GEORGIA POWER COMPANY

HATCH NUCLEAR PLANT

PROCEDURE

Eberline Model PCM-1 Portal Monitor
Operation and Calibration
PROCEDURE TITLE

HNP-8161
PROCEDURE NUMBER

Lab
RESPONSIBLE SECTION

SAFETY RELATED (X) NON-SAFETY RELATED ( )

REV.	DESCRIPTION	APPROVED DEPT. MANAGER	APPROVED GENERAL MANAGER	DATE
0	New Procedure	W H Rogers for RW	Harry Nix	1/14/84
1	Pages 1 thru 22	RW Zawadoski	Harry Nix	7/23/84
2	Pages 8,11-13,15,19&21	RW Zawadoski	Harry Nix	9/27/84
3	Pages 1, 4-6, 9-15, 3-20 & 22	W H Rogers for RW	Harry Nix	2/6/85

PRC 11/84

(1) NEED BY DATE : 1/1

PROCEDURE REVISION REQUEST

(2) PROCEDURE NO. : HNP - 8116l (3) SHEET 1 of 35

(4) REVISION NUMBER OF CURRENT PROCEDURE : 2

(5) PROCEDURE TITLE : Eberline Model PCM-1 Pocket Monitor Operation and Calibration

(6) REQUESTED BY : Mike Finch SIGNATURE 10/24/84 DATE

(7) LIST ANY QA TRACER NUMBERs BEING ADDRESSED : 84-675 and 84-202

(8) PRG REVIEW : Reviewed-QASM SIGNATURE 11/15/84 DATE

(9) PRESENT STATUS : (X) SAFETY RELATED ; ( ) NON-SAFETY RELATED

(10) THE ABOVE STATUS IS BEING CHANGED: ( ) YES, TO N/A ; ( ) NO

(11) TRAINING REQUIREMENTS (FOR ADMINISTRATIVE PROCEDURES ONLY) : N/A

(12) DEPARTMENT MANAGER ENDORSEMENT : RW Zavadoski SIGNATURE 11/30/84 DATE

(13) IF QA TRACER(S) APPLICABLE, INDICATE REVIEW BY QA REP. : 84-202 & 84-675 reviewed & returned

MARKED-UP COPY OF CURRENT PROCEDURE MUST BE ATTACHED TO THIS FORM!! ✓

(14) REVIEW BY DOCUMENT CONTROL CLERK: E. Carter SIGNATURE 12/04/84 DATE

(17) PRB DISPOSITION : ( ) N/A ; (✓) RECOMMEND FOR APPROVAL ; ( ) REJECT

(18) PRB NUMBER : 84-256 ; DATE OF PRB MEETING : 12/13/84

(19) PRB SECRETARY's SIGNATURE : Tom Sheppard

PROCEDURE REVISION REQUEST

(CONTINUATION SHEET)

(2) PROCEDURE NO. : HNP - 8161 (3) SHEET 2 of 5

(4) REVISION NUMBER OF CURRENT PROCEDURE : 2

(15) REASON FOR REQUEST :

1) Close OH item.
2) Make procedure more workable.
3) Add tolerance to gas flow.

PROCEDURE REVISION REQUEST

(CONTINUATION SHEET)

(2) PROCEDURE NO. : HNP - 8161 (3) SHEET 3 of 8

(4) REVISION NUMBER OF CURRENT PROCEDURE : 2

(11) TRAINING REQUIREMENTS (FOR ADMINISTRATIVE PROCEDURES ONLY) : N/A

SAFETY EVALUATION

(1) PROCEDURE NO. : HNP - 8161 (2) SHEET 4 of 25

(3) REVISION NUMBER OF CURRENT PROCEDURE : 2 (N/A IF FOR NEW PROCEDURE)

(4) PROCEDURE TITLE : Eberline Model PCM-1 Portal Monitor

(5) TYPE OF DOCUMENT TO WHICH THIS EVALUATION APPLIES : ( ) NEW PROCEDURE

(X) PROCEDURE REVISION

(6) DOES THIS DOCUMENT CHANGE THE MODE OF OPERATION OR INTENT AS DESCRIBED IN THE FSAR? ( ) YES ; (X) NO

(7) DOCUMENT : ( ) INVOLVES AN UNREVIEWED SAFETY QUESTION

( ) REQUIRES A TECH. SPECS. CHANGE BEFORE THE DOCUMENT CAN BE USED; IF SO, RECORD THE ASSOCIATED DoCR NUMBER : _____

(X) NEITHER

(8) DOES THE IMPLEMENTATION OF THIS DOCUMENT REPRESENT AN UNREVIEWED SAFETY QUESTION? ( ) YES ; (X) NO

(9) GIVE THE BASIS FOR THE DETERMINATION OF WHETHER OR NOT THE IMPLEMENTATION OF THIS DOCUMENT REPRESENTS AN UNREVIEWED SAFETY QUESTION :

The revision of this procedure does not represent any unreviewed safety question because; the changes do not change any safety related systems.

SAFETY EVALUATION
(CONTINUED)

(1) PROCEDURE NO. : HNP - 8161 (2) SHEET 05 of 05

(3) REVISION NUMBER OF CURRENT PROCEDURE : 2 (N/A IF FOR NEW PROCEDURE)

(10) THE IMPLEMENTATION OF THIS DOCUMENT ~~(DOES~~ / DOES NOT) CONSTITUTE AN UNREVIEWED SAFETY QUESTION AS EXPLAINED BELOW:

1. THE PROBABILITY OF OCCURRENCE AND THE CONSEQUENCES OF AN ACCIDENT OR MALFUNCTION OF EQUIPMENT IMPORTANT TO SAFETY ~~(ARE~~ / ARE NOT) INCREASED ABOVE THOSE ANALYZED IN THE FSAR DUE TO THE IMPLEMENTATION OF THIS DOCUMENT BECAUSE: This equipment does not affect any safety related systems.

2. THE POSSIBILITY OF AN ACCIDENT OR MALFUNCTION OF A DIFFERENT TYPE THAN ANALYZED IN THE FSAR ~~(DOES~~ / DOES NOT) RESULT FROM THE IMPLEMENTATION OF THIS DOCUMENT BECAUSE: This procedure revision does not increase the possibility of an accident as analyzed in the FSAR

3. THE MARGIN OF SAFETY AS DEFINED IN TECHNICAL SPECIFICATIONS ~~(IS~~ / IS NOT) REDUCED DUE TO THE IMPLEMENTATION OF THIS DOCUMENT BECAUSE: No safety system has been changed.

(11)	SAFETY EVALUATION PERFORMED BY :	[illegible]	10/24/84
(12)	SAFETY EVALUATION REVIEWED BY :	RW Zawadoski	11/30/84
(13)	DEPARTMENT MANAGER APPROVAL :	RW Zawadoski	11/30/84

LB

EBERLINE MODEL PCM-1 PORTAL MONITOR OPERATION AND CALIBRATION

A. PURPOSE

This procedure provides the necessary details and methodology for placing the PCM-1 into operation, performing initial calibrations, setting operating parameters, and performing the periodic checks on the instrument.

B. SAFETY

Observe Radiation Protection procedures. Do not place the hands, eyes, or other parts of the body in close proximity to the thin window side of the beta sources.

