GEORGIA POWER COMPANY PLANT E.I. HATCH	DOCUMENT TYPE: RADIATION PROTECTION	PAGE 1 OF 6
DOCUMENT TITLE: AIRBORNE RADIOACTIVITY CONCENTRATION DETERMINATION	DOCUMENT NUMBER: 62RP-RAD-009-0S	REVISION NO: 1
EXPIRATION DATE: N/A	APPROVALS: DEPT. MGR. RW Brigdale DATE 11/21/85 GEN. MGR. Jim Howe DATE 11/24/85	EFFECTIVE DATE: MRW 12/2/85

1.0 OBJECTIVE

To establish a method for taking air samples and determining the concentration of airborne radioactivity.

2.0 APPLICABILITY

This procedure applies to HP/Chemistry personnel who would take and/or count an airborne sample.

3.0 REFERENCES

3.1 Helgeson "Determination of Concentrations of Airborne Radioactivity," Health Physics, Vol. 9, 1963, pp. 931-942. TDC #0502.

3.2 60AC-HPX-006-0S Respiratory Protection Program

4.0 REQUIREMENTS

4.1 PERSONNEL REQUIREMENTS

Personnel should be trained in the use of the selected air sampler and the use of the HP Well Counter.

4.2 MATERIAL AND EQUIPMENT

4.2.1 Selected air sampler

4.2.2 Appropriate filter media

4.3 SPECIAL REQUIREMENTS

N/A - not applicable to this procedure

A045 1/1

5.0 PRECAUTIONS/LIMITATIONS

5.1 PRECAUTIONS

N/A - not applicable to this procedure

5.2 LIMITATIONS

N/A - not applicable to this procedure

6.0 PREREQUISITES

N/A - not applicable to this procedure

7.0 PROCEDURE

7.1 GENERAL

Although the plant is designed to operate within the limits set forth for airborne activity by 10 CFR 20, there is a possibility that some event may cause a release of airborne radioactivity to the immediate local plant environment. Such an occurance could be the result of routine operations or maintenance; for example, welding, grinding or opening a system to the atmosphere. In order to increase protection to plant personnel, routine air samples will be taken in conjunction with area radiation surveys and when any operation or maintenance work is being performed on radioactive material on systems where loose radioactive material may be present.

7.2 DATA ANALYSIS

Due to naturally occurring Radon and Thorium gases in the atmosphere and their particulate daughters being carried directly or indirectly on dusts, air samples normally show significant activity from these isotopes alone. Radon daughters, whose longest half-life is 30 minutes, may be considered as completely decayed four hours after completion of sampling. Thoron daughters, whose longest half-life is 10.6 hours, will take approximately 72 hours to be considered completely decayed. It is seen, therefore, that for the measured count rate without regard to the delay time between stopping and counting the sample, will give highly variable results.

NOTE

Where an emergency exists, the concentration of activity of the contaminant is well above normal background trends and can be readily recognized.

7.2.1 Long lived activity can be estimated by counting the sample four hours after sampling (count C_1) and again 24 hours after sampling (count C_2). The estimated long lived activity count rate (C_{LL} in counts/min) may then be determined from the following formula:

$$C_{LL} = \frac{C_2 - 0.271\ C_1}{0.729}$$

The use of this formula imposes a delay in obtaining data on the concentration of activity immediately. Therefore, for routine operations the filter samples will be counted immediately after collection and the air contamination estimated, assuming all counts on the filter are due to the contaminant.

7.2.2 When air samples are taken and the concentrations are used to set stay times for MPC hours for personnel, then if the results are greater than or equal to 2.0×10^{-9} uci/cc, the sample activity should be identified for specific radionuclides. A decay count may be conducted to determine if the sample half-life is < two hours. The sample may also be recounted at four and twenty four hours for further evaluation.

7.3 Install a 2" diameter glass fiber filter, by removing the outer ring and placing the filter paper over the cross-grid support. Where radioiodine or gases are suspected to be present, install a charcoal cartridge in addition to the glass fiber filter.

7.4 Replace the outer ring by threading clockwise until seal is made between the outer ring, filter paper, and the "O" ring seal.

7.5 Carry the unit to the designated air sampling location and plug into a 115 VAC outlet. For locations where 115 VAC is unavailable, a battery operated sampler may be used.

NOTES

- Always try to obtain a breathing zone air sample if possible.
- Do not lay air samplers on the floor.
- Do not tie off air samplers with the power cord. Use a rope to tie off the air sampler.
- Survey the air sampler and cord upon completion of sampling.
- Attach the "HASP" printout to Attachment 2 if needed.
- Air samples drawn with a charcoal shall be drawn at no greater rate than 3 CFM.

7.6 Turn on the air sampler.

7.7 Record the applicable information on an Air Sample Envelope (shown in Attachment 1) or other suitable container.

7.8 Turn off the air sampler after a minimum time of:

15 minutes - Low volume air sampler (Eberline)
15 minutes - Low volume air sampler (Radeco at 3 cfm)

7.9 Remove filter and place in Air Sample Envelope or other suitable container. Take to laboratory for counting.

7.10 Count the charcoal sample for a minimum of 2 minutes and the paper filter for a minimum of 5 minutes and note the total counts on the Portable Air Sample Log shown on Attachment 2.

7.11 Transfer all data from the air sample envelope to the Portable Air Sample Log. Be specific about sample point location.

