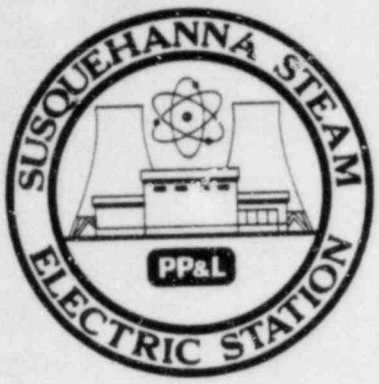



## AVERAGE DAILY UNIT POWER LEVEL

DOCKET NO. 50-387
UNIT One
DATE 01/09/84
COMPLETED BY L.A. Kuczynski
TELEPHONE (717)542-2181

MONTH December, 1983

| DAY | AVERAGE DAILY POWER LEVEL (MWe-Net) | DAY | AVERAGE DAILY POWER LEVEL (MWe-Net) |
|---|---|---|---|
| 1 | 1058 | 17 | 0 |
| 2 | 1021 | 18 | 0 |
| 3 | 36 | 19 | 0 |
| 4 | 0 | 20 | 0 |
| 5 | 0 | 21 | 0 |
| 6 | 0 | 22 | 0 |
| 7 | 0 | 23 | 0 |
| 8 | 0 | 24 | 0 |
| 9 | 0 | 25 | 0 |
| 10 | 0 | 26 | 0 |
| 11 | 0 | 27 | 0 |
| 12 | 0 | 28 | 0 |
| 13 | 0 | 29 | 0 |
| 14 | 0 | 30 | 0 |
| 15 | 0 | 31 | 0 |
| 16 | 0 | | |

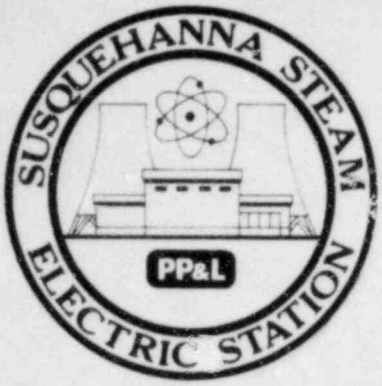
**INSTRUCTIONS**

On this format, list the average daily unit power level in MWe-Net for each day in the reporting month. Compute to the nearest whole megawatt.

(9/77)



IE24




## OPERATING DATA REPORT

DOCKET NO. 50-387
DATE 01/09/84
COMPLETED BY L.A. Kuczynski
TELEPHONE (717)542-2181

### OPERATING STATUS

1. Unit Name: Unit 1 Susquehanna Steam Electric Station
2. Reporting Period: December, 1983
3. Licensed Thermal Power (MWt): 3293
4. Nameplate Rating (Gross MWe): 1152
5. Design Electrical Rating (Net MWe): 1065
6. Maximum Dependable Capacity (Gross MWe): 1068
7. Maximum Dependable Capacity (Net MWe): 1032
8. If Changes Occur in Capacity Ratings (Items Number 3 Through 7) Since Last Report, Give Reasons:

None

Notes

9. Power Level To Which Restricted, If Any (Net MWe): None
10. Reasons For Restrictions, If Any: None

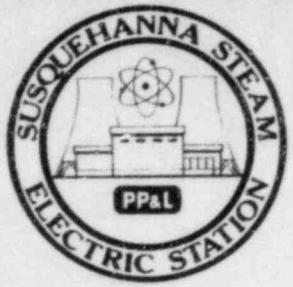
| | This Month | Yr.-to-Date | Cumulative |
|---|---|---|---|
| 11. Hours In Reporting Period | 744 | 4,969 | 4,969 |
| 12. Number Of Hours Reactor Was Critical | 51.8 | 3,845.3 | 3,845.3 |
| 13. Reactor Reserve Shutdown Hours | 0 | 156.7 | 156.7 |
| 14. Hours Generator On-Line | 51.8 | 3,768.3 | 3,768.3 |
| 15. Unit Reserve Shutdown Hours | 0 | 0 | 0 |
| 16. Gross Thermal Energy Generated (MWH) | 163,960 | 11,251,818 | 11,251,818 |
| 17. Gross Electrical Energy Generated (MWH) | 52,900 | 3,666,550 | 3,666,550 |
| 18. Net Electrical Energy Generated (MWH) | 50,757 | 3,536,373 | 3,536,373 |
| 19. Unit Service Factor | 7.0 | 75.8 | 75.8 |
| 20. Unit Availability Factor | 7.0 | 75.8 | 75.8 |
| 21. Unit Capacity Factor (Using MDC Net) | 6.6 | 69.0 | 69.0 |
| 22. Unit Capacity Factor (Using DER Net) | 6.4 | 66.8 | 66.8 |
| 23. Unit Forced Outage Rate | 0 | 12.0 | 12.0 |

