U. S. ATOMIC ENERGY COMMISSION
DIVISION OF COMPLIANCE
REGION V

Report of Inspection

CO Report No. 50-133/69-2

Licensee: Pacific Gas and Electric Company
License No. DPR-7
Category C

Date of Inspection: January 21-22, 1969

Date of Previous Inspection: January 16-17, 1969

Inspected by: R T Dodds 2/24/69
R. T. Dodds
Reactor Inspector

Reviewed by: G S Spencer 2/24/69
G. S. Spencer
Senior Reactor Inspector

Proprietary Information: None

SCOPE

Type of Facility: Boiling Water Reactor

Power Level: 240 Mwt (70 Mwe)

Location: Humboldt Bay, Eureka, California

Type of Inspection: Routine - Announced

Accompanying Personnel: D. L. Pomeroy, Nuclear Engineer, Technical Support Branch, Compliance Headquarters

J. R. Metzger, Radiation Specialist, Region V - January 17, 1969 (Sections, P., Q., and R. were prepared by Mr. Metzger.)

Scope of Inspection: Review of facility records including radiation protection program and control rod surveillance tests, observe reactor operation and a tour of the facility.

SUMMARY

Safety Items - No significant safety items were identified during the visit.

Noncompliance Items - No items of noncompliance were observed.

Unusual Occurrences - Control rod drive A-5 drifted from notch 11 to notch 20 (26 notches is fully withdrawn) during a startup on December 23. The problem which corrected itself after the rod was fully inserted, was believed to have been caused by a crud particle under the collet piston. No further difficulties have been experienced with the drive. (Section F.2.)

Reportable?

The information relating to the complete loss of off-site power that occurred on December 22, 1968 is contained in CO Report No. 50-133/69-1.

Status of Previously Reported Problems - A study of past reactor operation history, prompted by a lower core flow correlation finding, did not disclose any noncompliance with the technical specification operating limit.* The reactor power level was curtailed pending acceptance of the AEC of the new minimum burnout ratio correlation. (Section E.1.)

The licensee is now decaying the refueling building air samples sufficiently to observe the long half life radioisotopes. Also, routine air samples are now taken in the drywell access shaft. (Section P.2.)

Other Significant Items -

1. For the year 1968, the reactor availability factor was 92.5% and the capacity factor was 81.5%. The average off-gas release rate was 28,400 uCi/sec. The only inadvertent scram since the November visit was the loss of power incident on December 22, 1968. (Section C.)

2. The licensee has reviewed the possible effects of steam leakage onto instrument sensors and has concluded that the Saxton occurrence** was not applicable to Humboldt. (Section F.1.)

*CO Inquiry Memorandum dated December 30, 1968.
**Information report dated November 27, 1968.

3. The yearly summary of personnel exposures, effluent releases and environmental monitoring results were obtained. (Sections P., Q., and R.)

Exit Interview - The significant results of the visit were discussed with Messrs. Nix, Raymond and Weeks. The effects of the new emergency electrical power requirements that are imposed by the new license were discussed in depth. Mr. Raymond said that in the event Humboldt cannot meet the electrical power supply requirements for continued operation in a timely manner, the reactor power will probably be decreased slowly and the reactor shut down in accordance with standard operating procedures. ?

Mr. Weeks provided assurance that the use of the lower core flow correlation had been explored in depth with General Electric by Messrs. Shiffer and Carroll.

Some attention was given to the timing of control rod withdrawal speeds. As noted in previous CO reports, a significant number of the rods have not met the technical specification withdrawal time limit of ≥ 20 seconds when tested in the "as found" condition. Mr. Weeks stated that they will continue to sincerely try to improve the timing of the rods. Mr. Carroll informed the inspector on February 17 that they were investigating the problem further and were requesting some answers from General Electric. He hypothesized that there may be other sources of leakage that may be effecting the withdrawal rates.

The license requirement to immediately report variances from those values that were calculated and predicted in the tables contained in the technical specifications, such as the lower than predicted core flow, was discussed with Mr. Carroll on January 16 and during the exit interview. They agreed that the new core flow correlation finding was probably reportable and that in the future, as in the past, each case will be evaluated on its own merits. too cute!

