SEMI-ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

July - December

1987

Public Service Company of Colorado

Fort St. Vrain
Nuclear Generating Station

February 1988

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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/ml
Tritium	1.00E-05 µCi/ml
Iodine-131	1.00E-06 µCi/ml
Gross Alpha	1.00E-07 µCi/ml
Strontium-89, 90 (Composite)	5.00E-08 µCi/ml
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)	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 patn except for when P-3308 was in use. Subsequently the tritium levels in the service water system dropped significantly. To correct this problem the Onerations 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/Q values.

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

Iodine, Particulates, Tritium

Adult		
	Whole Body	1.18E-01 mrem
	Organ (maximum)	1.18E-01 mrem
	Bone	0.00E+01 mrem
Teen		
	Whole Body	1.35E-01 mrem
	Organ (maximum)	1.35E-01 mrem
	Bone	0.00E+01 mrem
Child		
	Whole Body	1.94E-01 mrem
	Organ (maximum)	1.94E-01 mrem
	Bone	0.00E+01 mrem
Infant		
	Whole Body	1.51E-01 mrem
	Organ (maximum)	1.51E-01 mrem
	Bone	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 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 site boundary are at home during 50% of gaseous effluent releases.

2) As game fishing is not 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.

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT

SUPPLEMENTAL INFORMATION

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:

a. 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.

3. 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

Number of Releases	1.00E+00
Total Activity Released	9.62E-02 CURIES

b. Gaseous

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

TABLE 1A

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	Ci	1.26E+02	1.43E+01	1.70E+01
2. Average release rate for period	uCi/sec	1.56E+01	1.80E+00	
3. Percent of technical specification limit	%	1.79E+00	4.38E-01	
B. Iodine				
1. Total iodine-131	Ci	<4.44E-06	<4.44E-06	
2. Average release rate for period	uCi/sec	<5.58E-07	<5.58E-07	
3. Percent of technical specification limit	%			
C. Particulates				
1. Particulates with half-lives > 8 days	Ci	<2.09E-07	<1.78E-07	
2. Average release rate for period	uCi/sec	<2.64E-08	<2.24E-08	
3. Percent of technical specification limit	%			
4. Gross alpha radioactivity	Ci	<4.49E-08	<4.11E-08	
D. Tritium				
1. Total release	Ci	1.12E+00	7.21E-01	1.70E+01
2. Average release rate for period	uCi/sec	1.41E-01	9.07E-02	
3. Percent of tech. spec. limit	%	2.35E-03	1.51E-03	

TABLE 1C

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT (1987)

GASEOUS EFFLUENTS--GROUND-LEVEL RELEASE

		CONTINUOUS MODE		BATCH MODE	
Released	Unit			Quarter 3	Quarter 4
Fission gases					
krypton-85	Ci			<6.49E+00	<5.83E+00
krypton-85m	Ci			1.14E-01	2.26E-01
krypton-87	Ci			9.49E-03	1.40E-02
krypton-88	Ci			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	Ci			5.69E-01	
Total for period *	Ci			1.26E+02	1.43E+01
Iodines					
iodine-131	Ci			<1.08E-09	<9.69E-10
iodine-133	Ci				
iodine-135	Ci				
Total for period	Ci			0.00E+00	0.00E+00

* Total values do not include "<" data

TABLE 1C (Continued)

Particulates

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

* Total values do not include "<" data

TABLE 2A

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT 1987

LIQUID EFFLUENT-SUMMATION OF ALL RELEASES

	Nuclide	Units	Quarter 3	Quarter 4	Est. Total Error, %
A. Fission and activation products					
1. Total release	Cs-137	Ci	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	Co-60	Ci	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		%			
B. Tritium					
1. Total release	H-3	Ci	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	
C. Dissolved and entrained gases					
1. Total release	Xe-133	Ci	1.17E-03	0.00E+00	1.70E+01
2. Average diluted concentration		uCi/ml	2.12E-09	0.00E+00	
3. Percent of applicable limit		%	1.06E-03		
1. Total release	Xe-135	Ci	2.67E-05	0.00E+00	1.70E+01
2. Average diluted concentration		uCi/ml	4.84E-11	0.00E+00	
3. Percent of applicable limit		%	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
E. 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	Ci	<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	Ci	<7.16E-04	<4.59E-03	<2.77E-04	<1.73E-04
tritium	Ci	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	Ci	<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.	m^3 Ci	0.00E+00 0.00E+00	0
b. Dry compressible waste, contaminated equip. etc.	m^3 Ci	2.76E+00 3.04E-01	2.41
c. Irradiated components, control rods, etc.	m^3 Ci	2.74E+01 1.03E+02	7.4
d. Other (describe)	m^3 Ci	0.00E+00 0.00E+00	0

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

		Content %	Curies	Error %
a. PROCESS WASTE: NONE				
b. DRY ACTIVE WASTE:				
	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
c. IRRADIATED COMP.:				
	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
d. 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

FORM (A)292-12-3546

HOURS AT EACH WIND SPEED AND DIRECTION

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

STABILITY CLASS: A

WIND DIRECTION	WIND SPEED - MPH 0.75-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	1.77	13.35	5.55	0.76	0.00	0.00	21.47
NNE	2.79	16.35	9.26	1.78	0.00	0.00	30.17
NE	3.28	32.78	13.29	1.78	0.00	0.00	51.13
ENE	3.53	53.52	18.74	0.46	0.00	0.00	76.25
E	3.79	53.29	7.58	0.25	0.00	0.00	64.91
ESE	6.00	40.95	10.10	0.25	0.00	0.00	57.30
SE	5.55	31.13	6.05	0.75	0.00	0.00	43.48
SSE	7.29	50.40	11.32	0.25	0.00	0.00	69.27
S	7.82	40.42	8.58	1.41	0.00	0.00	58.23
SSW	6.56	13.13	2.01	0.50	0.00	0.00	22.20
SW	2.27	7.79	1.52	0.25	0.00	0.00	11.83
WSW	2.78	6.53	4.03	1.01	0.00	0.00	14.34
W	0.25	1.77	1.52	0.76	0.00	0.00	4.29
WNW	0.25	0.51	0.00	0.50	0.25	0.00	1.52
NW	0.75	1.76	0.76	2.02	1.00	0.00	6.30
NNW	0.25	3.02	1.01	0.25	0.00	0.00	4.54
TOTAL	54.93	366.68	121.32	12.99	1.25	0.00	537.17

TIME DURATION OF CALMS = 1.30 HRS.

TIME IN STABILITY CLASS = 538.47 HRS.

FORM (A)292-12-3546

HOURS AT EACH WIND SPEED AND DIRECTION

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

STABILITY CLASS B

WIND DIRECTION	WIND SPEED - MPH 0.75-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	2.01	3.28	5.81	1.26	0.00	0.00	12.36
NNE	1.76	3.80	3.99	0.50	0.00	0.00	10.05
NE	3.23	7.74	3.54	0.00	0.00	0.00	14.51
ENE	4.03	10.5	1.52	0.25	0.00	0.00	16.36
E	2.02	12.86	2.27	0.00	0.00	0.00	17.15
ESE	3.02	7.2	0.76	0.00	0.00	0.00	11.06
SE	4.29	8.33	0.75	0.25	0.00	0.00	13.63
SSE	4.04	8.32	1.25	0.00	0.00	0.00	13.61
S	3.79	6.56	0.25	0.00	0.00	0.00	10.59
SSW	3.27	7.30	0.50	0.00	0.00	0.00	11.00
SW	2.77	5.55	0.76	0.00	0.00	0.00	9.08
WSW	1.51	4.54	0.26	0.25	0.00	0.00	6.56
W	0.51	1.01	0.25	0.51	0.50	0.00	2.78
WNW	0.00	0.25	0.26	0.50	0.75	0.00	1.76
NW	0.00	1.26	0.00	0.50	0.75	0.00	2.52
NNW	0.00	1.52	1.51	0.50	0.00	0.00	3.53
TOTAL	37.26	90.15	23.68	4.53	2.00	0.00	156.63

TIME DURATION OF CALMS = 0.00 HRS.

