Date _____

DSS _____

Units 1 & 2

RECORD

PROCEDURE VERIFIED CURRENT AND CHECKED FOR TEMPORARY CHANGES. IF FIELD COPIES REQUIRED, USE PBF-0026i IAW NP 1.2.4 AND DO NOT COMPLETE THIS BLOCK.

BY: _____ DATE: _____

1.0 PURPOSE

To outline operation of the 80 gpm letdown gas strippers, its cryo support systems (cryo compressors and chiller), and to recover from an actuation of radwaste component cooling isolation.

2.0 REFERENCES

IR 96-006, NRC Inspection Report, NRC Commitment for Operations procedure PMT/QC reviews.

3.0 PRECAUTIONS AND LIMITATIONS

3.1 A Unit 2 containment isolation will cause LW-63 and LW-64 to close. This will isolate component cooling water to the radwaste system.

3.2 When either LW-63 and/or LW-64 leave the full open position, the following equipment will trip or close:

K-10A	Cryogenic Gas Compressor	Trip Off
K-10B	Cryogenic Gas Compressor	Trip Off
P-130A	Letdown Gas Stripper Circ Pump	Trip Off
P-130B	Letdown Gas Stripper Circ Pump	Trip Off
P-137	Aux Condensate Return Pump	Trip Off
RS-SA-1	Radwaste Steam Supply Control Valve	Trip Close

To respond to an isolation and auto shutdown of letdown gas stripper and cryogenic compressor, GO TO STEP 5.6.

3.3 The gas strippers shall not be operated with supply and/or return valves crossconnected.

3.4 Prior to operation of either gas stripper, the cryogenic system must be in operation and aligned per CL-9J.

3.5 All manual valves are prefixed "1-" or "2-" to denote unit. All control valves are suffixed with an "A" for Unit 1 or "B" for Unit 2.

3.6 Steam supply will be taken from either unit but not both. Condensate return will be to the condenser of the unit supplying the steam, except for short periods during inservice testing which necessitate radwaste steam supply isolation. During these periods condensate may be left to the unit being tested for the period of the test.

3.7 The gas stripper can be shut down rapidly in the event of an emergency by closing the preheater outlet TCV GS-GW-1A(B). More rapid cool down is available by opening GS-GW-5A(B) which controls cooling flow to the stripper condenser. However, do not draw a vacuum in the gas stripper.

3.8 The following valves related to these systems are locked shut for the reasons indicated.

3.8.1 1GS-17 (2GS-17) cryogenic unit bypass to the Unit 2 containment purge stack. This valve permits bypassing the cryogenic unit which removes certain radioisotopes of noble gas from the stripper output and permits the gas to be diverted directly to the atmosphere.

3.8.2 1GS-19 (2GS-19) HX-135 vent cooler drain loop seal bypass valve. This valve permits bypass of the steam seal on the discharge of the vent cooler leading back to the gas stripper.

3.8.3 1GS-61 (2GS-61) nitrogen purge inlet on the gas stripper relief line penetration. This open ended vent line is provided to give a preoperational purge replacing air in the stripper with a blanket of nitrogen.

3.8.4 1GS-36 (2GS-36) stripper outlet cross-connect valve. This valve permits cross-connection between Unit 1 and Unit 2 primary letdown by permitting stripper discharge into the other unit from which it is fed.

3.8.5 1GS-16 (2GS-16); 1GS-20 (2GS-20) stripped gas lines vents. This valve permit release of contaminated gas to the atmosphere.

3.9 Health Physics should be informed if Unit 1 or Unit 2 gas strippers are off-line for an extended period of time.

3.10 Following a unit outage, the letdown gas stripper system should not be placed in service until the fuel conditioning is complete, and the RCS nitrogen inventory is reduced to an acceptable level and verified by chemical analysis. An acceptable nitrogen concentration is reached when daily VCT gas space analysis contains less than 10 percent nitrogen without an interim purge of the VCT gas space and with a normal letdown lineup. Nitrogen is removed by purging the VCT to the vent header/gas decay tank system. The letdown gas stripper system does not permanently remove nitrogen; rather it dilutes and redistributes the nitrogen between the operating units.