DETAILS

A. Persons Contacted

Personnel contacted during the visit included the following:

D. Nix - Plant Superintendent
W. Raymond - Assistant Plant Superintendent
E. Weeks - Plant Engineer
J. Shiffer - Nuclear Engineer
G. Allen - Radiation Protection Engineer
G. Boots - Plant Chemist

C. Operations

Reactor operation for the period of November, 1968 - January, 1969 was reviewed by discussion with Mr. Raymond and by reading the operating records, logbooks and sheets. The only scram since the last visit occurred on December 22, 1968 and was caused by a complete loss of off-site power as well as the two on-site conventional units (CO Report No. 50-133/69-1). Operating statistics for the year 1968 were as follows:

Accumulated Power	- 62,817 Mwdt
Electrical Generation	- 465,510 Mwhr
Availability Factor	- 92.5%
Capacity Factor	- 81.5%
Average Stack Gas Release Rate	- 28,400 uCi/sec

D. Facility Procedures (Emergency Procedures)

According to Mr. Weeks, an unannounced site emergency evacuation alarm was initiated as a test on November 20, 1968. The test was considered satisfactory. All persons reported to their proper stations.

E. Primary System

1. Thermal Power Level (Core Flow Analysis)

Mr. Shiffer discussed General Electric's reanalysis of core flow at Humboldt. The new analysis has shown core flow to be substantially less than predicted (i.e.; 9.7×10^6 lb/hr rather than 10.5×10^6 lb/hr).* General Electric's first explanation to PG&E concerning this discrepancy was that it was discovered during an analysis of flow measurements of PWR type fuel. This fuel closely approximates the hydraulic characteristics of the "tighter latticed" Humboldt type II fuel. However, subsequent testing in conjunction with the computer correlation for core flow has demonstrated that the "tighter lattice" is not a major effect. Rather, the principal reason for the change is the adoption by G-E of a new thermal-hydraulics code which incorporates an improved correlation of steam voids versus steam quality, including subcooled voids. The new void-quality correlation indicates less in-core voids than previously calculated, with a subsequent reduction in the natural circulation driving head.

PG&E first learned of the over-estimation of the flow (by approximately 1×10^6 lb/hr) on December 12, 1968. As a result, operation at 220 Mwt was considered marginal with respect to the minimum licensed burnout ratio (MBR) of 1.5. G-E's calculations were confirmed by the Humboldt staff. The

*CO Inquiry Memorandum dated December 30, 1968.

reactor was derated immediately to 210 Mwt to insure a MBR of at least 1.7 when evaluated at the 125% overpower condition. A new rod pattern was implemented to give a flatter flux profile and reduce the peaking factors. In addition, a series of thermal-hydraulic measurements were made which were forwarded to G-E in order to enable them to complete their analyses. The final results indicate that total core flow is approximately 9.7×10^6 lb/hr.

Mr. Shiffer made an extensive review of earlier data obtained from the current and previous cycle. His review showed that the present core is more restrictive since the peaking factors are higher as a result of the removal of the poison curtains from the core during the refueling outage in October, 1968. The calculations indicate that at 125% of 220 Mwt (flux trips set at 120% of 220 Mwt) for all operations conducted to date using worst case conditions, the lowest MBR was approximately 1.52. The calculations and data were reviewed by the inspector. From the calculations, it does not appear that the MBR operating limit of 1.5 (Section V.B.1.b.(3) of the technical specifications) has been exceeded.

The MBR calculations discussed above were based on the critical heat flux (CHF) correlation given in "Burnout Limit Curves For Boiling Water Reactors" by Jansen and Levy, April 14, 1962, APED-3892 as required by the provisional operating license. Subsequently, DRL has amended the license (Change No. 24, dated January 28, 1969) to allow the use of a newer CHF correlation, the adoption of which results in an addition of approximately 0.5 to the MBR calculation (i.e.: 2.0 rather than 1.52). With the new correlation, it will be possible to proceed to the licensed power limit of 70 Mwe, 240 Mwt.