24. Shutdowns Scheduled Over Next 6 Months (Type, Date, and Duration of Each):

None

25. If Shut Down At End Of Report Period, Estimated Date of Startup: 7 February 1984
26. Units In Test Status (Prior to Commercial Operation):

| | Forecast | Achieved |
|---|---|---|
| INITIAL CRITICALITY | | |
| INITIAL ELECTRICITY | | |
| COMMERCIAL OPERATION | | |




## UNIT SHUTDOWNS AND POWER REDUCTIONS

**REPORT MONTH** December, 1983

**DOCKET NO.** 50-387
**UNIT NAME** One
**DATE** 01/09/84
**COMPLETED BY** L.A. Kuczynski
**TELEPHONE** (717)542-2181

| No. | Date | Type[1] | Duration (Hours) | Reason[2] | Method of Shutting Down Reactor[3] | Licensee Event Report # | System Code[4] | Component Code[5] | Cause & Corrective Action to Prevent Recurrence |
|---|---|---|---|---|---|---|---|---|---|
| 20 | 831203 | S | 692.2 | H | 2 | N/A | ZZ | ZZZZZZ | Manual scram of reactor from a reactor power level of 33 percent to commence tie-in outage.<br>No action required to prevent recurrence.<br>This was a scheduled event. |

1
F: Forced
S: Scheduled

2
Reason:
A-Equipment Failure (Explain)
B-Maintenance or Test
C-Refueling
D-Regulatory Restriction
E-Operator Training & License Examination
F-Administrative
G-Operational Error (Explain)
H-Other (Explain)

3
Method:
1-Manual
2-Manual Scram.
3-Automatic Scram
4-Other (Explain)

4
Exhibit G - Instructions for Preparation of Data Entry Sheets for Licensee Event Report (LER) File (NUREG-0161)

5
Exhibit I - Same Source

(9/77)

SUSQUEHANNA STEAM ELECTRIC STATION

Docket Number 50-387 Date 01-09-84
Completed By L.A. Kuczynski Telephone (717)542-2181

Challanges to Main Steam Safety Relief Valves

None

Changes to the Offsite Dose Calculation Manual

See Attachment

Major Changes to Radioactive Waste Treatment Systems

None

Diesel Generator Unit Failures

During the performance of Surveillance Test Procedure SO-24-005, "Eighteen Month Test Diesel Generator Air Start Operability, ESW Automatic Initiation, Auto Start and Twenty-Four Hour Diesel Operability Run", Diesel Generator 'C' tripped due to a generator over excitation alarm/trip. The cause of the trip was determined to be related to Startup Transformer Tap changes that increased plant voltage during the test. The test was classified as non-valid in accordance with Regulatory Guide 1.108, Section c.2.e.(2) in that the trip was caused by a condition bypassed during emergency operation. There have been no failures in the last 100 valid test. A followup diesel surveillance test was conducted after the trip; diesel tripping logic and relay operation were found to be operational. The generator's field current was determined to be within its specified values. The generator protective relay settings are being evaluated and any necessary changes will be implemented.

The current surveillance frequency remains 31 days in compliance with Technical Specification Table 4.8.1.1.2-1 and Section c.2.d of Regulatory Guide 1.108.

ATTACHMENT TO

December, 1983, Monthly Operating Report

Change to tne

Offsite Dose Calculation Manual

These revised pages were made effective on October 25, 1983 upon signature by the Manager-Nuclear Support.

Changes have been denoted by revision bars in the right margin. The reasons for the changes are as follows:

Clarify that actual MPC values for identified mixtures can be used for liquid radwaste monitor setpoint determination in lieu of using the MPC for an unidentified mix (p.8).

To clarify setpoint methodology for the liquid radwaste effluent monitor (pp.8,8b).

To include methodology for cooling tower blowdown line and LRW discharge line and LRW discharge line flow rate setpoints (p.8b).

To reflect the fact that the SSES vent monitors use calibration factors to convert count rate to activity, therefore, setpoints are input as uCi/cc (p.11).

