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AP 1001

Three Mile Island Nuclear Station

SIDE 1

Figure 1001-8

Special Operating Procedure

SOP No. E-9
(From SOP Log Index)

NOTE: Instructions and guidelines in AP 1001 must be followed when completing this form.

REVISION 2

Unit No. 2

Date 4-10-79

1. Title Sampling MU-T-1

2. Purpose (include purpose of SOP) REVISION INCORPORATES SKETCH CHANGE FROM Z-32-A-2 (ie SKETCH) TO IDENTIFY EXISTING TEMPORARY PIPING & PROVIDES PROCEDURE FOR OBTAINING SAMPLE USING PRESENT SYSTEM.

3. Attach procedure to this form written according to the following format.

A. Limitations and Precautions

- 1. Nuclear Safety
- 2. Environmental Safety
- 3. Personnel Safety
- 4. Equipment Protection

ATTACHED

B. Prerequisites

C. Procedure

4. Generated by C E RANDOLPH / C. Gatto Date 4-10-79

5. Duration of SOP - Shall be no longer than 90 days from the effective date of the SOP or (a) or (b) below - whichever occurs first.

- (a) SOP will be cancelled by incorporation into existing or new permanent procedure submitted by NA
 - (b) SOP is not valid after NA
- (fill in circumstances which will result in SOP being cancelled)

6. (a) Is the procedure Nuclear Safety Related?

If "yes", complete Nuclear Safety Evaluation. (Side 2 of this Form) Yes No

(b) Does the procedure affect Environmental Protection?

If "yes", complete Environmental Evaluation. (Side 2 of this Form) NA Yes No

(c) Does the procedure affect radiation exposure to personnel? Yes No

NOTE: If all answers are "no", the change may be approved by the Shift Supervisor. If any questions are answered "yes", the change must be approved by the Unit Superintendent.

7. Review and Approval

NRC [Signature] Approved - Shift Supervisor [Signature] 4-11-79

B&W [Signature] Reviewed - List members of PORC contacted James K. Paulis 4/11/79

ALARA [Signature] 4/11/79 TACCON [Signature] 4/11/79 John C. [Signature] 4/11/79

Approved - Unit Superintendent [Signature] 4/11/79

WY-T-1 GAS SAMPLE

A. LIMITS AND PRECAUTIONS

1. NUCLEAR SAFETY - NOT APPLICABLE

2. ENVIRONMENTAL SAFETY

a. AN UNANTICIPATED RELEASE COULD OCCUR IF THE SAMPLING PURGE WENT FOR AN EXTENDED PERIOD OF TIME DUE TO ABNORMAL PLANT CONDITIONS REQUIRING EVACUATION OF THE AUXILIARY BUILDING DURING THE PURGE.

b. ATTACHMENT 4 IS A CALCULATED RELEASE OF I_{131} AND K_{233} FROM THE STATION VENT. MONITORING OF THE STATION VENT DURING THE SAMPLE PROCEDURE MUST BE CONTINUOUS.

3. PERSONNEL SAFETY

a. DOSE RATES IN THE AREA OF THE SAMPLE CAMP ARE 150-200 MR/hr. general area with a maximum of 25R hot spots. To limit personnel dosage, start the sample purge and return to the Auxiliary Building Door Area (dose levels of 10-15 mr/hr.) but keeping track of the time for the 1 minute surge assumed in Attachment 4.

1. DD. H. O. L. B. I. N. A. P. I. C. I. N. G.

4. EQUIPMENT PROTECTION - NONE REQUIRED. ^{P. 2}

PREREQUISITES

1. 1/2" Copper Tubing has been installed in the Auxiliary and Fuel Handling Buildings of TMI 2 per Attachment 1.
2. The discharge ^{valve} of the sample bomb WDG-TV5 has been connected to a collection bottle with Absolute Carbon filter per HP requirements.

3. Check the following system lines to
Commenced Sampling.

Check ~~the~~ ^{CLOSED} THE FOLLOWING VALVES

MUV-134	WOGT-V1
MUV-310	WOGT-V2
MUV-311	WOGT-V3
MUV-293	WOGT-V5
SUV-135	BSV-149
WOGT-V10	WOGT-V7
MU-TV4	WOG V-143.B
WOGT-V6	

4. SHUT REGULATOR WOGT PCV-1 TO ALLOW FOR

... .. PRESSURE - | | | |

7. POWDEX bucket with lead blanket available.

1.1 PROCEDURE

1.0 DRAWING SAMPLES

1.1 TO OBTAIN MUTAIRC SAMPLE OPEN THE FOLLOWING VALVES - (THIS WILL LINE UP THE SYSTEM FOR THE SAMPLE)

MUV-134

SNV-135

WDGT-V10

WDGT-V6

SAMPLE BOMB STOP COCKS

1.2 OPEN WDGT-V1 AND WDGT-V2 AND SET ^{WDGT-PCV1} REGULATION OUTLET PRESSURE TO $1 \leq P_{REG} \leq 3$ psig.

1.3 THE OPERATOR SHALL START A PORTABLE AIR SAMPLER AT THE START OF THE PURGE AND STOP IT UPON COMPLETION OF THE SAMPLE.

1.4 TO PURGE THE SAMPLE BOMB AND OBTAIN THE SAMPLE, OPEN WDGT-V5 AND WDGT-V3 AND PURGE INTO THE FILTERED COLLECTION BOTTLES FOR 1 TO 1.25 MINUTES OR UNTIL SAMPLE FLUSH VOLUME HAS BEEN ---

