Repl. Carbon.

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(47)

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FYI
10/20

SUMMARIZED POST ACCIDENT TMI UNIT 2 HVAC ADSORBER SYSTEMS SAMPLE DATA

prepared for

Metropolitan Edison Company
Three Mile Island Nuclear Station
Middletown PA

P.O. 80521

October 1979

DISTRIBUTION

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I. INTRODUCTION

This report is a presentation of the data for the May thru August samples from Exhaust Systems located at the Three Mile Island Unit #2 Nuclear Plant.

The Systems are:

1) Fuel Handling Building "A" Train AHF 10A
2) Fuel Handling Building "B" Train AHF 10B
3) Auxilliary Building "A" Train AHF 14A
4) Auxilliary Building "B" Train AHF 14B
5) Condenser Vacuum Pump
6) Supplementary Filter Train #1 AM-1
7) Supplementary Filter Train #2 AM-2
8) Supplementary Filter Train #3 AM-3
9) Supplementary Filter Train #4 AM-4

For the Fuel Handling Building Trains and the Auxilliary Building Trains, bulk samples have been received. Moisture and pH analysis were performed on these samples per ASTM D2867-D for moisture and ASTM D1293 for pH. Radioiodine removal efficiency tests at 30% RH, 25°C and 95% RH and 25°C were also performed on these samples per RDT M16-1T.

The Condenser Vacuum Pump and Supplementary Filter Train samples were sampling canisters. There was only enough sample to perform a 95% RH, 25°C radioiodine removal efficiency and activity analysis in June & July.

A complete cell has been received each month for the Fuel Handling Train "B", AHF 10B, sample. Core samples are removed per NUCON Report 6MT611/04. Each layer of the core samples are analyzed for moisture and pH per their respective ASTM procedures. A composite sample is also taken and radioiodine removal efficiencies are performed at 30% RH, 25°C and 95% RH, 25°C per RDT M16-1T October 1973.

Activity analyses are performed on all samples on a PGT IGW 7026 #601 Detector, Norland INO-Tech 5400 Analyzer.

II. RESULTS & DISCUSSUION

The results are outlined in the following tables and graphs.

NOTE: The iodine efficiency test data in this report is from NUCON reports 6MT611/05, 06, 07 Rev 1 (which replaces NUCON 6MT611/07), 09 and 011. See these reports for the detailed radioiodine efficiency test parameters and results.

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TMI SAMPLES PROJECT: 6MT611 TABLE I

MONTHLY 95% RH, 25°C, $CH_3{}^{131}I$ REMOVAL EFFICIENCY COMPARISON CHART

SAMPLE/ SYSTEM ID	MAY 1979	JUNE 1979	JULY 1979	AUG 1979	SEPT 1979	OCT 1979	NOV 1979	DEC 1979
AHF 10A Fuel Handling Bldg Train A	98.67	93.30	80.35	82.43				
AHF 10B Fuel Handling Bldg Train B	98.68 NUCON Test Tray S-846-L	91.15 NUCON NUCELL 821-L	85.99 MSA Cell 79-242	82.65 MSA Cell 79-205 Inst 22/6/79				
AHF 14A Aux Bldg Train A	97.87	88.84	94.08	92.16				
AHF 14B Aux Bldg Train B	88.74	95.91	96.54	94.51				
Condenser Vacuum Pump	99.58 Canister 720540	89.00 Canister 720541	85.61 Canister 720544	89.66				
AM-1 Supplementary Filter Train #1	No Sample	70.85	87.95	93.81 Av 4 Samples				
AM-2 Supplementary Filter Train #2	No Sample	81.48	96.23	94.44 Av 4 Samples				
AM-3 Supplementary Filter Train #3	No Sample	96.28	95.69	90.71 Av 4 Samples				
AM-4 Supplementary Filter Train #4	No Sample	99.25	97.17	84.33 Av 4 Samples				

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TMI SAMPLES PROJECT: 6MT611 TABLE II

MONTHLY 30% RH, 25°C, $CH_3{}^{131}I$ REMOVAL EFFICIENCY COMPARISON CHART

SAMPLE/ SYSTEM ID	MAY 1979	JUNE 1979	JULY 1979	AUG 1979	SEPT 1979	OCT 1979	NOV 1979	DEC 1979
AHF 10A Fuel Handling Bldg Train A	99.99	99.99	99.28	99.74				
AHF 10B Fuel Handling Bldg Train B	99.99 NUCON Test Tray S-846-L	99.99 NUCON NUCELL 821-L	99.99 MSA Cell 79-242	99.36 MSA Cell 79-205 Inst 22/6/79				
AHF 14A Aux Bldg Train A	99.99	99.91	99.87	99.66				
AHF 14B Aux Bldg Train B	99.99+	99.99	99.99	99.99				
Condenser Vacuum Pump	Not Enough Sample	Not Enough Sample	Not Enough Sample	Not Enough Sample				
AM-1 Supplementary Filter Train #1	Not Enough Sample	Not Enough Sample	Not Enough Sample	99.76 Av 4 Samples				
AM-2 Supplementary Filter Train #2	Not Enough Sample	Not Enough Sample	Not Enough Sample	99.99 Av 4 Samples				
AM-3 Supplementary Filter Train #3	Not Enough Sample	Not Enough Sample	Not Enough Sample	99.95 Av 4 Samples				
AM-4 Supplementary Filter Train #4	Not Enough Sample	Not Enough Sample	Not Enough Sample	99.91 Av 4 Samples				

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TMI SAMPLES
TABLE III

PROJECT: 6MT611 MONTH SAMPLED MAY 1979

SAMPLE/ SYSTEM ID	95% RH 25°C $CH_3{}^{131}I$	30% RH 25°C $CH_3{}^{131}I$	MOISTURE %	pH	ACTIVITY ci/g
Sampled 25 May 79 Fuel Handling Bldg Train A	98.60	99.99	30.59	9.2	$1.27X10^{-7}$
*Sampled 30May79 S/N Fuel S-846-L Handling Bldg Train B	98.57	99.99	15.06	9.3	$3.25X10^{-10}$
Sampled 18 May 79 Aux Bldg Train A	97.88	99.99	7.6	9.3	$2.57X10^{-6}$
*Sampled 30 May 1979 Aux Bldg Train B	88.74	99.99^{+}	13.17	9.2	$1.33X10^{-6}$
*Sampled 30 May 79 Condenser Vacuum Pump	99.58	Insufficient Sample Size	Insufficient Sample Size	Insufficient Sample Size	$4.89X10^{-9}$
Supplementary Filter Train					
Supplementary Filter Train					
Supplementary Filter Train					
Supplementary Filter Train					

*30 May 1979 is assumed sampling date, since no date was recorded by TMI.