TIME IN STABILITY CLASS = 156.63 HRS.

FORM (M)292-12-3546

HOURS AT EACH WIND SPEED AND DIRECTION

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

STABILITY CLASS: C

WIND DIRECTION	WIND SPEED - MPH 0.75-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	2.27	2.02	8.82	6.56	0.25	0.00	19.72
NNE	4.79	4.30	6.07	0.50	0.00	0.00	15.66
NE	7.55	11.64	1.53	0.25	0.25	0.00	21.22
ENE	4.01	8.03	0.76	1.51	0.00	0.00	14.31
E	4.79	9.13	1.27	0.00	0.00	0.00	15.18
ESE	2.79	14.71	3.03	0.75	0.00	0.00	21.27
SE	3.54	10.36	2.02	0.00	0.00	0.00	15.92
SSE	4.56	9.08	0.51	0.00	0.00	0.00	14.15
S	6.77	6.82	0.56	0.00	0.00	0.00	14.15
SSW	5.04	7.81	0.75	0.25	0.00	0.00	13.84
SW	3.53	6.29	0.50	0.50	0.00	0.00	10.83
WSW	2.27	5.06	0.00	0.00	0.00	0.00	7.33
W	1.26	0.75	0.50	1.01	0.25	0.00	3.78
WNW	0.75	0.75	0.76	0.75	0.25	0.00	2.77
NW	1.01	0.25	1.01	0.50	0.50	0.00	3.27
NNW	0.25	0.75	2.27	0.75	0.00	0.00	4.03
TOTAL	52.14	97.25	38.15	13.35	1.51	0.00	194.42

TIME DURATION OF CALMS = 0.51 HRS.

TIME IN STABILITY CLASS = 194.94 HRS.

FORM (A)292-12-3546

HOURS AT EACH WIND SPEED AND DIRECTION

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

STABILITY CLASS: D

WIND DIRECTION	WIND SPEED - MPH 0.75-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	12.86	21.47	10.60	8.08	4.04	1.26	58.31
NNE	32.20	29.27	16.63	8.82	3.28	0.25	90.45
NE	25.45	43.34	16.34	9.84	0.50	0.00	95.46
ENE	20.94	37.66	15.87	1.26	0.00	0.00	75.73
E	28.28	23.23	6.32	0.25	0.00	0.00	58.08
ESE	18.63	27.47	15.97	1.52	0.00	0.00	63.58
SE	19.91	23.21	12.62	0.76	0.00	0.25	56.75
SSE	23.75	20.96	6.81	0.76	0.00	0.25	52.53
S	26.37	27.84	8.85	1.61	0.00	0.00	63.27
SSW	21.20	27.48	3.53	1.77	0.00	0.25	54.23
SW	20.10	17.68	1.26	0.50	0.00	0.00	39.54
WSW	15.13	12.61	3.50	2.77	0.25	0.25	34.51
W	8.85	2.27	2.27	0.50	0.25	0.25	14.39
WNW	4.60	1.26	1.51	3.03	2.01	1.01	13.43
NW	5.58	3.02	4.28	1.52	0.25	0.25	14.91
NNW	8.23	11.37	10.85	2.02	0.50	0.00	32.97
TOTAL	292.07	330.12	136.41	44.41	11.10	4.04	818.14

TIME DURATION OF CALMS = 1.76 HRS.

TIME IN STABILITY CLASS = 819.90 HRS.

FORM (A)292-12-3544

HOURS AT EACH WIND SPEED AND DIRECTION

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

STABILITY CLASS: E

WIND DIRECTION	WIND SPEED - MPH 0.75-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	16.02	22.19	16.54	6.26	2.28	0.25	63.53
NNE	19.68	25.99	17.91	9.58	0.25	0.00	73.41
NE	23.17	28.51	16.67	3.78	0.00	0.00	72.14
ENE	20.46	24.98	3.79	0.00	0.00	0.00	49.22
E	16.34	14.13	3.02	0.50	0.00	0.00	33.99
ESE	13.43	17.14	4.04	0.25	0.25	0.00	35.11
SE	11.65	10.23	4.26	1.51	0.00	0.00	27.67
SSE	14.86	14.86	5.00	1.52	0.00	0.00	37.03
S	20.37	18.42	5.53	0.50	0.25	0.00	45.07
SSW	21.20	15.13	0.75	0.25	0.25	0.00	37.59
SW	17.81	19.39	3.00	0.25	0.25	0.00	40.71
WSW	15.67	9.12	2.78	1.27	0.00	0.00	28.83
W	7.58	4.79	2.01	1.01	0.25	0.00	15.64
WNW	6.25	3.53	2.26	2.77	1.01	0.50	16.33
NW	10.36	11.57	5.04	2.27	0.59	0.25	30.00
NNW	13.15	17.10	4.29	4.03	0.25	0.00	38.91
TOTAL	248.01	257.17	97.70	35.75	5.55	1.01	645.19

TIME DURATION OF CALMS = 4.00 HRS.

TIME IN STABILITY CLASS = 645.19 HRS.

HOURS AT EACH WIND SPEED AND DIRECTION

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

STABILITY CLASS: F

WIND DIRECTION	WIND SPEED - MPH 0.75-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	28.09	22.23	7.65	1.26	0.00	0.00	59.23
NNE	35.18	27.68	4.11	1.00	0.25	0.00	68.23
NE	30.15	23.29	0.51	0.25	0.00	0.00	54.20
ENE	120.01	24.87	1.26	0.00	0.00	0.00	146.14
E	19.05	12.11	0.25	0.25	0.00	0.00	31.66
ESE	17.24	8.85	1.77	0.00	0.00	0.00	27.86
SE	15.16	8.56	2.78	0.51	0.00	0.00	27.00
SSE	20.93	8.58	4.27	0.25	0.00	0.00	34.03
S	20.92	18.86	6.29	0.25	0.00	0.00	46.34
SSW	24.67	14.00	1.52	0.25	0.00	0.00	40.52
SW	33.40	32.03	3.03	0.00	0.00	0.00	68.47
WSW	29.90	29.77	3.28	1.01	0.00	0.00	63.96
W	13.37	7.05	0.76	0.51	0.50	0.00	22.19
WNW	9.40	8.02	1.27	1.52	0.51	0.00	20.71
NW	17.19	16.64	4.26	1.01	0.00	0.00	39.10
NNW	24.17	13.08	3.53	0.00	0.25	0.00	41.03
TOTAL	458.82	276.52	46.53	8.07	1.52	0.00	791.46

TIME DURATION OF CALMS = 4.54 HRS.

TIME IN STABILITY CLASS = 796.00 HRS.

