Concentration Released	µCi/ml	<2 E-13	4 E-13	-	-	-	-	1E-1
5. Volume of liquid waste to discharge canal	Liters	7.23E+5	7.57E+5	3.56 E+5	4.61 E+5	5.72 E+6	2.51 E+6	1.05
6. Volume of Dilution Water	Liters	5.03E+10	4.57E+10	2.21 E+10	1.46E+10	4.91E+10	4.08E+10	2.23
7. Isotopes Released	Curies							
C-14		4 E-4	9.8 E-4	NDA	1.3 E-3	NDA	NDA	2.7E-
Cr-51		NDA	8.89E-3	NDA	1.49 E-2	NDA	NDA	2.38
Mn-54		5.7 E-4	NDA	NDA	6.97E-4	1.58 E-4	2.12 E-3	3.54
Fe-59		<6 E-5	NDA	NDA	NDA	NDA	NDA	6E-5
Co-58		NDA	NDA	3.31 E-3	5.40E-2	4.99 E-2	1.33 E-1	2.40
Co-60		NDA	2.75E-3	1.21 E-3	8.73 E-4	4.30 E-3	1.32 E-2	2.24
Zn-65		NDA	NDA	NDA	NDA	NDA	NDA	NDA
Sr-89		3.2 E-4	7.6 E-6	NDA	3.7 E-5	NDA	NDA	3.7E-
Sr-90		3.2 E-5	5.3 E-5	1.4 E-5	7.4 E-5	2.1 E-4	8.3 E-4	1.2E-
Ag-110m		4 E-5	NDA	NDA	1.38 E-2	NDA	NDA	1.38
Sb-124		NDA	NDA	NDA	NDA	NDA	NDA	NDA
I-131		NDA	NDA	NDA	NDA	NDA	NDA	NDA
I-133		NDA	NDA	NDA	NDA	NDA	NDA	NDA
Xe-131m		6.61E-2	4.27	NDA	NDA	NDA	NDA	4.34
Xe-133		1.84E-3	2.47E-2	9.93 E-3	NDA	NDA	3.83 E-1	4.20
Xe-133m		NDA	NDA	NDA	NDA	NDA	NDA	NDA
Xe-135		3.83E-4	1.09E-3	NDA	NDA	NDA	NDA	1.47
Cs-134		1.00 E-2	3.91E-3	2.14 E-2	1.27 E-2	6.95 E-2	1.16 E-1	2.34
Cs-137		1.00 E-2	3.91E-3	3.74 E-2	2.42 E-2	1.52 E-1	2.78 E-1	5.06
Ba-140		NDA	NDA	NDA	NDA	NDA	NDA	NDA
La-140		NDA	NDA	NDA	NDA	NDA	NDA	NDA
Ce-144		2 E-5	NDA	NDA	NDA	NDA	NDA	2E-5
Sb-122		NDA	NDA	NDA	NDA	NDA	NDA	ND
Unidentified		NDA	NDA	NDA	NDA	NDA	NDA	ND
8. Percent of Tech. Spec. Limit For Total Activity Released	%	4.36 E-1	4.35 E-1	1.35 E-1	3.18 E-1	9.83 E-2	4.05 E-1	3.17

III. SOLID WASTE

	UNITS	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTAL
1. Total solid waste packaged	Ft^3	0	0	0	0	0	0	0
2. Total est. radioactivity	Curies	0	0	0	0	0	0	0
3. Dates of shipment and Disposition if shipped Offsite.								

JULY
No shipments
AUGUST
No shipments
SEPTEMBER
No shipments
OCTOBER
No shipments
NOVEMBER
No shipments
DECEMBER
No shipments

13.3

July 29, 1976

Director
U. S. Nuclear Regulatory Commission
Region V
Suite 202, Walnut Creek Plaza
1990 North California Boulevard
Walnut Creek, California 94596

Docket 50-206

Dear Sir:

An inspection on June 15-18, 1976 by Region V personnel disclosed that the "calculated error" required to be associated with some radiological environmental measurements had inadvertently been omitted from San Onofre Nuclear Generating Station Unit 1 Semi-Annual Operating Reports 16 and 17. These reports cover the periods January 1, 1975 to June 30, 1975 and July 1, 1975 to December 31, 1975, respectively. The omitted data are provided in the enclosed supplement for the subject reports.