C. REFERENCES

1. TDC-6002M, Model PCM-1 Technical Manual, January 1983
2. HNP-830, Performance and Review of Plant Functions and Procedures
3. HNP-8116, Eberline Minipulser Procedure

D. TEST EQUIPMENT

1. Wide range digital voltmeter
2. Eberline minipulser
3. Oscilliscope
4. Calibration and check sources. (Calibration sources must have NBS traceable documentation).
5. Electrostatic Voltmeter 3kv

E. DEFINITIONS

1. Alarm Hold Time: The length of time the audible alarm and the display module remain activated during an alarm condition. (Operator determined, 1 to 9 seconds)
2. Alarm Setting (R_A): (Operator determined - Modes 1 and 3). The minimum number of counts (N) collected before a contamination alarm will occur is:

$$N=R_AT + R_BT$$

Therefore, R_A specifies the minimum activity count rate that will trigger an alarm. The probability that a given amount of activity will produce a count rate R_A during the period T is determined by the Z factor (see below).

3. Count Time (T): (Modes 1 & 2) A predetermined period of time for the count duration of the background update and the personnel count. (Operator determined 1 to 10 seconds)

4. Count Time, Test: The length of time that the system counts in the "Count Rate" mode, normally used for source checking individual channels. (Operator determined 1 to 900 seconds)

5. Maximum Alarm Limit ($R_{A\ max}$): (Mode 2) Preset count rate that will cause a high background alarm if the setpoint is exceeded.

6. Maximum Count Time (T_{max}): (Mode 3 only) The maximum allowable amount of counting time, (T). A high background alarm will occur when $T \geq T_{max}$.

7. Reliability of Detection: The probability that activity which produces an average count rate R_a in a detector will trigger an alarm during a counting time, T, is determined by the equation:

$$R_A = R_a - Z\sqrt{\frac{R_a+R_b}{T} + \frac{R_b}{T\,(2W+1)}}$$

where R_b is the background count rate during the counting time T. R_B is the best estimate of R_b. W is the Weighting Factor (see below).

Z is determined by choosing the desired confidence level that will produce an acceptable false alarm rate, and still maintain a reasonable confidence in the detection level. This determination should be based on the location of the monitor and the conditions (e.g. background level) under which it is to be used.

For 99.9 percent confidence level, F(z) = .999, z = 3.090

For 99.0 percent confidence level, F(z) = .990, z = 2.326

For 95.0 percent confidence level, F(z) = .950, z = 1.645

For 90.0 percent confidence level, F(z) = .900, z = 1.282

For 75.0 percent confidence level, F(z) = .750, z = 0.674

For 50.0 percent confidence level, F(z) = .500, z = 0.

8. Sigma Factor (SF): A user entered variable that is a multiplier of the background standard deviation used in determining alarm setpoints.

   a. Mode 1, the SF is used in determining the alarm setpoint for the high background alarm. When

   $$SF \sqrt{R_B T} \geq R_A T$$

   the alarm will occur.

   b. Mode 2, the SF is used in determining the personnel alarm setpoint, R_A,

   where $R_A = SF \sqrt{R_B / T}$

   c. Mode 3: the SF is used in determining the minimum count time, where the alarm setpoint R_A is preset and the highest average channel background is R_B:

   $$T = (SF)^2 \ R_B/(R_A)^2$$

   NOTE

   The value of the Sigma Factor will vary based on which of the three modes of operation is to be used. Determine values for the variable represented in the formulas based on the location and operating conditions of the monitor. Use these to arrive at an acceptable value for the SF that will produce the most sensitive operation with the least amount of false alarms.

   d. Units: The units displayed can be in counts per second or minute, whichever is selected.

   e. Weighting Factor (W): A number that is used in compensating for background variation. An increase in the W value results in an increased ability to reject false alarms, but at the same time it increases the amount of time it takes to respond to real changes in the ambient background. A value between 5 and 20 is recommended.

F. DESCRIPTION

1. General

The Eberline Personnel Contamination Monitor, Model PCM-1, is a microprocessor-based radiation detection system which provides a quick indication of beta-gama contamination on personnel.

The PCM-1 has an operate mode and a test mode. While in the operate mode the monitor will run in its main routine, measuring and storing background for all channels, checking for high background alarm levels, low or high count failure, and low gas pressure conditions. This causes the personnel monitoring routine to be executed. This routine checks all channels for high activity alarm conditions with automatic background subtraction, according to the protocol of one of the three operating modes in which the monitor has been set to operate. The test mode is used to run detector plateaus, determine counting efficiencies, etc.

The PCM-1 has fifteen (15) independent gas-flow proportional detectors. Maximum detector sensitivity is achieved through the use of an input preamplifier for each channel which interfaces each detector to the microcomputer. Each channel has adjustable gain and discriminator to permit the operating point to be optimized for each detector.

Each group of five channels has an independently adjustable high voltage power supply, with a nominal range of 500 to 2500 VDC.

The outputs from the fifteen discriminators are fed to a counter board, and then to a central processing unit (CPU) module which includes an Intel 8085 microprocessor, memory, and input/output parameters during periods of power outage.

2. Controls and Indicators

a. External

(1) Ultrasonic sensing unit: (When in use) Senses one's approach to the monitor and causes background counting to stop and the display to read STEP UP--INSERT RIGHT ARM, accompanied by a short beep.

(2) Alphanumeric display: Indicates appropriate messages to users in the operate mode and indicates operating conditions and parameters when the monitor is in the test mode.

(3) Display lights: Alarm, Counting, Ready and Trouble lights that assist in indicating appropriate messages to users.

(4) Photoelectric sensor: Indicates to the monitor that it is occupied or if the occupant has exited the monitor before the count cycle has been completed.

(5) Operate/Test switch: A key operated switch that controls the operation of the monitor between the normal operation mode and its test and maintenance routines.

(6) Keyboard: A 16 key control board that serves as the interface for communication between the operator and the monitor.

(7) Alarm acknowledge: Silences contamination alarm.

b. Internal

(1) Power Switch: provides on-off capabilities for 110 volt AC power.

(2) Flow gauges: (3) indicate inlet flow rates in cc/minute for flow groups A, B, & C.

(3) Pressure Regulators: (2) a dual guage fully adjustable control for the P-10 gas used in the detectors. They are mounted on type 1A gas cylinders and are connected to the instrument by 3/16" ID Tygon Tubing.

(4) HV Switches: (3) switches that provide on-off capabilities for each of the three high voltage sections.

(5) HV Adjust: (3) potentiometers that provide a reference voltage to each of the high voltage power supplies enabling control of the HV setting.

3. Test Mode

If the OPERATE/TEST switch S1 is set to TEST, the monitor runs in its test and maintenance routines. In this mode, the keyboard is active and the other sensors are inactive. Background measurements and related computations are suspended while in TEST, and all parameters are available for display and/or modification as listed in Table 1. The display prompts the operator with the name of the parameter list ready for examination or, within a list, the name of the variable being displayed and its present value. The keyboard protocol is such that touching the "+" key causes an increment to the next time, the "-" key causes a decrement to the prior item and the ENTER key causes entry to that list.

4. Operate Mode

If the OPERATE/TEST switch next to the keyboard is set to OPERATE, the monitor will run in its main routine, measuring and storing background for all channels, checking for high background alarm levels, low count failure, and low gas pressure conditions until the actuation of sensing switches calls the personnel monitoring routine. This routine causes all channels to check for high activity alarm conditions with automatic background subtraction, according to the protocol of one of the three operating modes in which the monitor has been set to operate:

a. Mode 1: Preset All

b. Mode 2: Maximum Sensitivity

c. Mode 3: Minimum Count Time

The ultrasonic unit will, when in use, sense an individual's approach to the monitor. All background counting will cease, and the display will read STEP UP--INSERT RIGHT ARM.