FORM (A)292-12-3546

HOURS AT EACH WIND SPEED AND DIRECTION

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

STABILITY CLASS: G

WIND DIRECTION	WIND SPEED - MPH 0.75-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	27.99	13.36	2.78	0.00	0.00	0.00	44.13
NNE	37.87	14.72	0.75	0.00	0.00	0.00	53.34
NE	38.77	23.68	1.26	0.00	0.00	0.00	63.71
ENE	28.22	20.10	0.25	0.00	0.00	0.00	48.57
E	24.31	10.17	0.00	0.00	0.00	0.00	34.49
ESE	21.08	8.57	0.50	0.00	0.00	0.00	30.16
SE	20.15	7.78	0.76	0.50	0.00	0.00	29.20
SSE	29.52	11.62	1.27	0.25	0.00	0.00	42.65
S	55.22	29.07	3.52	0.25	0.00	0.00	88.06
SSW	101.61	53.30	1.01	0.25	0.25	0.00	156.43
SW	124.51	143.04	2.82	0.00	0.00	0.00	269.58
WSW	84.03	99.73	4.29	0.00	0.00	0.00	188.04
W	29.65	17.83	1.25	0.50	0.00	0.00	49.23
WNW	18.93	12.17	0.51	2.01	0.00	0.00	33.62
NW	18.13	11.27	2.26	0.50	0.00	0.00	32.16
NNW	23.14	11.72	1.00	0.25	0.00	0.00	36.11
TOTAL	683.14	488.13	23.44	4.53	0.25	0.00	1199.49

TIME DURATION OF CALMS = 8.17 HRS.

TIME IN STABILITY CLASS = 1207.66 HRS.

FORM (A)292-12-8546

HOURS AT EACH WIND SPEED AND DIRECTION

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

STABILITY CLASS: TOTAL - ALL CLASSES

WIND DIRECTION	WIND SPEED - MPH 0.75-3	4-7	8-12	13-18	19-24	24	TOTAL
N	91.01	97.90	57.54	24.18	6.56	1.52	278.72
NNE	134.26	122.10	50.73	22.19	3.78	0.25	341.32
NE	128.60	170.98	53.14	15.90	0.76	0.00	369.37
ENE	201.20	179.72	42.19	3.49	0.00	0.00	426.59
E	98.57	134.92	20.76	1.26	0.00	0.00	255.45
ESE	82.18	124.95	36.16	2.77	0.25	0.00	246.33
SE	80.26	99.60	29.26	4.28	0.00	0.25	213.64
SSE	104.95	123.82	31.22	3.03	0.00	0.25	263.28
S	141.26	147.99	32.78	3.43	0.25	0.00	325.71
SSW	183.55	138.23	10.00	3.27	0.50	0.25	335.89
SW	204.39	231.77	12.99	1.51	0.25	0.00	450.83
WSW	151.28	167.35	18.13	6.31	0.25	0.25	343.57
W	61.47	35.46	8.57	4.80	1.76	0.25	112.31
WNW	40.19	26.00	6.56	11.10	4.79	1.51	90.14
NW	53.02	45.78	17.60	8.33	3.02	0.51	128.25
NNW	69.19	59.45	24.47	7.81	1.00	0.00	161.92
TOTAL	1825.38	1906.03	459.23	123.64	23.18	5.05	4342.51

TIME DURATION OF CALMS = 20.29 HRS.

TIME IN STABILITY CLASS = 4362.79 HRS.

LOST TIME ALL CLASSES = 53.21 HRS.

PROBABILITY WITHIN STABILITY CLASS FREQUENCY DISTRIBUTION

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

STABILITY CLASS: A

WIND DIRECTION	WIND SPEED - MPH 0.75-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	3.288E-03	2.488E-02	1.031E-02	1.409E-03	0.000E+00	0.000E+00	3.961E-02
NNE	5.188E-03	3.037E-02	1.720E-02	3.382E-03	0.000E+00	0.000E+00	5.605E-02
NE	6.892E-03	6.089E-02	2.469E-02	3.311E-03	0.000E+00	0.000E+00	9.499E-02
ENE	6.559E-03	9.942E-02	3.482E-02	8.530E-04	0.000E+00	0.000E+00	1.417E-01
E	7.032E-03	9.900E-02	1.489E-02	4.660E-04	0.000E+00	0.000E+00	1.206E-01
ESE	1.115E-02	7.697E-02	1.876E-02	4.722E-04	0.000E+00	0.000E+00	1.065E-01
SE	1.031E-02	5.783E-02	1.124E-02	1.397E-03	0.000E+00	0.000E+00	8.078E-02
SSE	1.354E-02	5.364E-02	2.103E-02	4.701E-04	0.000E+00	0.000E+00	1.287E-01
S	1.452E-02	7.579E-02	1.595E-02	2.621E-03	0.000E+00	0.000E+00	1.082E-01
SSW	1.218E-02	2.439E-02	3.729E-03	9.304E-04	0.000E+00	0.000E+00	4.123E-02
SW	4.220E-03	1.448E-02	2.821E-03	4.660E-04	0.000E+00	0.000E+00	2.198E-02
WSW	5.156E-03	1.212E-02	7.490E-03	1.874E-03	0.000E+00	0.000E+00	2.665E-02
W	4.650E-04	3.280E-03	2.815E-03	1.409E-03	0.000E+00	0.000E+00	7.969E-03
WNW	4.650E-04	9.423E-04	0.000E+00	9.377E-04	4.706E-04	0.000E+00	2.816E-03
NW	1.402E-03	3.274E-03	1.408E-03	3.755E-03	1.659E-03	0.000E+00	1.170E-02
NNW	4.717E-04	5.616E-03	1.879E-03	4.644E-04	0.000E+00	0.000E+00	8.431E-03
TOTAL	1.020E-01	6.812E-01	1.882E-01	2.414E-02	2.330E-03	0.000E+00	9.979E-01

PROBABILITY OF CALM WITHIN STABILITY CLASS = 2.407E-03

FORM (A)292-12-3546

PROBABILITY WITHIN STABILITY CLASS FREQUENCY DISTRIBUTION

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

STABILITY CLASS: B

WIND DIRECTION	WIND SPEED - MPH 0.75-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	1.286E-02	2.093E-02	3.707E-02	8.661E-03	0.000E+00	0.000E+00	7.892E-02
NNE	1.122E-02	2.425E-02	2.549E-02	3.198E-03	0.000E+00	0.000E+00	6.414E-02
NE	2.064E-02	4.939E-02	2.268E-02	0.000E+00	0.000E+00	0.000E+00	9.264E-02
ENE	2.573E-02	6.744E-02	9.638E-03	1.609E-03	0.000E+00	0.000E+00	1.045E-01
E	1.288E-02	8.213E-02	1.447E-02	0.000E+00	0.000E+00	0.000E+00	1.095E-01
ESE	1.931E-02	4.643E-02	4.849E-03	0.000E+00	0.000E+00	0.000E+00	7.059E-02
SE	2.741E-02	5.317E-02	4.828E-03	1.596E-03	0.000E+00	0.000E+00	8.780E-02
SSE	2.582E-02	5.316E-02	8.000E-03	0.000E+00	0.000E+00	0.000E+00	8.692E-02
S	2.419E-02	4.186E-02	1.596E-03	0.000E+00	0.000E+00	0.000E+00	6.764E-02
SSW	2.089E-02	4.663E-02	3.219E-03	0.000E+00	0.000E+00	0.000E+00	.074E-02
SW	1.766E-02	3.544E-02	4.858E-03	0.000E+00	0.000E+00	0.000E+00	5.796E-02
WSW	9.632E-03	2.098E-02	1.628E-03	1.621E-03	0.000E+00	0.000E+00	4.186E-02
W	3.242E-03	6.463E-03	1.623E-03	3.242E-03	3.192E-03	0.000E+00	1.776E-02
WNW	0.000E+00	1.621E-03	1.630E-03	3.215E-03	4.794E-03	0.000E+00	1.126E-02
NW	0.000E+00	8.066E-03	0.000E+00	3.217E-03	4.813E-03	0.000E+00	1.610E-02
NNW	0.000E+00	9.703E-03	9.666E-03	3.198E-03	0.000E+00	0.000E+00	2.257E-02
TOTAL	2.315E-01	5.756E-01	1.512E-01	2.895E-02	1.280E-02	0.000E+00	1.000E+00