To correct SSES Tech. Spec. table number references (pp.14,17,22).

To clarify the frequency of analysis for several Radiological Environmental Monitoring Program (REMP) sample types (pp.41,42).

To update REMP sampling location descriptions and designations (pp.41,42,43,45).

To provide sample calculations for the updated LRW monitor setpoint methodology (p.A1,A2).

PENNSYLVANIA POWER & LIGHT COMPANY
SUSQUEHANNA STEAM ELECTRIC STATION
OFFSITE DOSE CALCULATION MANUAL

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Prepared By Thomas E. Widmer Date 10/25/83

Reviewed By Kenneth E. Shank Date 10/25/83

PORC Review Required Yes ( ) No (✓) Date

Approved By [signature] Date 10/25/83
Manager-Nuclear Support

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TABLE OF CONTENTS

# LIST OF TABLES

LIST OF FIGURES

f = the flow setpoints as measured at the radiation monitor location, in volume per unit time but in the same units as F.

F = the dilution water flow setpoint as measured prior to the release point, in volume per unit time.

Radioactive liquid effluents from the SSES are only discharged as batch releases and are discharged through the liquid radwaste effluent line. The radioactive liquid waste stream is diluted in the plant discharge (cooling tower blow-down) line prior to entering the Susquehanna River. The limiting batch release concentration (c) corresponding to the liquid radwaste effluent line monitor setpoint is calculated from the above expression. The MPC value used for the liquid effluent concentration limit (C) in the above expression for the liquid radwaste effluent line monitor setpoints is $1 \times 10^{-7}$ μCi/ml or the actual MPC for identified mixtures. Therefore, the expression for determining the setpoint on the liquid radwaste effluent line monitor becomes:

$$c \leq (1 \times 10^{-7}) \frac{F + f}{f} \quad (\mu Ci/ml) \qquad (2)$$

In order to prevent spurious isolations by the LRW effluent radiation monitor, the setpoint concentration, c, can be defined as:

$c = X \cdot (A)$
where (A) is the actual tank activity, and $X \geq 1$

The setpoint dilution factor must then be some factor, Y (where $Y > X$), times the minimum dilution factor.

$$\left(\frac{F + f'}{f}\right)_M = \frac{(A)}{MPC}$$

where $\left(\frac{F + f'}{f}\right)_M$ = the minimum dilution factor

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$$\frac{F + f}{f} = \frac{Y \cdot (A)}{MPC}$$

where $\frac{F + f}{f}$ = the setpoint dilution factor

The requirements of Equation (2) are then met as follows:

$$Y \cdot (A) = MPC\left(\frac{F + f}{f}\right)$$

Since, by definition, Y > X and Y(A) > X(A), then

$$(c) = X(A) < MPC\left(\frac{F + f}{f}\right)$$

The setpoint concentration (c) can then be converted to a setpoint count rate value by use of the monitor calibration factor.

$$\text{Setpoint (cpm)} = \frac{c\ (\mu Ci/ml)}{\text{Cal. Factor } (\mu Ci/ml \text{ per cpm})} \qquad (3)$$

The setpoint for the dilution water flow (cooling tower blowdown) is 5000 gpm from either cooling tower basin. The setpoint for the LRW discharge flow can then be determined from:

$$\frac{F + f}{f} = \frac{(A)}{MPC} \cdot Y .$$

Sample calculations for determining the release concentration limits and setpoints are given in Section A.1.1 of Appendix A.

## 2.2 GASEOUS EFFLUENT MONITORS

SPECIFICATION 3.3.7.11 - THE RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION CHANNELS SHOWN IN TABLE 3.3.7.11-1 SHALL BE OPERABLE WITH THEIR ALARM/TRIP SETPOINTS SET TO ENSURE

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500 = the 10 CFR 20 annual whole body dose limit (mrem/yr) to an individual in an unrestricted area.

$L_i$ = the skin dose factor due to beta emissions for each identified noble gas radionuclide (i) (mrem/yr per $\mu Ci/m^3$) from Table 2.

$M_i$ = the air dose factor due to gamma emissions for each identified noble gas radionuclide (i) (mrad/yr per $\mu Ci/m^3$) from Table 2 (conversion constant of 1.1 converts air dose-mrad to skin dose-mrem).

3000 = the 10 CFR 20 annual skin dose limit (mrem/yr) to an individual in an unrestricted area.