3.11 When the stripper is shutdown for maintenance, the circ pump, P-130A(B) breaker must be closed (P-130A(B) may be stopped) or GW-17A(B) control switch must be in HAND. If the breaker is open, i.e., for pump maintenance, the circ pump thermal overload interlock will cause GW-17A(B) stripper gas outlet to close (in Auto). This will prevent the cryo system gas from backfeeding the stripper as it cools.

4.0 INITIAL CONDITIONS

4.1 Verify panel mounted recorders on C-60A/B are on.

4.2 The letdown gas stripper is aligned per CL-9E. The cryogenic system is aligned per CL-9J.

4.3 Radwaste steam is available.

5.0 PROCEDURE

5.1 Startup To Hot Standby

5.1.1 Start K-10A and/or K-10B cryo system compressors per Section 5.5 to maintain gas strippers gas pressure.

5.1.2 Open 1GS-39(2GS-39), water return from cryo system moisture separator HX-138A(B).

5.1.3 Start 1P-130A(2P-130B) gas stripper circulating pump.

5.1.4 Place TICK-GW-1A(B) preheater temperature controller in manual and shut. Open RS-44(30) and slowly open RS-45(31) to admit steam to preheater HX-132A(B).

5.1.5 Ensure GS-GW-17A(B) vent cooler outlet TCV is in auto and open.

5.1.6 Place PICK-GW-5A(B) condenser pressure controller in manual and open, to maintain gas stripper pressure as low as possible during heatup.

NOTE: ***During heatup of the gas stripper, the gas inventory will increase in either the opposite units VCT (PCV-158 not in service) or in the cryo system decay tanks (PCV-158 in service). In either case, venting of the VCT on the opposite unit will be needed.***

5.1.7 During heatup of the gas stripper, gas will be displaced to the cryogenic system. Cryo system response depends upon the VCT gas system lineup on the opposite unit.

a. If the opposite unit's gas stripper is on-line and the opposite unit's VCT fine control regulator, PCV-158 is in service, then pressure will increase in the cryogenic delay tanks. Periodically vent that unit's VCT to maintain cryo compressor discharge pressure <80 psi.

b. If the opposite unit gas stripper is on-line and the opposite unit VCT fine control regulator PCV-158 is not in service, then pressure will increase in the VCT. Periodically vent that unit's VCT to maintain VCT pressure <30 psi.

c. If the opposite unit gas stripper is not on-line, opening of CV-261C cryo return may be required along with venting of the VCT if cryo compressor discharge exceeds 80 psig.

5.1.8 Open TICK-GW-1A(B) preheater temperature controller manually to establish a heat up rate. Monitor point one on TR-GW-30A(B) gas stripper temperature controller during heat up. Control heat up rate to within the capacity of the cryo compressors as monitored on PICK-GW-5A(B), condenser pressure controller.

5.1.9 Heat up to 258°F, then place TICK-GW-1A(B) in auto at the 258° setpoint.

5.1.10 Place PICK-GW-5A(B) in auto when it reaches its setpoint of 2.15 psig.

5.2 Hot Standby To On Line

5.2.1 If required, sample the letdown gas stripper to determine the boron concentration.

5.2.2 Verify GS-GW-73A(b)control switch on C04 is in the local position.

5.2.3 If plant conditions allow, have the control operator go to one crifice if two orifices are on line.

5.2.4 Place the gas stripper outlet control valve GS-GW-72A(B) in AUTO.

CAUTION **IF THE LETDOWN GAS STRIPPER BORON CONCENTRATION IS NOT THE SAME AS THE UNIT'S RCS BORON CONCENTRATION, PLACING THE LETDOWN GAS STRIPPER ON LINE WILL HAVE A REACTIVITY CHANGE. IF REQUIRED, DIVERT THE UNIT'S LETDOWN TO THE HUT WHILE BLENDING VIA THE MAKEUP SYSTEM AT THE PROPER BORON CONCENTRATION PER OP-5B.**

5.2.5 Go to open on GS-GW-71A(B) stripper feed isolation valve. This will open GS-GW-72A(B) stripped liquid return control valve and shut GS-GW-73A(B) letdown isolation valve, provided preheater temperature is >220°F but <270°F, and level is >41".