PROBABILITY OF CALM WITHIN STABILITY CLASS = 0.000E+00

PROBABILITY WITHIN STABILITY CLASS FREQUENCY DISTRIBUTION

PERIOD OF REC'D: 87/ 7/ 1 THRU 87/12/31

STABILITY CLASS: C

WIND DIRECTION	WIND SPEED - MPH 0.75-3	4-7	8-12	13-18	19-24	124	TOTAL
N	1.166E-02	1.035E-02	4.422E-02	3.367E-02	1.283E-03	0.000E+00	1.012E-01
NNE	2.456E-02	2.204E-02	3.114E-02	2.588E-03	0.000E+00	0.000E+00	8.033E-02
NE	2.332E-02	5.970E-02	7.867E-03	1.283E-03	1.301E-03	0.000E+00	9.348E-02
ENE	2.058E-02	4.120E-02	3.885E-03	7.752E-03	0.000E+00	0.000E+00	7.342E-02
E	2.455E-02	4.682E-02	6.492E-03	0.000E+00	0.000E+00	0.000E+00	7.787E-02
ESE	1.426E-02	7.545E-02	1.553E-02	3.862E-03	0.000E+00	0.000E+00	1.091E-01
SE	1.814E-02	5.315E-02	1.036E-02	0.000E+00	0.000E+00	0.000E+00	8.165E-02
SSE	2.338E-02	4.659E-02	2.605E-03	0.000E+00	0.000E+00	0.000E+00	7.257E-02
S	3.474E-02	3.497E-02	2.861E-03	0.000E+00	0.000E+00	0.000E+00	7.257E-02
SSW	2.584E-02	4.005E-02	3.867E-03	1.265E-03	0.000E+00	0.000E+00	7.102E-02
SW	1.810E-02	3.228E-02	2.586E-03	2.585E-03	0.000E+00	0.000E+00	5.556E-02
WSW	1.164E-02	2.598E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.762E-02
W	6.475E-03	3.853E-03	2.579E-03	5.174E-03	1.302E-03	0.000E+00	1.938E-02
WNW	3.867E-03	1.284E-03	3.883E-03	3.869E-03	1.304E-03	0.000E+00	1.421E-02
NW	5.156E-03	1.304E-03	5.166E-03	2.585E-03	2.582E-03	0.000E+00	1.679E-02
NNW	1.288E-03	3.872E-03	1.164E-02	3.855E-03	0.000E+00	0.000E+00	2.066E-02
TOTAL	2.676E-01	4.989E-01	1.547E-01	6.849E-02	7.772E-03	0.000E+00	9.974E-01

PROBABILITY OF CALM WITHIN STABILITY CLASS = 2.628E-03

FORM (A)292-12-3546

PROBABILITY WITHIN STABILITY CLASS FREQUENCY DISTRIBUTION

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

STABILITY CLASS: D

WIND DIRECTION	WIND SPEED - MPH 0.75-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	1.569E-02	2.619E-02	1.294E-02	9.863E-03	4.926E-03	1.543E-03	7.115E-02
NNE	3.929E-02	3.571E-02	2.029E-02	1.077E-02	4.003E-03	3.057E-04	1.104E-01
NE	3.105E-02	5.288E-02	1.993E-02	1.200E-02	6.155E-04	0.000E+00	1.165E-01
ENE	2.556E-02	4.595E-02	1.934E-02	1.533E-03	0.000E+00	0.000E+00	9.240E-02
E	3.450E-02	2.835E-02	7.706E-03	3.098E-04	0.000E+00	0.000E+00	7.086E-02
ESE	2.273E-02	3.351E-02	1.940E-02	1.850E-03	0.000E+00	0.000E+00	7.758E-02
SE	2.429E-02	2.832E-02	1.540E-02	9.243E-04	0.000E+00	3.058E-04	6.924E-02
SSE	2.098E-02	2.558E-02	8.307E-03	9.263E-04	0.000E+00	3.098E-04	6.410E-02
S	3.217E-02	3.396E-02	9.827E-03	1.233E-03	0.000E+00	0.000E+00	7.720E-02
SSW	2.587E-02	3.353E-02	4.309E-03	2.156E-03	0.000E+00	3.091E-04	6.617E-02
SW	2.452E-02	2.157E-02	1.535E-03	6.139E-04	0.000E+00	0.000E+00	4.824E-02
WSW	1.845E-02	1.539E-02	4.271E-03	3.388E-03	3.057E-04	3.064E-04	4.210E-02
W	1.088E-02	2.764E-03	2.771E-03	6.148E-04	3.101E-04	3.054E-04	1.756E-02
WNW	5.619E-03	1.539E-03	1.843E-03	3.693E-03	2.456E-03	1.235E-03	1.638E-02
NW	6.889E-03	3.687E-03	5.223E-03	1.852E-03	3.098E-04	3.094E-04	1.819E-02
NNW	1.004E-02	1.387E-02	1.324E-02	2.469E-03	6.145E-04	0.000E+00	4.023E-02
TOTAL	3.564E-01	4.028E-01	1.664E-01	5.419E-02	1.354E-02	4.929E-03	9.982E-01

PROBABILITY OF CALM WITHIN STABILITY CLASS = 2.149E-03

PROBABILITY WITHIN STABILITY CLASS FREQUENCY DISTRIBUTION

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

STABILITY CLASS: E

WIND DIRECTION	WIND SPEED - MPH 0.75-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	2.468E-02	3.419E-02	2.548E-02	9.644E-03	3.509E-03	3.912E-04	9.790E-02
NNE	3.032E-02	4.005E-02	2.760E-02	1.476E-02	3.831E-04	0.000E+00	1.131E-01
NE	3.571E-02	4.394E-02	2.569E-02	5.818E-03	0.000E+00	0.000E+00	1.112E-01
ENE	3.152E-02	3.049E-02	5.837E-03	0.000E+00	0.000E+00	0.000E+00	7.585E-02
E	2.519E-02	2.177E-02	4.646E-03	7.764E-04	0.000E+00	0.000E+00	5.238E-02
ESE	2.069E-02	2.641E-02	6.220E-03	3.869E-04	3.904E-04	0.000E+00	5.410E-02
SE	1.795E-02	1.576E-02	6.600E-03	2.324E-03	0.000E+00	0.000E+00	4.264E-02
SSE	2.298E-02	2.298E-02	8.930E-03	2.340E-03	0.000E+00	0.000E+00	5.707E-02
S	3.139E-02	2.839E-02	8.518E-03	7.752E-04	3.865E-04	0.000E+00	6.946E-02
SSW	3.267E-02	2.332E-02	1.157E-03	3.869E-04	3.852E-04	0.000E+00	5.792E-02
SW	2.744E-02	2.988E-02	4.618E-03	3.916E-04	3.912E-04	0.000E+00	6.272E-02
WSW	2.415E-02	1.405E-02	4.278E-03	1.954E-03	0.000E+00	0.000E+00	4.443E-02
W	1.167E-02	7.387E-03	3.103E-03	1.556E-03	3.852E-04	0.000E+00	2.418E-02
WNW	9.620E-03	5.444E-03	3.488E-03	4.271E-03	1.554E-03	7.717E-04	2.516E-02
NW	1.597E-02	1.783E-02	7.763E-03	3.492E-03	7.769E-04	3.912E-04	4.622E-02
NNW	2.027E-02	2.640E-02	6.613E-03	6.212E-03	3.857E-04	0.000E+00	5.996E-02
TOTAL	3.822E-01	3.963E-01	1.505E-01	5.509E-02	8.547E-03	1.554E-03	9.942E-01