When an individual inserts an arm into the hand/forearm cavity, a light beam will be broken and the monitor will initiate counting. The display will read COUNTING RIGHT SIDE for the duration of the counting time. If no alarm levels are exceeded, the unit beeps and displays RIGHT SIDE OK--INSERT LEFT ARM. The display will indicate COUNTING LEFT SIDE when the left arm interrupts the light beam in the detector cavity. At the end of the counting time the unit displays COUNT COMPLETE, YOU MAY PASS, accompanied by a chime if no alarm levels are exceeded.

Contamination in excess of alarm levels is signaled at the end of Right or Left side counting, or both, by the alarm sonalert and display messages. All contaminated zones will be indicated on the display.

Premature arm withdrawal will cause the alarm sonalert to sound and COUNT INCOMPLETE **RECOUNT** to be displayed. Reinsertion restarts the count.

(1) Mode 1: Preset All

In this mode, the alarm setpoint (R_A) for each channel, and the counting time (T) and the sigma factor (SF) for all channels, are entered via the keyboard. A personnel alarm occurs if the count (N) in the counting time (T) is such that:

$$N \geq R_B T + R_A T$$

The high background alarm occurs if:

$$SF \sqrt{R_B T} \geq R_A T$$

(2) Mode 2: Maximum Sensitivity

In this mode the maximum alarm limit (R_A max), counting time (T), and sigma factor (SF), are entered via the keyboard. Each time the background is updated, a new alarm setting (R_A) is computed for each channel.

$$R_A = SF \sqrt{R_B/T}$$

A personnel alarm occurs if:

$$N \geq R_B T + R_A T$$

The high background alarm occurs if:

$$R_A \geq R_A \text{ max}$$

(3) Mode 3: Minimum Count Time

In this mode, R_A, SF and maximum count time (T_{max}) are entered. Each time background is updated, a new count time is computed from;

$$T = (SF)^2 RB/(R_A)^2,$$

based on the channel with the highest R_B.

A personnel alarm occurs if:

$$N \geq R_B T + R_A T$$

The high background alarm occurs if:

$$T \geq T \text{ max}$$

5. Failure and Trouble Indications

a. High Background

If the background count rate, R_B, in any zone(s) should increase to such an extent that it, and the selected sigma factor, SF, counting time, T, alarm level, R_A max alarm limit, R_A max, and max count time, Tmax, relate so as to satisfy the inequaltities of Section F.4.a, F.4.b, or F.4.c; the alarm light, trouble light, sonalert, and (ZONE/CHANNEL DESIGNATION)

HIGH BACKGROUND message, will be activated for the duration of the alarm hold time. The trouble light will remain illuminated when the unit automatically reverts to counting background, but the zone(s) involved will not update background or be capable of further alarm sensing until cleared through the DISPLAY TROUBLE LIST section of the test mode menu, which lists all the currect trouble conditions and zones. After returning to the operate mode, any trouble which persists will cause reactivation of the alarm and message.

b. High Count Fail

If the 64K count capacity of any zone counter is exceeded during a background count interval, the alarm light, trouble light, sonalert, and (CHANNEL DESIGNATION) HIGH COUNT FAIL message, are activated. The trouble light will remain on and the fail zone will remain inactive until cleared, as in the case of the high background alarm. High count fail is more likely to be caused by electrical noise than by legitimate counts.

c. Low Count Fail

If a zone counter receives counts below the Low Count Fail Setpoint, a (ZONE/CHANNEL DESIGNATION) LOW COUNT FAIL message/alarm is activated in a manner identical to the previous ones. Any counts which occur between background counting cycles, during the overhead time of the computer, are not registered in the zone counters.

d. Loss of Gas Pressure

If both gas bottles have pressure when the PCM-1 is first turned on, gas will be drawn from bottle #1, through ports 2 and 3 of gas bottle select valve V1 (unactuated), to the input flowmeter. When bottle #1 runs out of gas, pressure switch S2 senses the loss of pressure, causing the computer to activate the alarm and the message BOTTLE #1 EMPTY, and to actuate V1, drawing gas from bottle #2. The trouble light will remain on until bottle #1 is replaced. V1 will remain actuated until Bottle #2 runs out of gas, whereupon V1 switches back to Bottle #1, and the alarm and message BOTTLE #2 EMPTY is activated. If both bottles are out of gas, the alarm and message FAILURE**OUT OF GAS! are activated, all counting stops, and the message remains on the display until pressure is restored to either, or

both, pressure sensors. If the gas supply fails, the high voltage should be turned off. This is achieved by opening the power switch or by pulling the AC line cord. The gas should be restored prior to re-energizing the system.

e. All Zones Failed

If personnel counting is attempted while all zones have failed, the display will indicate FAILED, and no count will be attempted.

G. OPERATION OF INSTRUMENT

1. Mode 3 is the normally preferred system configuration at Plant Hatch based on system flexibility. Modes 1 or 2 may also be utilized, however, (as deemed necessary by the Health Physics Laboratory Supervisor), when conditions or use are such that Mode 3 operation becomes impractical.

a. The system set-up data must be used to calculate the necessary parameters for Mode 1 or 2 operation. Appropriate informational entries should be made in the PCM-1 log book when any mode other than Mode 3 is used.

2. Initial Set-up

a. P-10 gas hook up: Install one 1A cylinder of P-10 gas in each side (bottle #1 is on the left, bottle #2 is on the right). Set the regulators to minimum pressure, connect the pressure regulators on bottles 1 & 2, and connect the 3/16" tygon tubing to the outlet side of the regulators. Secure the gas bottles in place.

b. Gas Flow and Pressure Adjust: Adjust the pressure regulators to 5 $\pm$ 0.5 psig and the flow regulators to 50 $\pm$ 5.0 cc/minute.

CAUTION

Do not exceed 50 $\pm$ 5.0 cc/minute or 5 $\pm$ 0.5 psig because damage to the detectors may occur.

c. Power Connnection: The instrument uses 110 volt AC power. It should be plugged in and turned on at this time.

d. Test the pressure switches by shutting off the main gas bottle valves in sequence and verifying that the trouble and failure alarms occur as expected.

e. Initial Purge: Allow approximately 4 to 5 hours purge time at 50 ± 5.0 cc/minute to insure that the system is completely purged of outside air and moisture. Adjust the flow rates to 25 ± 2.5 cc/minute for normal operation.

NOTE

Complete purging prior to initiation of testing.

