SEMI-ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

July - December

1987

Public Service Company of Colorado

Fort St. Vrain Nuclear Generating Station

February 1988

IE48

8803070165 871231 PDR ADDCK 05000267 PDR DCD This report summarizes the radiological effluent released from the Fort St. Vrain Nuclear Generating Station for the period of July through December, 1987. This information is provided pursuant to the requirements of Sections 7.5.1.e, 8.1.1.g.8), 8.1.2.d, and 8.2.1.h.1) of the Fort St. Vrain Technical Specifications.

An attempt has been made during this report period to follow the report format recommended by Regulatory Guide 1.21 as well as the requirements of the aforementioned sections of our Technical Specifications and 40CFR190, subpart B.

The following tables with a supplemental information section are included with this report:

Table	Description
1A	Gaseous Effluents - Summation of All Releases
1C	Gaseous Effluents - Ground-Level Releases
2A	Liquid Effluents - Summation of All Releases
2B	Liquid Effluents
3	Solid Waste and Irradiated Fuel Shipments
4A	Hourly Meteorological Data

Please note that Table 1B (of Regulatory Guide 1.21) has been omitted from this report because all of our gaseous effluents are assumed to be ground-level releases as opposed to being elevated releases.

Fort St. Vrain Technical Specifications apply exclusively to the following radionuclides: Kr-87, Kr-88, Xe-133, Xe-133m, Xe-135, and Xe-138 for gaseous emissions and Mn-54, Fe-59, Co-58, Co-60, Zn-65, Mo-99, Cs-134, Cs-137, Ce-141, and Ce-144 for particulate emissions. This list does not mean that only these nuclides are considered. Other gamma emitting nuclides that are identifiable, together with those of the above nuclides, are analyzed and included in this report.

Sample activities that are less than the detection capabilities of our equipment are entered in this report using the value resulting from the calculation of the lower limit of detection (LLD) or minimum detectable activity (MDA). This results in reporting upper limit values that are in excess of true activities.

The lower limit of detection (LLD), for the purpose of this report, is defined as the smallest concentration of radioactive material in a sample that will yield a net count, above the system background, that will be detected with a 95% probability of being correct and only a 5% probability of falsely concluding that a blank observation represents a real signal. The LLD values specified in our Technical Specifications are as follows:

Liquid

Principle Gamma Emitters	5.00E-07 µCi/ml
Dissolved Noble Gases	1.00E-05 µCi/m1
Tritium	1.00E-05 µCi/ml
Iodine-131	1.00E-06 µCi/m1
Gross Alpha	1.00E-07 µCi/ml
Strontium-89, 90 (Composite)	5.00E-08 µC1/m1
Gaseous	
Principle Gamma Emitters (Gas)	1.00E-04 µCi/cc
Principle Gamma Emitters (Particulate)	1.00E-11 µCi/cc
Tritium (Gas)	1.00E-06 µCi/cc
Iodine-131 (Charcoal)	1.00E-12 µCi/cc
Gross Alpha (Particulate)	1.00E-11 µCi/cc
Strontium-89, 90 (Particulate	e) 1.00E-11 μCi/cc
Gross-Beta (Particulate)	1.00E-11 µCi/cc

Where applicable, we have listed "less-than" values for those nuclides listed specifically in our Technical Specifications. These "less-than" values were calculated using the observed LLD values and the total volume of the media. The "less-than" values were not included in the total values for the pathway.

The percent of Technical Specification limit on Table 1A is blank in some cases because this value could not be calculated from data which were at or below the minimum detectable activity. On Table 1C, the continuous release mode values are not reported because this release pathway is the same as the batch mode. All other blanks on Tables 1C and 2B are due to the fact that no LLD values for these nuclides are required to be calculated per Technical Specifications.

There has been some confusion in the past as to the total volume of water used for dilution of radioactive liquid effluent. All average diluted concentrations are based on the activity at the unrestricted area. Although this effluent could eventually reach one of two rivers (St. Vrain Creek and South Platte River) which converge approximately one and one half miles downstream of the plant, no further dilutions were assumed. Additional discussion on river flow is contained in section 4a) of the Supplemental Information Section.

Tritium was introduced into System 42 by the malfunction of a pressure relief valve from secondary coolant, System 31. The malfunction lasted from September 17, 1987 through December 31, 1987, and was reported as an abnormal release in both the third and fourth quarters. The relief valve (V-31367) was known to have lifted in December, 1987, due to an accidental over-pressurization of the line and probably also lifted prior to the September release. It apparently did not reseat properly. The leakage past this relief valve was not detected until January 11, 1988, and was not identified as the tritium source until January 30, 1988. At this time an existing Operations Deviation Report was modified to isolate this leakage path except for when P-3308 was in use. Subsequently the tritium levels in the service water system dropped significantly. To correct this problem the Operations Deviation Report will remain in place until the valve is repaired. The valve will be repaired as soon as the parts arrive which are currently on order. In addition, to prevent a recurrence of this problem, a Design Change Action Request has been written to reroute the relief discharge line.

There were no unplanned radioactive gas waste releases made during this report period.

The following discussion correlates specific points mentioned in Fort St. Vrain Technical Specification 7.5.1.e to the contents of the WASTETRAK generated Regulatory Guide 1.21 Radioactive Waste Report for the Semiannual Effluent Report.

Container volumes are given in cubic meters for each of four waste types. Only Dry Active Waste and Irradiated Components were shipped for disposal during this period. A total waste volume of 30.2 cubic meters (1066 cubic feet) was disposed of consisting of 27.4 cubic meters (968.5 cubic feet) of irradiated components (irradiated graphite reflector blocks and orifice valves) and 2.76 cubic meters (97.5 cubic feet) of Dry Active Waste.

Total curie quantity is given for each waste type. The curie content of each container was estimated by the WASTETRAK computer code. WASTETRAK calculated the concentration of gamma emitting nuclides from the measured radiation level on each container and, after applying the appropriate scaling factor to obtain the concentration of difficult to measure radionuclides summed the concentrations and calculated a total curie content for the container.

Principal radionuclides were estimated by the WASTETRAK computer code based on scaling factors and nuclide distribution determined from direct and representative samples as part of the 10CFR61 Waste Classification program performed in 1986.

All waste disposed of was either Irradiated Components or Dry Active Waste. No Process Waste was shipped for disposal in 1987. All waste disposed of was Low Specific Activity Waste. No solidification agents or absorbents were employed in processing either waste type disposed of in 1987.

There were no major changes made to the radioactive waste systems during this report.

There were no changes to the Process Control Program (SUSMAP-3), Issue 2, effective date November 13, 1984, during this report period.

A rewrite of Offsite Dose Calculation Manual, SUSMAP-2, (Issue 14) was performed to incorporate the changes suggested by the Nuclear Regulatory Commission (NRC) (Docket No. 50-267) contained in G-87017. A note "Issue 15 responded to the recommendations made by the NRC in G-87017. This is not considered to be a commitment" was added. In addition, the setpoint calculation for RT-6314-2 was changed and the location description for waterborne sample point R-5 was changed to a working well in close proximity. The setpoint calculation for RIS-6314-2 was changed to incorporate suggestions from the NRC contained in G-87617, to clarify the procedure and to be consistent with the FSAR. The sample point change was due to the owner not using the well in the previous location. The distance to the sample site was changed from 8.7 km to 9.0 km. Minor clarifications were also made in this rewrite.

Numerous changes were made to the Offsite Dose Calculation Manual, SUSMAP-2 (Issue 15, effective date October 20, 1987) to clarify the location description of airborne sample site numbers F-7, F-9, A-19, and R-11; direct radiation sample site numbers F-12, F-13, F-18, A-7, A-9, A-20, R-2, and R-4; and waterborne drinking water site number R-3. Reference Procedure Deviation Report number 87-2095 and the associated SUSMAP-2 pages for detailed description of the changes.

The final report on the Reactor Building Sump In-line Beta Monitor System, submitted to the Nuclear Regulatory Commission via letter P-87376 was issued October 22, 1987. This report recapped the series of events which resulted in the purchase and testing of the monitoring system. The testing demonstrated that the Reactor Building Sump water could not be sufficiently cleaned to operate the in-line beta monitor on a continuous basis. As a result, plans for the continuous release mode have been abandoned.

RIS-73437-1 and 2 were both damaged in the fire of October 2, 1987. New cables were installed and the monitors were reworked during the fire outage.

Radiation doses resulting from the release of radioactive liquid and gaseous effluents from Fort St. Vrain during 1987 are reported below. Radiation doses are calculated in accordance with the Fort St. Vrain Offsite Dose Calculation Manual (Procedure SUSMAP-2), which is based on NUREG-0472, "Radiological Effluent Technical Specifications for PWR's", NUREG-0133, "Preparation of Radiological Effluent Technical Specifications for Nuclear Power Plants", and other inputs from the Nuclear Regulatory Commission. The Nuclear Regulatory Commission recently reviewed the Fort St. Vrain Offsite Dose Calculation Manual (ODCM) with the assistance of the Idaho National Engineering Laboratory and determined that "... the Fort St. Vrain ODCM generally uses documented and approved methods consistent with the guidelines in NUREG-0133." As it is not practical to list all of the assumptions used in making the dose assessment to the public, the reader is directed to SUSMAP-2 for further details.

Doses are calculated for a hypothetical "maximum" individual present at all times of the year in the sector with the highest X/Q and D/Qvalues.

Liquid - 10CFR50

Whole Body	6.25E-02	mrem
Bone	1.86E-03	mrem
Liver	6.34E-02	mrem
Thyroid	6.08E-02	mrem
Kidney	6.17E-02	mrem
Lung	6.11E-02	mrem
GI	6.09E-02	mrem

Gaseous - 10CFR50

Noble	Gas	Gamma	6.15E-01	mrad
Beta			1.61E+00	mrad

eta				1.61E+UU	mrad
odir	ne, Pa	articu	lates, Tritium		
	Adu1t	Whole	Body (maximum)	1.18E-01 1.18E-01 0.00E+01	mrem
	Teen	Whole Organ Bone	Body (maximum)	1.35E-01 1.35E-01 0.00E+01	mren
	Chilo	Whole	Body (maximum)	1.94E-01 1.94E-01 0.00E+01	mrem
	Infar	Whole	Body (maximum)	1.51E-01 1.51E-01 0.00E+01	mrem

Gaseous - 10CFR20

Iodine, Particulates, Tritium 5.93E+02 mrem

All doses are within acceptable limits in accordance with 10CFR20 and 10CFR50.

It was felt that use of actual dilution factors was more accurate than the annual average $\rm X/Q$ of 1.37E-06 s/m3 as previously reported in the Final Safety Analysis Report. Beginning with 1987, dilution factors for actual periods of release were used to calculate doses from gaseous effluent releases.

The doses from gaseous releases are calculated including contribution from direct radiation. A review of Thermoluminescence Dosimeter data collected in 1986 has confirmed that no measurable direct radiation exposure is attributable to Fort St. Vrain.

As mentioned earlier, the doses reported here are to the hypothetical most exposed member of the public. In order to assess the actual dose to the likely most exposed member of the public due to their activities inside the site boundary, the following assumptions are made:

- 1) Residents living within the lite boundary are at home during 50% of gaseous effluer. ses.
- 2) As game fishing is the prevalent within the site boundary, fish consumption is 25% of the adult fish consumption of 21 kg/yr as listed in SUSMAP-2.
- 3) All other assumptions of SUSMAP-2 remain valid.