PROBABILITY OF CALM WITHIN STABILITY CLASS = 6.167E-03

FORM (A)292-12-3546

PROBABILITY WITHIN STABILITY CLASS FREQUENCY DISTRIBUTION

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

STABILITY CLASS: F

WIND DIRECTION	WIND SPEED - MPH 0.75-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	3.531E-02	2.794E-02	9.612E-03	1.582E-03	0.000E+00	0.000E+00	7.445E-02
NNE	4.421E-02	3.408E-02	5.171E-03	1.262E-03	3.194E-04	0.000E+00	0.576E-02
NE	3.789E-02	2.927E-02	6.357E-04	3.187E-04	0.000E+00	0.000E+00	6.812E-02
ENE	1.500E-01	3.125E-02	1.587E-03	0.000E+00	0.000E+00	0.000E+00	1.837E-01
E	2.394E-02	1.522E-02	3.184E-04	3.142E-04	0.000E+00	0.000E+00	3.979E-02
ESE	2.167E-02	1.112E-02	2.221E-03	0.000E+00	0.000E+00	0.000E+00	3.501E-02
SE	1.906E-02	1.075E-02	3.490E-03	6.350E-04	0.000E+00	0.000E+00	3.393E-02
SSE	2.630E-02	1.078E-02	5.368E-03	3.142E-04	0.000E+00	0.000E+00	4.277E-02
S	2.619E-02	2.372E-02	7.908E-03	3.146E-04	0.000E+00	0.000E+00	5.824E-02
SSW	3.100E-02	1.770E-02	1.910E-03	3.146E-04	0.000E+00	0.000E+00	5.092E-02
SW	4.198E-02	4.026E-02	3.818E-03	0.000E+00	0.000E+00	0.000E+00	0.695E-02
WSW	3.758E-02	3.741E-02	4.122E-03	1.269E-03	0.000E+00	0.000E+00	8.039E-02
W	1.681E-02	8.861E-03	9.531E-04	6.378E-04	6.343E-04	0.000E+00	2.789E-02
WNW	1.182E-02	1.008E-02	1.591E-03	1.912E-03	6.382E-04	0.000E+00	2.603E-02
NW	2.160E-02	2.092E-02	5.352E-03	1.267E-03	0.000E+00	0.000E+00	4.914E-02
NNW	3.037E-02	1.745E-02	4.437E-03	0.000E+00	3.142E-04	0.000E+00	5.257E-02
TOTAL	5.767E-01	3.475E-01	5.849E-02	1.014E-02	1.906E-03	0.000E+00	9.947E-01

PROBABILITY OF CALM WITHIN STABILITY CLASS = 5.711E-03

FORM (A)292-12-3546

PROBABILITY WITHIN STABILITY CLASS FREQUENCY DISTRIBUTION

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

STABILITY CLASS: G

WIND DIRECTION	WIND SPEED - MPH 0.75-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	2.319E-02	1.107E-02	2.366E-03	0.000E+00	0.000E+00	0.000E+00	3.656E-02
NNE	3.138E-02	1.219E-02	6.239E-04	0.000E+00	0.000E+00	0.000E+00	4.419E-02
NE	3.212E-02	1.963E-02	1.046E-03	0.000E+00	0.000E+00	0.000E+00	5.278E-02
ENE	2.338E-02	1.665E-02	2.101E-04	0.000E+00	0.000E+00	0.000E+00	4.024E-02
E	2.014E-02	8.428E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.857E-02
ESE	1.746E-02	7.103E-03	4.179E-04	0.000E+00	0.000E+00	0.000E+00	2.499E-02
SE	1.670E-02	6.448E-03	6.273E-04	4.174E-04	0.000E+00	0.000E+00	2.419E-02
SSE	2.446E-02	9.622E-03	1.049E-03	2.073E-04	0.000E+00	0.000E+00	3.534E-02
S	4.575E-02	2.488E-02	2.913E-03	2.103E-04	0.000E+00	0.000E+00	7.295E-02
SSW	8.418E-02	4.416E-02	8.367E-04	2.101E-04	2.076E-04	0.000E+00	1.296E-01
SW	1.032E-01	1.185E-01	1.677E-03	0.000E+00	0.000E+00	0.000E+00	2.233E-01
WSW	6.961E-02	8.262E-02	3.551E-03	0.000E+00	0.000E+00	0.000E+00	1.558E-01
W	2.457E-02	1.477E-02	1.038E-03	4.142E-04	0.000E+00	0.000E+00	4.079E-02
WNW	1.568E-02	1.009E-02	4.184E-04	1.669E-03	0.000E+00	0.000E+00	2.785E-02
NW	1.502E-02	9.333E-03	1.672E-03	4.174E-04	0.000E+00	0.000E+00	2.664E-02
NNW	1.917E-02	9.711E-03	8.287E-04	2.078E-04	0.000E+00	0.000E+00	2.992E-02
TOTAL	5.659E-01	4.034E-01	1.941E-02	3.753E-03	2.076E-04	0.000E+00	9.937E-01