NOTE: IF NO SAMPLE FLOW IS OBTAINED
AS EVIDENCED BY BUBBLES IN THE COLLECTION
CONTAINER, SHUT MU-V13 UNTIL MAKE UP
TANK PRESSURE INCREASED SUFFICIENTLY
TO ALLOW SAMPLE FLOW. DO NOT RAISE
SYSTEM PRESSURE ABOVE ⁵⁰⁰ 400 PSIG. IN 5 PSIG
INCREMENTS. OBTAIN
NACB APPROVAL FOR
EACH PRESSURE CHG.
TIME MU-V13 WAS SHUT: _____

1.5 AFTER THE PONGS HAS BEEN COMPLETED
SHUT WDG-T-05 AND ISOLATE THE SAMPLE
BOMB BY SHUTTING THE INLET AND OUTLET
STOP COCKS AT THE SAME TIME.

1.6 SHUT WDG-T-03, WDG-T-02 AND WDG-T-01

1.7 REMOVE THE SAMPLE BOMB AND PLACE IN
LEAD LINED PONDYX BUCKET AND TRANSPORT OUT OF AREA.

1.8 SHUT MU-V-134 OR SNU-185 AND RETURN
THE SYSTEM VALUE LINE UP TO AN APPROXIMATE
LINE UP IN ACCORDANCE WITH THE

SHUT COMMANDS IN STATION LOGS. RECORD TIME
MU-V13 WAS ^{OPENED} SHUT: _____ RECORD MU-T-1

NOTE

IF MU-013 WAS SHUT, ENSURE THAT IT IS
REOPENED AND MAKEUP TANK, PRESSURE IS
NOT INCREASING ABOVE ⁴⁰PSIG.
C63

ATTACHMENTS

(1) PRESENT SYSTEM INSTALLATION SKETCH
FROM SOP-232 REVISION 2

(2) INITIAL VALVE LINEUP FOR INITIAL
CONDITION

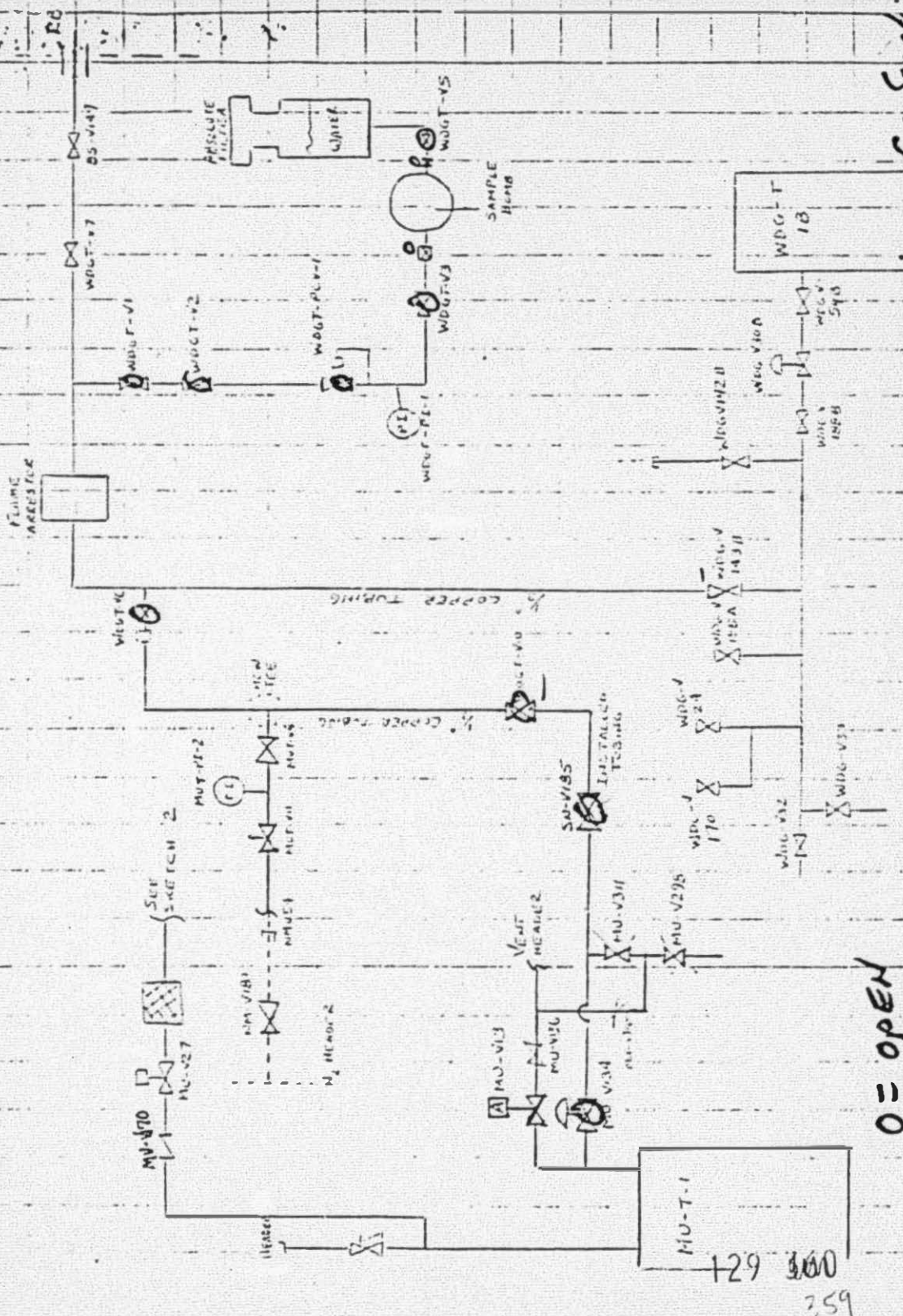
(3) VALVE LINEUP FOR SAMPLING.