3. Testing

a. Set all alpha threshold voltages to 500 mV on the amplifier/discriminator boards, using the ALPHA THLD controls. Set all beta-gamma threshold voltages to 500 mV using the B-G THLD controls. Check these items in Data Package 1.

b. Set amplifier gains (R411 on amplifier-discriminator boards) to 50. This is accomplished by applying a 1mV (approximately) negative going pulse at the input to the channel being adjusted, yielding a 40 mV signal at the preamp output, TP-1 referenced to TP-3 ground. Refer to the Amplifier-Discriminator schematic and component layout in that section for more details. R411 is then adjusted to provide a 2V signal at the amplifier output, TP-2 referenced to TP-3 ground. Check this item in Data Package 1.

c. Place all the ANTI-COIN switches to OUT. Check this item in Data Package 1.

d. Set the TEST/OPERATE switch to TEST, and access the Count Rate Mode, Upper Arm display. This is the typical beta-gamma channel used for set-up.

e. Place a suitable beta source, ideally, a large area, uniformly distributed source of 200K to 2M dpm (4π) (approximately 75% Co-60, 25% Cs-137) on the screen of the Upper Arm detector. Use a calibration jig (source holder) to position the source, and plot the beta plateau, adjusting the high voltage in the middle card cage in 50 V steps. The plateau should extend from 1100 to 1800 volts.

f. Lower the high voltage so that the beta count rate is approximately 50% of the gross counts recorded at the plateau value. Record the count rate.

g. Lower the high voltage in the other card cages to the same value as in step f.

h. Position the beta soure on the other zone detectors and adjust the appropriate B-G THLD controls to obtain similar (approximately ± 5%) count rates in all the other zones, except the foot detector, which is treated separately.

i. Increase the high voltage in all three card cages to a value which is midway on the measured beta plateau. Record the voltage.

j. Beta efficiency with Co-60 and Cs-137 should be approximately 10 percent of the 4π beta emission rate of the source (or greater) for all zones, except 8 percent (or greater) for the foot detectors.

k. Verify the plateaus of the other 14 detectors by counting the beta source when the high voltage is adjusted by -50, 0, and +50 volts from the selected plateau value. If necessary, return to step i. If repeating steps i & j is not adequate, return to step a.

l. Using a source of 75% CO-60, 25% Cs-137 (percentages are approximate) calibrate all the detectors (with the exception of the foot detector) when the distance from the active surface of the source to the face is approximately 3" (use the 3" calibration source jig). Calculate each detector's efficiency and enter all data on the Data Package.

m. Measure the efficiency of the foot detector when the source lies flat on the footplate. Enter all data on the Data Package.

n. Calculate the average of all the detector efficiencies, (except the foot detector) and enter on the Data Package. This overall value, (EFF), is the reference value for the weekly calibration checks and the control chart preparation for all but the foot detector.

o. Calculate T_{max}:

$$T_{max} = \frac{(SF)^2 * 3000}{(5000 * EFF)^2}$$

where EFF is the overall efficiency (most detectors). If T_{max} exceeds 40 seconds, reduce the background count rate, SF, or consider using a different operational mode (1 or 2), as appropriate.

p. Calculate R_A according to:

$$R_A = SCL * EFF,$$

where SCL = surface contamination limit ($dpm/100cm^2$) the monitor is expected to detect, and R_A has units of cpm.

q. Set the Low Count Fail Setpoint at 60% of the Average Background count rate for each channel.

r. Complete the Data Package and route for review.

H. DAILY ALARM CHECK

1. Verify that the P-10 gas regulators are set at 5 $\pm$ 0.5 psig and the gas flows to all three Zone/Channel detector branches are 25 $\pm$ 2.5 cc/minute. Adjust as necessary.

2. Turn the Operate/Test switch to the Test position. Access the Display System Parameters Listing and ensure that the "Alarm Hold Time" is set at 2 seconds. Access the Display Channel Parameters Listing and verify that the backgrounds for all Zone/Channel detectors are between 750 and 4000 cpm.

3. Return the Operate/Test switch to the Operate position and allow the monitor to background count momentarily.

4. Place the 75% Co-60/ 25% Cs-137 (percentages are approximate) beta-gamma source used for the alarm check (approximately 5000-10,000 DPM/100 cm^2, uniformly distributed) in "contact" with the screen (use the contact calibration jig) of each zone/channel detector while standing in the monitor. Verify that the appropriate alarm, as indicated audibly and on the display is received, stepping out of the monitor between alarms.

5. In the event that one or more of the Zone/Channels does not alarm, immediately remove the unit from service and investigate the cause in accordance with the manufacturer's check out procedure.

6. Make an appropriate entry in the PCM-1 log book, similar to: "All Zone/Channel alarms satisfactory, monitor #_____", or "Zone/Channel alarm for (Zone #_____, or Channel _____) unsatisfactory for Monitor #_____". In addition, enter the date and time of the alarm check and print the name of the individual who performed the check. Initial the entry.

NOTE

An entry must be made in the PCM-1 log book for corrective actions taken in the event of a failed alarm check.

I. Weekly Calibration Check

1. Complete the Daily Alarm Check (section H of this procedure).

2. Turn the Operate/Test switch to the Test position. Access the Display System Parameters Listing and record the initial setting for "Mode", "Sigma Factor", and "Weighting Factor". Verify that the "Alarm Hold Time" is set at 2 seconds, and that the "Count Time, Test" is at 10 seconds. Record the "Count Time" (Mode 1 or 2), and the "Max. Count Time" (Mode 3). Ensure that the units are in cpm.

3. Advance to the Display Channel Parameter Listing and press the "Enter" key twice to gain access to the individual Zone/Channel detector parameters. Record the "Average Background cpm", the initial "Alarm Setting cpm" (Mode 1 or 3), the "Max Alarm Limit" (Mode 2), and the Low Count Fail Setpoint for each of the 15 Zone/Channel detectors on Data Package 2. If the Low Count Fail Setpoint is not within + 20% of 60% of the Average Background, adjust the Low Count Fail Setpoint to 60% of the Average Background.

4. Advance the display to the Count Rate Mode. Press "Enter" to gain access to the first Zone/Channel displayed. Position the 75% Co-60/ 25% Cs-137 calibration source (the NBS Traceable set-up source; percentages are approximate) using the 3" source jig at the centerline of the detector. Allow the count rate display to stabilize and record the displayed value on Data Package 2. Continue this operation through all 15 Zone/Channels and record all obtained data, with the exception that the foot monitor should only be checked at the "contact" position, and that count rate recorded.

5. Return the Operate/Test switch to the Operate position.

6. Calculate the overall efficiency of the monitor as in step G.2.n and record on the Data Package.

7. Calculate the weekly efficiencies for each of the Zone/Channel detectors from the 3" detector count rates, except as specified in G.3.m.

8. Enter the average detector efficiency, and the foot detector efficiency as measured during set-up (section G of this procedure). Verify that all detector efficiencies are within ± 20% of the appropriate value. If any Zone/Channel detector exceeds ± 20% of the applicable value, determine the cause, correct the problem, and repeat the steps of this section for that detector. In the event that the measured efficiency of any Zone/Channel detector exceeds ± 20% of the appropriate set-up value, and is not correctable, reperform the steps of section G. Record all information on the appropriate Data Package(s) and plot each detector efficiency on the instrument control chart (average and foot detector charts).

9. When operating in Mode 3, calculate T_{max}, as in step G.3.p, and record on the Data Package. If T_{max} exceeds 40 seconds, reduce the background rate, reduce SF, or consider the use of Mode 1 or 2, as appropriate.

10. When operating in Mode 3, calculate R_A as in step G.3.q, and record on the Data Package.

11. Turn the Operate/Test switch to the Test position, update the T_{max} and R_A values through editing those parameters, as necessary, and return the switch to the Operate position.

12. Complete the Data Package and forward for review.

J. ANNUAL CALIBRATION

Once each year, perform the steps in Section G.3 e-r in place of the weekly calibration checks.

K. DOCUMENTATION

1. Fill out the attached procedure Data Package 1 each time a unit is placed in service or electronic repair is completed. Complete Data Package 2 each week for the monitors in service. All data must be placed in the archives.