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TMI SAMPLES

TABLE IV

PROJECT: 6MT611 MONTH SAMPLED June

SAMPLE/ SYSTEM ID	95% RH 25°C $CH_3{}^{131}I$	30% RH 25°C $CH_3{}^{131}I$	MOISTURE %	pH	ACTIVITY ci/g
"0" Date 22June 1979 Fuel Handling Bldg Train A	93.30%	99.99%	21.95	9.5	$3.026X10^{-11}$
"0" Date 22June 1979 Fuel Handling Bldg Train B	91.15%	99.99%	25.00 Composite	10.1	$3.67X10^{-11}$
"0" Date 15 June 79 Aux Bldg Train A	88.84%	99.91%	8.23	9.4	$9.19X10^{-11}$
"0" Date 15 June 79 Aux Bldg Train B	95.91%	99.99%	8.70	10.0	$1.223X10^{-11}$
"0"Date 15 June 79 canister S/N 720541 Condenser Vacuum Pump	89.00%	N/A	N/A	N/A	$1.289X10^{-11}$
"0"Date 12June79 AM-1 Supplementary Filter Train #1	70.85%	N/A	N/A	N/A	$4.37X10^{-12}$
"0"Date 12 June79 AM-2 Supplementary Filter Train #2	81.48%	N/A	N/A	N/A	$4.958X10^{-12}$
"0"Date 12June79 AM-3 Supplementary Filter Train #3	96.28%	N/A	N/A	N/A	$1.2754X10^{-12}$
"0"Date 12June79 AM-4 Supplementary Filter Train #4	99.25%	N/A	N/A	N/A	$2.0564X10^{-12}$

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TMI SAMPLES
TABLE V

PROJECT: 6MT611 MONTH SAMPLED July

SAMPLE/ SYSTEM ID	95% RH 25°C $CH_3{}^{131}I$	30% RH 25°C $CH_3{}^{131}I$	MOISTURE %	pH	ACTIVITY ci/g
"0" Date 21 July 79 Fuel Handling Bldg Train A	80.35%	99.28%	20.0	9.0	$1.93X10^{-10}$
"0"Date 21 July79 MSA Cell 79-242 Installed May 79 Fuel Handling Bldg Train B	85.99%	99.99%	23.2 Composite	6.8 Composite	$2.57X10^{-10}$ Composite
"0"Date 25July79 Aux Bldg Train A	94.08%	99.87%	22.8	8.6	$3.59X10^{-10}$
"0"Date 25July79 Aux Bldg Train B	96.54%	99.99%	21.8	9.1	$8.24X10^{-11}$
"0"Date 14July79 Canister 720544 Condenser Vacuum Pump	85.61%	N/A	N/A	N/A	$2.32X10^{-11}$
"0"Date 12July79 AM-1 Supplementary Filter Train #1	87.95%	N/A	N/A	N/A	$1.14X10^{-10}$
"0"Date 12July79 AM-2 Supplementary Filter Train #2	96.23	N/A	N/A	N/A	$1.45X10^{-10}$
"0"Date 12July79 AM-3 Supplementary Filter Train #3	95.69%	N/A	N/A	N/A	$2.69X10^{-10}$
"0"Date 12July79 AM-4 Supplementary Filter Train #4	97.17%	N/A	N/A	N/A	$1.89X10^{-10}$

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TMI SAMPLES
TABLE VI

PROJECT: 6MT611 MONTH SAMPLED AUGUST

SAMPLE/ SYSTEM ID	95% RH 25°C $CH_3{}^{131}I$	30% RH 25°C $CH_3{}^{131}I$	MOISTURE %	pH	ACTIVITY ci/g
Sampled 19 Aug 79 Fuel Handling Bldg Train A	82.43%	99.74%	17.2%	9.12	5.97×10^{-11}
MSA Cell 79-205 Inst: 22/6/79 Fuel Handling Bldg Train B	82.65%	99.36%	18%	7.05	4.12×10^{-10}
Sampled 12 Aug 79 Aux Bldg Train A	92.16%	99.66%	13.2%	8.94	1.62×10^{-10}
Sampled 12 Aug 79 Aux Bldg Train B	94.51%	99.99%	12.4%	9.21	3.73×10^{-11}
Sampled 12 Aug 79 Condenser Vacuum Pump	89.66%	Insufficient Sample Size	Insufficient Sample Size	Insufficient Sample Size	2.58×10^{-11}
#1 Sampled 11 Aug 79 Supplementary Filter Train	93.81%	99.76%	7.6%	7.93	6.63×10^{-11}
#2 Sampled 11 Aug 79 Supplementary Filter Train	94.44%	99.99%	6.8%	7.50	3.29×10^{-11}
#3 Sampled 11 Aug 79 Supplementary Filter Train	90.71%	99.95%	7.6%	7.06	1.04×10^{-10}
#4 Sampled 11 Aug 79 Supplementary Filter Train	84.33%	99.91%	6.4%	6.78	6.14×10^{-11}

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TMI CORE SAMPLES TABLE VII

PROJECT 6MT611 MONTH/YR SAMPLED June 1979

SAMPLE ID AHF 108 NUCON NUCELL 821-L

INLET LAYER	MOISTURE	pH	ACTIVITY ci/g CORE A	CORE B	CORE C	CORE D
1	12.1	9.8	$1.78X10^{-10}$	$1.51X10^{-10}$	$8.61X10^{-11}$	$1.39X10^{-10}$
2	20.2	10.0	$2.80X10^{-11}$	$1.49X10^{-11}$	$1.34X10^{-11}$	$7.22X10^{-12}$
3	20.7	9.9	$9.17X10^{-13}$	$9.4X10^{-13}$	$1.12X10^{-12}$	0
OUTLET 4	18.0	10.1	$1.72X10^{-12}$	0	$8.3X10^{-13}$	$4.58X10^{-13}$

