

ID/10,1P

ASSESSMENT ACTIONS

<u>330-0</u> Assessment Actions	Rev. 10	03-10-82
<u>330-1</u> Abnormal Personnel Exposure	Rev. 3	08-10-81
<u>330-2</u> Accidental Release of Radioactivity Within the Site Boundary	Rev. 2	02-22-81
<u>330-3</u> Procedure Deleted	Rev. 3	01-21-82
<u>330-4</u> Estimation of Off-Site Dose from an Unplanned Release of Radioactive Effluents	Rev. 1	12-17-80
<u>330-5</u> Estimating High Activity Releases during Accident Conditions	Rev. 1	12-17-80
<u>330-6</u> Air Sampling Under Accident Conditions	Rev. 2	03-10-82
<u>330-7</u> In-Plant Iodine-131 Measurement During Post-Accident Conditions	Rev. 4	03-10-82
<u>330-8</u> Sampling, Handling, and Analysis of Post Accident Reactor Coolant Samples	Rev. 2	05-18-81
<u>330-9</u> Estimating Plant Release Using the Stack Gas Monitors	Rev. 1	12-17-80
<u>330-T1</u> Quad-Cities Station Environs Monitoring- Dairy Farms	Rev. 1	06-20-80
<u>330-T2</u> Dose Factors for Gaseous Releases	Rev. 2	03-10-82
<u>330-T3</u> Dose Factors for Liquid Releases	Rev. 1	12-17-80
<u>330-T4</u> Main Chimney Release Rate Table	Rev. 1	12-17-80

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330-T5  
Typical Gas Stack Monitor  
Calibration Curve

Rev. 1 12-17-80

330-T6  
Sample Cave

Rev. 1 05-18-81

330-T7  
Sample Dilution Equipment

Rev. 1 05-18-81

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AIR SAMPLING UNDER ACCIDENT  
CONDITIONS

QEP 330-6  
Revision 2  
February 1982

ID/3C

A. PURPOSE

This procedure outlines the methods by which airborne radioiodine samples and particulate samples are safely obtained under conditions of potentially extremely high radioiodine, noble gas, and particulate airborne concentrations.

B. REFERENCES

1. GY-130 Silver Zeolite Technical Data Sheets.
2. H-809 VII Technical Data Sheets.
3. QRS 200-18.
4. QRP 100-28.

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C. PREREQUISITES

1. Obtain an operable, calibrated, high range exposure rate instrument.
2. Obtain 0-5R and 0-1R direct-reading dosimeters.
3. Obtain finger TLD-rings for both hands.
4. Obtain RADeCO H-809 high volume air sampler with combination cartridge-filter head, 47 mm glass fiber filter paper, and GY-130 Silver Zeolite cartridge.
5. Obtain Self Contained Breathing Apparatus, if necessary.

D. PRECAUTIONS

1. Minimize direct contact between you and the sample.
2. Take care to avoid contaminating the sampling media.
3. Plan all phases of the operation prior to entering any high radiation exposure rate areas.
4. Insure that the instrument has been calibrated.
5. The air sampler should not be used in the variable mode.

E. LIMITATIONS AND ACTIONS

1. Take all appropriate steps to insure that the radiation exposure you receive does not exceed 3 and 18-3/4 Rems to the whole body or extremities, respectively, per quarter.

2. This procedure should only be used in such cases when QRP 100-28, Air Sampling of Suspected Radioactive Airborne Areas, is rendered useless by conditions in the plant.

F. PROCEDURE

1. Use a 47 mm glass fiber particulate filter. Mark the smooth side of the filter paper. This will serve as the inlet side.
2. Use a GY-130 Silver Zeolite cartridge. Draw an arrow on the side of the cartridge pointing in the direction of the flow.
3. Load the filter paper and the cartridge into the combinations sampler head. The particulate filter is supported by the honeycomb backing, and sealed by the outer aluminum ring.
4. Preparation of the sampler should if possible, be performed in a low exposure rate area.
5. To sample, place the VAR-OFF-HI switch in the Hi position.
6. Note the sample start time, and flow rate.
7. The sample time should be selected such that an adequate amount of activity is collected, and personnel radiation exposure is minimized. In areas of suspected extremely high airborne radioactive material concentrations, the sampling time should be limited to avoid sample preparation and analysis problems.

NOTE

A 1 minute sample should be adequate to assess radioiodine concentrations that would require respiratory protective measures, if isotopic analysis is available. If conditions allow, a 5-minute sample should be taken to assure more accurate results for both radioiodine and particulate analysis.

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8. When the sample is completed note the flow rate and time, and turn the sampler off.
9. Return the cartridge and filter paper to the designated area for analysis.
10. The GY-130 silver zeolite cannisters display a low retention for noble gases. Radioiodines of all species should be retained with a high efficiency. The glass fiber particulate filter will be used for the particulate analysis as it has a high efficiency for particulate retention.
11. The batch number of the cannister should be recorded, should specific information on the cannister efficiency be needed.

12. Perform the analysis as specified by QRS 200-18. For particulate analysis.
13. The analysis results should be reported to Radiation Protection supervision promptly.

G. CHECKLISTS

1. None.

H. TECHNICAL SPECIFICATION REFERENCES

1. None.

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IN-PLANT IODINE-131  
MEASUREMENT DURING  
POST-ACCIDENT CONDITIONS

QEP 330-7  
Revision 4  
February 1982

ID/3F

A. PURPOSE

The purpose of this procedure is to outline the methods for measuring I-131 in the plant following an accident, in order to assess the airborne radiological conditions.