2. Reactor Water Chemistry

A review of the reactor water chemistry records for the past three months disclosed that all parameters (conductivity, pH, chloride ion content, gross radioactivity, and boron content) were within the limits specified by Table IV-2 of the technical specifications.

F. Reactivity Control and Core Physics

1. Instrumentation

Mr. Weeks reviewed and discussed the possibility of steam leakage affecting instrument sensor operation at Humboldt.* His comments were as follows:

*Saxton Nuclear Experimental Corporation report of interest dated November 27, 1968.

a. Humboldt does not have instrument cabinets in the plant. They only have instrument panels which would permit any leakage as spray to be dissipated and the leakage as drips to drain to the floor.

b. The only critical items in the refueling building are the level and pressure sensors at elevation --34 ft. These are protected with a dew cell for high vapor content in the area and low pressure leakage alarms for any major leak.

c. At the -14 ft. elevation, the local pressure sensors are protected by a low pressure leakage alarm. Again, they are on an open panel where moisture would not collect and penetrate the units.

d. It appears that the problem experienced at Saxton was due to spray from a leaking fitting in an enclosed area penetrating the cases and affecting electronic transmit circuitry. Humboldt's type of installation would not be affected in this manner.

e. At Humboldt, where all sensors are out in the open, steam leakage would be detected by operating personnel making their routine plant checks long before the leak became a problem.

2. Control Rod Drives*

Control rod A-5 drifted out of the core at about one-third the normal withdrawal speed from notch 11 to notch 20 during a startup on December 23, 1968. Even with the drive unselected, it still continued to drift. It was then inserted to notch 12 but drifted out again. The next insertion was to notch 00 where it stayed and did not exhibit any further tendencies to drift. The drive was then satisfactorily notch and scram tested. Since then, its operation has been satisfactory.

Control rod A-5 is worth a maximum of 0.7% Δk (best estimate - approximately 0.6% Δk) in the startup configuration. It is normally fully withdrawn during routine power operation.

The best explanation as to cause of the drifting rod was that a crud particle may have gotten under the collet locking mechanism

*Mr. Pomeroy performed a special review of control rod drive tests that have been run over the past year. The results of his study will be included in a general report on G-E control rod drives.

(piston) and held the fingers open in the unlatched position. Apparently, the crud has been washed out and the drive is now functioning properly. It will be checked closely during the remainder of this fuel cycle and will again be thoroughly tested during the next refueling outage (approximately June, 1969). Presumably, it would not be removed for inspection unless more operating problems were experienced.

Before the continuation of normal operations, a special meeting was held by the On-Site Review Committee to review the rod drift problem. It was demonstrated that the shutdown requirements could be met with A-5 fully withdrawn in addition to the strongest rod being fully withdrawn. The Committee concluded that something had temporarily lodged under the collet piston. Since no problems were experienced on inserting the control rod and it now appeared to be normal, they decided that it was permissible to continue normal operations. All operators were cautioned to exercise close surveillance on A-5.

3. Liquid Poison System

A review of the liquid poison system log sheets disclosed that the solution temperature range was 99-107°F (limit - $\geq$ 84°F) and the range injection system pressure was 1330-1360 psig (limit - $\geq$ 1300 psig), during the period of November, 1968 - January, 1969.

4. Incore Flux Monitors

It was observed that there were 14 operable incore flux monitors (limit - $\geq$ 12 to operate above 180 Mwt). Four monitors were operable in the central channels (limit - 1).

K. Containment

1. Refueling Building

The records for the past three months show that the leakage to the refueling building has been demonstrated to be less than 134 cfm at 1/4" vacuum at least once per month and after each instance when the railroad doors have been opened.

2. Drywell and Suppression Chamber

The continuous leakage rate monitoring systems for the drywell and suppression chambers have demonstrated that the leakage from these containment structures have been $\leq$ 0.128 and $\leq$ 0.046% of volume per day respectively since the refueling outage (limit - 0.28 and 0.14% per day respectively).