SAMPLE ID _____

INLET LAYER	MOISTURE	pH	ACTIVITY ci/g CORE A	CORE B	CORE C	CORE D
1						
2						
3						
OUTLET 4						

SAMPLE ID _____

INLET LAYER	MOISTURE	pH	ACTVITY ci/g CORE A	CORE B	CORE C	CORE D
1						
2						
3						
OUTLET 4						

SAMPLE ID _____

INLET LAYER	MOISTURE	pH	ACTIVITY ci/g CORE A	CORE B	CORE C	CORE D
1						
2						
3						
OUTLET 4						

TMI CORE SAMPLES TABLE VIII

PROJECT 6MT611 MONTH/YR SAMPLED July 1979

SAMPLE ID AHF 10B MSA Cell 79-242 Installed May 79

INLET LAYER	MOISTURE	pH	ACTIVITY ci/g CORE A	CORE B	CORE C	CORE D
1	23.2	6.5	$7.22X10^{-9}$	$6.53X10^{-9}$	$6.24X10^{-9}$	$9.00X10^{-9}$
2	24.0	7.1	$5.21X10^{-10}$	$3.44X10^{-10}$	$7.66X10^{-10}$	$6.88X10^{-10}$
3	24.2	7.1	$1.11X10^{-10}$	$7.19X10^{-11}$	$1.94X10^{-10}$	$5.18X10^{-10}$
OUTLET 4	24.3	7.2	$2.02X10^{-11}$	$1.36X10^{-11}$	$6.86X10^{-11}$	$5.19X10^{-11}$

SAMPLE ID _____

INLET LAYER	MOISTURE	pH	ACTIVITY ci/g CORE A	CORE B	CORE C	CORE D
1						
2						
3						
OUTLET 4						

SAMPLE ID _____

INLET LAYER	MOISTURE	pH	ACTVITY ci/g CORE A	CORE B	CORE C	CORE D
1						
2						
3						
OUTLET 4						

SAMPLE ID _____

INLET LAYER	MOISTURE	pH	ACTIVITY ci/g CORE A	CORE B	CORE C	CORE D
1						
2						
3						
OUTLET 4						

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TMI CORE SAMPLES TABLE IX

PROJECT 6MT611 MONTH/YR SAMPLED AUGUST 79

SAMPLE ID S/N 79-205-FHB (MSA CELL W/MSA CARBON INSTALLED 6/22/79)

INLET LAYER	MOISTURE	pH	ACTIVITY ci/g CORE A	CORE B	CORE C	CORE D
1	22.0	6.72	2.05×10^{-9}	1.40×10^{-9}	1.10×10^{-9}	1.41×10^{-9}
2	23.2	7.45	4.47×10^{-10}	1.40×10^{-10}	3.16×10^{-11}	5.31×10^{-11}
3	24.4	7.41	1.14×10^{-10}	6.37×10^{-11}	4.25×10^{-11}	5.43×10^{-11}
OUTLET 4	23.6	7.44	6.37×10^{-11}	3.52×10^{-11}	6.02×10^{-11}	6.37×10^{-11}