The resultant maximum doses are as follows:

Gas 1.4E+00 mrem Liquid 3.5E-02 mrem

The doses demonstrate conformance with the exposure limit in 40CFR Part 190 of 25 mrem to the total body, 75 mrem to the thyroid, and 25 mrem to any organ.

To show conformance with 40CFR190 subpart B, the total curies of Krypton-85 released is <1.34E+00. The 29.78 kev iodine-129 peak is below the minimum detectable energy of our detectors. We assume that no iodine-129 (fission yield of 0.574 percent) has been released because no measurable amount of iodine-131 (fission yield of 2.78 percent) has been detected at this station. The total release value of gross alpha is listed in Table 2A Section D.

An annual land use census is performed as part of the Fort St. Vrain Radiological Environmental Monitoring Program. Changes made to environmental sampling locations as a result of the annual land use census are reported in the annual Radiological Environmental Monitoring Program report.

Facility: Fort St. Vrain Nuclear Generating Station

Licensee: Public Service Company of Colorado

1. Regulatory Limits

Results of radioactivity analyses of gaseous and liquid effluent are used in accordance with the methodology and parameters listed in the Offsite Dose Calculation Manual (SUSMAP-2) to assure that the concentrations at the point of release are maintained within the limits set forth in the Technical Specifications. These limits will ensure that the quantity of radioactive effluent released from the plant is maintained as low as reasonably achievable and in any event within the limits of 10CFR20 and in accordance with 10CFR50.

The air dose due to noble gases released in gaseous effluent at the unrestricted area is limited to:

- a. 5 millirads gamma and 10 millirads beta during any calendar quarter, and,
- b. 10 millirads gamma and 20 millirads beta during any calendar year.

The dose to a member of the public due to I-131, tritium and radioactive particulates with half-lives longer than eight days in gaseous effluent is limited to:

- 7.5 millirems to any organ during any calendar quarter, and,
- b. 15 millirems to any organ during any calendar year.

The dose rate due to radioactive gaseous effluent is limited to:

- a. For noble gases, less than or equal to 500 millirems per year to the total body and less than or equal to 3000 millirems per year to the skin, and.
- b. For I-131, tritium and radioactive particulates with half-lives greater than eight days, less than or equal to 1500 millirems per year to any organ.

The dose or dose commitment to a member of the public from radioactive material in liquid effluent released to unrestricted areas are limited as follows:

- a. During any calendar quarter to less than or equal to 1.5 millirem to the total body and to less than or equal to 5 millirems to any organ, and,
- b. During any calendar year to less than or equal to 3 millirems to the total body and to less than or equal to 10 millirems to any organ.

2. Maximum Permissible Concentrations

All Maximum Permissible Concentration (MPC) values used in determining allowable release rates from the gas waste holdup system and the liquid waste system are those listed in Table II, Columns 1 and 2 respectively, of Appendix B to 10CFR20. In addition, for the MPC of dissolved noble gases in liquid effluent, the value of 2.00E-04 microcuries per milliliter was used.

Average Energy

The average energy (E-BAR) of the radionuclide mixture in release of fission and activation gases is not calculated nor used at this facility.

4. Measurements and Approximation of Total Radioactivity

a. Fission and Activation Gases

Batch releases from the gas waste holdup system are performed after sampling and analyses for noble gases and tritium. These analytical results are used along with atmospheric dilution factors to determine the allowable release rate. Gas is released on a continuous basis through a gas waste header which is monitored by a noble gas monitor and an iodine monitor. In the event of high activity in the release header, control functions are initiated which divert the gas to the gas waste holdup system.

All radioactive gases are released to the Reactor Building exhaust ventilation system which has a flow rate of approximately 30,000 cubic feet per minute. The full flow of this is directed through high efficiency particulate filters (HEPA) and activated charcoal beds prior to the release to the environment.

Downstream of the activated charcoal beds, the gas stream radioactivity is continuously monitored and recorded by noble gas monitors, particulate monitors, and iodine monitors.

b. Iodine

For gaseous iodine, the Reactor Building exhaust ventilation is monitored and recorded on a continuous basis. The iodine cartridges used in these monitors are removed after one week of service and quantitatively analyzed on a gamma spectroscopy system. The quantity of radioiodine released during that period is calculated based on the integrated flow during the collection period.

c. Particulate

As in the case of the iodine discussed in b. above, a particulate filter is removed and analyzed each week. Gross beta analysis as well as gamma spectral analysis is performed to identify and quantify any radionuclides. The quantities of any radionuclides on this filter with half-lives greater than eight days would similarly be correlated to total flow during the collection period.

d. Liquid Effluent

All liquid effluent discharged from the site reaches the unrestricted area at the Goosequill Ditch. From that point the effluent can be diverted to the St. Vrain Creek via the St. Vrain Slough, or more commonly diverted to the Goosequill Pond which is approximately one mile North of the plant site. Outfall from the Goosequill Pond reaches the South Platte River. Both rivers converge approximately one and one half miles from the plant site. The average stream flow reported in section 5a. of this supplemental report is a summation of both rivers and was received and tabulated from data provided by the Colorado Department of Natural Resources in Greeley, Colorado.

Liquid effluent is released from the site using both a continuous and batch mode. The continuous mode (automatic discharge mode) is used on the Turbine Building Sump effluent where the only expected radionuclide is tritium. This discharge path utilizes a continuous sampler and an aliquot of this composite sampler is taken three times per week and analyzed for gross beta, gross alpha, tritium and gamma emitters. Total flow integrators enable us to calculate the total activity released via this pathway based on composite sample results. Discharge from the Turbine Building Sump is made directly to the unrestricted area with no dilution.

The batch release mode is used on the Reactor Building Sump effluent and the liquid waste processing system. The Reactor Building Sump can hold several hundred thousand gallons of waste water from various sources which could be contaminated. The liquid waste system consists of two 2000 gallon receivers, one 2000 gallon monitoring tank and associated filters and demineralizers. This system is designed to collect and process contaminated waste water resulting from reactor operations.

Prior to each release, duplicate samples are quantitatively analyzed for their radioactive constituents. These analyses include gross beta, gross alpha, tritium and gamma spectral analyses. The results of these analyses and other analyses as dictated by the gross beta results are used to determine the maximum release rate from the site. The liquid effluent is diluted with cooling tower blowdown which flows at a minimum of 1100 gallons per minute. The resulting mixture is sampled during the release period to confirm compliance with regulatory limits.

The liquid effluent from the batch release mode is monitored continuously by redundant gamma activity monitors.

All tank level indicating devices, flow monitoring and recording devices, and radiation monitor equipment are calibrated and maintained at scheduled intervals in accordance with established procedures.

Composite samples from the batch releases, and continuous releases are analyzed monthly for Sr-89, Sr-90 and S-35. All sample results are conservatively decay-corrected to the start of the composite period.

e. Overall Error

The overall error associated with determining the total activity released from the site for both gaseous and liquid effluent is estimated to be 17.3 percent. This value is the square root of the sum of squares of counting statistics, associated calibration errors, sampling errors and tank volume estimates, each considered to be plus or minus 10 percent.

5. Batch Releases

a. Liquid

Number of Batch Releases	75
Total Time Period for Batch Releases	7.35E+02 HOURS
Maximum Time Period for a Batch Release	4.77E+01 HOURS
Average Time Period for a Batch Release	9.80E+00 HOURS
Minimum Time Period for a Batch Release	1.48E+00 HOURS
Average Stream Flow During Period of Effluent Release into a Flowing Stream	3.19E+05 GALLONS PER MINUTE

b. Gaseous

Number of Batch Releases	104
Total Time Period for a Batch Release	3.71E+02 HOURS
Maximum Time Period for a Batch Release	8.43E+00 HOURS
Average Time Period for a Batch Release	3.57E+00 HOURS
Minimum Time Period for a Batch Release	7.76E-01 HOURS

6. Abnormal Releases

a. Liquid

1.00E+00
9.62E-02 CURIES

b. Gaseous

Number of Releases	0.00E+00	
Total Activity Released	0.00E+00 CURIES	

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT 1987

GASEOUS EFFLUENT-SUMMATION OF ALL RELEASES

Unit	Quarter 3	Quarter 4	Est. Total Error. %

A. Fission and activation products

- 1. Total release
- Average release rate for period
- Percent of technical specification limit

Ci I	1.26E+02	1.43E+01	1.70E+01
uC1/sec	1.56E+01	1.80E+00	
%	1.79E+00	4.38E-01	

B. Iodine

- 1. Total iodine-131
- Average release rate for period
- Percent of technical specification limit

Ci	<4.44E-06	<4.44E-06	
uCi/sec	<5.58E-07	<5.58E-07	
%			

C. Particulates

- Particulates with half-lives
 8 days
- Average release rate for period
- Percent of technical specification limit
- 4. Gross alpha radioactivity

C1	<2.09E-07	<1.78E-07
uCi/sec	<2.64E-08	<2.24E-08
%		
C1	<4.49E-08	<4.11E-08

D. Tritium

- 1. Total release
- Average release rate for period
- Percent of tech. spec.
 limit

Ci	1.12E+00	7.21E-01	1.70E+01
uCi/sec	1.41E-01	9.07E-02	
%	2.35E-03	1.51E-03	

TABLE 1C

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT (1987)

GASEOUS EFFLUENTS--GROUND-LEVEL RELEASE

CONTINUOUS MODE BATCH MODE

0.00E+00 | 0.00E+00

Released	Unit	Quarter 3	Quarter 4
Fission gases			
krypton-85	i Ci i	<6.49E+00	<5.83E+00
krypton-85m	Ci	1.14E-01	2.26E-01
krypton-87		9.49E-03	1.40E-02
krypton-88	C1	1.97E-01	2.51E-01
xenon-133	Ci	1.24E+02	1.25E+01
xenon-135	Ci	6.74E-01	1.11E+00
xenon-135m	Ci		
xenon-138	Ci	<2.68E-01	<2.41E-01
xenon-133m	Ci	9.31E-01	1.56E-01
xenon-131m	C1	5.69E-01	
Total for period *	Ci	1.26E+02	1.43E+01
		.	
Iodines			
iodine-131	į C1 į	<1.08E-09	<9.69E-10
iodine-133	Ci		

Ci

iodine-135

Total for period

^{*} Total values do not include "<" data

Particulates

strontium-89	Ci	
strontium-90	C1	
cesium-134	Ci	
cesium-137	Ci	
barium-lanthanum-140	C1	