2. Record all systems evolutions and changes to the calibration or edit/entry data of Table 1 in the PCM-1 logbook.

TABLE 1

TEST MODE MENU

Parameter List and Item	Operating Mode: Mode 1 Present All	Mode 2 Max. Sens	Mode 3 Min. Ct Time	Default Value
DISPLAY SYSTEM PARAMETERS				
Identification and type	H	H	H	--
Program Name and Version	H	H	H	--
Mode (1,2, or 3)	E	E	E	2
Sigma Factor (SF)	E	E	E	3.5
Weighting Factor (W)	E(5-20)	E(5-20)	E(5-20)	10
ALARM Hold Time (seconds)	E	E	E	1
Count Time, Test (seconds)	E	E	E	1
Count Time, (T, seconds)	CAL	CAL	C	1
Min. Count Time (Mode 1 only)	C	NA	NA	--
Max. Count Time (Mode 3 only)	NA	NA	E(40)	1
Units	CPM	CPM	CPM	Cps
DISPLAY CHANNEL PARAMETERS				
Zone or Channel Identification				
Average Background rate (R_B)	M	M	M	--
Alarm Setting rate (R_A)	CAL	NA	CAL	1000
(Mode 1 and 3 only)				
Low Count Fail Setpoint	E	E	E	--
Min. Alarm Limit (Mode 1 only)	C	NA	NA	--
Max. Alarm Limit (Mode 2 only)	NA	E	NA	1000
Alarm Level (Mode 2 only)	NA	C	NA	--
(Repeats for each zone or channel)				
COUNT RATE MODE				
Zone or Channel(cps or cpm)	M	M	M	--
(Repeats for each zone or channel)				
DISPLAY TROUBLE LIST				
(available only if trouble light is on)				
Zone or Channel Identification				
High Background	M	M	M	--
High Count Fail	M	M	M	--
Low Count Fail	M	M	M	--
Bottle 1 empty	M	M	M	--
Bottle 2 empty	M	M	M	--
Failure** Out of Gas!	M	M	M	--
SYSTEM DIAGNOSTICS				
Display Test	A	A	A	--
Keyboard Test	01	01	01	--
Alarm Ack	A	A	A	--
Light Test	A	A	A	--

TABLE 1 (CONT)

TEST MODE MENU

Parameter List and Item	Operating Mode: Mode 1 Present All	Mode 2 Max. Sens	Mode 3 Min. Ct Time	Default Value
Chime Test	A	A	A	--
Read/Write Memory Test	A	A	A	--
Program Memory Test	A	A	A	--
USAGE				
Personnel Counter/Elapsed Time	M	M	M	--
RESET				
Re-initialize system parameters & background averages	E	E	E	--

LEGEND

- H- Fixed by hardware/firmware configuration
- E- Edit/Enter via keyboard-(value must be between 0.25 and 600)
- E()- Edit/Enter via keyboard-(value or range in parenthesis normally used)
- C- Computed variable
- M- Measured variable
- NA- Not available
- A- Auto sequence
- 01- Operator Input
- CAL- Edit/Enter via keyboard based on calibration

PROCEDURE DATA PACKAGE

DOCUMENT NO: HNP-8161-1

SERIAL NO: R03-

MPL NO: _____

RTYPE: G15.14

XREF: _____

TOTAL SHEETS: 3

FREQUENCY: As Required

COMPLETED BY: _____

DATE COMPLETED: _____

I HAVE REVIEWED THIS DATA PACKAGE FOR COMPLETENESS AND AGAINST ACCEPTANCE CRITERIA IN ACCORDANCE WITH HNP-830.

ACCEPTABLE _____ UNACCEPTABLE _____

REVIEWED BY: _____

DATE REVIEWED: _____

REMARKS: _____

FIGURE 1
Page 1 of 3

DATA PACKAGE 1

PCM-1 SET-UP AND INITIAL CALIBRATION

Location:_____ MPL#:_____ Serial #:_____

Completed By:_____ Date: _____

ALPHA THLDS Set 500 mV: ( ) B-G THLDS Set 500 mV: ( )

AMP Gains Set 50: ( ) ANTI-Coin Switches Set out: ( )

Beta Source #: _____ Radionuclide(s):_____

Beta Activity:_____DPM On Date:_____

Source Placement:_____ Gas/Flow (cc/min):_____

1. PLATEAU DETERMINATION

- Upper Arm Detector -

High Voltage	Gross CPM	Average Detector Background	Net CPM
1100			
1150			
1200			
1250			
1300			
1350			
1400			
1450			
1500			
1550			
1600			
1650			
1700			
1750			
1800			

HV Set:_____
HV 50% Plateau Countrate:_____
50% Net CPM:_____

B-G THLD Reset (Value): _____ mV

B-G THLD Reset On All But Foot Detector: ( ) Plateaus Verified: ( )

FIGURE 1
Page 2 of 3

DATA PACKAGE 1 (CONT)

II. SET-UP CALIBRATION

Source #:_____ Radionuclides:_____

Activity:_____DPM On Date:_____

Decay Corrected Activity:_____DPM

ZONE/CHANNEL	CPM	ZONE/CHANNEL BACKGROUND	NET CPM	EFFICIENCY
Zone 1				
Zone 2				
Zone 3				
Zone 4				
Zone 5				
Zone 6				
Zone 7				
Zone 8				
Head				
Upper Arm				
Forearm				
Palm				
Thigh				
Calf				
Average	X	X	X	
Foot (contact)				

III. MODE 3 PARAMETER DETERMINATION

Detector Overall Efficiency:_____=EFF

Instrument Tmax:_____seconds

Instrument Ra:_____cpm

FIGURE 1
Page 3 of 3

PROCEDURE DATA PACKAGE

DOCUMENT NO: HNP-8161-2

SERIAL NO: R03-

MPL NO: _____

RTYPE: G15.14

XREF: _____

TOTAL SHEETS: 3

FREQUENCY: Weekly

COMPLETED BY: _____

DATE COMPLETED: _____

I HAVE REVIEWED THIS DATA PACKAGE FOR COMPLETENESS AND AGAINST ACCEPTANCE CRITERIA IN ACCORDANCE WITH HNP-830.

ACCEPTABLE _____ UNACCEPTABLE _____

REVIEWED BY: _____

DATE REVIEWED: _____

REMARKS: _____

Page 1 of 3

HNP-8161 R03

FIGURE 2
Page 1 of 3

DATA PACKAGE 2

PCM-1 WEEKLY CALIBRATION CHECK

Location:_____ MPL#:_____ Serial#:_____

Completed By:_____ Date:_____

Mode: 1 2 3 (Circle one)

SIGMA Factor:_____ Weighting Factor:_____

Count Time (Mode 1 or 2):_____seconds

Source #:_____ _____ Radionuclides:_____

Activity #:_____ _____DPM, On Date:_____

Decay Corrected Activity:_____ _____DPM

ZONE/CHANNEL	(Mode 1 or 3) ALARM SETTING CPM	(Mode 2) MAX ALARM LIMIT	LOW COUNT FAIL SETPOINT
Zone 1			
Zone 2			
Zone 3			
Zone 4			
Zone 5			
Zone 6			
Zone 7			
Zone 8			
Head			
Upper Arm			
Forearm			
Palm			
Thigh			
Calf			
Foot			

FIGURE 2
Page 2 of 3

DATA PACKAGE 2 (CONT)

PCM-1 WEEKLY CALIBRATION CHECK

ZONE/CHANNEL	CPM @ 3"	ZONE/CHANNEL BACKGROUND	NET CPM	WEEKLY EFFICIENCY
Zone 1				*
Zone 2				*
Zone 3				*
Zone 4				*
Zone 5				*
Zone 6				*
Zone 7				*
Zone 8				*
Head				*
Upper Arm				*
Forearm				*
Palm				*
Thigh				*
Calf				*
Foot(Contact)				**