SAMPLE ID _____

INLET LAYER	MOISTURE	pH	ACTIVITY ci/g CORE A	CORE B	CORE C	CORE D
1						
2						
3						
OUTLET 4						

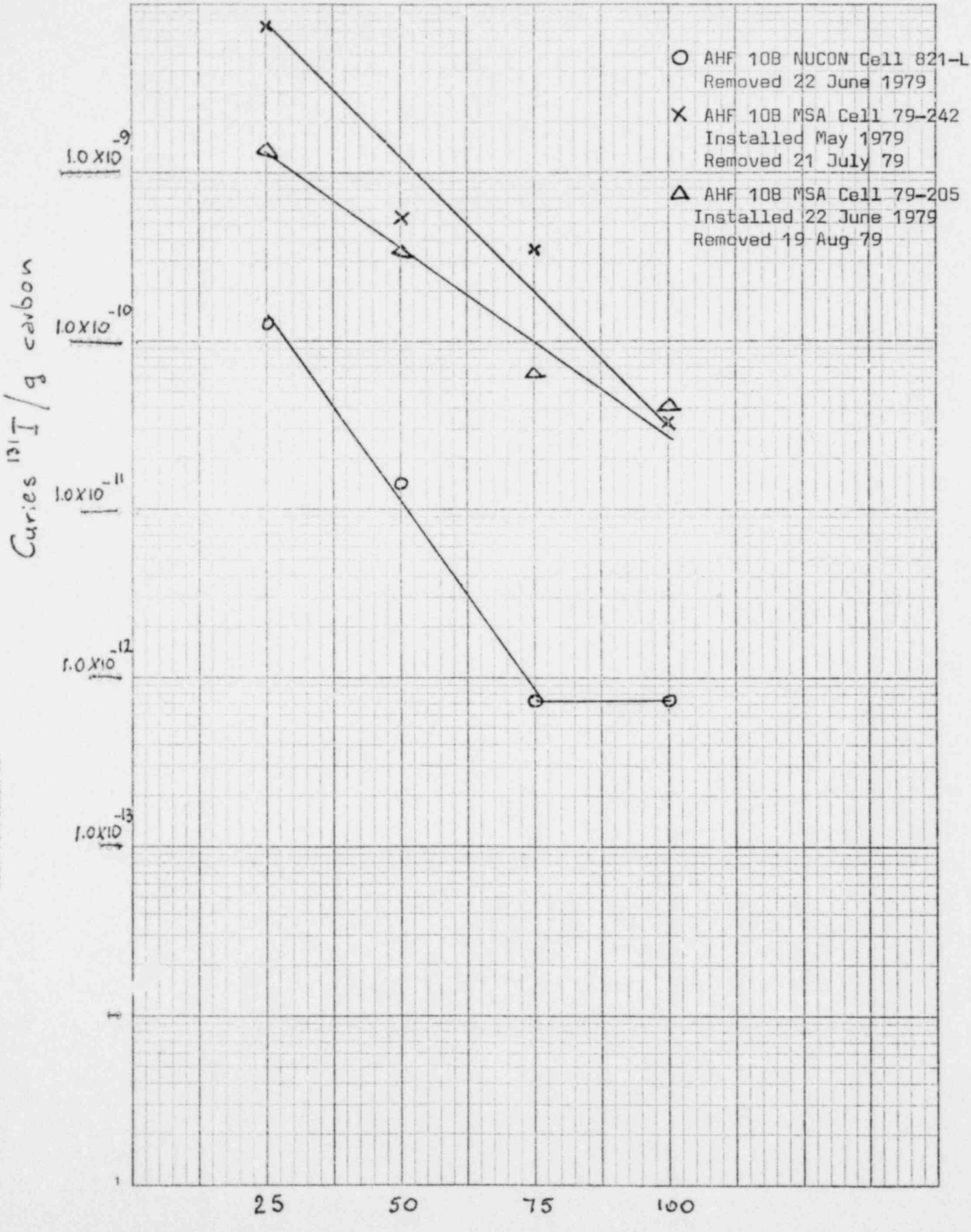
SAMPLE ID _____

INLET LAYER	MOISTURE	pH	ACTVITY ci/g CORE A	CORE B	CORE C	CORE D
1						
2						
3						
OUTLET 4						

SAMPLE ID _____

INLET LAYER	MOISTURE	pH	ACTIVITY ci/g CORE A	CORE B	CORE C	CORE D
1						
2						
3						
OUTLET 4						

MODEL DATE



Many of the numbers represented are basically just numbers rather than data of actual value. This is due to poor sampling procedures and poor data logging by those taking and preparing the samples.

The bulk samples were sent to NUCON in plastic bags. There is no data as to what cell, location in bank and at times what date taken noted on these bags. NUCON has been informed the bulk samples are taken by emptying a portion of a cell into a plastic bag and then taking a portion of that to be sent as the sample. The part of the cell that has been emptied is then refilled and the cell replaced into the adsorber bank. If this sample is not properly mixed then there is no homogeneous sample. If there is no homogeneous sample, then there is on reproducible data.

The Fuel Handling Building "B" Train AHF 108 cells that have arrived are not comparable. The June sample was NUCON NUCELL 821-L carbon type NUSORB KITEG Lot 024, Fill Date 7 March 79. The July sample was MSA Cell #79-242, carbon Type 463563, Lot C-244, Fill Date May 79. There is no data on installation dates or location in bank.* These cells have different manufacturers' carbon in them and may have been installed in the banks at different times. There is no manner in which meaningful data can be taken from differing cells with no background data.

The sample canister from the supplementary filter trains (AM-1 thru AM-4) are totally inadequate for a representative adsorbent sample from the installed bank. The inlet is 1/4" NPT and there is no detailed data on the length of the 1/4" inlet pipe. This does not allow for a representative air flow as compared to an actual Type II Adsorber. Appendix "A" discusses the requirements for adsorbent sampling. There are no reproducible serial number, installation date, sampling date, carbon type, or location information sent with them. Additionally the canisters rattle indicating insufficent fill, particularly for horizontal operation. There is data for the number of running days for May, June, and July for the supplementary filter trains.

	1May - 31May 79		1June - 29June79		30June - 31Jul 79	
	Days	Eff**	Days	Eff**	Days	Eff**
Supp. Train # 1	29	No Sample	29	70.85	32	87.95
Supp. Train #2	30	Taken	17	81.48	8	96.23
Supp. Train #3	24		29	96.28	32	95.69
Supp. Train #4	12		15	99.25	32	97.17

*Except for August sample which was MSA cell 79-205 and was identified as installed on 22 June 1979.

**Efficiencies at 95% RH, 25°C

There is a hint of a trend for Supplementary Train #3 and Supplementary #4, but the first two trains are not explainable with the data at hand. There is no background information to make any explanations. The possible explanations of sampler location, inadequate samplers, carbon type, etc., cannot be supported due to this inadequate background information.

The only sample that seems to have any reproducibility is the condenser vacuum pump system. The canister from this system has a two inch diameter inlet. There seems to be an order to the serial numbers of the canisters (May S/N 720540, June S/N 720541, July S/N 720544) and a carbon Lot Number AAF 0130. There is still no installation date for the canisters or the installation dates of the adsorbers in the bank or if the carbon in the canisters is the same as the carbon in the adsorbers. We have no sampler location information either.

Recommendations to alleviate the labeling and sampling discrepancies are:

1) Diagram each adsorber bank, put serial numbers of each cell in appropriate blank and indicate when sampled.

2) Supply serial number, installation date, cell manufacturer, carbon manufacturer, filling date, carbon type and lot number for each cell in each bank.

3) When sending bulk sample from a Type II cell remove the fill port cover from one side of a tray, empty the whole side into a plastic bag, refill that side of the tray and label the sampling date on the fill port cover. On the bag label the cell serial number, cell manufacturer, filling date, carbon manufacturer, carbon type and cell installation date. Then the next month repeat the procedure with the other side of the tray. Each cell will then provide two bulk samples.