NOTE: ***TICK-GW-9A(B) trim cooler temperature controller is now controlling VCT outlet temperature, and should be set at 115°F.***

5.2.6 Stabilize feed pressure at 40 psig with GS-GW-4A(B), recirc line PCV.

5.2.7 Stabilize level at 66" with LRC-GW-3A(B) level controller.

5.2.8 Align VCT H_2 gas makeup per OP-5D. Ensure that CV-261C is opened.

5.3 Shutdown

5.3.1 Placing the gas stripper in hot standby

a. Go to close on GS-GW-71A(B) stripper feed isolation valve and/or have the control operator place the gas stripper divert valve control switch to VCT.

b. Control pressure and temperature as needed to maintain standby conditions. Level will remain at the level at which the gas stripper was taken off line (assuming no leakage).

c. Align VCT H_2 gas makeup per OP-5D. Ensure that CV-261C is closed.

5.3.2 Complete shutdown

a. Align VCT H_2 gas makeup per OP-5D. Ensure that CV-261C is closed.

b. Go to close on GS-GW-71A(B) stripper feed isolation valve and/or have the control operator place the gas stripper divert valve control switch to VCT.

c. Close GS-GW-3A(B) trim cooler outlet level control valve.

CAUTION **COOLDOWN RATE MUST BE CONTROLLED TO AVOID DRAWING A VACUUM IN THE LETDOWN GAS STRIPPER.**

d. Go to manual and close on TICK-GW-1A preheater temperature controller. Close RS-44(30) and RS-45(31) to secure steam to preheater.

NOTE: ***GS-GW-17A(B) HX-135A(B) outlet TCV is to remain open during cooldown to provide for gas stripper gas backfill.***

e. Place control switch for GS-GW-17A(B) to HAND.

f. Verify cryo compressor suction is maintained at the normal value to allow backfeed. If necessary, adjust CR-PCV-2.

g. Go to manual and open on PICK-GW-4 gas stripper feed pressure controller.

h. Leave PICK-GW-5 condenser pressure controller, and TICK-GW-9 trim cooler temperature controller in auto.

i. Stop P-130A(B) circulating pump.

j. Shut 1GS-39(2GS-39), water return from cryo system moisture separator HX-138A(B).

5.4 Cryo Chiller System Operating Procedure

5.4.1 Chiller system startup

a. Chiller system lined up per applicable section CL-9J.

b. Verify that the temperature indication controller on the F-11 refrigeration units is set at 80°F.

c. Verify chiller/surge tank T-109 is >3/4 full of water.

d. Start P-143, T-109 recirculation pump (local switch on wall).

e. Verify that power to the F-11 refrigeration units HX-152A&B is available and turned on. Power supply is breakers 34 & 36 on the auxiliary systems heat tracing panel across from 2B32.

f. Position the two-way suction and discharge valves CR-103 and 104 for operating the desired chiller pump (P-139A or B). (Note valve operating handle points to the pump selected.)

g. Start the selected chiller pump. Control switch is located at the cryogenic electrical control panel.

h. Check chiller pump P-139A or B discharge pressure is between 15 to 30 psig.

i. Readjust temperature indication controller on F-11 refrigeration unit to 36°F. Observe that both F-11 units start. Observe that bubbles in the bulls-eye approach an intermittent rate after several minutes of operation. If a solid stream of bubbles persists the unit charge may be lost.

j. Allow the chiller unit to cool down for two hours. Check supply and return differential temperature is less than 10°F. If the F-11 refrigeration units have not started to cycle, they may need to be recharged.

k. When the chiller system has reached equilibrium condition, refill surge tank to >3/4 full. Inspect all piping for leaks.

l. Stop P-143 surge tank recirculating pump.

5.4.2 Shutdown

a. Stop chiller pump P-139A or B. Put control switches in pullout.

b. Reset temperature indication controller to greater than room ambient condition (greater than 80°F) and observe the F-11 chillers stop cycling.

5.5 Starting a Cryogenic Compressor

5.5.1 Prior to starting, check sump oil level, component cooling cut in, and diaphragm failure pressure indicator reading 0 psig.