Since the refueling outage, the oxygen content of the atmosphere inside containment has been $\leq 4.5\%$ (limit - 5%). The suppression pool temperature has been $\leq 87^{\circ}F$ (limit - $\leq 90^{\circ}F$). The drywell temperature has been $\leq 161^{\circ}F$ (limit - $175^{\circ}F$).

P. Radiation Protection

1. Facilities Tour, Storage, Posting and Labelling

During a facility tour, it was observed that posting and labelling of areas and containers, respectively, were in compliance with the requirements of 10 CFR 20.203. High radiation area warning devices and high radiation "B" lock areas were instrumented and locked in accordance with 10 CFR 20.203(c) and Part 7 of the license. Forms AEC-3 were also posted in several locations around the plant. An air sampler which is used in evaluating airborne radioactive concentrations in that area, was observed at the -54 foot level in the drywell access shaft. This item was discussed with the licensee during the previous visit of November 12-14, 1968.

2. Air Sampling

As a result of a discussion during the previous inspection of November 12-14, the licensee has begun taking air samples in the containment drywell access shaft in addition to the regular air samples taken elsewhere. Mr. Allen stated that samples have been taken three times per week in this location. Records showed that the initial concentrations of short half life activity were approximately 2×10^{-8} uCi/cc, and a 24-hour decay count showed approximately 5×10^{-10} uCi/cc (long half life activity). Also, Mr. Allen said that selected air samples from other areas at Humboldt had been given additional 24-hour decay counts resulting in concentrations for long half life activity in the 10^{-10} - 10^{-11} uCi/cc range.

3. Personnel Monitoring

Records of film badge results showed that the maximum whole body external radiation dose received during each quarter of 1968 was:

1st quarter - 2390 mrem
2nd quarter - 980 mrem
3rd quarter - 1950 mrem
4th quarter - 2510 mrem

The maximum dose received for the entire year by one employee was observed to be 4800 mrem. The licensee's internal yearly limit

is 5000 mrem. The average exposure received for 69 badged employees was 2960 mrem for the year. The annual personnel exposure data requested by J. P. O'Reilly in a memorandum dated February 12, 1969 follows. No exposure averages exceeded the 4-6 rem category.

1968 Exposure - Humboldt Bay

	0-2 Rem	2-4 Rem	4-6 Rem	Comments
No. People:	18	33	13	3 week refueling outage in October, 1968.

Forms AEC-4 were examined for those employees exceeding 1250 mrem in any one quarter and found to be complete. The film badge reports from the licensee's supplier, Radiation Detection Company of Mountain View, California, suffice as a Form AEC-5 equivalent. The reports showed that all employees were considerably under the lifetime permissible dose of 5(N-18) rems.

Q. Radioactive Waste

Liquid and gaseous waste results for the year are attached as Table I.

1. Liquids

As shown in Table I, the percent of limit was 19.66% for 1968 compared to 17% for 1967. Tritium release was calculated by the licensee assuming that all rad waste water was primary cooling water, although the only significant source of tritium for Humboldt is through fission. The numbers are conservative and reported here only for information purposes.

2. Gaseous

The gaseous releases are reported by the month in Table 2 as well as by the year in Table I, since the monitoring stations showed significant results.

a. Noble Gases

The percent of limits for 1968 was 56.8% compared with 57% for 1967.

b. Halogens and Particulates

With reference to item II.B.3. of Table I, the isotopic composition was I-131, Ba-La-140, and Cs-137, according to the Chemist, Mr. J. Boots. A graph maintained by the licensee showed that for the months of January, February,

March, October, November, December of 1968, the halogens constituted about one-third of the total halogen-particulate activity and about one-half of the activity for the remaining months. Mr. Boots explained that the particulate release appeared to increase until the off gas absolute filter was changed (April 1968).

Athough only the I-131 isotope was assumed in the table, the isotopic breakdown for the halogens (as determined from gamma scan graphs) was 65% I-133 and 35% I-131, according to Mr. Boots. Of the long lived particulate activity, the isotopes were La-Ba-140 - 97% and Cs-137 - 3%. Also, present (but not included in the table) were Cs-138 and Rb-88 which are always produced but are short lived. These latter isotopes were known to be present by short-term building air samples which were counted immediately after removal and a decay pattern established. The half lives are 32 and 17 minutes, respectively, for Cs-138 and Rb-88.