^{*} Total values do not include "<" data

TABLE 2A

EFFLUENT AND WASTE DISPOSAL SEMIANNUA' REPORT 1987 LIQUID EFFLUENT-SUMMATION OF ALL RELEASES

			Nuclide	Units	Quarter 3	Quarter 4	Est. Total Error. %
Α.		ion and activation ducts					
	1.	Total release	Cs-137	į C1	0.00E+00	0.00E+00	1.70E+01
	2.	Average diluted concentration		uCi/ml	0.00E+00	0.00E+00	
	3.	Percent of applicable limit		%			
	1.	Total release	1 Co-60	Ci	0.00E+00	0.00E+00 j	1.70E+01
	2.	Average diluted concentration		uC1/m1	0.00E+00	0.00E+00	
	3.	Percent of applicable limit		*			
	Trit	ium					
	1.	Total release	H-3	Cf	1.15E+01	1.06E+01	1.70E+01
	2.	Average diluted concentration	-	uCi/ml	2.08E-05	1.92E-05	
	3.	Percent of applicable limit		%	6.93E-01	6.40E-01	
	Dis	solved and entrained					
	1.	Total release	Xe-133	Ci	1.17E-03	0.00E+00	1.70E+01
	2.	Average diluted concentration		uCi/m1	2.12E-09	0.00E+00	
	3.	Percent of applicable limit		%	1.06E-03		
	1.	Total release	Xe-135	C1	2.67E-05	0.00E+00	1.70E+01
	2.	Average diluted concentration		uC1/m1	4.84E-11	0.00E+00	
	3.	Percent of applicable limit		0/0	2.42E-05	0.00E+00	

TABLE 2A (Continued)

D.	Gross alpha radioactivity	
	1. Total release	Ci <1.74E-04 <7.52E-04 1.70E+01
Ē.	Volume of waste released (prior to dilution)	Liters 1.06E+07 5.09E+07
F.	Volume of dilution water used during release	Liters 5.52E+08 5.52E+08

TABLE 2B

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT (1987)

LIQUID EFFLUENTS

CONTINUOUS MODE BATCH MODE

Nuclides Released	Unit	Quarter 3	Quarter 4	Quarter 3	Quarter 4
strontium-89	Ci	<1.92E-05	<1.03E-04	<6.55E-06	<3.48E-06
strontium-90	Ci	<1.99E-05	<1.07E-04	<5.44E-06	<3.64E-06
cesium-134	Ci	<5.50E-04	<3.53E-03	<2.13E-04	<1.32E-04
cesium-137	C1	<5.43E-04	<3.46E-03	<2.10E-04	<1.31E-04
iodine-131	Ci	<4.30E-04	<2.75E-03	<1.67E-04	<1.04E-04
cobalt-58	Ci	<4.56E-04	<2.91E-03	<1.76E-04	<1.10E-04
cobalt-60	Ci	<5.12E-04	<3.28E-03	<1.98E-04	<1.24E-04
iron-59	Ci	<8.97E-04	<5.74E-03	<3.47E-04	<2.16E-04
zinc-65	Ci	<1.10E-03	<7.07E-03	<4.28E-04	<2.66E-04
manganese-54	Ci	<4.48E-04	<2.86E-03	<1.73E-04	<1.07E-04
chromium-51	Ci				
zirconium-niobium-95	Ci				
molybdenum-99	Ci	<3.38E-03	<2.16E-02	<1.31E-03	<8.13E-04
technetium-99m	Ci				
barium-lanthanum-140	Ci				
cerium-141	C1	<7.16E-04	<4.59E-03	<2.77E-04	<1.73E-04
tritium	C1	1.91E-01	6.43E-01	1.13E+01	9.95E+00
sulfur-35	Ci	<1.59E+02	<7.78E-02	<7.75E-04	<1.31E-03
Total for period (above)*	Ci	1.91E-01	6.43E-01	1.13E+01	9.95E+00

^{*} Total values do not include "<" data

TABLE 2B (Continued)

Continuous Mode

Batch Mode

xenon-133	Ci	<1.51E-03	<9.66E-03	<1.73E-03	<3.64E-04
xenon-135	C1	<4.00E-04	<2.56E-03	<3.40E-05	<9.63E-05

^{*} Total values do not include "<" data

TABLE 3

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT (1987)

SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

A. SOLID WASTE SHIPPED OFFSITE FOR BURIAL OR DISPOSAL (Not irradiated fuel)

1. Type of waste	Unit	6-month Period	Est. Total Error. %
a. Spent resins, filter sludges, evaporator bottoms, etc.	m³ Ci	0.00E+00 0.00E+00	0
b. Dry compressible waste, contaminated equip. etc.	m³ C1	2.76E+00 3.04E-01	2.41
c. Irradiated components, control rods, etc.	m³ Ci	2.74E+01 1.03E+02	7.4
d. Other (describe)	m³ Ci	0.00E+00 0.00E+00	0

2. Estimate of major nuclide composition (by type of waste)

		Content	Curies	Error %
PROCESS WAST	E: NONE			
DRY ACTIVE W	ASTE:			
	Fe-55	74.3%	2.26E-01	2.98
	H-3	18.0%	5.47E-02	5.23
	S-35	2.8%	8.52E-03	3.22
	C-14	2.1%	6.37E-03	1.58
	Ag-110m	0.9%	2.83E-03	3.05
IRRADIATED C	OMP.:			
	H-3	86.2%	8.87E+01	9.20
	Fe-55	5.8%	6.01E+00	9.39
	Co-60	4.6%	4.69E+00	9.39
	C-14	1.7%	1.73E+00	2.32
	Eu-155	0.7%	6.97E-01	1.01
	Eu-154	0.7%	6.66E-01	1.01
OTHER:	NONE			

3. Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
10	Highway	Beatty, NV

B. IRRADIATED FUEL SHIPMENTS (Disposition)

Number of Shipments	Mode of Transportation	Destination
NONE		

Table 4A
Hourly Meteorological Data

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	ALC: CONTRACTOR	No. 3011-2023	S. P. Paris . W. A. Philippe . Mar.
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	W. A. A. Child. a soft talk.	No. 3011-2023	SAMPLE FILE LATER TO WARRY AND
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	W. A. A. Child. a soft talk.	No. 3011-2023	PROPERTY AND ASSESSED.

PERIOR OF	RECORD	87/ 7/ 1 THRU	87712731				
STABIL ITY	CLASS	< <	ת אנו כמבכנו	NO.			
DIRECTION	£.75-3	2.4	5 64	13-18	19-24	324	TOTAL
*	1.77	13.35	5,55	6.76	0.60	90.0	21.47
HHE	2.79	16.35	9.26	1.78	9.90	0.00	30.17
里	3.28	32.78	(3.29	1.78	0.00	0,00	51.13
ENE	52.53	53.52	18.74	0.46	9,00	90.0	76.25
tal	27.75	53,29	7.50	9.25	9.00	0.00	64.91
ESE	96.9	40.95	19.10	9.25	9.90	99.9	57.30
No.	5.55	31.13	6.95	0.75	9.00	0.00	43.48
STE	7,29	56.46	11.32	6.25	9,09	99.6	69.27
64	7.82	46.42	9.58	1.48	0.00	9.90	58.23
227	6.56	13,13	2.84	9.50	0.08	99.9	22.29
23	2.23	7.79	1.52	9.25	5.90	0.90	11.83
7	2.78	6.53	4,63	1,61	96.9	99.6	14.34
33	0.25	1.77	1.53	9.76	0.00	9.00	4.29
590	6.25	0.51	4.00	6.30	6,25	6.06	1.52
1994	8.75	1.76	6.76	2.82	1.60	0.00	6.30
HHE	0.25	3.62	1,41	6.25	60.0	96.9	4.54
TOTAL	54.93	366.68	191,32	12.99	.33	90.0	537,17
TIME BURAT	DURATION OF CALKS	LHS = 1.30 HRS.					

TIME IN STABILITY CLASS = 538.47 HRS.

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LIABILITY.	CLASS	34					
UT.THE			WIND SPEED	11- MeH			
DIRECTION	6.75-3	1-4	9-12	13-13	19-24	124	TOTAL
×	2.61	3,28	5.83	1.26	9 99	0,65	12.36
HWE.	1.76	3.80	3.99	0.50	9.68	8.50	19.95
選	3.23	7.74	1.54	6.98	0.00	0.00	14,51
303	4.83	10.5	1.52	9.25	9.90	9.90	16.36
w	2.67	12,86	2.27	0.00	0.60	99"0	17.15
ESE	3.02	7.2	6.76	9.00	96.6	9.00	11.06
35	4.29	8,32	6.75	9.25	96.96	0.00	13.63
SSE	4,04	8.32	1.25	6.90	9.00	9.99	13.61
64	3.79	6,50	9.75	6,60	90.0	90.0	10.59
277	3.22	7.30	9.53	0.90	9.66	9,00	11.66
75	2.77	5.55	9.76	6.64	6.86	90.0	89.6
0,575	1.51	4.54	4.26	6.2	0.60	9,99	6.56
28	6.51	1.98	6.25	6.51	6.50	0.00	2,78
MAN.	9.60	0.25	9.26	0.50	9.72	90.6	1.76
Mile	9.99	1.26	6.69	0.50	6.75	96.6	2.52
1987	0.00	1.52	1,51	0.50	96.0	0.00	3.53
TOTAL	3.26	90.15	23.68	1.51	2.66	9.66	156.63
TIME DOBAT	DORATION OF CALMS	. 9.90	1825				

TIME IN STABILITY CLASS = 156.63 HRS.

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STABILLTY CLASS	CLASS		CITAIN PER	POCETA - NOW			
NIND DIRECTION	0.75-3	1-4	9-12	13-13	19-24	124	TOTAL
*	2.27	2.92	8,55	6.56	6.25	0.00	19.72
386	4.79	4,36	76.9	9.56	00.00	6.00	15.66
ME	1,55	11.64	1,53	6.25	6.25	96.6	3.22
ENE	4.95	8.63	97.0	1.51	9.66	9.99	14.31
ы	4.79	5,13	1.27	6.6%	9.90	96"9	15,18
ESE	2.79	14,21	3.03	9.75	96.99	0.00	24.27
製	3,54	19,36	2.02	9.99	0.00	0.00	15,92
225	4.56	9.06	9.54	9.00	9.99	0.60	14,15
E/s	6.77	6.82	9.56	9,44	9.66	99.0	14,15
SEN	5.64	7.81	0.75	9.25	0.00	99.0	13.84
75	3.53	6.29	6.59	0.50	9.64	9.00	16.83
WOM	2.27	5.86	9.89	9.00	9.99	9.60	7,33
3	1,26	9.75	97.0	10"1	6.75	99"9	3,78
DHE	9.75	50,04	92.0	9.75	9.25	9.60	2.77
重	19"1	37	1.01	95.0	6.56	9.69	3.27
24	0.5	0.75	2.27	9.75	0.00	90.0	4.63
TOTAL	52.14	97.25	36,15	13.35	1.51	99.9	194.42
TIME DURA	TIME DURATION OF CALMS	= 0.51	HRS.				

TIME IN STABILITY CLASS = 194,94 HRS.

HOURS AT EACH WIND SPEED AND DIRECTION

DESTABLISH	ST SOM	WW. 2 %	 901,00000	1500 20	25, 275.6
PERIOD OF	KILLUKD:	2517 63	EMBOL	2117.7	27.31

STABILIT	f CLASS:	1	WIND SPE	ED - HPH			
WI.JD DIRECTION	0.75-3	4-7	9-12	13-19	19-24	324	TOTAL
8	12.86	21.47	19.69	8.98	4.04	1.26	58.31
WE	32.20	29.27	16.63	8.82	3.29	0.25	90.45
NE	25.45	43.34	16,34	9.84	0.50	0,00	95.46
EXE	29.94	37.66	15,97	1.26	0.00	0.00	75.73
E	28.28	23.23	6.32	0.25	0.00	0.00	58.68
EJE	19.43	27.47	15.97	1.52	0.00	9.80	45.58
SE	19.91	23.21	12.62	0.76	0.00	€.25	54.75
322	23.75	20.96	6.81	0.78	0.00	0.25	52.53
	26.37	27.84	8.05	1,61	0.00	0.00	63.27
422	21.20	27,48	3.53	1.77	0.00	0.25	54.23
28	20.10	17.68	1.26	0.50	9.00	0.00	39.54
823	15.13	12.61	3.50	2.77	0.25	0.25	34,51
N	8.85	2.27	2.27	0.50	0.25	0.25	14.39
DHD	4.60	1.26	1.51	3.03	2.01	1.01	13.43
HW	5,58	3.62	4.28	1.52	0.25	0.25	14.91
1950	9.23	11.37	10.85	2.02	0.50	0.00	32.97
TGTAL	292.67	330.12	136.41	44,41	11,10	4.04	818.14

TIME DURATION OF CALMS = 1.76 MRS.

