ADVANCED MEDICAL SYSTEMS

OPERATING PROCEDURE

TITLE: Hot Cell Air Samples	Procedure No: ISP - 10
	Revision: A
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1.0 PURPOSE:
To determine the airborne radiation level in the Hot Cell prior to entry so that personnel exposure may be kept ALARA.

2.0 SCOPE:
This procedure is to be followed each time work is to be performed in the Hot Cell.

3.0 EQUIPMENT REQUIRED:
Special tube and filter holder, filter, vacuum pump and flow meter, well counter, survey meter, personal dosimeter, film badge

4.0 REQUIREMENTS & PRECAUTIONS:
4.1 This procedure requires working in a restricted area, the isotope shop area. All applicable safety procedures must be followed.
4.2 The filter paper removed is to be considered contaminated, proper handling procedures must be followed to limit personal exposure ALARA and to prevent the spread of the contamination.

5.0 INSTRUCTIONS:
5.1 Attach the filter to the filter holder and insert through a cell access port into the Hot Cell.
Connect the filter hose to a vacuum pump with flowmeter set to 10 liters/min.
5.2 Turn the pump on and collect a sample for a ten (10) minute period. Then turn the pump off.
5.3 Retrieve the filter from the filter holder and count it in a well counter (see procedure ISP - 4)
Record the activity _____ cpm.
5.4 Calculate the concentration of activity in the Hot cell air as follows:
5.4.1 Formulae

$$\text{Concentration of sample} = \frac{\text{Quantity of Sample}}{\text{Volume of Sample}}$$

$$\text{Quantity of Sample} = \frac{\text{Quantity of Std.}}{\text{Activity of Std.}} \times \text{Activity of Sample}$$

$$\text{Volume of Sample} = \text{Flow rate} \times \text{time}$$

Prepared by	Approval	Revisions
	Howard Kotin 7-20-83	A 7 - 83 Format Change

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5.0 INSTRUCTIONS: cont'd.

5.4.2 Data
Standard source: _____ μ Ci (A) _____ cpm (B)
Sample activity (from 5.3) _____ cpm (C)
Volume of sample = 10 liters min. x 10 min = 100 liters or 10^5 ml.

5.4.3 Actual Calculation
Note: a computer program is available to perform the calculations
Concentration of Sample = $\frac{A \times C}{B \times 10^5 \text{ ml}}$ = _____ μ Ci/ml

5.5 Calculation of stay time based upon air sample data

Stay time = $\frac{\text{elapsed time x concentration of standard}}{\text{Concentration of Sample}}$

Elapsed time = 40 hours
Concentration of Standard = 9×10^{-9} μ Ci/ml
Concentration of Sample (from 5.4.3) = _____ μ Ci/ml (D)

Stay time = $\frac{40\ (9 \times 10^{-9})}{(D)}$ = _____ hrs.

This figure represents the maximum time an individual may work in the Hot Cell. Verification of the calculation shall be made by the RSO.

5.6 Enter the stay time on line 5.1, Procedure ISP - 18

5.7 Sign and Date this form below

DATE:_____ SIGNATURE:_____

AUDITED BY RSO:_____

Prepared by	Approval	Revisions
	Howard Polan 7-20-83	A 7 - 83 Format Change