The percent of limits for halogens-particulates for 1968 was 7.86% compared with 11% for 1967. The slight difference, according to J. Boots, was possibly due to a difference in the efficiency of the off-gas filtering system, since he believed that the particulates influenced the differences in percent of limits.

R. Environmental Monitoring

1. Stray Chambers and Film Badge Stations

Thirty-six stations are in use, thirty for routine monitoring (Stations 1-30) and an additional six stations used for experimental work (Stations 31-36). The latter incorporate thermoluminescent dosimeters (TLDs) as well as film badges and stray chambers. The six experimental stations are located near the plant ($\leq$ 3000 feet). Each station includes two stray chambers, type Victoreen Model 239, with a range of 0-10 mr, and one film badge. Most stray chambers are read every two weeks but some are read each week. The film is processed monthly.

Supp supplied per our request

The two highest stations reported for 1968 were Nos. 14 and 33. Number 14 is located at the South Bay Union School, which is about 3000 feet southeast of the plant and number 33 is located about 800 feet east of the plant. For the report period January 3, 1968 through December 30, 1968, the results were 90.5 mrem for station 14 and 113.5 mrem for station 33. These results do not include background radiation which is

taken as the average of stations No. 2 (in Fortuna) and 5 (in Arcata) located about ten miles south and ten miles north, respectively. The average 1968 reading from these two stations was 77.4 mrem.

Table 3 shows the results for all stations (film and stray chambers) for 1968. The film badge results are reported to the licensee without background which was shown to be 104 mrem for the year. Background is determined by adding the results of the control badges for each month. Mr. Allen explained that the differences in readings on the film badges and stray chambers may be accounted for in part by the minimum detectable readings on the film which is taken as 4 mrem. A badge with a reading of 3 mrem (per month) would be reported as "0" and could represent as much as 36 mrem per year. In one case (station 33), the film badge exceeds the stray chamber reading. Mr. Allen did not know the reason but the difference does appear to be significant. The licensee could not give any results of TLD readings for stations 31-36 at this time.

2. Other Environmental Samples

Additional samples of oysters, milk, grass, etc., totaled 166 for 1968. There appeared to be nothing significant in the results obtained. Results were available for the first three quarters of 1968. Only the number of each type of sample taken is tabulated for the fourth quarter. The results of these samples are shown in Table 4, attached.

ANNUAL REPORT OF POWER REACTOR EFFLUENTS AND ENVIRONMENTAL RADIOACTIVITY

Facility HUMBOLDT Docket No. 50-133

Inspector J. R. Metzger Reporting Period[1/] 1968

Source of Information: Calculations by the licensee from available records maintained by the licensee.

I. Liquids

A. Fission and Activation Products (Except Tritium)

1.	Total curies released during reporting period	3.18 Ci
2.	Volume average concentration uCi/cc at point of release for reporting period	1.966×10^{-8} uCi/cc
3.	MPC used[2/] (If $>1 \times 10^{-7}$ uCi/cc, provide applicable isotopic composition.)	1×10^{-7} uCi/cc
4.	Percent of Limit $\frac{(2)}{(3)} \times 100$	19.66 %

B. Tritium

1.	Total curies released during reporting period	*7.15 Ci
2.	Volume average concentration uCi/cc at point of release for reporting period	$*4.42 \times 10^{-8}$ uCi/cc
3.	Percent of Limit $\frac{(2)}{3 \times 10^{-3}} \times 100$	0.0015 %

1/ The reporting period should be annual except when environmental results indicate statistically significant levels of radioactivity above background and then monthly if monthly data is readily available.

2/ If more than one MPC was used during the reporting period, provide a brief description of the methods used in determining the average percent of limit.

* Assuming all rad waste water was primary cooling water.