5.5.2 Start K-10A (K-10B) and adjust as necessary CR-2-PCV to maintain suction pressure at 1.0 psig as indicated on suction pressure gauge PI-1A (PI-1B).

5.5.3 After five minutes' operation, check that the bulls-eye on the attached lube oil relief is partially full, with oil being injected on each stroke of the compressor. Check that the diaphragm failure pressure indicator is 0 psig. If a small pressure (0 to 12 psig) is indicated, vent off through CR-99 (CR-100) to the atmosphere and recheck after 10 minutes' operation. Note if this pressure buildup persists the diaphragm has failed, secure the compressor.

5.6 Response to and recovery from a radwaste CCW isolation and auto shutdown of the letdown gas strippers and cryogenic gas compressors. FOR BLOWDOWN EVAP RECOVERY, REFERENCE OI-16.

5.6.1 When either LW-63 and/or LW-64 leave the full open position, the following equipment will trip or close.

K-10A	Cryogenic Gas Compressor	Trip Off
K-10B	Cryogenic Gas Compressor	Trip Off
P-130A	Letdown Gas Stripper Circ Pump	Trip Off
P-130B	Letdown Gas Stripper Circ Pump	Trip Off
P-137	Aux Condensate Return Pump	Trip Off
RS-SA-1	Radwaste Steam Supply Control Valve	Trip Close

If the keyswitch "radwaste CCW isolation bypass for RS-SA-1" is used, then prior to opening RS-SA-1, steam should be secured to the letdown gas strippers by shutting RS-28.

5.6.2 If a radwaste CCW isolation occurs, perform the following for the letdown gas strippers and cryogenic compressors:

Place:

TICK-GW-1A	Gas Stripper Prehtr Temp Control	Manual & Shut
TICK-GW-1B	Gas Stripper Prehtr Temp Control	Manual & Shut
PRCK-GW-4A	Gas Stripper Feed Pressure Control	Manual & Shut
PRCK-GW-4B	Gas Stripper Feed Pressure Control	Manual & Shut

CAUTION **IF A CONTAINMENT ISOLATION WAS THE CAUSE OF CLOSURE OF LW-63 AND LW-64, THEN CONTAINMENT ISOLATION WILL HAVE TO BE RESET AND DSS PERMISSION IS REQUIRED TO RE-OPEN LW-63 AND LW-64.**

5.6.3 To recover from radwaste CCW isolation and establish normal operation:

a. Open LW-63 and LW-64 on 2C03

b. Place RS-SA-1 in manual and SHUT.

c. Depress the radwaste component cooling isolation reset pushbutton on C-180.

d. Check that the radwaste component cooling isolation alarm at C-180 is clear.

e. Start K-10A or B per Section 5.5 of this procedure.

f. Verify the following controllers in manual and shut:

TICK-GW-1A Gas Stripper Prehtr Temp. Control Manual & Shut
TICK-GW-1B Gas Stripper Prehtr Temp. Control Manual & Shut
PRCK-GW-4A Gas Stripper Feed Pressure Control Manual & Shut
PRCK-GW-4B Gas Stripper Feed Pressure Control Manual & Shut

g. Start P-130A and crack open TICK-GW-4A to ~5 percent open and observe pressure in the letdown gas stripper. Adjust TICK-GW-4A to obtain normal feed pressure while observing stripper pressure.

h. Start P-130B and crack open TICK-GW-4B to ~5 percent open and observe pressure in the letdown gas stripper. Adjust TICK-GW-4B to obtain normal feed pressure while observing stripper pressure.

i. Reference OI-16 for blowdown evaporator startup/lineup prior to opening RS-SA-1.

j. Manually throttle open RS-SA-1 and establish ~50 psig radwaste steam pressure.

k. If desired, place the letdown gas strippers in operation in accordance with Steps 5.1 and 5.2 of this procedure.