TIME IN STABILITY CLASS = 819.90 HRS.

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PERTOD OF RECORD: 377 7/ 1 THRU 97/12/31

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17.91 9.58 0.25 6.00 16.67 3.78 6.00 6.00 3.62 6.50 6.00 6.00 3.62 6.50 6.00 6.00 4.28 6.51 6.00 6.00 4.28 6.51 6.00 6.00 5.60 6.50 6.25 6.00 5.73 6.50 6.25 6.00 2.73 6.26 6.25 6.00 2.74 1.01 6.25 6.00 2.20 1.01 6.25 6.00 2.24 1.01 6.25 6.00 2.24 2.77 1.01 6.25 6.00 4.29 4.63 6.25 6.00 6.26 5.04 2.27 1.01 6.25 6.00 5.04 2.27 6.26 6.26 5.04 2.27 6.26 6.26 5.04 2.27 6.26 6.26 5.04 2.27 6.26 6.26 5.04 2.27 6.26 6.26 6.06 6.26 6.26 6.26 6.06 6.26 6.26 6.26 7.24 2.27 6.26 6.26<	22.19	0	16.54	6.26	2,28	0.25	63,53
16.67 3.78 6.99 6.09 3.42 8.59 9.09 6.09 4.04 0.25 6.09 6.09 4.04 0.25 6.09 6.09 4.28 1.51 8.99 6.09 5.49 1.51 8.99 6.09 5.49 1.52 6.09 6.09 5.53 6.59 6.25 6.99 2.73 1.81 6.25 6.99 2.24 1.81 6.25 6.99 2.26 1.81 6.25 6.99 2.24 2.77 1.81 6.59 5.94 2.27 6.25 6.99 4.29 4.63 6.25 6.99 97.70 35.75 5.55 1.01	25.99	50	17.91	9.58	0.25	9.90	73.41
3.47 6.60 6.00 6.00 3.42 6.50 6.00 6.00 4.04 0.25 6.00 6.00 4.28 1.51 8.90 6.00 5.30 (.52 6.00 6.00 5.33 6.50 6.25 6.00 2.73 1.27 6.26 6.26 2.24 1.81 6.25 6.00 2.24 1.81 6.25 6.00 5.94 2.77 1.81 6.26 5.04 2.27 6.26 6.26 5.04 2.27 6.26 6.26 5.04 2.27 6.26 6.26 5.04 2.27 6.26 6.26 5.04 2.27 6.26 6.26 5.04 2.27 6.26 6.26 5.04 2.27 6.26 6.26 5.04 2.27 6.26 6.26 5.04 2.27 6.26 6.26 5.04 2.27 6.26 6.26 6.26 6.26 6.26 6.26 6.26 6.26 6.26 6.26 6.27 6.26 6.26 6.26 6.28 6.26	28.51	700	16.67	3,78	96.9	6.49	72.14
3.62 9.59 9.69 6.99 4.04 0.25 9.29 9.00 4.28 1.51 9.99 9.00 5.39 1.52 9.00 9.00 5.53 6.59 9.25 9.00 9.75 9.25 9.26 9.00 2.73 1.27 9.00 9.00 2.24 1.81 9.25 9.00 5.94 2.27 1.81 9.26 4.29 4.63 9.25 9.00 97.70 35.75 5.55 1.01	24.98	93	3,79	00.0	90.00	0.00	49.22
4.04 0.25 0.25 0.00 4.28 1.51 0.00 0.00 5.80 1.52 0.00 0.00 5.53 0.59 0.25 0.00 3.00 0.25 0.25 0.00 2.73 0.25 0.25 0.00 2.74 1.01 0.25 0.00 5.94 2.27 1.01 0.20 4.29 4.63 0.25 0.00 97.70 35.75 5.55 1.01	14,13	3173	3.62	9,59	69.69	99.6	33.99
4.28 (.51 0.00 0.00 5.39 (.52 0.00 0.00 5.53 0.26 0.25 0.00 9.75 0.25 0.25 0.00 3.60 0.25 0.26 0.00 2.73 (.27 0.00 0.00 2.20 1.01 0.25 0.00 5.04 2.27 1.01 0.56 4.29 4.63 0.25 0.00 97.70 35.75 5.55 1.01	17.14		4.04	0.25	6.25	0,00	35.11
5.86 (1.52 0.06 0.06 5.53 0.56 0.25 0.06 0.75 0.25 0.25 0.06 3.69 0.25 0.25 0.06 2.73 (1.27 0.06 0.06 2.24 1.81 0.25 0.06 5.94 2.27 0.26 0.25 4.29 4.63 0.25 0.00 97.70 35.75 5.55 1.01	16.23		4.28	1.55	9.90	99"9	27.67
5.53 6.56 6.25 9.66 9.75 9.25 6.25 6.96 3.66 9.25 6.25 6.96 2.73 1.27 6.06 6.96 2.24 1.61 6.25 6.86 5.04 2.27 1.61 6.26 4.29 4.63 6.25 6.06 97.76 35.75 5.55 1.01	14.85		5.80	1.52	90.0	00.0	37,63
0.25 0.25 0.06 0.25 0.25 0.06 1.27 0.00 0.00 1.8! 0.25 0.00 2.77 1.0! 0.50 2.27 0.59 0.25 4.65 0.25 0.00 35.75 5.55 1.0!	18.42		5.53	6.56	0.25	9.69	45.87
6.25 6.25 6.86 1.27 6.00 6.29 1.81 6.25 6.80 2.77 1.81 6.56 2.27 6.59 6.25 4.63 6.25 6.80 35.75 5.55 1.01	15.13		9.75	9.25	6.25	9.99	37.59
1.27 6.06 6.96 1.81 6.25 6.86 2.77 1.91 6.56 2.27 6.59 6.25 4.63 6.25 6.00 35.75 5.55 1.01	19,39		3.66	9.25	6.25	99.6	46.71
1.81 0.25 0.80 2.77 1.81 0.50 2.27 0.59 0.25 4.63 0.25 0.60 35.75 5.55 1.01	9.12		2,78	1.27	0.00	0.90	29.83
2.27 1.01 0.50 2.27 0.59 0.25 4.63 0.25 0.66 35.75 5.55 1.01	4.79		2.01	1.61	6.25	99.9	15,64
2,27 6,59 6,25 4,63 6,25 6,66 35,75 5,55 (,.01	3.53		2.26	2.77	1.9(9.50	16.33
35,75 5,55 1.01	11.57		5.64	2.27	0.59	6.25	30.00
35,75 5,55 1.01	17.18		4.29	4.63	9.25	0.00	38.91
	257.17		97.79	35.75	5.55	1.01	645,19

645.19 HRS.

TIME IN STOCKLITY CLASS =

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PER SETS	MARKET SERVICE
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TEACULAITS	CONTROL MAN
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HERIOD OF REFORD: 87/ 7/ 1 THRU 87/12/31

STABILITY CLASS	CLASS	in.	STAR OD	SDEER - MEG			
WIND DIRECTION	9.75-3	4.7	9-12		9.28	124	TOTAL
	28.99	22.23	7.65	1,26	0.00	6.09	59.23
HEE	35.18	27.69	4,15	1.60	0.25	9.00	68.23
311	30,15	23,29	6.51	6.25	0.66	6.90	54.28
363	(29.84	24.87	1.26	0.00	0.85	9.60	146.14
tal	19.05	12.41	6.25	9.25	90.0	99.9	34.66
313	17.24	3.85	1.77	90'6	0.00	0.00	27.86
151	15,16	8.56	2.78	9.51	9.00	99"9	27.66
SIE	29.93	8.58	4.27	9.25	0.00	9.00	34.83
1/2	26.92	18.85	67.59	0.25	98"6	9.99	46.34
222	24.67	14.88	1.52	9.25	9.99	9.00	40.52
75	33.49	32,83	3,63	0.00	99-9	6.00	68.47
MUN	29.90	29.77	3.28	1.01	6.00	99.0	63.96
18	13.37	7.05	92.0	6.51	6.56	00.00	22.19
The state of	9.40	8.92	1.27	1.52	0.51	9.90	29.71
HE	17.19	16.64	4.26	1.65	9,00	99-9	39.18
1987	24,17	13.88	3,53	0.00	9.25	9.60	41.83
TOTAL	458.82	276.52	46.53	8.67	1.52	9.99	791.46
TIPE MURATION OF	TION OF CALMS	a 4.54	HRS.				

796.80 HRS.

TINE IN STABILITY CLASS =

	HEURS AT	EACH WIND SPEED	CD AND DIRECTION	TION		0	
PERTOD OF	RECORD.	87/ 7/ 1 THRU	U 87712/31				
STABILITY	CLASS		WIND SPEED	ED - 4PH			
WIND DIRECTION	6.75-3	4-7		227	19-24	524	TOTAL
120	27.99	13.36	27.78	9.99	99.9	99.9	44.13
ME	37.87	14,72	6.75	9.00	97.00	6.60	53,34
展	38.77	23.68	1.26	99.0	99.6	0.60	63.74
363	28.22	20,10	9.25	9.00	0.00	0.00	48.57
3	24.31	10,17	9.00	09.0	99.9	6,80	34.49
EJE	24.68	8.57	0.50	0.00	00.00	0.00	30,16
Lill E.s	29,15	7.78	97.9	6.59	6.09	99"0	29.20
2.2E	29.52	11.62	1,27	9.22	9.99	0.00	42.65
10	55.22	29.62	3.52	6,25	0.00	6.66	98"88
7227	191,161	53,30	10.1	6.25	0.25	9.00	(56.45
75	124.51	143.04	2,62	0.69	9.6	90.0	269.58
NEW	84.63	99,73	4.29	9.00	9.69	9.69	188.84
28	29.65	17.83	1.25	9.58	99"0	6.00	49.23
7967	19.93	12.17	9.51	2.66	0.00	9.00	33.62
980	18,13	11.27	2.26	9.59	9.66	9.99	32,46
1967	23.14	11.72	1.00	0.25	9.00	90.0	36.11
TOTAL	683,14	488,13	23.44	4.53	9.25	99.9	1199.49
TIME DURA	TIME MURATION OF CALMS	= 8.17	HRS.				

TIME IN STABILITY CLASS = (207.66 MRS.

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877 77 1 THRU 87/12/31

PERTOD OF RECORD.