II. Gaseous

A. Noble and Activation

1.	Total curies released during reporting period	8.97 x 10^5 Ci
2.	Time average release rate during reporting period	28,400 uCi/sec
3.	MPC used[3/] (If > 3 x 10^{-8} uCi/cc, provide applicable isotopic composition.)	N/A uCi/cc
4.	Licensed limit	5 x 10^4 uCi/sec
5.	Percent of Limit $\frac{(2)}{(4)}$ x 100	56.8 %

B.** Halogens and Particulates With Half Lives > 8 Days

1.	Total curies released during reporting period	0.447 Ci
2.	Time average release rate during reporting period	1.415 x 10^{-2} uCi/sec
3.	MPC used[3/] (If > 3 x 10^{-11} uCi/cc, provide applicable isotopic composition.)	3 x 10^{-10} uCi/cc
4.	Licensed limit	0.18 uCi/sec
5.	Percent of Limit $\frac{(2)}{(4)}$ x 100	7.86 %

III. Power History

A.	Integrated thermal power during reporting period	62,816.7 Mwd
B.	Licensed thermal power	240 ~~210~~ Mwt

IV. Environmental Monitoring

A. Total samples during reporting period 2814

2216	Stray chambers
432	Badges
166	Other

B. Significant results:
(see Tables 2, 3 and 4)

3/ Only required where technical specifications are in terms of "MPC".
** Particulate calculated after 48-hour decay period.

STRAY CHAMBERS AND FILM BADGES

Station	Film Badge Gross (Calculated) (mr)	Stray Chamber Dosimeter Gross (mr)	Film Badge Background (mr)	Stray Chamber Dosimeter Background (mr)	Film Badge Net (mr)	Stray Chamber Dosimeter Net (mr)
1	153	128.6	104	77.4	49	49.2
2	104	76.3	104	77.4	0	0
3	104	91.1	104	77.4	0	13.7
4	104	70.7	104	77.4	0	0
5	104	78.4	104	77.4	0	0
6	104	81.6	104	77.4	0	4.2
7	104	95.6	104	77.4	0	18.2
8	108	105.3	104	77.4	4	27.9
9	104	100.7	104	77.4	0	23.3
10	108	98.8	104	77.4	4	21.4
11	129	137.2	104	77.4	25	59.8
12	119	127.2	104	77.4	15	49.8
13	108	98.5	104	77.4	4	21.1
14	152	167.9	104	77.4	48	90.5
15	104	93.2	104	77.4	0	15.8
16	104	89.5	104	77.4	0	12.1
17	104	80.7	104	77.4	0	3.3
18	104	83.8	104	77.4	0	6.4
19	104	83.1	104	77.4	0	5.7
20	104	77.0	104	77.4	0	0
21	108	102.0	104	77.4	4	24.6
22	104	71.9	104	77.4	0	0
23	104	83.8	104	77.4	0	6.4
24	104	71.6	104	77.4	0	0
25	104	114.8	104	77.4	0	37.4
26	104	94.3	104	77.4	0	16.9
27	104	99.0	104	77.4	0	21.6
28	104	87.7	104	77.4	0	10.3
29	104	116.0	104	77.4	0	38.6
30	104	108.4	104	77.4	0	31.0
31	164	165.1	104	77.4	60	87.7
32	134	152.3	104	77.4	30	74.9
33	172	19.9	104	77.4	168	113.5
34	184	156.3	104	77.4	80	78.9
35	134	145.6	104	77.4	30	68.2
36	159	151.6	104	77.4	55	74.2