7.12 Calculate the activity using the appropriate equation and data on Attachment 2.

7.13 If the results of the particulate filter exceeds 25% of the MPC for unidentified air concentrations or 2.0×10^{-9} uCi/cc for all radioactivity, also if the results of the charcoal cartridge exceeds 25% of the MPC for unidentified air concentrations or 2.0×10^{-9} uCi/cc for all radioactivity, the Health Physics Supervisor or his designated alternate should be notified immediately. The particulate filter and charcoal cartridge will be counted together using GeLi detectors to sum the total MPC values and to identify each radionuclide present.

7.14 The results may then be further evaluated as determined necessary by the Health Physics Supervisor, or his designated alternate.

AIR SAMPLE ENVELOPE

AIR SAMPLE

Sample Location: | UNIT NO | Date

Sample Conditions:

Sample Taken By:

Sampler Type: |___| High Volume |___| Planchet |___| Low Volume

Collector: |___| Filter Paper |___| Stack |___| Charcoal

Sample Name _____

Monitor Reading _____

Flow Rate _____

Remarks _____

	Collection Time: Date	Time
ON		
OFF		

TITLE: AIR SAMPLE CALCULATION SHEET

UNIT# DATE / /

SAMPLE NO.	SAMPLE LOCATION	TIME (CST) ON	TIME (CST) OFF	(2) SAMPLE TIME (MIN)	FLOW RATE (CFM OR LPM)	VOLUME (FT OR L)	COLLECTED BY	STAY TIME HOURS
1.	ELEV RWP#							

COUNTING DATA	TIME SCALER (CST)	TOTAL COUNT	MIN CTD	BKG CPM	NET CPM	EFF.	ACTIVITY uCi/cc	CALC BY INIT	MPC RATIO IODINE	MPC INERT GASSES	MPC RATIO PART.	MPC RATIO TOTAL
GROSS BETA												
GROSS IODINE												
GROSS ALPHA												

SAMPLE NO.	SAMPLE LOCATION	TIME (CST) ON	TIME (CST) OFF	(2) SAMPLE TIME (MIN)	FLOW RATE (CFM OR LPM)	VOLUME (FT OR L)	COLLECTED BY	STAY TIME HOURS
2.	ELEV RWP#							

COUNTING DATA	TIME SCALER (CST)	TOTAL COUNT	MIN CTD	BKG CPM	NET CPM	EFF.	ACTIVITY uCi/cc	CALC BY INIT	MPC RATIO IODINE	MPC INERT GASSES	MPC RATIO PART.	MPC RATIO TOTAL
GROSS BETA												
GROSS IODINE												
GROSS ALPHA												

SAMPLE NO.	SAMPLE LOCATION	TIME (CST) ON	TIME (CST) OFF	(2) SAMPLE TIME (MIN)	FLOW RATE (CFM OR LPM)	VOLUME (FT OR L)	COLLECTED BY	STAY TIME HOURS
3.	ELEV RWP#							

COUNTING DATA	TIME SCALER (CST)	TOTAL COUNT	MIN CTD	BKG CPM	NET CPM	EFF.	ACTIVITY uCi/cc	CALC BY INIT	MPC RATIO IODINE	MPC INERT GASSES	MPC RATIO PART.	MPC RATIO TOTAL
GROSS BETA												
GROSS IODINE												
GROSS ALPHA												

SAMPLE NO.	SAMPLE LOCATION	TIME (CST) ON	TIME (CST) OFF	(2) SAMPLE TIME (MIN)	FLOW RATE (CFM OR LPM)	VOLUME (FT OR L)	COLLECTED BY	STAY TIME HOURS
4.	ELEV RWP#							

COUNTING DATA	TIME SCALER (CST)	TOTAL COUNT	MIN CTD	BKG CPM	NET CPM	EFF.	ACTIVITY uCi/cc	CALC BY INIT	MPC RATIO IODINE	MPC INERT GASSES	MPC RATIO PART.	MPC RATIO TOTAL
GROSS BETA												
GROSS IODINE												
GROSS ALPHA												

(2) MINIMUM SAMPLE TIME:

(a) Eberline LV 15 minutes

(b) Radeco: 15 min. at 3 cfm

NOTE: Max. sample rate when using charcoal is 3 cfm.
3 cfm = 85 Lpm

CALCULATIONS FOR DERIVING ACTIVITY IN uCi/cc

LOW VOLUME PARTICULATE

$$\frac{(\text{NET CPM})\ (4.5 \times 10^{-10})}{(\text{VOLUME IN LITERS})\ (\text{EFF})}$$

LOW VOLUME CHARCOAL

$$\frac{(\text{NET CPM})\ (4.5 \times 10^{-10})}{(\text{VOL. IN LITERS})\ (\text{EFF})\ (.999)}$$

Georgia Power Company
Post Office Box 439
Baxley, Georgia 31513
Telephone 912 367-7781
912 537-9444

Georgia Power

Edwin I. Hatch Nuclear Plant

December 5, 1985
LR-ADM-003-1285

PLANT E. I. HATCH
Emergency Implementing Procedures

Docket Nos. 50-321/50-366

Document Control Desk
United States Nuclear Regulatory Commission
Washington, D.C. 20555

Gentlemen:

Pursuant to Appendix E, Section V of 10 CFR 50, please find enclosed two (2) copies of the latest revisions to the Plant E.I. Hatch Emergency Implementing Procedures. Three (3) copies of these procedures are also being forwarded to the Region II office in Atlanta, Georgia.

E. C. Sorrell
Document Control Supervisor

ECS/klm

xc: U.S.N.R.C./Region II w/3
J.P. O'Reilly/GPCo w/0

file

A045
1/1