Gas Pressures: 1._____ PSI _____ Regulator - A _____ cc/min Flow
2._____ PSI _____ Regulator - B _____ cc/min Flow
- C _____ cc/min Flow

Overall Monitor Efficiency:_____cpm/dpm

*Average Set-Up Efficiency:_____cpm/dpm

**Foot Detector Set-Up Efficiency:_____cpm/dpm

Tmax (Mode 3):_____seconds R_A (Mode 3):_____cpm

Revised Tmax and R_A Entered in Instrument: ( )

Remarks: _____

*Weekly Efficiency must be within ± 20% of Average Set-Up Efficiency

**Weekly Efficiency must be within ± 20% of Set-Up Effciency

GEORGIA POWER COMPANY

HATCH NUCLEAR PLANT

PROCEDURE

Waste Classification and Manifest Reporting
Resin Shipments
PROCEDURE TITLE

HNP-8036
PROCEDURE NUMBER

Lab
RESPONSIBLE SECTION

SAFETY RELATED (X) NON-SAFETY RELATED ( )

REV.	DESCRIPTION	APPROVED DEPT. MANAGER	APPROVED GENERAL MANAGER	DATE
0	New Procedure	RW Zawadzki	Jon Shaffer	1/3/84
1	Pages 2-3, 6, & 8	W A Rogers for RW	Jon Shaffer	2/6/84
2	Pages 1, 3 and 9	WB Kitchen for RW	Harry Nix	2/9/85

PRC MTG

NEED BY DATE: 1 / 1

PROCEDURE REVISION REQUEST

PROCEDURE NO. HNP- 8036 SHEET 1 OF 3

CURRENT REVISION NO. 1

REQUESTED BY : Charles Hart SIGNATURE 9 / 26 / 84 DATE

DEPARTMENT MANAGER APPROVAL : RW Zavadoski SIGNATURE 10/29/84 DATE
PAF-MRW

PRESENT STATUS : (✓) SAFETY RELATED ; ( ) NON-SAFETY RELATED

THE ABOVE SAFETY/NON-SAFETY STATUS HAS CHANGED: ( ) YES; TO _____

LIST ANY APPLICABLE QA TRACER NUMBER's : 84-139 & 84-057 & 83-478

IF QA TRACER IS APPLICABLE, INDICATE REVIEW BY REG. COMP. : 10-23-84

MARKED-UP COPY OF CURRENT PROCEDURE MUST BE ATTACHED TO THIS FORM!

REVIEW BY DOCUMENT CONTROL CLERK : S Bradley SIGNATURE 12/11/84 DATE

REASON FOR REQUEST : Add Safety Section, Revise Data Sheet 3
To comply with QA Tracers 84-139 & 84-057

DESCRIPTION OF CHANGES : Add Section C. SAFETY Observe Radiation Protection Procedures. Revise Data sheet 3 under Waste Stability Characteristics section by deletion of Numbers, 4, 5, 7, and Addition of NOTE

PRB RECOMMENDS APPROVAL: (✓) YES ; ( ) NO Tom Shepard PRB SECRETARY'S SIGNATURE

PRB NUMBER : 84-256 ; DATE : 12-13-84

HNP - 9
REV 2

(2)

SAFETY EVALUATION

TYPE OF DOCUMENT TO WHICH THIS EVALUATION APPLIES : ( ) NEW PROCEDURE

(✓) PROCEDURE REVISION

DOES THIS DOCUMENT CHANGE THE MODE OF OPERATION OR INTENT AS DESCRIBED IN THE FSAR? ( ) YES ; (✓) NO

DOCUMENT INVOLVES :
( ) AN UNREVIEWED SAFETY QUESTION , ( ) TECH. SPECS. , (✓) NEITHER
IF A TECH. SPECS. REVISION IS INVOLVED RECORD THE ASSOCIATED DOCR NUMBER BELOW:
DOCR NO. _____.

DOES THE IMPLEMENTATION OF THIS DOCUMENT REPRESENT AN UNREVIEWED SAFETY QUESTION : ( ) YES ; (✓) NO

GIVE THE BASIS FOR THE DETERMINATION OF WHETHER OR NOT THE IMPLEMENTATION OF THIS DOCUMENT REPRESENTS AN UNREVIEWED SAFETY QUESTION :

Implementation of this document, as pertaining to safety, involves the concern for radiation protection for which procedures have been instituted. Therefore the implementation of this document, HNP-8036, does not represent an unreviewed safety question.

SAFETY EVALUATION
(CONTINUED)

THE IMPLEMENTATION OF THIS DOCUMENT (~~DOES~~ / DOES NOT) CONSTITUTE AN UNREVIEWED SAFETY QUESTION AS EXPLAINED BELOW:

1. THE PROBABILITY OF OCCURRENCE OR THE CONSEQUENCES OF AN ACCIDENT OR MALFUNCTION OF EQUIPMENT IMPORTANT TO SAFETY (~~ARE~~ / ARE NOT) INCREASED ABOVE THOSE PREVIOUSLY ANALYZED IN THE FSAR DUE TO THE IMPLEMENTATION OF THIS DOCUMENT BECAUSE: This procedure mathematically determines the waste class of resin for shipment, as required in 10CFR 61 and in no way increases the probability of accident or equipment malfunction as previously analyzed in the FSAR.

2. THE POSSIBILITY OF AN ACCIDENT OR MALFUNCTION OF A DIFFERENT TYPE THAN ANALYZED IN THE FSAR (~~DOES~~ / DOES NOT) RESULT FROM THE IMPLEMENTATION OF THIS DOCUMENT BECAUSE: Deletion of inapplicable steps from lab foreman's check off sheet as pertaining to resin shipments, and addition for safety of radiation protection procedures creates no different possibility of accident or malfunction.

3. THE MARGIN OF SAFETY AS DEFINED IN THE BASIS FOR ANY TECHNICAL SPECIFICATION (~~IS~~ / IS NOT) REDUCED DUE TO THE IMPLEMENTATION OF THIS DOCUMENT BECAUSE: This procedure is not related to any plant function and its implementation does not reduce the margin of safety as defined in the technical specifications.

SAFETY EVALUATION PERFORMED BY: Charles Hart (SIGNATURE) 9/26/84 (DATE)

DEPARTMENT MANAGER APPROVAL: RW Zavadoski (SIGNATURE) 10/29/84 (DATE)

WASTE CLASSIFICATION AND MANIFEST REPORTING RESIN SHIPMENTS

A. PURPOSE

To detail the steps necessary to classify radioactive waste resin shipments in accordance with the requirements of 10 CFR 61.55 and to identify manifest reporting requirements in accordance with 10 CFR 20.311.

B. REFERENCES

1. 10 CFR 20, Standards for Protection Against Radiation.
2. 10 CFR 61, Licensing Requirements for Land Disposal of Radioactive Waste.
3. HNP-8016 Shipment of Radioactive Material.

C. SAFETY

Observe radiation protection procedures.

D. DEFINITIONS

1. TRU - Alpha emitting transuranic nuclides with half-lives greater than 5 yr. (in particular - Pu-238, Pu-239, Pu-240, Am-241, Pu-242, Cm-243 and CM-244).
2. Principle gamma emitters - any radionuclide of plant origin identified by gamma spectroscopy and contributing > 1% of the total identifiable gamma activity for the waste under consideration.

E. PRECAUTIONS

If the shipment includes multiple containers with differing waste composition, separate analysis for each different type waste should be performed. A single analysis may be used for multiple containers of the same type waste provided the container composition (i.e., radionuclide distribution) is considered the same.