STABILITY	CLASS	TOTAL - ALL	CLASSES DING 3PK	JPCED - NPS			
DIRECTION	6.25-3	1.4	9-12	63-18	19-24	124	TOTAL
*	91.01	95"26	57.54	24,18	6.56	1.52	278.72
NE	134.26	(22,16	58.73	22.19	3,78	6.25	341.32
第	128.60	176.98	53.14	15,98	0,76	6.46	369.37
315	201.26	179,72	42.19	3.49	0.00	00'0	426.59
tal.	78,57	134,92	29.76	1.26	9,00	90.0	255.45
ESE	82.18	(24.95	36.16	2.77	6.25	0.00	246,35
T.	86,26	99"66	29.26	4.28	90.0	9.25	213,64
335	164,95	(23.82	31.22	3.63	0.00	0.25	263.28
E-1	141.26	147.99	32,78	3.43	6.25	99.6	325.74
222	183,55	139.23	16.88	3.27	0.50	9.25	335.89
TO.	204.39	231.77	12.89	1.51	9.25	99.6	450.03
MSM	151.28	167.35	18,13	6.31	8.25	6.25	343.57
138	61.47	35,46	8,57	4.89	1.76	6.25	152,33
7907	46,19	26.00	6.56	11.16	4.79	1.51	99.14
Ni	53.65	45.78	17,60	8.33	3.62	0.51	128.25
New	49.19	59.45	24.47	7.81	1.06	6.90	161.92
TOTAL	1825.38	1906.03	459.23	123.64	23.18	5.45	4342.51
TIME DUNAT	DURATION OF CALMS	= 20.29	HKS.				

LAST TIPE ALL CLASSES = 53.21 HRS.

TIME IN STABILITY CLASS = 4362.79 HRS.

PROBABILITY WITHIN STABILITY CLASS FREQUENCY DISTRIBUTION

PERIOD OF RECORD: 87/ 7/ 1 THRU 87/12/31

STABILITY CLASS A

2.665E-02 7,9491-63 8.4315-03 5.665E-62 9.499E-02 8.678E-02 2,1985-62 2,816E-03 1.176E-02 9.9795-44 10-3289" 4.123E-02 1.286E-01 10-3556 1.287E-01 1.417E-81 1234 0.900€+60 0.090E+06 0.0905+90 9.45-0E+99 9,0906+00 9-000E+00 0.0005100 00+3699°C 9.000E+00 0.698E+66 0.00E+00 0.000E+06 0.0605+60 0.0005-60 9.000E+00 0.000E+00 0.0005400 2.336E-63 19-24 9.000E+00 0.6665+66 9.690E+66 0.0065+00 9.000E+00 0.660E+60 9.000E+00 6.666E+86 0.6695.40 0.000E+90 1.8591-03 9.905E+00 0.988E+96 9.006E+00 0.9665-00 4.786E-04 = 2.407E-03 13-19 2.4146-02 MIND SPEED - HPH 1,4096-03 3,3626-03 3,3115-43 4.668E-04 4.7225-04 397E-63 4-316F-94 2,624E-93 9,3046-04 4.6695-64 1,8746-63 1,469E-03 P. 377E-04 3,755E-63 4.6446-64 9.5386-04 ROBABILITY OF CALM WITHIN STABILITY CLASS 9-12 1.931E-02 1.8795-03 1.726E-02 2.469E-02 1.1246-62 2,163E-02 3.7298-03 2.824E-63 7,4996-63 2,815E-03 1.408E-63 1,8825-01 3,4825-02 1,4895-02 1,876.-02 1.595E-02 0.0005+66 4-7 3.037E-02 2,488E-02 6-889E-02 9.9426-02 9.960E-02 7.607E-02 5.78IE-02 3.364E-62 7.1.9E-02 2.437E-62 1.448E-02 1,212E-02 3.280E-03 9.4232-64 3.274E-03 5.616E-03 6.8HIE-04 6.75-3 3.288E-03 5, 198E-63 6.692E-03 6.559E-03 7.0325-93 1.1156-02 1.6315-02 1,3546-02 f.452E-02 1.2186-62 4.226E-03 5.154E-03 4,656E-94 .462E-03 4.7176-04 1.820E-01 4.6506-04 MIND DIRECTION 301 里 SKE ESE 벙 355 (F.3.5) MUNICIPAL STREET

PROBABILITY MITHIN STABILITY CLASS FREQUENCY DISTRIBUTION

87/12/31

THRU

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PERIOD OF RECORD

1.776E-02 1,600E+08 6.4146-02 9.264E-02 8.760E-02 3,4925-62 6.764E-02 374E-02 5.794E-02 4.1966-02 1.126E-02 29-3019 2.257E-02 1.095E-01 7.0576-02 1.045E-01 9.606E+60 0.000E+60 0.000E+00 8-960E+88 0.906E+90 9.000E+00 22 0.0005+60 0.990E+69 0.006E+60 0,500E+90 0.990E+99 0.6606+90 0.00005+00 9.500£+60 0,000E+60 0.000£+60 0.00885+00 4.813E-03 9.666E+66 1,286E-02 19-24 0.0001+00 9-9006-6 0.9966+90 3,1925-83 0.0601+66 0.660€+00 0,0000+00 0.888E+50 0.600E+00 9.960E+09 9.00K+99 0.660E+60 D. 666E+90 4.7946-63 = 0.9996+96 2.895E-02 13-18 0.060E+60 1.624E-03 3.2AZE-03 3.21 TE-63 3.198E-03 1.596E-03 9.990E+90 0.000E+00 0.6000-60 3.215E-63 WIND SPEED - NPH 8.8615-83 3.1986-63 6.996E+99 1.6008-03 9.000E+90 0.9995+96 PROBABILITY OF CALM WITHIN STABILITY CLASS 8-12 9.666E-03 3.787E-02 2.549E-02 2.268E-62 4.84%E-03 4.8266-03 8,8695-63 £0-3965-1 3,2196-03 4,858E-63 1.628E-03 1.623E-93 1,6306-03 0.000E+09 1.5135-01 9.686E-63 1.447E-02 4-7 B. Béél-63 P. 703E-03 5.7566-91 2.693E-62 2,425E-02 5.317E-02 5,3166-62 3.544E-02 2.898E-02 6.463E-93 4.9395-62 6.744E-02 8.24 IE-62 4,6436-62 4.186E-62 4.663E-62 1,624E-03 0.75-3 3.242E-03 1.286E-02 1,1235-02 2.664E-02 .93/E-62 2.74(E-02 2.419E-02 2,8891-52 1.766E-02 9.63X-65 9-0005+00 8.000E+68 8.000E+00 2,3151-01 2.573E-02 .288E-92 2.582E-02 CLASS STABILLITY DIRECTION 120 湿 西 £2E 超 222

PROBABILITY MITHIN STABILITY CLASS FREQUENCY DISTRIBUTION

PERIOD OF REC' 2: 377 77 1 THRU 37712/31
STABILITY CLASS C

MEND IPEES - HPH

	TOTAL	1,012E-01	8.0336-02	9.348E-82	7.342E-62	7.787E-82	1.0916-01	8,165E-92	7.257E-02	7.257E-02	7.102E-02	5.554E-02	3.7626-02	1.938E-02	1,4215-02	1,6798-62	2.666E-02	9,9746-81	
	124	0.000E+60	0,000£+60	0.0005+00	0.660E+00	0.668E+86	0.0006100	9.900E+90	0.000€+00	0.686E+66	0.000E+00	0.000E+00	0.000E+60	0.000E+00	0.9996+66	8,000E+00	9.9996+69	0.000E+00	
	19-24	1,283E-03	0.9096+90	1.3016-03	0.000E+00	9.006E+00	0.690E+00	0.890E+66	0.0005+00	6.000E+00	0.696E+00	8.866E+86	0.696E+60	1.302E-03	1.304E-03	2,5825-63	9.996E+90	7.772E-63	
	(3-18	3,367E-02	2,588£-03	1.283E-63	7,753E-03	9.000E+00	3.862E-03	0.000E+00	0.000E+00	0-000E+06	1.265E-03	2.585E-83	0.990£+66	5.1746-03	3.369E-63	2.585E-93	3,8556-03	6.849E-02	= 2.628£-03
	9-12	4.422E-82	3,1146-02	7.867E-03	3.805E-03	6.492E-03	1.553E-02	1.636E-02	2.605E-63	2.861E-03	3.867E-03	2,586E-63	8.609E+66	2,5796-03	3,883£-03	5.166E-03	1.164E-02	1.547E-01	
	4	1.035E-02	2.204E-02	5.978E-02	4,126E-02	4.682E-62	7.54SE-02	S.315E-02	4.659E-62	3.497E-02	4.605E-02	3.228E-62	2.5986-02	3.853E-03	1.284E-03	1.304E-03	3.872E-03	4.989E-61	WITHIN STAB
	DIRECTION 0.75-3	1,166E-02	2.454E-02	2,332E-02	2.058E-62	2.455E-62	1.425E-62	1,814E-62	2.338E-02	3.474E-02	2.584E-02	1.816E-02	1.164E-02	6.475E-03	3.867E-03	5.156E-03	1.288E-63	2.676E-01	PROBABILITY OF CALM WITHIN STABILITY CLASS
THIN.	DIRECTIO	10	HHE	光	ENE	List Control	ESE	SE	377	54	325	ns.	NO.	28	THE	94	New	TOTAL	PRODABIL

PROBABILITY WITHTH STABILITY CLASS FREQUENCY DISTRIBUTION

PERTOD OF RECORD: 87/ 7/ 1 THRU 87/12/31

STABILITY CLASS: D

WIND SPEED - HPH

7. 886E-82 7.758E-02 6.924E-02 6.4106-62 7.7206-92 5.617E-02 4.824E-02 4.216E-02 .754E-92 .678E-02 .819E-02 4.023E-02 9,9825-65 1.104E-91 1.16SE-01 9.246E-62 1.543E-03 4.9296-63 3.057E-04 0.000E+00 0.960E+90 0.6605+60 0.996E+00 3.0586-04 3,098E-04 0.000E+00 5.091E-04 9-000E+00 3.664E-04 3.054E-04 3.0946-04 9.000E+00 .235E-03 19-24 4.926E-03 4.063E-63 6,155E-04 6,000E+00 0.000E+60 6.1456-04 1.354E-02 9.0006+00 0.0000.00 0.600E+60 9.000E+00 0.0005+00 0.0005+90 3.8575-64 3. HOVE-BA 2,4566-03 3.698E-64 = 2,149E-03 12-18 6.148E-64 5,419E-62 9.86JE-03 9.263E-04 2.1546-03 6.138E-04 3.389E-03 f.852E-33 2.469E-03 1.9776-62 1.200E-02 . 533E-63 3.698E-64 1.856E-03 9.2AE-04 f.233E-03 3.07%-03 PROBABILITY OF CALM WITHIN STABILITY CLASS 8-12 1,2946-02 1.3246-02 2.829E-02 1.993E-02 7.786E-63 1.9486-02 1.540E-02 8.3076-63 9.827E-03 1.535E-03 4.271E-63 2.771E-03 5.2236-83 1.664E-91 1.934E-02 4.30%--03 1.843E-03 2,619E-62 3.5716-62 5.288E-62 2,832E-02 2.5586-02 3.396E-02 2.157E-02 .539E-02 2,7646-03 I. 697E-63 1.387E-02 4.028E-01 N. 595E-82 2.835E-02 3,35/6-02 3.3532-02 .53R-45 1.5696-62 3.9296-02 6,75-3 3.105E-02 3.4506-02 2.4296-02 3.217E-02 2.45E-02 2.556E-02 2.273E-02 2.898E-02 2,507E-02 1.845E-02 1.080E-02 .619E-03 6.8898-63 1.004E-02 3,564E-84 DIRECTION 꾶 SHE ESE 뭐 325 0.53