PROBABILITY OF CALM WITHIN STABILITY CLASS = 6.768E-03

FORM (A)292-12 3546

PROBABILITY WITHIN STABILITY CLASS FREQUENCY DISTRIBUTION

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

STABILITY CLASS: TOTAL

WIND DIRECTION	WIND SPEED - MPH 0.75-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	2.008E-02	2.246E-02	1.320E-02	5.549E-03	1.506E-03	3.485E-04	6.395E-02
NNE	3.081E-02	2.802E-02	1.348E-02	5.092E-03	8.681E-04	5.749E-05	7.832E-02
NE	2.951E-02	3.923E-02	1.219E-02	3.648E-03	1.739E-04	0.000E+00	8.475E-02
ENE	4.617E-02	4.124E-02	9.681E-03	7.979E-04	0.000E+00	0.000E+00	9.788E-02
E	2.262E-02	3.096E-02	4.750E-03	2.900E-04	0.000E+00	0.000E+00	5.861E-02
ESE	1.886E-02	2.867E-02	8.298E-03	6.365E-04	5.813E-05	0.000E+00	5.652E-02
SE	1.842E-02	2.285E-02	6.714E-03	9.814E-04	0.000E+00	5.736E-05	4.902E-02
SSE	2.408E-02	2.841E-02	7.164E-03	6.954E-04	0.000E+00	5.826E-05	6.041E-02
S	3.241E-02	3.396E-02	7.522E-03	7.868E-04	5.755E-05	0.000E+00	7.474E-02
SSW	4.212E-02	3.172E-02	2.312E-03	7.501E-04	1.149E-04	5.813E-05	7.707E-02
SW	4.690E-02	5.310E-02	2.775E-03	3.469E-04	5.826E-05	0.000E+00	1.033E-01
WSW	3.471E-02	3.840E-02	4.160E-03	1.448E-03	5.749E-05	5.762E-05	7.883E-02
W	1.410E-02	8.137E-03	1.966E-03	1.100E-03	4.045E-04	5.743E-05	2.577E-02
WNW	9.221E-03	5.965E-03	1.504E-03	2.546E-03	1.098E-03	3.472E-04	2.068E-02
NW	1.217E-02	1.050E-02	4.039E-03	1.910E-03	6.921E-04	1.164E-04	2.943E-02
NNW	1.588E-02	1.364E-02	5.615E-03	1.792E-03	2.303E-04	0.000E+00	3.715E-02
TOTAL	4.180E-01	4.373E-01	1.054E-01	2.837E-02	5.320E-03	1.150E-03	9.964E-01

PROBABILITY OF CALM WITHIN STABILITY CLASS = 4.654E-03

OVERALL PROBABILITY OF CONDITION OCCURRENCE

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

STABILITY CLASS: A

WIND DIRECTION	WIND SPEED - MPH 0.75-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	4.061E-04	3.063E-03	1.273E-03	1.746E-04	0.000E+00	0.000E+00	4.917E-03
NNE	6.397E-04	3.751E-03	2.123E-03	4.079E-04	0.000E+00	0.000E+00	6.923E-03
NE	7.524E-04	7.521E-03	3.049E-03	4.089E-04	0.000E+00	0.000E+00	1.173E-02
ENE	8.181E-04	1.228E-02	4.300E-03	1.054E-04	0.000E+00	0.000E+00	1.750E-02
E	9.685E-04	1.223E-02	1.240E-03	3.755E-05	0.000E+00	0.000E+00	1.409E-02
ESE	1.377E-03	9.395E-03	2.317E-03	5.832E-05	0.000E+00	0.000E+00	1.315E-02
SE	1.274E-03	7.142E-03	1.388E-03	1.725E-04	0.000E+00	0.000E+00	9.977E-03
SSE	1.673E-03	1.157E-02	2.598E-03	5.806E-05	0.000E+00	0.000E+00	1.589E-02
S	1.794E-03	9.274E-03	1.978E-03	3.237E-04	0.000E+00	0.000E+00	1.336E-02
SSW	1.505E-03	3.012E-03	4.606E-04	1.149E-04	0.000E+00	0.000E+00	5.093E-03
SW	5.212E-04	1.788E-03	3.484E-04	5.754E-05	0.000E+00	0.000E+00	2.715E-03
WSW	6.369E-04	1.498E-03	9.251E-04	2.315E-04	0.000E+00	0.000E+00	3.291E-03
W	5.743E-05	4.051E-04	3.477E-04	1.741E-04	0.000E+00	0.000E+00	9.843E-04
WNW	5.743E-05	1.164E-04	0.000E+00	1.158E-04	5.813E-05	0.000E+00	3.478E-04
NW	1.732E-04	4.044E-04	1.739E-04	4.630E-04	2.296E-04	0.000E+00	1.445E-03
NNW	5.826E-05	6.937E-04	2.321E-04	5.736E-05	0.000E+00	0.000E+00	1.041E-03
TOTAL	1.260E-02	8.414E-02	2.325E-02	2.901E-03	2.879E-04	0.000E+00	1.233E-01

OVERALL PROBABILITY OF CALM OCCURRENCE = 2.973E-04

OVERALL PROBABILITY OF CONDITION OCCURRENCE

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

STABILITY CLASS: D

WIND DIRECTION	WIND SPEED - MPH 0.75-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	4.622E-04	7.521E-04	1.332E-03	2.897E-04	0.000E+00	0.000E+00	2.836E-03
NNE	4.031E-04	8.714E-04	9.159E-04	1.149E-04	0.000E+00	0.000E+00	2.305E-03
NE	7.419E-04	1.775E-03	8.121E-04	0.000E+00	0.000E+00	0.000E+00	3.329E-03
ENE	9.248E-04	2.424E-03	3.479E-04	5.749E-05	0.000E+00	0.000E+00	3.754E-03
E	4.629E-04	2.952E-03	5.202E-04	0.000E+00	0.000E+00	0.000E+00	3.935E-03
ESE	6.941E-04	1.669E-03	1.743E-04	0.000E+00	0.000E+00	0.000E+00	2.537E-03
SE	9.852E-04	1.911E-03	1.732E-04	5.736E-05	0.000E+00	0.000E+00	3.127E-03
SSE	9.280E-04	1.908E-03	2.875E-04	0.000E+00	0.000E+00	0.000E+00	3.124E-03
S	8.692E-04	1.504E-03	5.736E-05	0.000E+00	0.000E+00	0.000E+00	2.431E-03
SSW	7.507E-04	1.676E-03	1.157E-04	0.000E+00	0.000E+00	0.000E+00	2.542E-03
SW	6.348E-04	1.274E-03	1.746E-04	0.000E+00	0.000E+00	0.000E+00	2.083E-03
WSW	3.462E-04	1.041E-03	5.851E-05	5.826E-05	0.000E+00	0.000E+00	1.504E-03
W	1.165E-04	2.323E-04	5.832E-05	1.165E-04	1.147E-04	0.000E+00	6.383E-04
WNW	0.000E+00	5.826E-05	5.857E-05	1.456E-04	1.723E-04	0.000E+00	4.047E-04
NW	0.000E+00	2.899E-04	0.000E+00	1.156E-04	1.730E-04	0.000E+00	5.785E-04
NNW	0.000E+00	3.487E-04	3.474E-04	1.149E-04	0.000E+00	0.000E+00	8.110E-04
TOTAL	8.326E-03	2.069E-02	5.434E-03	1.040E-03	4.600E-04	0.000E+00	3.594E-02