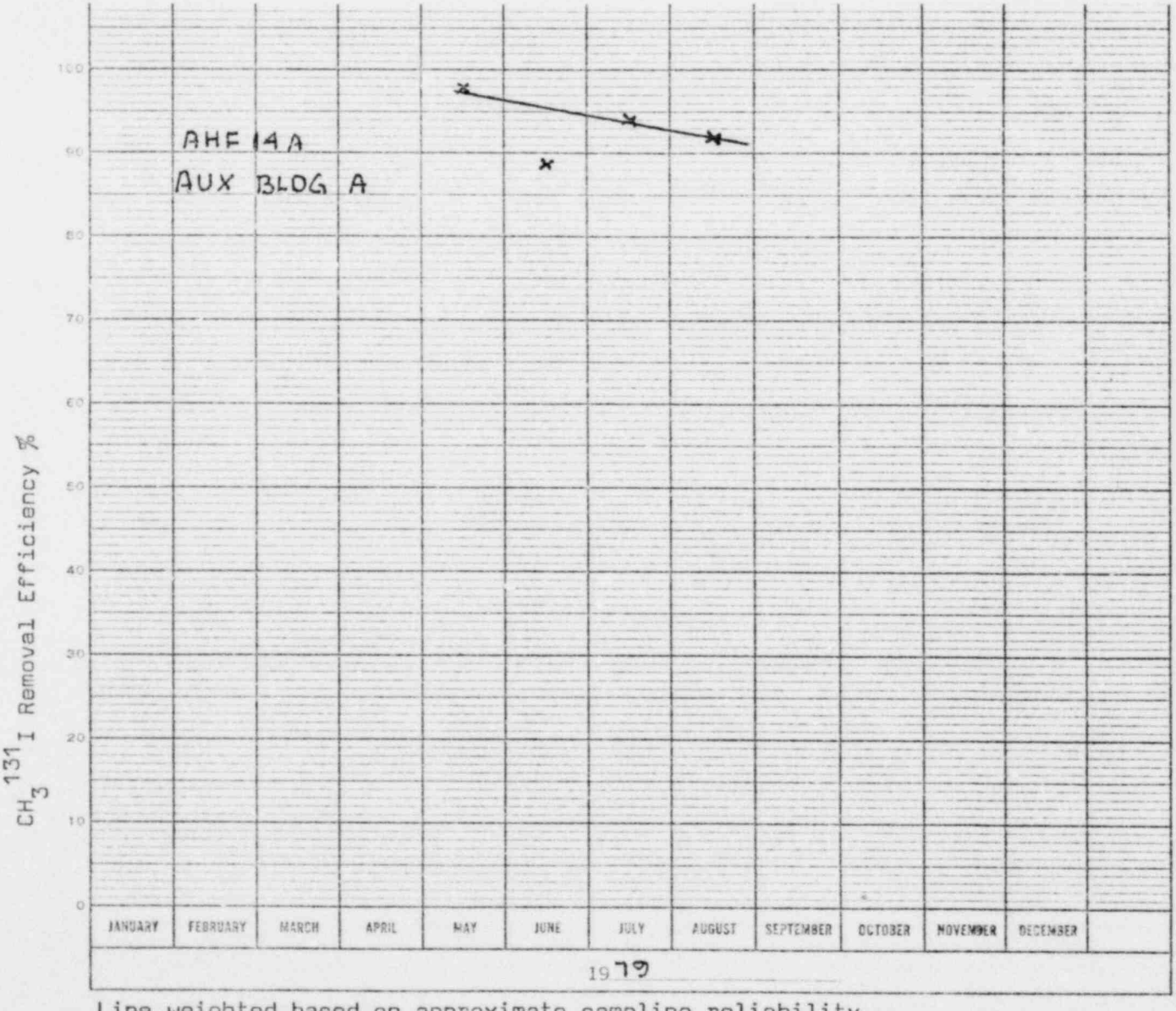
4) Diagram canister sampler location, serialize canisters, blank off sample canister port after sampled, make sure carbon in canister is the same as the carbon in the bank (installation date, carbon manufacturer and type). Send four canisters per system to allow sufficient sample for a full set of testing.

5) Use NUCON Procedure 34 (Appendix 2) when sampling a NUCON Test Tray Assembly.

III. SUMMARY

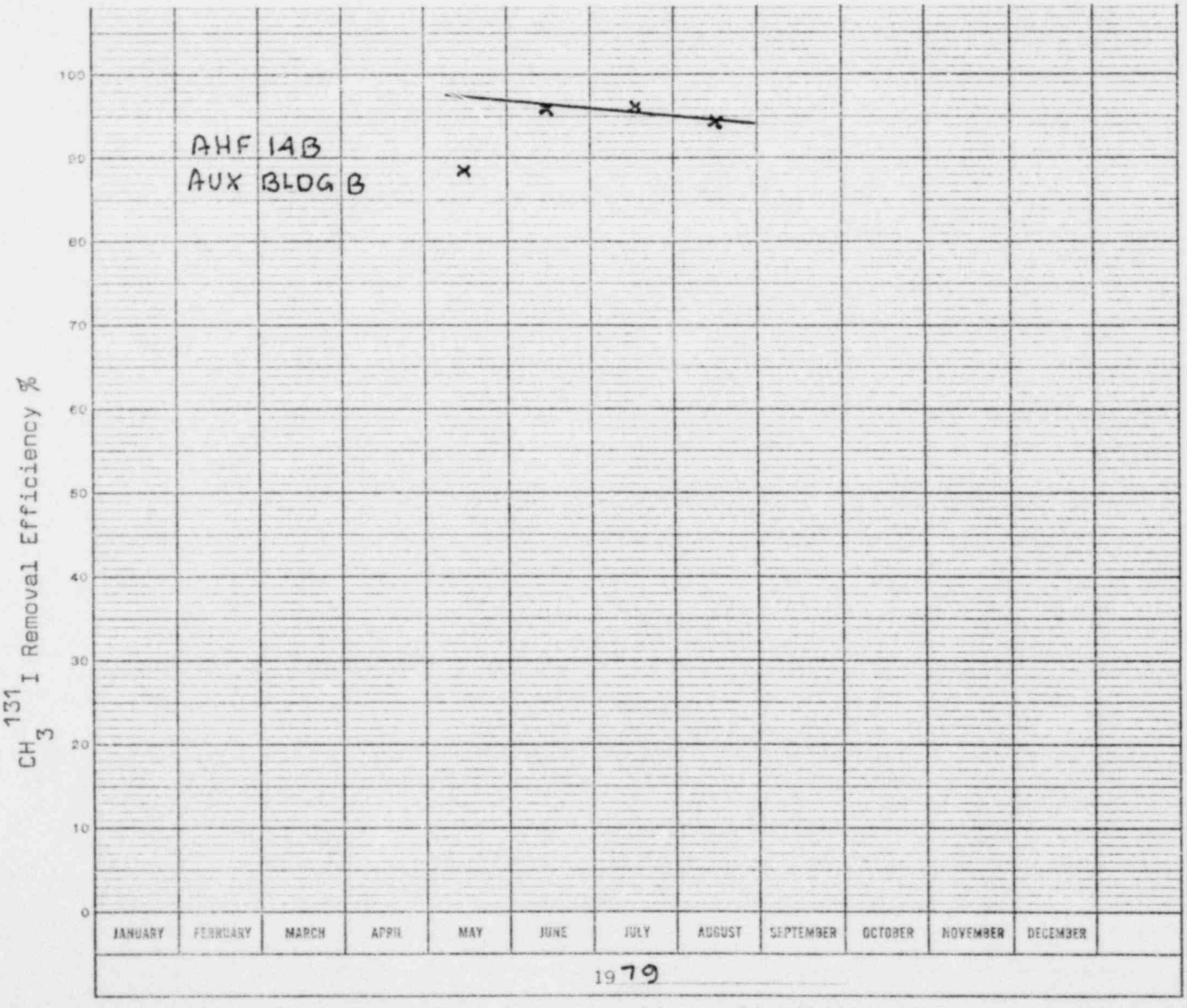
Unless proper sampling is performed and sufficient detailed data is obtained and provided on the samples sent, NUCON cannot properly analyse the performance of the carbon in the adsorber banks in the sampled systems. Based on carbon properties only an approximation is made on Figures 2 thru 5 on the efficiency trend for the primary systems.