Xenon-135 should be the principal noble gas radionuclide released from the reactor building vents and the standby gas treatment system vent while Xenon-133 should be the principal noble gas radionuclide released from the turbine building vent due to the offgas holdup system. It is appropriate that these noble gas radionuclides be used as the reference isotopes for establishing the particular monitor setpoints. The whole body dose will be the most limiting and the release rate limit is calculated by substituting the appropriate values in Equation 4. After the release rate limit is determined for each vent, the corresponding vent concentration limits can be calculated based on normal vent flow rates:

$$\text{Setpoint}\left(\frac{\mu Ci}{cc}\right) = \frac{Q'_{iv}\ (\mu Ci/sec)}{\text{Flow rate (cc/sec)}} \qquad (6)$$

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## 3.0 LIQUID EFFLUENT CONCENTRATION MEASUREMENTS

SPECIFICATION 3.11.1.1 - THE CONCENTRATION OF RADIOACTIVE MATERIAL RELEASED IN LIQUID EFFLUENTS TO UNRESTRICTED AREAS (SEE FIGURE 5.1.3-1) SHALL BE LIMITED TO THE CONCENTRATIONS SPECIFIED IN 10 CFR PART 20, APPENDIX B, TABLE II, COLUMN 2 FOR RADIONUCLIDES OTHER THAN DISSOLVED OR ENTRAINED NOBLE GASES. FOR DISSOLVED OR ENTRAINED NOBLE GASES, THE CONCENTRATION SHALL BE LIMITED TO THE CONCENTRATIONS SPECIFIED IN TABLE 3.11.1.1-1.*

Liquid batch releases are controlled individually and each batch release is authorized based upon sample analysis and the existing dilution flow in the discharge line. The methods for sampling and analysis of each batch prior to release are given in the applicable plant Procedures. A release rate limit is calculated for each batch based upon analysis, dilution flow and all procedural conditions being met before it is authorized for release. The liquid radwaste effluent stream entering the discharge line is monitored and will automatically be terminated if the pre-selected monitor setpoint is exceeded as described in Section 2.1.

Additional monthly and quarterly analyses shall be performed in accordance with Table 4.11.1.1.1-1 of the SSES Technical Specifications.

A discussion of the method to be used in determining the fraction of the 10 CFR 20 annual concentration limits represented by each batch release is given in Section A.2.1 of Appendix A. Also, summation of these fractions from a series of batch releases within given time periods is described.

*Table 3.11.1.1-1 contains the following Maximum Permissible Concentrations of Dissolved or Entrained Noble Gases Released From the Site to Unrestricted Areas in Liquid Waste:

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| Nuclide | MPC (μCi/ml) |
|---|---|
| Kr-85m | 2E-4 |
| Kr-85 | 5E-4 |
| Kr-87 | 4E-5 |
| Kr-88 | 9E-5 |
| Ar-41 | 7E-5 |
| Xe-133m | 5E-4 |
| Xe-133 | 6E-4 |
| Xe-135m | 2E-4 |
| Xe-135 | 2E-4 |

Computed from Equation 20 of ICRP2 (1959), adjusted for infinite cloud submersion in water, and R = 0.01 rem/week, $\rho_w$ = 1.0 gm/cm$^3$ and $P_w P_T$ = 1.0.

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where:

$K_i$ = the whole body dose factor due to gamma emissions for each identified noble gas radionuclide (i) (mrem/yr per $\mu Ci/m^3$) from Table 2.

$Q'_{iv}$ = the release rate of radionuclide (i) from vent (v) ($\mu Ci/sec$).

$(X/Q)_v$ = the highest calculated annual average relative concentration for any area at or beyond the site boundary in an unrestricted area from vent release point (v) ($sec/m^3$) such as from Table 3.

$D_{wb}$ = the annual whole body dose (mrem/yr).

$L_i$ = the skin dose factor due to the beta emissions for each identified noble gas radionuclide (i) (mrem/yr per $\mu Ci/m^3$) from Table 2.

$M_i$ = the air dose factor due to gamma emissions for each identified noble gas radionuclide (i) (mrad/yr per $\mu Ci/m^3$) from Table 2 (conversion constant of 1.1 converts air dose-mrad to skin dose-mrem).

$D_s$ = the annual skin dose (mrem/yr).

Sample calculations for determining whole body and skin doses from noble gas radionuclides released from the SSES are given in Section A.2.2.1 of Appendix A.