OVERALL PROBABILITY OF CALM OCCURRENCE = 0.000E+00

FORM (A)292-12-3546

OVERALL PROBABILITY OF CONDITION OCCURRENCE

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

STABILITY CLASS: C

WIND DIRECTION	WIND SPEED - MPH 0.75-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	5.243E-04	4.629E-04	1.978E-03	1.506E-03	5.736E-05	0.000E+00	4.525E-03
NNE	1.699E-03	9.868E-04	1.393E-03	1.157E-04	0.000E+00	0.000E+00	3.593E-03
NE	1.043E-03	2.670E-03	3.519E-04	5.736E-05	5.819E-05	0.000E+00	4.101E-03
ENE	9.286E-04	1.843E-03	1.737E-04	3.467E-04	0.000E+00	0.000E+00	3.284E-03
E	1.998E-03	2.074E-03	2.904E-04	0.000E+00	0.000E+00	0.000E+00	3.483E-03
ESE	6.379E-04	3.375E-03	6.947E-04	1.727E-04	0.000E+00	0.000E+00	4.880E-03
SE	8.112E-04	2.377E-03	4.636E-04	0.000E+00	0.000E+00	0.000E+00	3.652E-03
SSE	1.846E-03	2.084E-03	1.165E-04	0.000E+00	0.000E+00	0.000E+00	3.246E-03
S	1.554E-03	1.564E-03	1.280E-04	0.000E+00	0.000E+00	0.000E+00	3.246E-03
SSW	1.156E-03	1.791E-03	1.730E-04	5.660E-05	0.000E+00	0.000E+00	3.177E-03
SW	8.097E-04	1.444E-03	1.157E-04	1.156E-04	0.000E+00	0.000E+00	2.405E-03
WSW	5.207E-04	1.162E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.683E-03
W	2.896E-04	1.723E-04	1.154E-04	2.314E-04	5.826E-05	0.000E+00	9.670E-04
WNW	1.730E-04	5.743E-05	1.737E-04	1.730E-04	5.832E-05	0.000E+00	6.355E-04
NW	2.306E-04	5.832E-05	2.310E-04	1.156E-04	1.155E-04	0.000E+00	7.511E-04
NNW	5.762E-05	1.732E-04	5.207E-04	1.724E-04	0.000E+00	0.000E+00	9.239E-04
TOTAL	1.197E-02	2.231E-02	6.919E-03	3.063E-03	3.476E-04	0.000E+00	4.461E-02

OVERALL PROBABILITY OF CALM OCCURRENCE = 1.175E-04

FORM (A)292-12-3546

OVERALL PROBABILITY OF CONDITION OCCURRENCE

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

STABILITY CLASS: D

WIND DIRECTION	WIND SPEED - MPH 0.75-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	2.950E-03	4.926E-03	2.433E-03	1.855E-03	9.264E-04	2.902E-04	1.330E-02
NNE	7.389E-03	6.715E-03	3.815E-03	2.025E-03	7.527E-04	5.749E-05	2.075E-02
NE	5.839E-03	9.944E-03	3.798E-03	2.257E-03	1.157E-04	0.000E+00	2.196E-02
ENE	4.806E-03	8.641E-03	3.642E-03	2.883E-04	0.000E+00	0.000E+00	1.738E-02
E	6.488E-03	5.330E-03	1.449E-03	5.826E-05	0.000E+00	0.000E+00	1.333E-02
ESE	4.274E-03	6.302E-03	3.664E-03	3.478E-04	0.000E+00	0.000E+00	1.459E-02
SE	4.568E-03	5.327E-03	2.096E-03	1.738E-04	0.000E+00	5.736E-05	1.302E-02
SSE	5.449E-03	4.818E-03	1.562E-03	1.742E-04	0.000E+00	5.826E-05	1.205E-02
S	6.058E-03	6.387E-03	1.848E-03	2.319E-04	0.000E+00	0.000E+00	1.452E-02
SSW	4.865E-03	6.305E-03	8.184E-04	4.054E-04	0.000E+00	5.813E-05	1.244E-02
SW	4.612E-03	4.056E-03	2.887E-04	1.154E-04	0.000E+00	0.000E+00	9.072E-03
WSW	3.470E-03	2.893E-03	8.032E-04	6.356E-04	5.749E-05	5.762E-05	7.918E-03
W	2.031E-03	5.197E-04	5.211E-04	1.156E-04	5.832E-05	5.743E-05	3.303E-03
WNW	1.057E-03	2.894E-04	3.466E-04	6.945E-04	4.618E-04	2.323E-04	3.081E-03
NW	1.201E-03	6.933E-04	2.892E-04	3.483E-04	5.826E-05	5.819E-05	3.421E-03
NNW	1.887E-03	2.600E-03	2.490E-03	4.644E-04	1.156E-04	0.000E+00	7.566E-03
TOTAL	6.702E-02	7.575E-02	3.130E-02	1.819E-02	2.546E-03	9.269E-04	1.877E-01

OVERALL PROBABILITY OF CALM OCCURRENCE = 4.042E-04

FORM (A)292-12-3548

OVERALL PROBABILITY OF CONDITION OCCURRENCE

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

STABILITY CLASS: E

WIND DIRECTION	WIND SPEED - MPH 0.75-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	3.676E-03	5.091E-03	3.794E-03	1.436E-03	5.225E-04	5.826E-05	1.453E-02
NNE	4.515E-03	5.964E-03	4.111E-03	2.198E-03	5.704E-05	0.000E+00	1.684E-02
NE	5.317E-03	6.542E-03	3.826E-03	8.663E-04	0.000E+00	0.000E+00	1.655E-02
ENE	4.694E-03	5.731E-03	8.691E-04	0.000E+00	0.000E+00	0.000E+00	1.129E-02
E	3.756E-03	3.242E-03	6.918E-04	1.156E-04	0.000E+00	0.000E+00	7.000E-03
ESE	3.081E-03	3.933E-03	9.262E-04	5.762E-05	5.813E-05	0.000E+00	8.056E-03
SE	2.673E-03	2.347E-03	9.828E-04	3.461E-04	0.000E+00	0.000E+00	6.349E-03
SSE	3.410E-03	3.409E-03	1.330E-03	3.484E-04	0.000E+00	0.000E+00	8.498E-03
S	4.674E-03	4.227E-03	1.266E-03	1.154E-04	5.755E-05	0.000E+00	1.034E-02
SSW	4.865E-03	3.473E-03	1.723E-04	5.762E-05	5.736E-05	0.000E+00	8.625E-03
SW	4.007E-03	4.449E-03	6.877E-04	5.832E-05	5.826E-05	0.000E+00	9.340E-03
WSW	3.596E-03	2.092E-03	6.376E-04	2.906E-04	0.000E+00	0.000E+00	6.615E-03
W	1.738E-03	1.100E-03	4.621E-04	2.317E-04	5.736E-05	0.000E+00	3.589E-03
WNW	1.434E-03	8.106E-04	5.193E-04	6.368E-04	2.314E-04	1.149E-04	3.746E-03
NW	2.379E-03	2.655E-03	1.156E-03	5.200E-04	1.157E-04	5.826E-05	6.802E-03
NNW	3.018E-03	3.943E-03	9.848E-04	9.250E-04	5.743E-05	0.000E+00	8.928E-03
TOTAL	5.691E-02	5.901E-02	2.242E-02	8.203E-03	1.273E-03	2.314E-04	1.486E-01