F. DATA SHEET 1 GUIDANCE

1. Obtain results of gamma spectrum analysis of the resin sample for the resin shipment that has been collected and analyzed per Procedure HNP-8016.

2. Enter the sample identification information and the results of the gamma spectrum analysis on Data Package 1, Data Sheet 1. Record the measured concentration for each principal gamma emitter in the designated entries in Column #1 and #2. The blank entries in Column #1 may be used to record radionuclides that are identified but not specifically listed.

3. Total the radionuclide concentration for Column #1 and #2 entries to determine Subtotals #1 and #2.

4. Using the entries under Column #3, calculate the concentrations of the correlated radionuclides. Multiply the previously determined concentration of the scaling radionuclide, as listed, by the scaling factor (SF); the product is the correlated radionuclide concentration.

NOTE

Generic scaling nuclides and generic resin scaling factors (SF) have been included in the Column #3 and #4 entries. If other than generic scaling nuclides or SF are to be used, cross through the generic value and insert the appropriate value. The Lab Supervisor (or designated alternate) will determine if other than the generic values should be used. H-3 and C-14 are not correlated to any other radionuclides. The concentrations listed under Column #3 for these nuclides are conservative, generic values. Technical bases for selection of scaling factors (if other than the generic resin values) shall be documented on Data Package 1 (or by an accompanying attachment).

NOTE

The generic scaling factors will normally be updated yearly or once every two years as appropriate for the particular type of waste and activity levels.

5. Similarly for Column #4, calculate the correlated concentration of TRU, Pu-241 and Cm-242, as indicated, by multiplying the measured Cs-137 concentration by the designated scaling factor (SF). These correlated concentrations shall be multiplied by 1.25×10^3 to convert from uCi/cm^3 to nCi/g (based on a dewatered resin density of $0.8\ g/cm^3$) for use in comparison with the waste classification limits on Data Package 1.

6. Calculate Subtotal #3 by adding the Column #3 entries, Subtotal #4 by adding the Column #4 entries.

7. Determine the total radionuclide concentration (GRAND TOTAL) by summing Subtotals #1, #2, #3 and #4.

8. For each nuclide as identified or correlated above, determine its fractional abundance by dividing its concentration (uCi/cm^3) by the GRAND TOTAL. The quotient is the fractional abundance for the nuclide.

9. Determine the TOTAL MILLICURIES (total activity, in millicuries, of the shipment) by multiplying the GRAND TOTAL concentration by the volume of the waste (which may be less than the container size but in no case larger) and a conversion factor of 28.3 (cm^3/ft^3 * mCi/uCi).

10. Similarly, determine the total activity (millicuries) of the shipment for the nuclides H-3, C-14, Tc-99 and I-129. (Total activity of these radionuclides must be included on the shipping manifest).

G. DATA SHEET 2 GUIDANCE

1. Transfer the radionuclide concentrations for Data Package 1 for each radionuclide or radionuclide grouping to appropriate entries on Data Package 1, Data Sheet 2.

2. The concentrations (and corresponding limits) for all nuclides are expressed as uCi/cm^3, except for TRU, Pu-241 and Cm-242 for which the units are nCi/g. Therefore, the concentrations for TRU, Pu-241 and Cm-242 that should be used are those under the heading Conc. (nCi/g) from Data Package 1.

3. Perform the required calculations to determine waste class. After dividing each radionuclide concentration by the 10 CFR 61 limit (as included on Data Package 1), determine the "sum of fractions" for each column.

4. Waste class is determined per the guidance included on Data Package 1.

5. Enter the WASTE CLASS; sign and date Data Package 1.

6. Provide completed Data Package 1 to the Lab Foreman (or designated alternate).

7. The Lab Foreman (or designated alternate) will review the calculations and waste class determination of Data Package 1. If satisfactory, the Lab Foreman (or designated alternate) will sign and date the data sheets.

8. The Lab Foreman (or designated alternate) shall complete Data Package 1, Data Sheet 3, QA/QC Check List. A "N/A" entry shall be recorded for any item of Data Sheet 3 that is not applicable to the type waste being evaluated. Any designated "No" response shall be explained on the data sheet (or by an accompanying attachment).

9. The completed data sheets shall be provided to the Lab Supervisor (or desingated alternate) for review. The Lab Supervisor (or designated alternate) will sign and date Data Sheet 3, QA/QC Check List.

10. All completed Data Sheets 1, 2, and 3 shall be included in the station records for the waste shipment.

PROCEDURE DATA PACKAGE

DOCUMENT NO: HNP-8036-1

SERIAL NO: R02-

MPL NO: _____

RTYPE: G15.14

XREF: _____

TOTAL SHEETS: 6

FREQUENCY: _____

COMPLETED BY: _____

DATE COMPLETED: _____

I HAVE REVIEWED THIS DATA PACKAGE FOR COMPLETENESS AND AGAINST ACCEPTANCE CRITERIA IN ACCORDANCE WITH HNP-830.

ACCEPTABLE _____ UNACCEPTABLE _____

REVIEWED BY: _____

DATE REVIEWED: _____

REMARKS: _____

FIGURE 1
Page 1 of 6

DATA PACKAGE 1
DATA SHEET 1
WASTE CLASSIFICATION - RESIN

Sample Identification:_____ Shipment #:_____

Type Waste:_____ Technician:_____

Volume of Shipment:_____ ft^3 Date:_____

GAMMA SPECTRUM ANALYSIS RADIONUCLIDES

	Column #1 Radionuclides with T 1/2 <5 yr.		Column #2 10 CFR 61 Nuclides	
	Conc. (uCi/cm^3)	Fractional Abundance	Conc. (uCi/cm^3)	Fractional Abundance
Cr-51			Co-60	
Mn-54			Cs-137	
Fe-59				
Co-58			Subtotal #2	
Zn-65				
Cs-134				
Ce-144				
_____				
_____				
_____				
Subtotal #1				

CALCULATION OF CORRELATED RADIONUCLIDES

				Column #3 Conc. (uCi/cm^3)	Fractional Abundance
H-3	=		=	4E-04	
C-14	=		=	5E-04	
Ni-63	= _____	(Co-60) * 4E-02 (SF)	=		
Sr-90	= _____	(Cs-137) * 2E-03 (SF)	=		
Tc-99	= _____	(Cs-137) * 1E-04 (SF)	=		
I-129	= _____	(Cs-137) * 1E-05 (SF)	=		
Subtotal #3			=		

FIGURE 1
Page 2 of 6

DATA PACKAGE 1 (CONT)
DATA SHEET 1 (CONT)
WASTE CLASSIFICATION - RESIN

CALCULATION OF CORRELATED RADIONUCLIDES (CONT)

Column #4

			Conc. (uCi/cm^3)	*	Conversion Factor	=	Conc. (nCi/g)	Fractional Abundance
TRU	= _____ (Cs-137)	* 2E-04 (SF)	= _____	*	1.25×10^3	=	_____	_____
Pu-241	= _____ (Cs-137)	* 6E-03 (SF)	= _____	*	1.25×10^3	=	_____	_____
Cm-242	= _____ (Cs-137)	* 7E-05 (SF)	= _____	*	1.25×10^3	=	_____	_____

Subtotal #4 = _____

DETERMINATION OF TOTAL ACTIVITY

GRAND TOTAL = _____ (Subtot #1) + _____ (Subtot #2) + _____ (Subtot #3) + _____ (Subtot #4) = _____ uCi/cm^3