## 4.2 RADIONUCLIDES OTHER THAN NOBLE GASES

The methods for sampling and analysis of continuous ventilation releases for radioiodines, radioactive particulates, and other radionuclides except noble gases are given in the applicable plant Procedures. Additional monthly and quarterly analyses shall be performed in accordance with Table 4.11.2.1.2-1 of the SSES Technical Specifications. The dose rate in unrestricted areas due to radioactive materials released in gaseous effluents may

$C_i$ = the average concentration of radionuclide (i) in undiluted liquid effluent during time period, $\Delta t$, for any liquid effluent batch release (μCi/ml).

$F$ = the discharge line dilution factor for $C_i$ during any liquid effluent batch release. Defined as the ratio of the maximum undiluted liquid radwaste effluent line flow during release to the average flow from the plant discharge line to unrestricted receiving waters.

$A_{i\tau}$ = the composite dose parameter for the total body or any organ ($\tau$) for each identified principal gamma and beta emitter (i) (mrem/hr per μCi/ml) (see Equation 11, Table 5).

$$A_{i\tau} = K_o \left(U_w/D_w + U_f\, BF_i\right) DF_{i\tau} \qquad (11)$$

where:

$k_o$ = conversion factor of $1.1 \times 10^5 = \frac{(10^6\ \text{pCi/}\mu\text{Ci})(10^3\ \text{ml/kg})}{8760\ \text{hr/yr}}$

$U_w$ = a receptor person's water consumption by age group from Regulatory Guide 1.109, Table E-5.

$D_w$ = the dilution factor from the near field area of the release point to potable water intake. (The nearest potable water intake is located at Danville; dilution factor is 321.)

$U_f$ = a receptor person's fish consumption by age group from Regulatory Guide 1.109, Table E-5.

$BF_i$ = the bioaccumulation factor for nuclide (i) in fish (pCi/kg per pCi/l) from Regulatory Guide 1.109, Table A-1.

$DF_{i\tau}$ = the dose conversion factor for nuclide (i) in a receptor person for pre-selected organ ($\tau$) (mrem/pCi) from Regulatory Guide 1.109, Tables E-11, E-12, E-13, and E-14.

The projected quarterly dose contribution from batch releases for which radionuclide concentrations are determined by periodic composite sample analysis, as stated in Table 4.11.1.1.1-1 of the SSES Technical Specification may be approximated by assuming an average concentration based on the previous monthly or quarterly composite analysis.

TABLE 7

OPERATIONAL RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM



| Exposure Pathways and/or Sample | Number of Samples and Locations* | Sampling and Collection Frequency | Type and Frequency of Analysis |
|---|---|---|---|
| Airborne | | | |
| Radioiodine and Particulates | 11S2 (0.43 mi SW - Golomb House)<br>9B1 (1.28 mi S - Transmission Line)<br>5S4 (0.76 mi E - W of Bio Consult)<br>12E1 (4.68 mi WSW- Berwick Hospital)<br>7G1 (13.51 mi SE - PP&L Hazleton Chemical Lab)[a] | Continual sampler operation with sample collection weekly.** | Radioiodine Canister: analyze weekly for I-131<br><br>Particulate Sampler: Analyze for gross beta radioactivity ≥ 24 hours following filter change. Perform gamma isotopic analysis on composite sample (by location) quarterly. |
| Direct Radiation | 1S2 Security Fence - 0.24 mi N<br>1D2 Mocanaqua Substation - 3.97 mi N<br>2S3 Security Fence - 0.22 mi NNE<br>2B3 Luzerne Outerwear - 1.31 mi NNE<br>2F1 St. Adalberts Cemetery - 5.88 mi NNE<br>3S4 Security Fence - 0.30 mi NE<br>3D1 Pond Hill - 3.88 mi NE<br>3F1 Valania Resident (Nanticoke) - 9.10 mi NE<br>3G3 Wilkes-Barre-Horton St. Substation - 15.80 mi NE<br>4S3 Security Fence - 0.23 mi ENE<br>4F1 Pole (#) 46422 N35-197 - 4.75 mi ENE<br>4G1 Mountain Top - Industrial Park - 13.91 mi ENE[a]<br>5S7 Security Fence - 0.22 mi E<br>5E2 Bloss Farm - 4.51 mi E<br>6S4 Security Fence - 0.18 mi ESE<br>6A3 State Police - 0.55 mi ESE | Quarterly | Gamma Dose: Quarterly. |