B. REFERENCES

1. Quad-Cities Station, Project No. 5954-00 Sargent & Lundy; Post-Accident Radiation Levels, A Review of the Quad-Cities Station in Response to Item 2.1.6.b of NUREG-0578.

C. PREREQUISITES

1. Obtain self-contained breathing apparatus, if necessary.

D. PRECAUTIONS

1. Verify that while performing this procedure, radiation levels are monitored.
2. Measure sample cartridges for radiation level to insure samples are safe to handle.
3. Based upon the analyses of Reference 1, exposure rates under post-accident conditions may severely limit residence time in many plant locations. In particular, the following areas should be carefully assessed prior to I-131 sampling and analysis.
  - a. All of the reactor building.
  - b. Turbine building elevation 639'.
  - c. Turbine building between units, elevation 611'6".
  - d. HPCI access tunnel.

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E. LIMITATIONS AND ACTIONS

1. This procedure is designed for use during a post-accident situation when a "go-no go" decision needs to be made concerning entry into an area where airborne I-131 is present.
2. This procedure assumes a sample volume of 30 ft<sup>3</sup>. If another volume is used, adjust the 4100 net peak area accordingly. A 4100 net peak area for a 30 ft<sup>3</sup> sample is equal to 1 MPC for I-131,  $9 \times 10^{-9}$  uci/cc.

F. PROCEDURE

1. Equipment needed.
  - a. Post-Accident Radionuclide - Analysis Portable System (PARAPS).
  - b. Portable air sampler.
  - c. Silver zeolite cartridge.
  - d. Glass fiber filter paper.
2. Start up of the detection system.
  - a. Turn on the AC line conditioner.
  - b. Turn on the nim bin power supply.
  - c. Turn power on to the detector bias supply.
  - d. Using the 10 turn pot on the bias supply, raise the voltage to 3,000 volts.
  - e. Turn the 11/34 computer power switch to the "DC ON" position.
  - f. Turn on the disc drive and put the RUN/LOAD switch in the run position. The disc ready light should light in a few minutes.
  - g. Turn on the 7050 MCA.
  - h. Turn on the line printer.
3. Proceed with the air sampler and sample media to the area where the sample is to be taken. Place a silver zeolite cartridge in the sample holder, and a glass fiber filter paper in the filter holder. Turn the air sampler on, note the flow rate, sample time, and sample for 10 minutes.
4. Remove cartridge and filter from sampler. Place samples in separate plastic sample bags; label each sample. Place cartridge, in the sample bag on the 10 cm shelf.
5. Steps 6 through 10 is the primary method to determine the samples activity. If either the 11/34 computer or the disc drive is not working, steps 11 through 26 can be used to determine if the area sampled may be entered.
6. Initialize the system using the Automated Analytical Instrumentation System's (AAIS) Central System Procedure (CSP).
7. Set the system prime using the AAIS's CSP.

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8. Log on the sytem using the AAIS's CSP.
9. Determine the iodine activity by running the AAIS's Central Chemical Procedure for iodine radionuclide analysis.
10. If another sample is to be analyzed, repeat step 13.
11. On the Ortec 7050 MCA, depress "LT".
12. Depress "600" on the data entry pad.
13. Depress "ENTER".
14. Depress "STOP".
15. Depress both "ERASE" buttons at the same time.
16. Depress "START". The 7050 MCA will now start a count for 10 minutes.
17. Check the deadtime. If over 30%, stop count. Call a chemist.
18. Observe the MCA screen and find the cursor.
19. Move the cursor to channel 729.
20. Depress horizontal expand button 5 times. If a peak is present, it is Iodine 131.
21. After the count is over depress "SET" on the region of interest pad so that the "SET" light comes on. The cursor will become brighter.
22. Move the cursor to highlight the entire peak. As you highlight each channel it will become brighter.
  - a. If you make a mistake depress "CLEAR" and remove the highlight from the affected channels. Then repeat step 20.
23. Depress "SET" so that the "OFF" light goes on.
24. Depress the "GROSS-NET" button so that "NET" is lit.
25. Observe the net peak area in the upper right hand corner of the screen, second row down. It will say: AREA(N)=\_\_\_\_\_ (net peak area).
  - a. If the net peak area after a ten minute count is less than 4100 counts, it is safe to enter the area without supplied air.
  - b. If the area is greater than 4100 counts, do not enter the area unless supplied air is used.
  - c. If the net peak area exceeds 4,100,000 counts, do not enter the area and contact the Radiation Chemical Supervisor.

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26. If another sample is to be analyzed, repeat steps 14 through 25.

G. CHECKLISTS

1. None.

H. TECHNICAL SPECIFICATION REFERENCES

1. None.

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DOSE FACTORS FOR GASEOUS RELEASES

Total Dose (mrem) = Dose Factor  $\left(\frac{\text{mrem}}{\text{Ci}}\right)$  X Release (Ci) X Distance Correction Factor

Dose Factors (mrem/Ci) (1)

Release Type (Characteristic Radionuclides)	Organ of Interest	Chimney Release	Rx. Bldg. Vent or Ground Level Release
Noble Gases	Whole Body	0.001	0.02
Iodine (2)	Thyroid	8.	355.

Distance Correction Factors

Release Mode	Site Boundary ( $\frac{1}{2}$ mi)	1/2	1 mi	2 mi	5 mi	10 mi
Chimney	1.0	0.4	.07	.04	0.02	0.01
Rx. Bldg. Vent/Ground Level	1.0	0.6	.3	.2	0.07	0.03

(1) Total dose at site boundary for short term release assuming worst case meteorology.

(2) Factors are for inhalation pathway. Milk pathway is significantly higher if contaminated milk is drunk over a two week period.

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