TABLE 3

*OTHER ENVIRONMENTAL SAMPLES

	Units	1st Quarter		2nd Quarter		3rd Quarter		4th Quarter	
		No. of Samples	Results	No. of Samples	Results	No. of Samples	Results	No. of Samples	Results
Oysters & Clams	pCi/gr	7	3.2 ± 1.0	11	4.1 ± 0.3	7	4.01 ± 0.18	7	-
Invertebrates (Muscles, barnacles, starfish)	pCi/gr	13	2.6 ± 0.5	14	3.8 ± 0.7	13	3.77 ± 0.74	14	-
Bottom Sediments	pCi/gr	2	19.2 ± 2.8	3	13.9 ± 2.8	2	11.49 ± 2	3	-
Milk	pCi/l	2	< 10	2	< 10	2	< 10	2	-
Domestic Water	pCi/l	1	2.0 ± 0.2	1	1.5 ± 0.3	1	1.44 ± 0.16	1	-
Rabbit Thyroid	pCi total	1	< 10	1	0 ± 4	1	0 ± 4	1	-
Air Samples (Humboldt Hill particulate)	pCi/m^3	12	0.256 ± 0.007	13	0.242 ± 0.004	13	0.118 ± 0.004	12	-
Algea	pCi/gr	-	-	3	6.5 ± 0.4	-	-	-	-
Grass	pCi/gr	-	-	1	7.6 ± 0.3	-	-	-	-
		38		49		39		40	

*All gross beta-gamma except thyroids (I-131).

TABLE 4

Facility HUMBOLDT

Docket Number 50-133

Inspector J. R. Metzger

Reporting Period 1968

Source of Information: **Calculations by the licensee from available records maintained by the licensee.**

	Units	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec
I. Liquids													
A. Fission and Activation Products (Except Tritium)													
1. Total curies released during reporting period	Ci												
2. Volume average concentration uCi/cc at point of release for reporting period	uCi/cc												
3. MPC used (If > 1×10^{-7} uCi/cc, provide applicable isotopic composition.)	uCi/cc												
4. Percent of limit $\frac{(2)}{(3)} \times 100$	%												
B. Tritium													
1. Total curies released during reporting period	Ci												
2. Volume average concentration uCi/cc at point of release for reporting period	uCi/cc												
3. Percent of limit $\frac{(2)}{3 \times 10^{-3}} \times 100$	%												
II. Gaseous													
A. Noble and Activation													
1. Total curies released during reporting period	Ci	1.02×10^{5}	1.03×10^{5}	8.88×10^{4}	1.95×10^{4}	8.4×10^{4}	8.78×10^{4}	7.3×10^{4}	5.3×10^{4}	5.24×10^{4}	1.34×10^{4}	5.742×10^{4}	5.85×10^{4}
2. Time average release rate during reporting period	uCi/sec	38,900	39,800	33,700	30,200	31,900	33,300	29,700	20,100	19,900	5,100	21,800	22,200
3. MPC used (If > 3×10^{-8} uCi/cc, provide applicable isotopic composition.)	uCi/cc	N/A											
4. Licensed limit	uCi/sec	5×10^{4}											
5. Percent of limit $\frac{(2)}{(4)} \times 100$	%	78.0	78.0	62.3	60.5	63.7	66.6	55.4	40.0	39.8	10.2	43.7	44.4
B. Halogens and Particulates With Half Lives 8 Days													
1. Total curies released during reporting period	Ci	5.31×10^{-2}	5.21×10^{-2}	5.97×10^{-2}	3.52×10^{-2}	2.81×10^{-2}	2.86×10^{-2}	2.21×10^{-2}	1.26×10^{-2}	1.29×10^{-2}	1.45×10^{-2}	5.74×10^{-2}	4.47×10^{-2}
2. Time average release rate during reporting period	uCi/sec	2.02×10^{-2}	1.96×10^{-2}	2.00×10^{-2}	1.34×10^{-2}	1.10×10^{-2}	1.07×10^{-2}	8.42×10^{-3}	4.78×10^{-3}	4.84×10^{-3}	5.5×10^{-3}	2.18×10^{-2}	1.78×10^{-2}
3. MPC used (If > 3×10^{-11} uCi/cc, provide applicable isotopic composition.)	uCi/cc	3×10^{-10}											
4. Licensed limit	uCi/sec	0.18											
5. Percent of limit $\frac{(2)}{(4)} \times 100$	%	11.2	11.0	20.0	7.43	6.1	6.06	4.76	2.66	2.69	3.06	12.2	7.94
III. Power History													
A. Integrated thermal power during reporting period	Mwd												
B. Licensed thermal power	Mw												
IV. Environmental Monitoring													
A. Total samples during reporting period													
Significant results:													

TABLE 2