TABLE 7 (Continued)



| Exposure Pathways and/or Sample | Number of Samples and Locations | Sampling and Collection Frequency | Type and Frequency of Analysis |
|---|---|---|---|
| | 6E1 St. James Church - 4.74 mi ESE | | |
| | 7S3 Security Fence - 0.20 mi SE | | |
| | 7E1 Harwood Transmission Line Pole A2 - 4.22 mi SE | | |
| | 7G1 Hazleton Chemical Lab - 13.51 mi SE[a] | | |
| | 8S2 Security Fence - 0.22 mi SSE | | |
| | 8B2 LaWall Residence - 1.40 mi SSE | | |
| | 8D2 Mowry Residence - 3.95 mi SSE | | |
| | 9S1 Security Fence - 0.26 mi S | | |
| | 9D1 Smith Farm - 3.64 mi S | | |
| | 10S1 Security Fence - 0.43 mi SSW | | |
| | 10D2 Ross Ryman Residence - 3.00 mi SSW | | |
| | 11S3 Security Fence - 0.34 mi SW | | |
| | 11E1 Jacobsen - 4.74 mi SW | | |
| | 12S5 Security Fence - 0.36 mi WSW | | |
| | 12E1 Berwick Hospital - 4.68 mi WSW | | |
| | 12G1 Bloomsburg - 14.57 mi WSW[a] | | |
| | 13S2 Security Fence - 0.38 mi W | | |
| | 13E4 Kessler Farm - 4.10 mi W | | |
| | 14S5 Security Fence - 0.47 mi WNW | | |
| | 14E1 Knouse Farm - 4.11 mi WNW | | |
| | 15S3 Security Fence - 0.34 mi NW | | |
| | 15F1 Zawatski Farm - 5.37 mi NW | | |
| | 16S1 Security Fence - 0.29 mi NNW | | |
| | 16F1 Hidlay Residence (Huntington Mills) - 7.81 mi NNW | | |
| Waterborne | | | |
| Surface | 5S8 Intake area[b] (upstream) | Grab sample over monthly period | Gamma isotopic analysis monthly. Composite tritium analysis quarterly. |
| | 6S5 outfall area[b] (downstream) | | |
| | 6S6 river water intake line | Monthly composite | |
| | 6S7 cooling tower blowdown discharge line | Monthly composite | |
| Drinking | 12H2 Danville Water Co.[d] (Approximately 30 miles downstream) | Monthly composite | Gross beta and gamma isotopic analyses monthly. Composite for tritium analysis quarterly. |

TABLE 7 (Continued)



| Exposure Pathways and/or Sample | Number of Samples and Locations | Sampling and Collection Frequency | Type and Frequency of Analysis |
|---|---|---|---|
| Sediment from Shoreline | 7B Bell Bend - 1.2 mi SE | Semiannually | Gamma isotopic analysis semiannually. |
| Milk*** | 12B2 Shultz Farm - 1.69 mi. WSW<br>13E3 Dent Farm - 4.9 mi. W<br>5E1 Bloss Farm - 4.4 mi. E<br>10G1 Davis Farm - 14 mi. SSW[a] | Semi-monthly when animals are on pasture, monthly otherwise | Gamma isotopic and I-131 analysis of each sample. |
| Fish and Invertebrates | Outfall area<br>2H Falls, Pa.<br>(Approximately 30 mi NNE) | Sample in season.<br>One sample of each of the following species[c]:<br>1. Walleye<br>2. Catfish | Gamma isotopic on edible portions. |
| Food Products | 12B1 Kisner Farm - 1.15 WSW vegetable<br>11D1 Zehner Farm - 4.3 mi SW vegetable<br>7B2 Heller's Farm - 1.5 mi SE fruit<br>2H1 Yalick's Produce - 21 mi NNE[a] vegetable | At time of harvest | Gamma isotopic on edible portions. |

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*The location of samples and equipment were designed using the guidance in the Branch Technical Position to NRC Reg. Guide 4.8, Rev. 1 Nov. 1979, Reg. Guide 4.8 1975 and ORP/SID 72-2 Environmental Radioactivity Surveillance Guide. Therefore, the airborne sampler locations were based upon X/Q and/or D/Q.

**A dust loading study (RMS-TR-81-01) concluded that the assumption of 1 for the transmission correction factor for gross beta analysis of air particulate samples is valid. Air particulate samples need not be weighed to determine a transmission correction factor.