INITIALS

5.7 Gas Stripper System Gas Leak Check

CAUTION **THIS SYSTEM CONTAINS RADIOACTIVE GASES AND LIQUIDS. THE AREAS BEING ENTERED MAY BE HIGH RADIATION AREAS. APPROPRIATE HEALTH PHYSICS PRACTICES MUST BE OBSERVED AND AN RWP IS REQUIRED.**

NOTE: ***This procedure leak checks both gas strippers.***

5.7.1 Place both letdown gas strippers in a hot standby condition per Step 5.3.1 and allow stripper conditions to stabilize. _____

NOTE: ***If primary system conditions permit, wait an additional 8-16 hours before proceeding to allow decay of the short-lived isotopes.***

5.7.2 Align gas stripper building ventilation exhaust through a purge exhaust charcoal filter unit per the guidelines of AOP-11B. _____

5.7.3 Setup of helium test equipment:

a. Obtain an RWP. _____

b. Locate the helium detector system on El. 6.5' of the facade outside the gas stripper entrance door. _____

c. Route sufficient tubing inside the gas stripper building, through a hole above the main entrance door, to reach the upper elevation piping and valves. _____

d. Route roughing pump return to the gas stripper building via tubing through the hole above the entrance door. _____

INITIALS

e. Danger tag shut 2WG-1657A, N_2 supply to the gas strippers. _____

f. Verify 1&2GS-61 locked shut, local N_2 purge isolation valve. _____

g. Attach a helium bottle with regulator to the tubing downstream of N_2 regulator PCV-61, in Pipeway 4. _____

5.7.4 Start up and calibrate the helium detector:

NOTE: ***Reference OI-85 and the leak detector manual for the proper operation of the helium detector system.***

NOTE: ***The position of the needle valve should not be altered during calibration and testing.***

a. Tune the detector for peak response and for zero calibration. _____

b. Connect a 2 percent helium test cylinder to the detector system and plot the corresponding count rate on Figure 1. _____

c. Extend a straight line from zero through the above point as the expected detector response for various helium concentrations. _____

5.7.5 Helium addition to the gas stripper:

a. Secure the Cryo compressors and danger tag the control switch in pullout.

K-10A in Pullout
K-10B in Pullout _____

INITIALS

b. Shut and danger tag the following valves:

CR-17	Compressor Gas Makeup Isolation
CR-4	K-10A Suction Isolation
CR-5	K-10B Suction Isolation
1GS-39	Water Separator Return Isolation
2GS-39	Water Separator Return Isolation
CR-39	Cryo System Outlet
CR-40	Cyro Outlet to VCT
CR-41	Cryo Outlet to VCT

_____

CAUTION **HELIUM ADDITION MUST BE PERFORMED IN A SLOW AND CONTROLLED MANNER TO PREVENT GAS BINDING IN THE STRIPPER CONDENSER OR ERRATIC OPERATION OF THE CONDENSER PRESSURE CONTROLLERS, PICK-GW-5A(B).**

SECURE HELIUM ADDITION IMMEDIATELY IF GAS STRIPPER PRESSURE IS >4.0 PSIG AND PCV-GW-5A(B) IS WIDE OPEN OR AUTOMATIC RADWASTE STEAM ISOLATION WILL OCCUR VIA THE TRIPPING SHUT OF RS-SA-1 WHEN STRIPPER PRESSURE IS >20 PSIG.

NOTE: ***At normal operating level, each gas stripper vapor volume is 250 cubic feet. A T-size helium cylinder contains 10.8 cu ft of gas per 100 psi drop in cylinder pressure.***

c. Add equal amounts of helium to each gas stripper via 1&2GS-61 local N_2 purge isolation valve for a 2 percent helium concentration.

_____

d. Lock shut 1&2GS-61

_____

INITIALS

e. Request Chemistry to obtain a sample volume of stripper gas at 1 or 2GS-20 local sample valve. _____

f. Attach the gas sample to the leak detector and record:

Count rate _____

He concentration _____% _____

5.7.6 Align the helium detector for leak detection per Figure 2. _____

5.7.7 Establish radio communication between the detector operator and the person at the sniffer tube in the gas stripper building. _____

CAUTION **THE PERSON IN THE GAS STRIPPER BUILDING IS UNDER THE CONTROL OF THE DSS AND MUST EXIT PROMPTLY WHEN NOTIFIED BY CONTROL ROOM PERSONNEL OF DETERIORATING RADIOLOGICAL CONDITIONS IN THE STRIPPER BUILDING.**