Methyl Iodide Efficiency at 95% RH 25°C



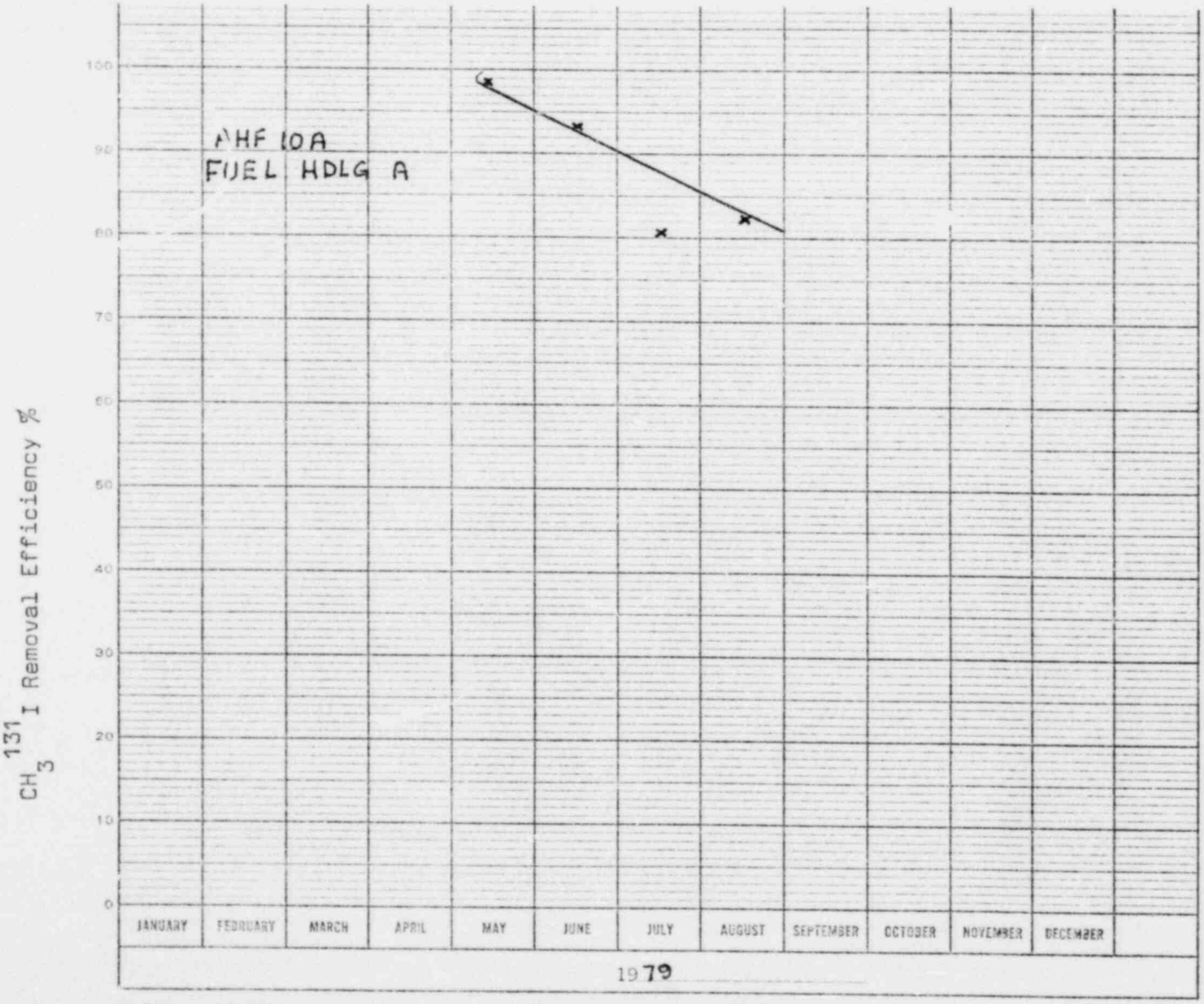
Line weighted based on approximate sampling reliability.