***If a milk sample is unavailable for more than two sampling periods from one or more of the locations, a vegetation sample shall be substituted until a suitable milk location is evaluated. Such an occurrence will be documented in the REMP annual report.

[a] Control sample location.

[b] Temporary locations until compositor is installed in intake and discharge lines; then frequency changes to composite sample collected over one-month period and location changes to 6S6 intake line, 6S7 discharge line. The upstream sample will be taken in the intake line and which is beyond significant influence of the discharges. The downstream sample will be taken in the discharge line.

[c] Other species in the same family could be sampled instead of the stated species if deemed desirable by the biological consultants.

[d] There is no river water intake at Berwick for drinking water. See Susquehanna SES-ER-01, Appendix G, page RAD-3.1. The calculated dose for Danville to the infant thyroid was 0.13 mrem per year. Therefore, there is no need to [illegible] sample over two-week period and perform an I-131 analysis.

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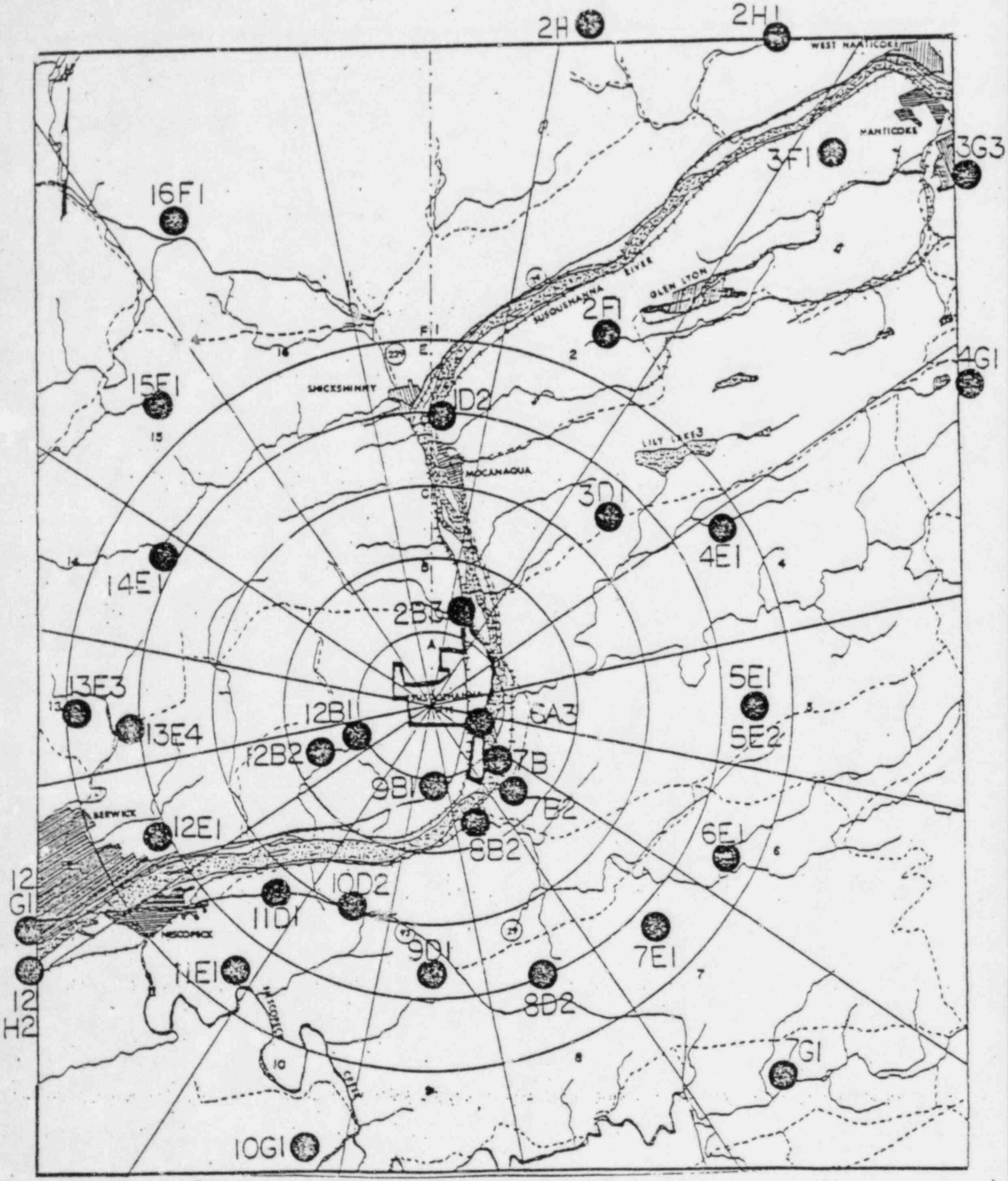