ORIGINAL SIGNED

R. S. Currie
Manager of Steam Generation

HEM:dc

Enclosures

cc: Director, NRC Office of Inspection and Enforcement
Director, NRC Office of Management Information and Program Control

bcc:
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B. W. Colston (SDG&E)
D. L. Couchman (NUS)
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SAN ONOFRE NUCLEAR GENERATING STATION

SEMI-ANNUAL OPERATING REPORT NO. 17

SUPPLEMENT 1

Section H, Radiological Environmental Monitoring, part (d) for each of the following categories should be modified to read as shown below. The "calculated error" for the "highest" and "lowest" activity sample is one standard deviation due to counting statistics. A "calculated error" for the "mean" was determined from the square root of the sum of the squares of the individual standard deviations.

Air Particulate

Camp San Onofre showed the highest airborne radioactivity levels of the locations measured. This area is located 2.3 miles from the plant at 043° magnetic north.

	Beta pCi/m^3	I-131 pCi/m^3
highest	0.064 ± 0.001	< LLD
mean	0.027 ± 0.009	
lowest	0.012 ± 0.001	

	Alpha pCi/m^3	Sr-90 pCi/m^3
highest	0.0009 ± 0.0001	< LLD
mean	0.00086 ± 0.0001	
lowest	0.00081 ± 0.00008	

Drinking Water

Water from Tri-Cities Water District showed the highest gross beta radioactivity levels in the filtrate for the quarterly composite samples analyzed. Gross alpha and tritium radioactivity were observed in one quarterly composite sample. The Tri- Cities Water District reservoir is 8.7 miles from the plant at 320° magnetic north.

	Beta pCi/l	Alpha pCi/l	H-3 pCi/l
highest	24 ± 1	observed 3 ± 1	observed 400 ± 200
mean	21 ± 1		
lowest	19 ± 1		

Ocean Water

Newport Beach, the control location, showed the highest mean beta radioactivity level measured. Tritium and gamma radioactivity levels were below LLD for both sampling locations. Newport Beach is 30 miles from the station at 305° magnetic north.

	Beta pCi/l
highest	1250 ± 60
mean	920 ± 80
lowest	740 ± 40

Local Crops

The Highland Farm (2.2 miles at 315° magnetic north) showed the highest strontium-90 level measured. Iodine-131, cesium-137 and tritium were all below LLD at both locations.

	Sr-90 nCi/kg
highest	0.018 ± 0.001
mean	0.017 ± 0.003
lowest	0.015 ± 0.003

Non-migratory Marine Animals

Samples collected near the station discharge generally showed higher radioactivity levels than samples collected from Newport Beach. The discharge is 0.5 mile at 215° magnetic north from the station. Total gamma data shown below represent a summation of isotopic data for all naturally present and other isotopes detected in individual samples.

Total gamma	dry weight pCi/g	wet weight pCi/g
highest	4.58 ± 0.29	0.49 ± 0.03
mean	0.89 ± 0.19	0.13 ± 0.03
lowest	0.013 ± 0.001	0.0040 ± 0.0003

Tritium	dry weight pCi/g	wet weight pCi/g
highest	61 ± 4	16 ± 1
mean	34 ± 9	7.9 ± 2.1
lowest	9 ± 3	2.8 ± 0.9

Kelp

The sample collected from the San Mateo Kelp Bed showed the highest tritium and gamma activity levels of the samples analyzed. The San Mateo Kelp Bed is 6 miles at 145° magnetic north from the station.

	Total gamma		Tritium	
	dry weight nCi/Kg	wet weight nCi/Kg	dry weight nCi/Kg	wet weight nCi/Kg
Observed	0.35 ± 0.04	0.029 ± 0.003	24 ± 2	2.0 ± 0.1

Ocean Bottom Sediments

The sample collected 0.5 mile south of the station discharge at 215° magnetic north showed the highest radioactivity level of the areas sampled. Total gamma data shown below represent a summation of isotopic data for all naturally present and other isotopes detected.

Total gamma	dry weight nCi/Kg	wet weight nCi/Kg
Observed	1.31 ± 0.10	0.94 ± 0.07