Methyl Iodide Efficiency At 95% RH 25°C



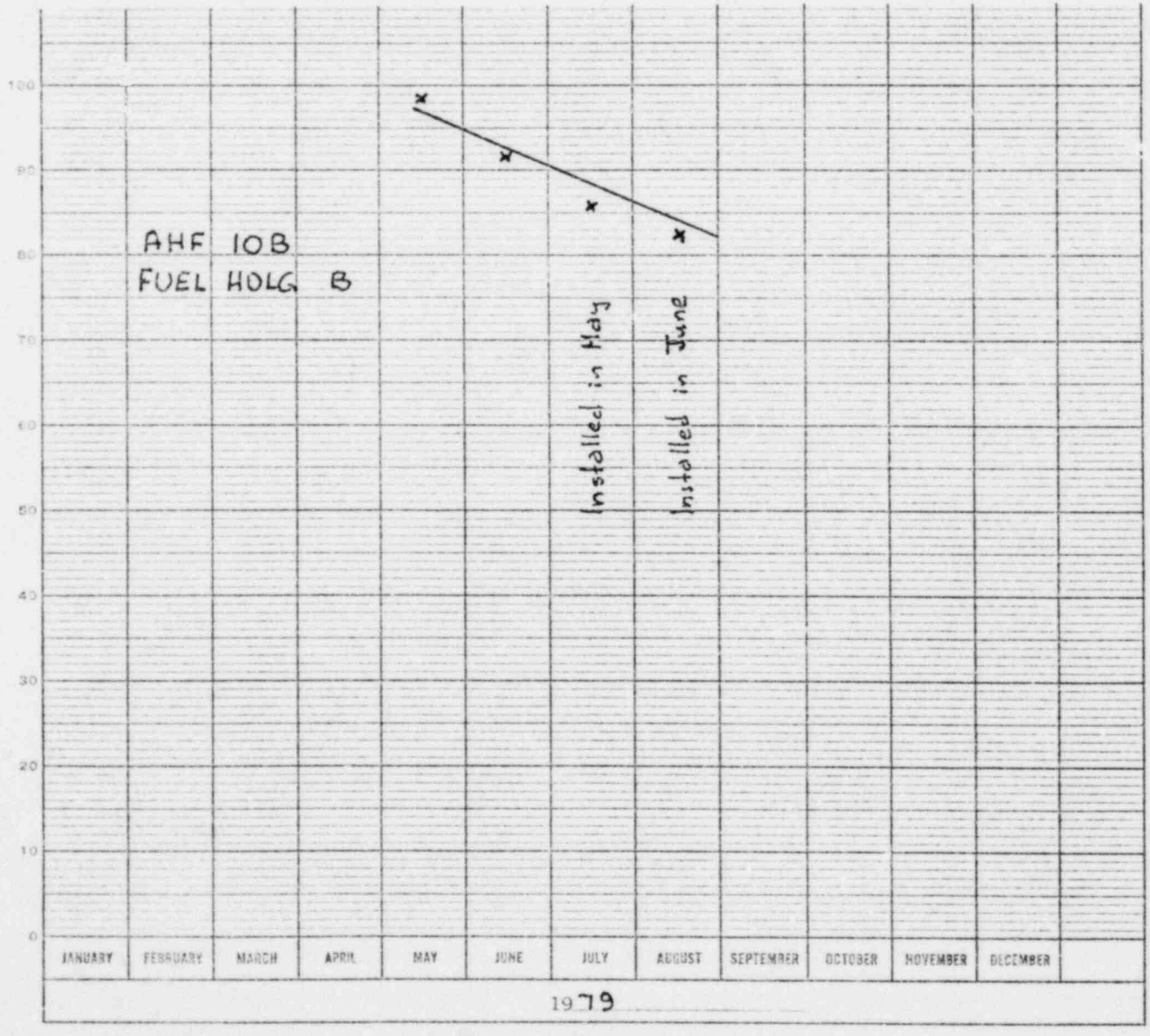
Line weighted based on approximate sampling reliability.

Methyl Iodide Efficiency at 95% RH 25°C



Line weighted based on approximate sampling reliability.

Methyl Iodide Efficiency at 95% RH 25°C



Line weighted based on approximate sampling reliability.

Sampling of Installed Adsorbents for Surveillance Testing

A. 1 SCOPE

Provision shall be made to periodically remove a representative sample of adsorbent from an installed system for Surveillance Tests.

A representative sample is defined as one that has experienced flow within ± 20% of the average flow of the system (as confirmed by testing per Section 8 of ANSI N510). The detailed means to achieve this is left to the designer of each system but detailed supporting data (either theoretical or empirical) shall be presented to substantiate that the flow is representative and the sample is, therefore, representative of the entire adsorber bank.

A. 2 DESIGN BASIS FOR SAMPLERS

Since the sample shall be representative it shall have experienced the same exposure to all contaminants as the entire bed it represents. To accomplish this it shall have experienced the same flow (± 20%) for the same time. This criterion can be met only if the bed depth and pressure drop through a sampler section are the same as through the overall adsorber bank. All flow restrictions must be taken into account when designing a sampler. Pipe stubs, valves, unions, fittings, elbows, nozzle effects and similar items or effects all add pressure drop and tend to make a sampler non-representative. This standard does not restrict any specific approach or hardware but stresses the flow criterion must be met.

A. 3 GENERAL TYPES OF SAMPLES (SAMPLERS)

A. 3.1 Individual Samplers

A special adsorbent sample holder should be designed to hold adsorbent for testing. It shall be the same depth as the main bed, a minimum of 2" in diameter and in the same orientation as the main bed. If there is a guard bed it shall be duplicated for the sampler.

The sampler shall be filled with adsorbent from the same lot and batch as the main bed. The guard bed, if any, shall be filled with adsorbent from the same lot as the main bed.

Each sampler shall have at least the following data permanently attached:

Serial Number
Adsorbent Lot and Batch Number
Adsorbent Mfg. and Type
Installation Date
System Where Installed

The details of sampler design shall include a method to ensure no bypass will occur, that the sampler(s) will be halide leak tested along with the main bank per Section 12 of ANSI N510 as part of an integrated system leak test, and that the flow path shall be sealed leak tight after the sampler is removed. Consideration should be given in the design to allow insertion of the sampler into a laboratory test apparatus for determination of methyl iodide penetration without disturbing any of the adsorbent.

A. 3.2 Test Tray Assemblies

A Test Tray Assembly is an adsorber unit modified for provision for removal of a portion of the adsorbent (usually one eighth) without disturbing the remainder of the adsorbent. Its use is acceptable as an alternate to individual samplers described in Section A.3.1 of this appendix for obtaining representative samples.