OVERALL PROBABILITY OF CALM OCCURRENCE = 9.183E-04

FORM (A)292.12-3546

OVERALL PROBABILITY OF CONDITION OCCURRENCE

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

STABILITY CLASS: F

WIND DIRECTION	WIND SPEED - MPH 0.75-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	6.446E-03	5.102E-03	1.755E-03	2.088E-04	0.000E+00	0.000E+00	1.359E-02
NNE	8.071E-03	6.352E-03	9.441E-04	2.305E-04	5.832E-05	0.000E+00	1.566E-02
NE	6.918E-03	5.344E-03	1.161E-04	5.819E-05	0.000E+00	0.000E+00	1.244E-02
ENE	2.754E-02	5.706E-03	2.897E-04	0.000E+00	0.000E+00	0.000E+00	3.353E-02
E	4.370E-03	2.779E-03	5.813E-05	5.736E-05	0.000E+00	0.000E+00	7.264E-03
ESE	3.956E-03	2.030E-03	4.055E-04	0.000E+00	0.000E+00	0.000E+00	6.392E-03
SE	3.479E-03	1.963E-03	6.372E-04	1.159E-04	0.000E+00	0.000E+00	6.195E-03
SSE	4.802E-03	1.969E-03	9.001E-04	5.736E-05	0.000E+00	0.000E+00	7.808E-03
S	4.000E-03	4.331E-03	1.444E-03	5.743E-05	0.000E+00	0.000E+00	1.063E-02
SSW	5.660E-03	3.231E-03	3.487E-04	5.743E-05	0.000E+00	0.000E+00	9.297E-03
SW	7.665E-03	7.350E-03	6.956E-04	0.000E+00	0.000E+00	0.000E+00	1.571E-02
WSW	6.861E-03	6.831E-03	7.525E-04	2.316E-04	0.000E+00	0.000E+00	1.468E-02
W	3.068E-03	1.618E-03	1.740E-04	1.164E-04	1.158E-04	0.000E+00	5.092E-03
WNW	2.157E-03	1.840E-03	2.904E-04	3.492E-04	1.165E-04	0.000E+00	4.753E-03
NW	3.944E-03	3.819E-03	9.770E-04	2.314E-04	0.000E+00	0.000E+00	8.971E-03
NNW	5.545E-03	3.185E-03	8.101E-04	0.000E+00	5.736E-05	0.000E+00	9.598E-03
TOTAL	1.053E-01	6.345E-02	1.068E-02	1.852E-03	3.480E-04	0.000E+00	1.816E-01

OVERALL PROBABILITY OF CALM OCCURRENCE = 1.043E-03

FORM (A)292-12-3546

OVERALL PROBABILITY OF CONDITION OCCURRENCE

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

STABILITY CLASS G

WIND DIRECTION	WIND SPEED - MPH 0.75-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	6.422E-03	3.065E-03	6.384E-04	0.000E+00	0.000E+00	0.000E+00	1.013E-02
NNE	8.690E-03	3.376E-03	1.728E-04	0.000E+00	0.000E+00	0.000E+00	1.224E-02
NE	8.895E-03	5.434E-03	2.897E-04	0.000E+00	0.000E+00	0.000E+00	1.462E-02
ENE	6.475E-03	4.613E-03	5.819E-05	0.000E+00	0.000E+00	0.000E+00	1.115E-02
E	5.579E-03	2.334E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.913E-03
ESE	4.837E-03	1.967E-03	1.157E-04	0.000E+00	0.000E+00	0.000E+00	6.920E-03
SE	4.625E-03	1.786E-03	1.737E-04	1.156E-04	0.000E+00	0.000E+00	6.700E-03
SSE	6.774E-03	2.665E-03	2.905E-04	5.743E-05	0.000E+00	0.000E+00	9.787E-03
S	1.267E-02	6.670E-03	8.060E-04	5.838E-05	0.000E+00	0.000E+00	2.021E-02
SSW	2.332E-02	1.223E-02	2.317E-04	5.819E-05	5.749E-05	0.000E+00	3.589E-02
SW	2.057E-02	3.282E-02	4.644E-04	0.000E+00	0.000E+00	0.000E+00	6.186E-02
WSW	1.928E-02	2.288E-02	9.835E-04	0.000E+00	0.000E+00	0.000E+00	4.315E-02
W	6.804E-03	4.090E-03	2.876E-04	1.147E-04	0.000E+00	0.000E+00	1.136E-02
WNW	4.343E-03	2.793E-03	1.159E-04	4.622E-04	0.000E+00	0.000E+00	7.714E-03
NW	4.159E-03	2.585E-03	5.186E-04	1.156E-04	0.000E+00	0.000E+00	7.370E-03
NNW	5.389E-03	2.690E-03	2.295E-04	5.755E-05	0.000E+00	0.000E+00	8.286E-03
TOTAL	1.567E-01	1.120E-01	5.377E-03	1.040E-03	5.749E-05	0.000E+00	2.752E-01

OVERALL PROBABILITY OF CALM OCCURRENCE = 1.875E-03

FORM (A)292-12-3546

OVERALL PROBABILITY OF CONDITION OCCURRENCE

PERIOD OF RECORD: 87/ 7/ 1 THRU 97/12/31

STABILITY CLASS: TOTAL

WIND DIRECTION	WIND SPEED - MPH 0.75-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	2.080E-02	2.246E-02	1.328E-02	5.549E-03	1.506E-03	3.485E-04	6.395E-02
NNE	3.081E-02	2.802E-02	1.346E-02	5.092E-03	8.681E-04	5.749E-05	7.832E-02
NE	2.951E-02	3.923E-02	1.219E-02	3.648E-03	1.739E-04	0.000E+00	8.475E-02
ENE	4.617E-02	4.124E-02	9.681E-03	7.979E-04	0.000E+00	0.000E+00	9.788E-02
E	2.262E-02	3.096E-02	4.750E-03	2.988E-04	0.000E+00	0.000E+00	5.861E-02
ESE	1.886E-02	2.867E-02	8.298E-03	6.365E-04	5.813E-05	0.000E+00	5.652E-02
SE	1.842E-02	2.285E-02	6.714E-03	9.014E-04	0.000E+00	5.736E-05	4.902E-02
SSE	2.408E-02	2.841E-02	7.164E-03	6.954E-04	0.000E+00	5.826E-05	6.841E-02
S	3.241E-02	3.396E-02	7.522E-03	7.066E-04	5.755E-05	0.000E+00	7.474E-02
SSW	4.212E-02	3.172E-02	2.312E-03	7.501E-04	1.149E-04	5.813E-05	7.707E-02
SW	4.699E-02	5.313E-02	2.775E-03	3.469E-04	5.826E-05	0.000E+00	1.033E-01
WSW	3.471E-02	3.840E-02	4.168E-03	1.448E-03	5.749E-05	5.762E-05	7.883E-02
W	1.410E-02	8.737E-03	1.966E-03	1.100E-03	4.045E-04	5.743E-05	2.577E-02
WNW	9.221E-03	5.965E-03	1.504E-03	2.546E-03	1.698E-03	3.472E-04	2.068E-02
NW	1.217E-02	1.056E-02	4.039E-03	1.916E-03	6.921E-04	1.164E-04	2.943E-02
NNW	1.588E-02	1.364E-02	5.615E-03	1.792E-03	2.303E-04	0.000E+00	3.715E-02
TOTAL	3.108E-01	4.173E-01	1.054E-01	2.837E-02	5.320E-03	1.150E-03	9.984E-01

OVERALL PROBABILITY OF CALM OCCURRENCE = 4.654E-03

FORM (A1292.12-3546

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

LOST TIME = 53.21 HRS TOTAL TIME = 4416.00 HRS

DATA AVAILABILITY = 98.80 %

NUMBER OF RECORDS IN SELECTED TIME PERIOD =	23887
NUMBER OF OBSERVATIONS TAKEN FROM PRIMARY LOCATION =	23816
NUMBER OF OBSERVATIONS TAKEN FROM THE NOAA TOWER =	11
NUMBER OF OBSERVATIONS TAKEN FROM THE 58M LEVEL =	5
NO. OF OBSERVATIONS WITH NO VALID WIND SPEED/DIR. =	55
NUMBER OF OBSERVATIONS WITH INVALID DELTA TEMP. =	67

DETERMINED ANNUAL AVERAGE X/Q = 2.66247E-06

Public Service™

Public Service
Company of Colorado

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

IE48
1/1

cc w/attachments:

Regional Administrator, Region IV
U. S. Nuclear Regulatory Commission
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