(4) UNIT 2 - MU-T-1 GAS SAMPLE RELEASE PERMIT

~~# (5) MAKEUP TANK COVER PRESSURE ALLOWABLE TO
PREVENT H₂ FROM ENTERING PUMP SUCTION AFTER
LOCA FCY~~

Box Building 305

Flux Building 305



VALUE LINE UP FOR SUPPLY
 ATTACHMENT W-3

0 = OPEN
 29 Aug 2

SKETCH 1

129 300
 359

4/10/77

Unit 2 RC Makeup Tanks Sample (Yrs)

300' run from sample point to makeup tank (3/8 ID line) = 135'

3 volumes of sample line required for purge (Dn Beil)

$$\begin{matrix} \text{sample line} \\ [1.35 \times 10^3 \text{ cc}] \times 3 = 4 \times 10^3 \text{ cc purge} \end{matrix}$$

1) ¹³¹I Hazardous Analysis

Specific Activity \approx ¹³¹I in original coolant = 1.4 $\times 10^4$ $\mu\text{Ci/cc}$ on 3/30/77; 07

$$A = A_0 e^{-\lambda t} = [1.4 \times 10^4] \times .372 = \boxed{5.2 \times 10^3 \mu\text{Ci/cc } ^{131}\text{I at 1900 hrs on 4/10/77}}$$

$$5.2 \times 10^3 \mu\text{Ci/cc} \times 4 \times 10^3 \text{ cc} = 2 \times 10^7 \mu\text{Ci } ^{131}\text{I if a liquid}$$

Assume a partition factor of 10^3 *

$$\frac{2 \times 10^7 \mu\text{Ci}}{10^3} = 2 \times 10^4 \mu\text{Ci going into Special Pelletier Charcoal Cartridges (2) for a total of 1000 cc Java$$

$$\frac{2 \times 10^4 \mu\text{Ci}}{10^6 \text{ cc}} = 2 \times 10^{-2} = \boxed{.002 \mu\text{Ci release into Arterial Bldg for } ^{131}\text{I}}$$

Trick Spec = 0.30 $\mu\text{Ci/cc}$

$$\text{out flow} \frac{2 \times 10^{-2} \mu\text{Ci}}{2.4 \times 10^4 \text{ cc}} = \boxed{8.3 \times 10^{-12} \mu\text{Ci/cc out vent assuming entire operation is completed in 1 min.}}$$

2) ^{133}Xe Analysis

Assume $\frac{100}{1}$ ratio of ^{133}Xe to ^{131}I

$\therefore 5.7 \times 10^5 \mu\text{Ci/cc}$ of ^{133}Xe at 1900 hrs on 4/10/79

$5.7 \times 10^5 \mu\text{Ci/cc} \times 4 \times 10^3 \text{ cc} = 2 \times 10^9 \mu\text{Ci } ^{133}\text{Xe}$ released during purge for Unit 2 RC Makeup Tank Loss Sample.

Assume a partition factor of 10 in bubbling through the sampling rig, then a factor of 10^5 for the special Peletier 1000 cc Charcoal Cartridge Train.

$$\therefore \frac{2 \times 10^9}{10^6} = 2 \times 10^3 \mu\text{Ci}$$

Note: Tech Spec limit is $1.5 \times 10^5 \frac{\text{m}^3}{\text{sec}}$ vs 1.11×10^2 in this case.

$$\text{Air flow in Aux. Bldg} = 42,000 \text{ cfm} \times 2.832 \times 10^4 \text{ cf/ft} = 1.2 \times 10^9 \text{ cc}$$

$$\text{Air flow in F.H. Bldg} = 42,000 \text{ cfm} = 1.2 \times 10^9 \text{ cc}$$

$$\frac{2 \times 10^3 \mu\text{Ci}}{1.2 \times 10^9} = 1.7 \times 10^{-7} \mu\text{Ci/cc}$$