When a test tray assembly is removed an entire section is emptied into a clean plastic container or bag, mixed to ensure uniformity, a sample taken, and the section refilled with such makeup adsorbent as required. This makeup carbon shall meet the same requirements as the original adsorbent.

The section sampled shall be marked to indicate when a sample was taken and the section number and position noted both in the field test report and permanent plant records to ensure that this section is not used again.

Each cover plate shall be permanently marked with a unique identification symbol.

Each test tray assembly shall have at least the following data permanently attached:

Serial Number
Adsorbent Lot and Batch Number
Adsorbent Mfg. and Type
Installation Date
System Where Installed

A. 3.3 Sampling by Adsorber Unit Removal

As a further alternate, an entire adsorber cell or bed may be removed to obtain a sample. It shall be emptied into a clean plastic container or bag, the adsorbent mixed to ensure uniformity, a sample taken, the cell refilled or replaced. If the unit is refilled it shall be marked as having been refilled and shall not be used for future samples. New or refilled units shall not be used for samples, since they are not representative of the adsorbent in the bank.

A. 3.4 Slotted-Tube Sampling

For existing systems where the adsorbent bed is refilled in-place (Type III) a sample may be taken with a slotted-tube sampler. See ASTM E-300 for slotted-tube sampler details and background. For future Type III systems, slotted-tube samplers shall not be used; rather, samplers as described in Section A.3.1 shall be employed.

For systems where the adsorbent bed is 2" deep insert the slotted-tube sampler into the bed far enough to ensure that the sample will be taken from an area where flow is experienced by the adsorbent.

For systems where the adsorbent bed is greater than 2" the position where the slotted-tube sampler is inserted into the bed is important.

If a single sample representative of the entire bed is desired, then use the slotted-tube sampler at an angle to pick-up sample from both the inlet and outlet faces of the bed. Do not use carbon from areas of no flow.

If separate samples from inlet and outlet faces are desired then sample positions should be noted. These separate samples should not be mixed. A composite efficiency may be required to be calculated for the bed if separated samples are taken.

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PROCEDURE TO SAMPLE CARBON FROM A NUCON TEST TRAY ASSEMBLY (TTA)

May 1979

I. TOOLS AND SUPPLIES REQUIRED

A. Drill (hand or electric, not air powered).

B. Drill Bit - #30 (1/8") (recommend having 3 or more available).

C. Pop Rivets - 300 Series Stainless Steel, 1/8" Dia X 1/8" Grip Range.

D. Pop Rivet Gun - (hand or power) with jaws for stainless rivets corresponding to manufacturer recommendations to "pull" 1/8" dia rivets.

E. Replacement carbon of quality equal to that removed.

F. Clean plastic bags for holding carbon samples. Size to hold at least 1 gallon with excess for sealing with tape or ties. Thickness to hold 7-8 pounds carbon and withstand some rough handling. At least 3 bags should be in hand. Two (2) for double bagging and one (1) spare.

G. Plastic sheet for floor covering to catch carbon that may spill while transfer takes place.

H. Leather or raw hide mallet.

I. Tape or ties to close bags.

J. Marking pen to label sample and TTA compartment.

K. Tools as required to remove and reinstall adsorber cell.

L. Antiradiation/contamination protection as required by local situation.

II. PROCEDURE

A. This is a two (2) man job.

B. Lay out area to pull sample, cover floor with plastic, lay out tools and supplies for ease of use.

C. Obtain Health Physics approval and support to enter system. Obtain and put on required protective clothing.

D. Shutdown system flow.

E. Enter system and remove TTA.

F. Set TTA on plastic sheeting on handles with 8 access plates facing up.

G. Select section to be sampled and drill out pop rivets with #30 bit.

H. Remove section of pop rivet that remains in/on cell so it does not become mixed with carbon (local radiation situation permitting).

I. Pick up cell and dump open section into a clean plastic bag. Note: If the cell is contaminated there is a possibility of high airborne activity. Appropriate H.P. coverage and protective measures must be taken.

J. Close sample bag, label bag, double bag and label second bag. Note bank designation, TTA number, TTA section number, time, date and person performing sampling, plant and utility.

K. Refill section with new carbon while cell is upright (i.e., fill port facing up). Rap cell with mallet to ensure complete fill. Sharp raps with mallet will jar cell and cause carbon to settle. Rap until no more settling occurs. Do not hit hard enough to damage perforated metal. Top off carbon by hand to ensure complete fill.

L. Replace access plate and pop rivet on. Be sure that carbon grains do not become trapped between plate and cell preventing a tight seal.

M. Mark access door with data sampled and that it is not to be reused. Use marking pen.

N. Replace TTA; tighten gasket in an even manner to at least 50% - 80% compression.

O. Remove all tools and supplies from system and by visual check confirm that no damage was done to particulate filters or any other part of system.

P. Close and secure door.

Q. Restart system.

R. Perform a Halide Leak test per ANSI N510-75 if required by Plant Technical Specification.

S. Return system to operational status.

T. Forward sample carbon for required testing along with required test parameters per NUCON FI-04 (attached). Ensure proper radiological safety measures are taken as required by contamination level of sample.

U. Note TTA number, location, TTA sample section, bank/system number, date as minimum data in permanent plant records.

FI-04 (5-78)

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REQUIRED DATA 131I EFFICIENCY TESTS

NUCON PROJECT_____

CLIENT_____

CLIENT P.O._____

ADSORBENT SAMPLE IDENTIFICATION_____

MFG & GRADE_____

PREPARED BY_____

DATE_____

ACCEPTANCE LIMIT_____

DATE INSTALLED_____

OPERATING PARAMETERS

Pressure_____psig, atm, N/m^2

Temperature_____°F, °C

Velocity_____fpm, meters per second

Relative Humidity_____%

Bed Depth_____inches, centimeters

TEST	CONCENTRATION IN GAS FLOW
$CH_3{}^{131}I$____	_____mg/m^3
$^{131}I_2$ ____	_____mg/m^3

IF REQUIRED telephone results

TO_____ PHONE_____