PROBABILITY WITHIN STABILITY CLASS FREG-ENCY DISTRIBUTION

PERIOD OF RECORD: 877 7/ 1 7HRU 87/12/31

STABILITY CLASS: E

SITZE			MIND :	MIND SPEED - HPH			
DIRECTION	ION 0.75-3	4-7	8-12	13-18	19-54	124	TOTAL
*	2.468E-92	3.419E-02	2.548E-02	9.644E-03	3.509E-03	3.912E-04	9.798E-62
ME	3.032E-02	4.005E-02	2.766E-62	1.47UE-02	3.83/5-04	9.9996+60	1.1315-01
ME	3.5715-02	4.394E-02	2.569E-62	5.8H8E-03	9-669E+66	0-900E-0	1.112E-01
30	3.152E-02	3.949E-62	5.837E-03	8,6600.+96	0.999E+00	9.890E+60	7,5856-02
144	2.519E-02	2.177E-02	4.646E-03	7.764E-84	0.0995+00	0.000E+00	5.238E-92
100 100 100	2.069E-02	2.64IE-02	6. 2265-63	3.869E-04	3,9646-04	5.650E+00	5.4106-02
27	1.795E-62	1.576E-02	6.600E-03	2.324E-03	0.6965+66	0.0000.0	4.264E-02
325	2.2906-02	2.296E-62	8.936E-63	2.3406-03	0.660E+00	0.000£+60	5.707E-02
E-s	3,139E-02	2.839E-02	8.518E-03	7.75ZE-84	3.865E-04	0.0095+00	6.946E-92
253	3.267E-02	2.332E-62	1.157E-03	3.869E-04	3.0525-04	9,000£+60	5,7926-02
25	2,744E-02	2.988E-02	4.618E-03	3.94 6E-64	3.912E-84	6,000E+00	6.272E-02
77.77	2.415E-02	1.405E-02	4.279E-03	1.951E-63	0.0005.400	0.0006+66	4.443E-02
139	6.467E-02	7.387E-63	3,163E-63	1.556E-93	3.852E-94	0.060E+00	2,410E-02
79.07	9.628E-03	5,444E-63	3.488E-03	4.274E-03	1.554E-03	7.717E-04	2.516E-02
799	1.597E-02	1.783E-02	7.763E-03	3.492E-03	7,769E-64	3.9126-84	4.622E-92
7987	2.027E-02	2.6436-62	6.61 E-03	6.243E-03	3.8576-04	0.686E+60	5.996E-02
TOTAL	3.8225-61	3.963E-01	1.505E-01	5.509E-02	8,547E-93	1.554E-03	9.942E-01
PRODAD	PROBABILITY OF CALH WITHIN STABILITY CLASS = 6.167E-03	H WITHIN STA	BILITY CLASS	= 6.167E-03			

PROBABILITY WITHIN STABILITY CLASS FREQUENCY BISTRIBUTION

PERLOD OF RECORD: 877 7/1 THRU 87/12/3/1

STABILITY CLASS

WIND SPEED - HPM

UTAS			0.720	NIND SPLED - MYN			
DIRECTION	TON 9.75-3	+1	9-12	13-13	19-24	324	TOTAL
*	3.531E-02	2.794E-02	9.612E-03	1.5826-63	9.6665+66	0.8665+96	7.445E-02
HKE	4.423E-02	3.4896-02	5,171E-03	(,262E-03	3.1946-04	0.900£+00	9,576€-02
班	3.789E-62	2.927E-02	6.357E-64	3.187E-94	0.6605+00	6.900E+88	6.812E-02
SKE	1,500£-94	3.125E-02	1.587E-03	0.966E+06	0.000E+00	0,9006+00	1.8376-61
V	2,394E-02	1.522E-02	3,184E-64	3.1425-04	0.000E+66	0.6005+60	3.979E-62
1303	2.167E-02	1.1126-02	2,221E-03	0.000£100	0.000£+00	9.000E+00	3,5016-02
Es	1.996E-62	1.075E-02	3.490E-03	6.350E-04	00+3000-0	9.0608+60	3.393E-02
122	2.6366-62	1.078E-02	5.368E-03	3.142E-04	8,6966+66	0.0006+00	4.277E-02
En	2.6.9E-62	2.3725-02	7.908E-03	3.148E-64	0,000E+00	0.690E+66	5.824E-62
138 6-2 6-3	J. (60E-02	1,7708-02	1,910E-63	J. (46E-04	0,000E+96	0.800E+00	5.092E-02
25	4,1986-02	4.0266-02	3,9166-63	0.600E+60	0.000E+00	9.890£+00	0.69%E-02
MSM	3.758E-02	3,7416-92	4,122E-03	1,269E-63	9.000E+09	0.990E+00	8.0391-62
59	1.681E-62	8,36fE-63	9.531E-64	6.378E-04	6.343E-04	0.666E+60	2,7396-02
NUM	1.1826-02	1.998E-92	1.5916-03	1.91ZE-03	6.382E-64	0.0005+60	2.603E-02
1946	2.160E-02	2.0926-02	5.35%-63	1.267E-93	9.990E+60	0.660E+00	4.9146-02
NHI	3.0376-02	1.745E-02	4.437E-93	0.000E+00	3.142£-84	0.990E+90	5.257E-02
TOTAL	5.7676-01	3,4756-61	5.849E-62	1.014E-02	1.986E-03	0.0006+09	9.947E-01
PKOBAB	PROBABILITY OF CALH WITHIN STABILITY CLASS	H MITHIN STA	BILITY CLASS	= 5.7HE-83			

PROBABILITY ATTHIN STABILITY CLAST FREGOEMCY DISTRIBUTION

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DIRECTION	TON 6.75-3	4-7	8-12	23	19-24)24	TOTAL	
*	2.3196-02	1.167E-62	2,3866-03	0,696E+60	0.609E+00	9,806£+60	3,454E-02	
MIE	3.138E-02	1.219E-02	6.239E-84	0.0905+00	0.0005+00	9-900E+00	4,419E-02	
34	3.212E-02	1.943E-02	1,0466-03	0.0006+00	0.000€+00	0,660€+60	5.278E-02	
363	2.338E-62	1.665E-02	2,16/6-64	0.0005+60	0.0005+00	90+3000'9	4.624E-62	
Lai	2.014E-02	9,429E-03	0.000€+00	9.000£+00	8.669E+00	9.000E+00	2.857E-02	
EZE	1,7466-02	7.103E-03	4,179E-64	0.0805+60	90+3000.0	9,069E+09	2,499E-02	
E.	1.670€-62	6.448E-03	6.273E-64	4.1745-04	0.60%+66	0.000E+00	2.419E-02	
143 143 143	2,446E-02	9.622E-63	f_049E-63	2.073E-04	0.0005.00	0.000E+00	3.534E-02	
6-9	4.575E-02	2,4686-62	2.913E-03	2.1036-04	0.000E+00	0.000E+60	7.295E-02	
253	8,418E-02	4,456E-02	8.367E-64	2,1015-04	2.676E-94	0.6605+60	1.294E-01	
2	1.0325-01	1.185E-01	1.677E-03	0.000E+60	0.000£+00	0.800£+00	2.232-01	
28	29-3196"9	8.262E-02	3.554E-03	0.000E+00	8.666E+69	0.898E+60	1.558E-01	
238	2.457E-02	1.477E-02	1.838E-03	4.1426-64	9,9996+90	0.0005+00	4.6795-02	
NAM	1.568E-02	1.869E-82	4,184E-04	1.669E-63	0.300E+60	0.000E+00	2,785E-62	
NV.	1.50Œ-02	9.3336-03	1.8725-03	4,1745-64	0.9095+00	0.660E+06	2.664E-02	
HHR	1.9175-02	9.7HE-93	8.287E-04	2.078E-64	0-9005+00	0.990E+96	2.992E-02	
TOTAL	5.6598-01	4.044E-01	1.941E-02	3.753E-03	2.6766-04	9.000E+90	9.937E-01	
PROBAB	PROBABILITY OF CALH WITHIN STABILITY CLASS = 6.768E-63	HUTHIN STAI	STLITY CLASS	= 6.768E-63				

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PERIOD OF	OF RECORD	1 // //8	THRU 87712731	18C (FC)			
STABILITY	ITY CLASS:	TOTAL	UNIO	Mak - Wildo			
NINCTION	TON 0.75-3	1.1	8-12		19-24)24	TOTAL
*	2.868E-62	2.2466-62	1,3266-62	5.54%E-83	1.5866-63	3,4856-64	6.395E-02
ME	3.08HE-02	2.862E-02	1.348E-02	5.892E-83	8.681E-64	S.749E-95	7.832E-02
NE	2.9516-02	3,923E-02	1,2196-62	3.648E-63	1.739E-84	9,6006+66	8.475E-02
EME	4.617E-02	4.124E-02	9.681E-03	7.979E-84	0.000E+90	0.600E+00	9.788E-62
u	2.2626-02	3,896E-02	4,7506-03	2.989E-04	0.000€+00	0.000E+60	5.861E-02
E253	1.896E-02	2.867E-02	8.298E-03	6.365E-64	5.613E-05	0.000E+00	5.652E-02
37	6.842E-62	2.285E-02	6.7146-03	9.814E-61	9.999E+65	5.7366-65	4.90XE-02
225	2.468E-62	2.841E-92	7,164E-03	6,954E-64	0.0005+90	5.8265-05	6.0415-62
6-9	3.24IE-02	3,3966-02	7,5226-03	7,848E-04	5.75E-05	6.000E+90	7.474E-82
222	4.212E-02	3.1725-02	2,342E-03	7.584E-94	1.1495-64	5.813E-05	7.707E-02
320	4.5966-02	5.3186-02	2.7756-63	3.469E-04	5.826E-05	0.650E+00	1.833E-91
NEW	3.47HE-02	3.846E-02	4,160E-03	1.448E-03	5.749E-35	5.762E-85	7.883E-02
54	1.4106-02	9, (37E-63	1.966E-03	1.166E-03	4, 645E-04	5.743E-05	2.577E-02
MHR	9.22/E-83	5.965E-03	1.584E-83	2.546E-03	1.098E-03	3.472E-84	2.048E-02
186	1.217E-02	1.050E-02	4.939E-03	1.9195-03	6.921E-04	1.164E-04	2.94% -02
7000	1.588E-02	1.364E-02	5.615E-03	1.792E-03	2.303E-04	0.000E+90	3.715E-82
TOTAL	4.188E-01	4.3736-01	1.0546-01	2.837E-02	5.320E-03	1.1586-03	9.964E-61
PROPAR	PROBABILITY OF CALM WITHIN STABILITY CLASS = 4.6546-63	H WITHTH STA	BTI TTY CLASS	= 4.6545-67			