Figure 7. Offsite Environmental Sampling Locations - Susquehanna SES



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APPENDIX A

SAMPLE CALCULATIONS OF ODCM PARAMETERS

## A.1 SETPOINTS

### A.1.1 Liquid Effluent Monitors

For an unidentified mixture with an assumed MPC of 1E-7 µCi/ml, an actual activity of 1E-5 µCi/ml, and a blowdown flow setpoint of 5000 gpm, the setpoint concentration, c, can be determined from $c = X \cdot (A)$. If $X = 3$, then the actual setpoint concentration is:

$$c = X \cdot (A) = 3 \cdot (1E\text{-}5)$$
$$c = 3E\text{-}5 \ \mu Ci/ml$$

The setpoint value for the liquid effluent monitors is then determined by Equation 3 in the ODCM. For the above release conditions, the setpoint value, assuming a typical calibration factor of $1.3 \times 10^{-8}$ µCi/ml per cpm, would be:

$$\text{Setpoint cpm} = \left(\frac{c}{\text{Cal. Factor}}\right) + \text{Background (cpm)}$$

$$\text{Setpoint cpm} = \frac{3E\text{-}5}{1.3 \times 10^{-8}} + \text{Background}$$

$$\text{Setpoint cpm} = 2.3E3 + \text{Background}$$

The LRW discharge flow setpoint is then determined as follows:

$$\left(\frac{F + f}{f}\right) = \frac{Y \cdot (A)}{MPC}$$

where Y is made equal to 10.

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$$\left(\frac{5000 + f}{f}\right) = \frac{10 \cdot (1E-5)}{1E-7}$$

$f = 5$ gpm

For an identified mixture with an actual MPC of 7.22E-7 µCi/ml and the same activity, blowdown flow and X and Y values as above, the LRW discharge monitor setpoint value and LRW discharge flow setpoint become:

Setpoint concentration (c) = 3E-5 µCi/ml

Setpoint value = 2.3E3 cpm + Background

LRW discharge flow setpoint (f) = 36 gpm

A.1.2 Gaseous Effluent Monitors

To determine the total release rate limit ($Q'_{iv}$) for all vents in the SSES, the highest calculated annual average relative concentration $(\chi/Q)_v$ for any sector offsite must be determined. For the SSES site, the critical downwind sector is the West sector with an annual dispersion factor of $2.6 \times 10^{-5}$ sec/m$^3$ (from Table 3). Equation 4 in the ODCM is used to determine the release rate limit for the whole body dose. If the principal noble gas radionuclide released is Xenon-133, the whole body dose factor ($K_i$) from Table 2 would be $2.94 \times 10^2$ mrem/yr per µCi/m$^3$. Substituting these values into Equation 4, the total release rate limit ($Q'_{iv}$) for the whole body dose in Xenon-133 equivalent from all vent releases at the SSES would be $6.5 \times 10^4$ µCi/sec:

Pennsylvania Power & Light Company
Two North Ninth Street • Allentown, PA 18101 • 215 / 770-5151

Bruce D. Kenyon
*Vice President-Nuclear Operations*
215/770-7502

JAN 12 1984

Director, Data Automation &
Management Information Division
Attention: Mr. M. R. Beebe
Management Information Branch
Office of Resource Management
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

SUSQUEHANNA STEAM ELECTRIC STATION
MONTHLY OPERATING REPORT - DECEMBER 1983
ER 100450 FILE 841
PLA-2031 Docket No. 50-387

Dear Mr. Beebe:

The December 1983 monthly operating report for Susquehanna SES Unit 1 is attached.

Very truly yours,

B. D. Kenyon
Vice President-Nuclear Operations

Attachment

cc: Dr. Thomas E. Murley
Regional Administrator-Region I
U.S. Nuclear Regulatory Commission
631 Park Avenue
King of Prussia, PA 19406

Director
Office of Inspection and Enforcement
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555
Attn: Document Control Desk (12 copies)

Mr. G. Rhoads - NRC
Mr. R. Perch - NRC

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Department of Environmental
Resources
Bureau of Radiation Protection
P.O. Box 2063
Harrisburg, PA 17120

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