5.7.8 Using the detector tubing, sniff all vapor space mechanical joints for leaks. Include all valves, valve bonnets, valve packing on stems, pipe caps or plugs, relief valves, flanged joints and mechanical connectors. _____

5.7.9 Record sampling flow, background counts and the indicated counts for any leaks found in Section 6.0, Leak Quantification, data sheet attached. _____

5.7.10 Shut GS-GW-17A(B) HX-135A(B) vent cooler outlet TCV and recheck the valve stem seal for leaks. _____

5.7.11 Repeat Step 5.7.10 with the valve open. _____

INITIALS

5.7.12 Restore the system for operation:

a. Disconnect and remove the helium bottle from the N_2 purge line in Pipeway 4. Reconnect the normal N_2 purge tubing at PCV-61. _____

PMT

b. Snoop all disturbed fittings to determine leak tightness. _____

c. Remove the leak detection system supply and return tubing from the stripper building. _____

d. Open the following valves:

CR-4 K-10A Suction Isolation
CR-5 K-10B Suction Isolation
CR-17 Compressor Gas Makeup Isolation _____

PMT

e. Start one cryo compressor and observe that the gas strippers and cryo system return to normal operating pressure. _____

f. Restore the balance of the valves on the danger tag series to a normal operating lineup. _____

g. Restore the stripper building ventilation system to normal. _____

5.7.13 Return the gas strippers to operation per the direction of the DSS. _____

6.0 LEAK QUANTIFICATION

Leaks found can be quantified by using the following relationship.

$$L = F (I-B)/S$$

L = Leak size, sccm
F = Sample flow, sccm
B = Natural background helium, ppm
S = System helium, ppm
I = Indication helium, ppm

I = (natural background, ppm) (indication, counts)/(Natural background, counts)

6.1 Quantify Leakage

Leak Location	Natural ppm	Background Counts	Indication		System Concentration (ppm)	Flow (sccm)	Leak Size (sccm)	MWR No.
			ppm	Counts				
	5.24							
	5.24							
	5.24							
	5.24							
	5.24							
	5.24							
	5.24							

6.2 Hang maintenance request identification tags at each leak location.

Evaluation Performed by _____ Date _____

Remarks:

FIGURE 1

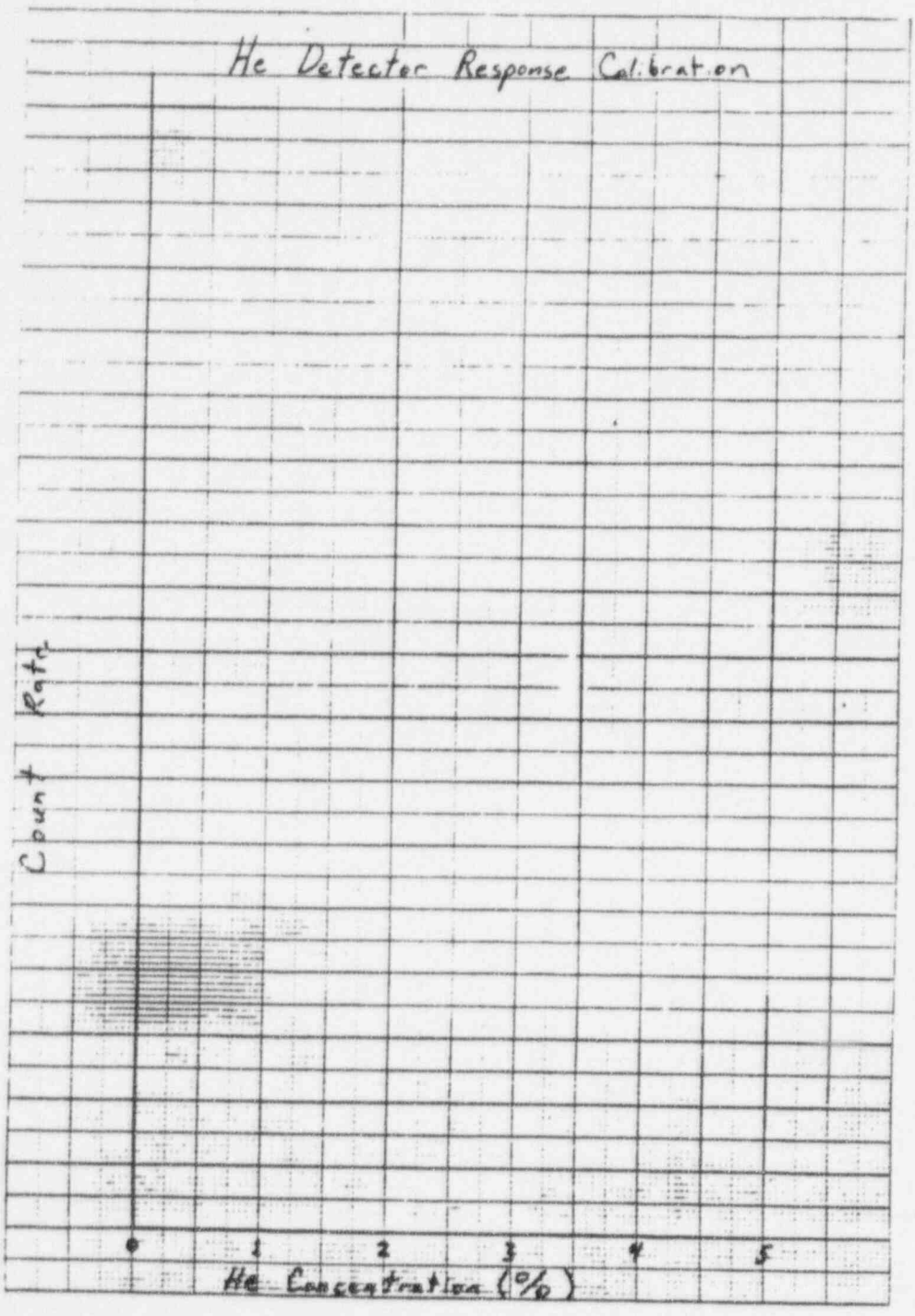
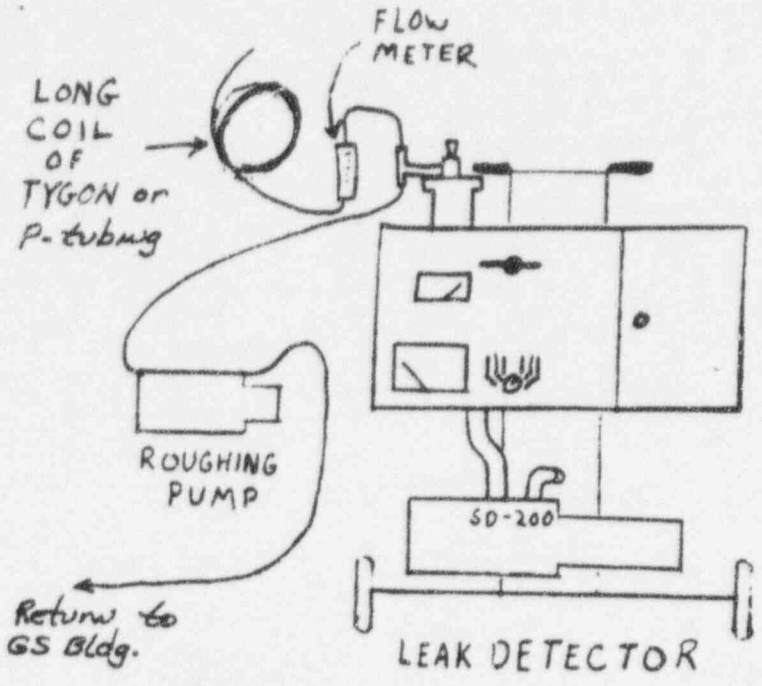

He Detector Response Calibration
Count Rate
0
1
2
3
4
5
He Concentration (%)

FIGURE 2



SETUP FOR LEAK SNIFFING

Point Beach Nuclear Plant	
SHOWING	FIGURE 2
LOCATION	
DRAWN BY	CAC DATE 7-21-96
DRAWING NO.	