OVERALL PROBABILITY OF CONDITION OCCURRENCE

PERIOD OF RECORD 87/ 2/ 1 THRU 87/12/31

STABILITY CLASS: A

WIND SPEED - HPH

TOTAL 5.923E-63 1.589E-62 5.093E-63 3.294E-03 . 04/E-03 .173E-02 .756E-62 . 469E-02 .345E-02 9.977E-03 .3366-02 2.745E-03 9.843E-04 3.478E-04 .. 445E-03 1.2335-01 0.000E+00 124 0.9605+90 0.0005+00 0.0000100 9.000E+00 9.000£+00 8,6665+96 0.000E+66 0.6906+66 0.000E+00 0.000E+60 9.000E+00 0.000£+00 0.000E+00 0.000£+90 0.000E+00 0.000E+00 19-24 0.666E+00 0.960E+00 0.0000.466 0.000E+00 0.006€+60 0-600E+00 9.969£409 5.8H3E-05 2.296E-94 6.000E+60 0.0005400 0.800E+66 0-000E+00 2.8786-04 0.900E+00 9.000E+00 9.6065+66 13-18 1.7466-51 4.979E-94 1,6545-84 5,755.45 832E-05 5.866E-05 3,2376-04 1,149E-64 5,754E-85 2,315E-04 1.741E-04 1.1586-94 4.6386-64 5,7366-05 2. 9atE-63 4,9695-04 1,725-04 OF CALM OCCURRENCE = 2,973E-84 9-12 31 7E-03 1.273E-65 2,1236-47 2.324E-04 2.325E-02 18 3.484E-04 9.25IE-04 3.477E-04 0.000E+00 1.73%-04 3.0496-03 4.300E-03 1.3886-63 2.599E-03 1.9706-03 4,6966-94 .274E-05 3.4146-02 3.751E-03 4.044E-04 6.937E-64 3.663E-63 9,395E-03 .142E-03 .,157E-42 - BH ZE-63 1.786E-03 .498E-03 4.051E-04 164E-04 52/E-03 .228E-92 .223E-02 PROBABILITY 7946-03 .212E-04 5.826E-05 1.2666-02 4,961E-04 6.3975-64 1.377E-63 .274E-03 1.673E-03 .505E-03 6.369E-04 5.74至-65 5.743E-05 .732E-64 7.5246-04 8.1816-84 9.685E-04 DIRECTION DYERALL 100 SHE 633 533 33 뇊 122 SEE

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PERTOD	OF RECORD	877 77 1	THRU 87712/31	31			
STABILITY	ITY CLAST		MIND	BdF - G33dI			
NIND	108 0.75-3	4-7	8-12		19-24)24	TOTAL
×	4.622E-04	7.5216-64	1.3326-03	2,897E-04	0.300£+60	0.000E+60	2.834E-03
NNE	4.031E-64	8.7146-94	9.159E-04	1.1495-84	0.090E+98	0.000E+00	2.305E-63
39	7.4196-04	1.775E-03	8.121E-04	6.968E+60	0.000E+00	0.990E+00	3.329£-03
EME	9.248E-84	2.424E-03	3,479E-64	5.749E-85	90+3980-9	0,000E+66	3.754E-03
tel	4.6295-04	2.95E-03	5.202E-04	0.000E+00	0.0005+60	0.000€+90	3.935E-03
353	PO-3186-9	1-669E-03	1-7435-04	0,000E+00	0.6005+66	0.0005+00	2.537E-03
35	9.85%-04	1.911E-03	1.733E-04	5.734E-65	0,866E+60	0.0666+00	3.127E-03
322	9.2806-04	1.968E-03	2.875E-84	0.000E+90	0.000E+90	9.8895+88	3.124E-03
to	8.6925-64	1.5046-03	5,7366-05	0.000E+00	0,0066+00	0.000E+60	2,43(E-03
222	7.507E-04	1.676E-03	1.157E-04	0.000E+00	0.0605+60	0.000E+00	2.542E-03
27	6.3495-64	1.2746-63	1.7466-04	0.990E+60	0.000E+00	0.865E+00	2.083E-03
MSW	3.462E-64	1.041E-03	S.854E-05	5.826E-05	0.000E+66	0.600E+00	1,504E-03
.78	1.165E-04	2.3235-64	5.832E-05	1.165E-04	1.147E-04	0.500E+06	6.383E-94
NAME	0.000E+60	5,8266-65	5.857E-05	1.,56E-94	1.723E-84	6.600E+66	4.047E-04
365	6.9005+60	2.899E-64	0.0005460	1.154E-04	1.730E-94	9.990E+90	5.785E-04
New	8.000E+00	3.487E-64	3,4745-64	1.149E-84	97-997E+66	0.000E+00	8.110E-04
TOTAL	8.3205-63	2.069E-02	5.434E-03	1.6405-63	4.600E-04	0,500E+00	3.594E-02
DVERAL	PROBABILIT	OVERALL PROBABILITY OF CALM OCCURRENCE = 0.060E+00	CUKRENCE = 0	.000E+00			

OVERALL PROBABILITY OF CONDITION OCCURRENCE

PERIOD OF RECORD: 877 7/ 1 THRU 87/12/31

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DIRECTION	OH 0.75-3	4-7	8-12	13-18	19-24	324	TOTAL	
*	5,2135-04	4.6295-04	1,9786-63	1.5666-93	5,736E-05	9.600E+60	4.525E-03	
366	1.6991-03	9.8605-94	1.3935-63	1,457E-84	0.600E+66	9.6605+66	3,5936-63	
当	1.043E-03	2.5706-03	3.5195-04	5.7346-65	5.8196-65	0.0605+00	4, 191E-03	
ENE	9.286E-64	4.843E-03	1.737E-04	3,467E-64	0.0695+00	0.000E+00	3.284E-03	
Lai	1.998£-03	2.094E-03	2.9646-64	9.900E+00	0.0065+60	0.0006+00	3,4836-03	
III	6.3795-04	3.175E-03	6.947E-04	1,7275-64	8.600E+00	0.600E+86	4.880E-63	
100	8,1125-04	23.3776-63	4,6366-64	0.9666+90	0.000E+00	9.000£+90	3,6525-03	
327	1.846E-03	2.084E-03	1.165E-04	0.060E+00	6.606E+66	9.998E+06	3,246E-93	
6-9	1.554E-03	1.564E-63	1.2805-04	9,696£+86	9,990E+00	6.806E+66	3.246E-03	
2222	1.156E-03	1.794E-03	1.7305-04	5,4668-05	0.866E+68	8.909E+99	3.177E-83	
75	8.6776-64	1,4445-63	1.157E-04	1.1566-04	0.899€+66	0.666E+56	2.485E 463	
1521	5.287E-64	1.162E-03	00+3000°0	9.0006+00	0.996E+99	00+3090"0	1.683E-03	
29	2.894E-04	1,723-64	1.1546-04	2.3146.94	5.826E-05	9.000E+06	8.6796-04	
Men	1,730E-64	5.743E-05	1.737E-04	1.7366-04	5.832E-65	0.600E+09	6.3531-04	
2	2,3666-64	5.832E-05	2.3106-04	1.1565-64	1.155E-04	0,0000+90	7.5HE-05	
NAM	5.7625-05	1.732E-04	5,207E-04	1,7245-64	0.666E+68	90+3909°4	9,2355-04	
TOTAL	1.1976-02	2.23HE-02	6.919E-03	3.063E-03	3,4766-04	0,000E+00	4.4615-02	
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PERTOD	OF RECORD	877.77.1	THRU 877/12/38	222			
TIMBLITY	CTY CLASS		0.000	racera . seu			
9828				ř.,			
MIRECTI	10W 8.75-3	4-7	B-12	13-16	19-24	324	TOTAL
1000	2,9566-03	4,9266-03	2.433E-63	1.855E-03	9,2545-64	2.9035-04	1.3336-02
HHE	7,3895-63	6.71SE-03	3.845E-03	2,6256-93	7.527E-94	5.749E-85	2.075E-02
냋	5.839E-62	\$.9446-03	3.74GE-03	2.25 TE-03	1.1576-04	0.000£+50	2.1966-02
EME	4.806E-03	8.64fE-63	3.642E-03	2.883E-04	0.000E+00	0.0005+66	1,738E-62
tu)	6.4808-03	5.3306-03	1.4496-03	5.828£-95	0.000E+00	9.0005+00	1.333E-02
353	4,2746-03	6.302E-03	3.564E-03	3,478E-64	0.0005+00	0.000E+00	1,4596-82
财	4.548E-03	5.32Æ-63	2.394E-03	1.7386-04	0.0005-60	5,7366-65	1.302E-02
302	5,4495-63	4.819E-03	1.562E-83	1,742E-04	0.069E+00	5,8266-05	1.265E-02
***	6.0506-03	6.307E-03	1.843E-03	2,3196-04	8,000E+66	0,600£+60	1.4536-02
22	4.845E-03	6.305E-03	8.1945-84	4.854E-64	0.666€+66	5.8H3E-05	\$.244E-02
27	4.612E-03	4.054E-03	2.807E-04	1.154E-04	0,000€+00	0.0005+00	9.07X-03
NCN	3.476E-63	2.893E-03	6.0325-64	6.356E-94	5,749E-05	5.762E-95	7,9185-03
3	2.031E-03	5.1978-94	5.2115-64	1.156E-04	5,832E-65	5.74至-65	3.30XE-03
7667	f.057E-03	2.894E-04	3.466E-04	6.945E-64	4.618E-04	2.323E-04	3.081E-03
717	1.29IE-03	6.9336-04	10-770°	3,4836-04	5.826E-05	5. 部光-65	3.42HE-03
NA	1.887E-03	7,608E-03	2.496E-03	4,544E-94	1,156E-04	9.000E+00	7.566E-83
TOTAL	6.70Œ-62	7,5756-02	3,1305-02	1.0198-02	2.546E-03	9.26K-04	1.877E-01
NOCESAL	CONTRACTOR	CONTRACTOR OF PACE OF	PUDEFULF - A	5475.54			

OVERALL PROBNDILLTY OF CONDITION OCCURREDATE

FERIOD OF RECORD 87/ 7/ 1 THRU 87/12/31

STABILITY CLASS: E

HAR - STEEL SHIP

1.4536-62 1.684E-02 1,4554-02 1.1295-02 7.966E-03 8.056E-93 6.349E-03 8.498E-03 .6346-62 B. 625E-03 9.340E-63 6-615E-63 3.58%-03 3.746E-93 6.8826-43 8.928E-63 1.4906-01 324 5,826-95 9-9995+99 6.600E+90 0.866E+60 9.000€460 9.8005+69 0.000E+00 0.6002+60 9.0006-00 0.609E+66 0.000€+00 0,466E+46 1.149E-64 0.99685+66 5,828.-65 6.000E+60 2.3146-94 19-24 5,2256-04 5.784E-05 0.0005+00 0.0005+00 6,969£+96 5.BIX-65 6.696E+00 6.660E+00 5.7556-65 5.7366-05 5.8266-65 9.6995+96 5,7345-65 2.314E-04 1.157E-94 1.2736-03 5.743E-65 1,4366-63 2.198E-63 8.663E-64 9.0005+00 1.1545-04 5.762E-65 3.46/E 32 3,4845-64 1,1545-04 5.7625-65 5.87E-65 2.966E-64 2.3175-04 6.368E-94 5.2006-04 8.263E-63 9.250E-04 PRESABILITY OF CALM OCCURRENCE = 9,183E-64 8-12 3.794E-65 4,1115-63 3.8266-03 8.4915-64 6.918E-04 9.262E-64 9.828E-04 \$.330E-63 1.24GE-03 1.723E-04 6,8775-04 6,3762-04 4.62HE-04 2.242E-62 5.1931-84 1.156E-03 9.848E-64 1-4 5.964E-63 5.0HE-03 6.542E-63 5.734E-03 3.242E-63 3.933E-63 2.347E-03 3.409E-03 4.2272-63 3.47班-63 4,4495-03 2.0925-63 1.1005-03 9-106E-04 5.9616-02 2.655E-03 3.943E-03 DIRECTION 0.75-3 3.6746-63 4.515E-03 5,3175-03 4.694E-03 3.7566-63 3.08HE-03 2.673E-453 3.4166-03 4.674E-03 4.865E-03 3.596E-03 4.8876-63 1.7386-63 1.4348-93 2.3736-63 3.018E-63 5.69/E-02 DVERALL EZE kad Kag 131 151 151 151

DWERALL PRODABILITY OF CONDITION OCCURRENCE

PERIOD OF RECORD: 877 77 (TURU 87/12/3)

STABILITY CLASS

MIND SPEED - HPH 19-24 BIRECTION 9.75-3 4-7 8-12 13-19 19-24

324

1,468E-62 1.566E-02 2446-02 1,3536-02 7.2646-03 6, 392E-63 6, 1955-45 7. BBBE-83 CO-3E99") 297E-03 STIE-42 5. MRE-65 4.753E-63 8.974E-63 9.59E-03 1.8146-01 99+3966 9996-99 96+3936 0.000E+00 0.0005+30 6.699E+90 0.690E+90 0.000E+00 0.60/£+00 9,9996+99 8.669E+68 9965-499 0.65%+66 0.9006+99 0.666E+66 0.00E+00 0,9906-90 9995-199 666E+66 7366-05 0,000E+00 5,832E-65 999E+90 9.6605+06 1,1585-64 1.165E-04 8.00%E+00 3,4806-64 0.0005+00 0,0005-00 9995-499 Ø.06€+90 0.0000.400 9995-499 3165-64 1.85五-63 0.0005+60 3,4925-64 2.5146-04 0.000E+96 2.988E-04 2.305E-04 5,8195-45 0.666E+00 5.7346-05 9-09-E+90 1.15/E-94 5,7366-45 5,7436-65 5.7436-85 1.1645-94 OF CALM DECURFENCE = 1.043E-63 75%-46 444.5-64 9545-04 .897E-64 8.161E-04 1.0686-02 4,055E-64 6.372:-04 9.86JE-64 3,4875-64 7.525E-84 1,74%-94 2.984E-64 P. 770E-64 1,1615-04 5,8136-65 [.444E-63 5.60X-65 3506-63 6.8315-63 1.840E-03 BI 9E-053 3, 185E-63 5.34%-32 6,3526-03 639E-93 1.96W-63 1.969E-03 3316-03 3,234E-93 20-3619 5.3446-65 5.706E-03 20-3KLL PROBABILITY 5.4466-62 6.8615-03 8,9715-03 6.918E-63 3.956£-03 3.4795-03 4,8825-93 5,5605-03 7.665E-03 3.868E-03 2.157E-03 944E-03 5.545E-03 1.053E-01 2,7546-02 378E-43 4.9666-63 OVERALL 180 133 8578 墨 355 湖 规

0	ONERALL		PROBABILITY OF CONDITION OCCURRENCE	OCCUSSENCE		•	
PERICO	OF ACCORD	877 77 8	THRU 87712/31				
STADILITY	ITY CLASS:		RIND	Hele - CEDAT			
MIND	ION 9.75-3	4	8-12	100	19-51	77.	TOTAL
2	5.4235 63	3,645-63	6.3065-04	0,8005+60	8.84CE+00	0.0006+60	1.013E-02
HHE	8.690E-03	3.376E-03	1,7285-64	6.000E+66	0.9905-60	9.600E+60	1,2246-62
施	8,895E-63	5,4346-63	2.877E-64	0.0906+00	0.000€+00	0.0006.+00	1.462E-02
39/3	6.47SE-03	4.613E-93	5,8196-05	0.9006+00	8,6685-08	0.0005+00	1,115E-02
lat	5,5796-46	2.3546-03	0.5905+00	0.000E+00	0.0005+60	0.600€+60	7.91逐-63
353	4.8375-63	1,947E-03	1.157E-84	0.000E+00	0.090E+00	96+3009-6	6.928E-83
ini ka	4.625E-63	1.7846-03	1.7376-64	1.1566-64	0,900€+90	0.000E+00	6.700E-03
1111	6.7746-83	2,665E-63	2.905E-64	5.74E-05	6.000E+08	0,000£+66	9.787E-83
6-1	4.267E-62	6.5706-03	9.069E-04	5,838.75	0.800E+00	0.000E+60	2,6215-02
NOT	2,3326-02	1.223E-02	2.317E-04	5.8196-65	5.749E-05	99+3096*0	3,589E-82
180	2.857E-62	3.282E-02	4,5446-04	6,0006+06	0.0005-00	0,0005+00	6,1846-02
NCH.	1,9285-02	2.28BE-62	9.835E-84	0.000E+00	99-(3096.9	9.000E+00	4,315E-02
29	6,894E-63	4.6796-63	2.874E-04	1.147E-04	0.990E+00	0.000€+00	1.1306-02
THE	4,343E-03	2.793E-03	1,459E-84	4.622E-64	0.009E+60	8,000E+00	7.71AE-03
100	4,1596-03	2.585E-03	5.184E-04	(,1586-04	0.0006+00	0.0005+60	7,3736-63
Meth	5,389E-63	2.690E-03	2.295E-84	5,755E-85	0,000£+06	0.000E+00	8.286E-03
TOTAL	1.567E-01	1,1295-01	5,377E-63	1.0466-03	5,7496-05	6,000€+00	2.75XE-91
DVETAL	PROBABILIT	OVERALL PROBABILITY OF CALM OCCUMMENCE = 1.875E-03	CUNNEHCE = 1.	87512-63			

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PERIOD	OF RECORD:	877 77 1	THRU 87712/31	/31			
STABILITY	TTI GLASS	TOTAL	urun	PDETER - MOU			
MIND	ISM 0.75-3	12-4	8-12		19-24	724	TSTAL
**	2,6605-02	2,2466-62	1.3286-92	5,540E-03	1.500£-03	3,4856-64	6.395E-02
縦	3.681E-62	2.802E-02	1,3465-92	5.0926-03	8.4815-04	5,7498-95	7.832E-62
WE.	2,9515-02	3.923E-02	(,2196-62	3,646E-03	1,739E-04	9.0005-00	9.475E-62
DIE	4.617E-02	4.124E-02	£0-3(89°6	7.9795-04	00+3000"0	0.000E+00	9.788E-02
144	2.3626-02	3,0965-62	4,750£-63	2,939£-04	0.600E+60	0.866E+66	5,86fE-02
Ħ	1.886E-02	2.867E-62	8_298E-63	6.365E-04	5,813E-05	9.999E+60	5,6525-62
Lui Lui	1.842E-02	2.295E-02	6,7146.63	9.8146-64	0.0000+00	5.7386-65	4.90Œ-02
SSE	2.468E-02	2.84(E-02	7.164E-93	6.954E-04	0.000£+60	5.826E-95	6.841E-82
54	3,241E-02	3,3965-02	7.523E-03	7,866E-04	5.755-65	0.669£+60	7,474E-02
25%	4.2125-92	3.172E-92	2.3125-63	7.56/E-04	1.1495-64	5.813E-95	7.767E-02
276	4.696E-02	5.3196-02	2,775£-93	3,46%-64	5.826E-05	0.0006+00	1.03E-01
NON	3.471E-02	3.946E-62	4,160E-63	1,4486-63	5.749E-05	5.762E-05	7.883E-02
23	1.410E-02	8,7376-03	1.9666-03	1,1065-03	4.045E-04	5,7435-65	2.577E-02
Nen	9.22iE-03	5.965E-03	1.504E-03	2.546E-03	1.6988-03	3.472E-04	2.868E-82
786	1.2476-02	1.056E-02	4.039E-03	1.910£-03	6.9215-84	1.1646-04	2.943E-02
New	1.5885-62	1.364E-02	5.645E-63	1,792E-03	2.303E-64	0.000E+90	3,715E-92
TOTAL	C. (88E-61	4.1736-01	1.054E-01	2.8376-62	5,326-63	1.159E-03	9.9546-01
CVERALL	PREBABILITY	OF CALK UD	OF CALK DOUBPERCE = 4,454E-63	1,454E-03			

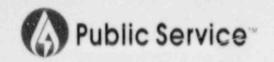
FORMA (A)299-12-3546

PERM RECORD 87/ 1/ 1 THRU 87/12/31

LOST TIME = 53.21 MRS TOTAL TIME = 4416.00 MRS
DATA AVAILABILITY = 90.80 I

MUMBER OF GELGRDS IN SELECTED TIME PERIOD = 23887 HUMBER OF OBSERVATIONS TAKEN FROM FREWORK LOCATION = 23316 HUMBER OF GESERVATIONS TAKEN FROM THE NOAM TOWER = 11 NO OF ODSERVATIONS WITH NO WALLD WIND SPEED/DIR. = 55 HUMBER OF GESERVATIONS WITH NO WALLD WIND SPEED/DIR. = 67

RETERMINED MAKKAL AVERAGE X/0 = 2.66247E-96



February 29, 1988 Fort St. Vrain Unit No. 1 P-88086

Document Control Desk U. S. Nuclear Regulatory Commission Washington, DC 20555

Docket No. 50-267

SUBJECT: Semi-Annual Radioactive Effluent

Release Report

Gentlemen:

Attached please find the Semi-Annual Radioactive Effluent Release Report for the Fort St. Vrain Nuclear Generating Station.

This report covers the period July 1, 1987 through December 31, 1987, and is submitted pursuant to Section 7.5.1.e of the Fort St. Vrain Technical Specifications.

Please contact Mr. M. H. Holmes at (303) 480-6960 if you have any questions regarding this report.

Sincerely,

R. O. Williams, Jr. Vice President, Nuclear

Operations

Fort St. Vrain Nuclear Generating Station

ROW: VHF/skd

Attachments

cc w/attachments:

Regional Administrator, Region IV
U. S. Nuclear Regulatory Commission
Attn: Mr. T. F. Westerman, Chief
Projects Section B
611 Ryan Plaza Drive, Suite 1000
Arlington, Texas 76011

Mr. Robert Farrell Senior Resident Inspector Fort St. Vrain Station

Dottie Sherman, ANI Library American Nuclear Insurers The Exchange Suite, 270 Farmington Avenue Farmington, Connecticut 06032

Mr. Albert J. Hazle, Director Radiation Control Division Colorado Department of Health 4210 E. 11th Ave. Denver, CO 80220

Mr. Mike Colphin, Site Manager General Atomic Company P.O. Box 426 Platteville, CO 80651

Mr. Paul B. Smith Regional Representative, Radiation Program U. S. Environmental Protection Agency Region VIII Suite 900, 1860 Lincoln St. Denver, CO 80203

Mr. Frank Rozich, Director Water Pollution Control Division Colorado Department of Health 4210 East 11th Ave. Denver, CO 80220