TOTAL MILLICURIES = _____ uCi/cm^3 GRAND TOTAL * _____ ft^3 (vol. of waste) * 28.3 = _____ mCi

Total H-3 = 4E-04 uCi/cm^3 * _____ ft^3 (vol. of waste) * 28.3 = _____ mCi

Total C-14 = 5E-04 uCi/cm^3 * _____ ft^3 (vol. of waste) * 28.3 = _____ mCi

Total Tc-99 = _____ uCi/cm^3 * _____ ft^3 (vol. of waste) * 28.3 = _____ mCi

Total I-129 = _____ uCi/cm^3 * _____ ft^3 (vol. of waste) * 28.3 = _____ mCi

FIGURE 1
Page 3 of 6

DATA PACKAGE 1 (CONT)
DATA SHEET 2
WASTE CLASSIFICATION WORKSHEET

SUM OF FRACTIONS - 10 CFR 61 TABLE 1 LIMITS

Nuclide[1]	Units of Entry	Class A					Class C				
C-14	uCi/cm^3	______	÷	0.8	=	______	______	÷	8.0	=	______
Tc-99	uCi/cm^3	______	÷	0.3	=	______	______	÷	3.0	=	______
I-129	uCi/cm^3	______	÷	0.008	=	______	______	÷	0.08	=	______
TRU (T1/2 >5 yr)	nCi/g	______	÷	10.0	=	______	______	÷	100.0	=	______
Pu-241	nCi/g	______	÷	350.0	=	______	______	÷	3500.	=	______
Cm-242	nCi/g	______	÷	2000.	=	______	______	÷	2E + 04	=	______

Sum of Fractions: (<1) → Table 2 limits; [= ______] Class A (>1) → [= ______] Class C (>1) → unacceptable for burial; Class C (<1) → Table 2 limits

SUM OF FRACTIONS - 10 CFR 61 TABLE 2 LIMITS

Nuclide[1]	Units of Entry	Class A					Class B					Class C				
Total (T1/2 <5 yr)	uCi/cm^3	______	÷	700.0	=	______			N/A					N/A		
H-3	uCi/cm^3	______	÷	40.0	=	______			N/A					N/A		
Co-60	uCi/cm^3	______	÷	700.0	=	______			N/A					N/A		
Ni-63	uCi/cm^3	______	÷	3.5	=	______	______	÷	70.0	=	______	______	÷	700.	=	______
Sr-90	uCi/cm^3	______	÷	0.04	=	______	______	÷	150.0	=	______	______	÷	7000.	=	______
Cs-137	uCi/cm^3	______	÷	1.0	=	______	______	÷	44.0	=	______	______	÷	4600.	=	______

Sum of Fractions: [= ______] (>1) → [= ______] (>1) → [= ______] (>1) unacceptable for burial

---

The waste classification is determined by the highest class for which the "sum of fractions" does not exceed 1.

If the "sum of fractions" for Table 1, Class A <1, waste class is determined by highest column of Table 2 with "sum of fraction" <1.

If "sum of fraction" of Table 1, Class A is >1 but Class C <1, waste is Class C, provided Table 2, Class C "sum of fraction" <1.

If "sum of fractions" of Table 1, Class C >1 or if "sum of fraction" of Table 2, Class C >1, waste not suitable for burial.

---

[1]Units for all nuclides are uCi/cm^3 except for TRU, Pu-241 and Cm-242 for which the units are nCi/g.

WASTE CLASS: ______________ Technician: ______________ Date: ______

Lab Foreman: ______________ Date: ______

DATA PACKAGE 1 (CONT)
DATA SHEET 3
WASTE CLASSIFICATION AND MANIFEST REPORTING

Shipment #:_____

Waste Class

YES	NO		
___	___	1.	Has waste been properly classified? Data Sheet 1 (and Data Sheet 2, if applicable) completed?
___	___	2.	Has waste container been labeled CLASS A, CLASS B, or CLASS C?

Waste Stability Characteristics

YES	NO		
___	___	1.	Has proper waste container been selected (Class A - carbon steel, Class B or C - HIC)?
___	___	2.	If HIC used, has User Checklist been completed?
___	___	3.	Confirm proper dewatering of resins (< 1% water).
___	___	4.	Have void spaces been reduced to extent practical?

NOTE

For shipments to Richland, the site criteria prohibits receipt of waste containing transuranics in excess of 10 nCi/g without special approval by Washington state.

DATA PACKAGE 1 (CONT)
DATA SHEET 3 (CONT)
WASTE CLASSIFICATION AND MANIFEST REPORTING

Manifest Reporting

YES	NO		
___	___	1.	Have the total millicurie quantities of H-3, C-14, Tc-99 and I-129 been determined and included on Manifest?
___	___	2.	Have all principal gamma emitters and all correlated radionuclides been included on manifest? Barnwell site criteria require reporting correlated abundances of TRU, Pu-241 and Cm-242.
___	___	3.	Ensure accounting for at least 99% of total activity by individual radionuclide identification.
___	___	4.	Confirm identification of Waste Class.
___	___	5.	Ensure correct physical description of waste.
___	___	6.	Confirm total volume of waste (same as used for determining millicurie content; if different explain below).
___	___	7.	Confirm correct chemical form.
___	___	8.	Confirm exclusion of chelating agents (if > 0.1%, chelating agents must be identified).

Lab Foreman: _____ Date: _____

Lab Supervisor: _____ Date: _____

FIGURE 1
Page 6 of 6

GEORGIA POWER COMPANY

HATCH NUCLEAR PLANT

PROCEDURE

Mini-Scaler Model MS-2
PROCEDURE TITLE

HNP-8106
PROCEDURE NUMBER

Lab
RESPONSIBLE SECTION

SAFETY RELATED (X) NON-SAFETY RELATED ( )

REV.	DESCRIPTION	APPROVED DEPT. MANAGER	APPROVED GENERAL MANAGER	DATE	
6	Pages 1-5 and 7	WB Kibley for RWS	Harvey Nix	2/9/85	PRI MR

(1) NEED BY DATE : 1/1/85

PROCEDURE REVISION REQUEST

(2) PROCEDURE NO. : HNP - 8106 (3) SHEET 1 of 5

(4) REVISION NUMBER OF CURRENT PROCEDURE : 5

(5) PROCEDURE TITLE : Mini-Scaler Model MS-2

(6) REQUESTED BY : B. L. Jackson X2485 or 2232 — SIGNATURE — 11/21/84 DATE

(7) LIST ANY QA TRACER NUMBERs BEING ADDRESSED : N/A

(8) PRG REVIEW : [signature] — SIGNATURE — 12/21/84 DATE

(9) PRESENT STATUS : (✓) SAFETY RELATED ; ( ) NON-SAFETY RELATED

(10) THE ABOVE STATUS IS BEING CHANGED: ( ) YES, TO _____ ; (✓) NO

(11) TRAINING REQUIREMENTS (FOR ADMINISTRATIVE PROCEDURES ONLY) : N/A

(12) DEPARTMENT MANAGER ENDORSEMENT : RW Zavadoski — SIGNATURE — 1/3/85 DATE

(13) IF QA TRACER(S) APPLICABLE, INDICATE REVIEW BY QA REP. : N/A OM Trace — 12-27-84

MARKED-UP COPY OF CURRENT PROCEDURE MUST BE ATTACHED TO THIS FORM!!

(14) REVIEW BY DOCUMENT CONTROL CLERK: Eleanor Carter — SIGNATURE — 1/8/85 DATE

(17) PRB DISPOSITION : ( ) N/A ; (✓) RECOMMEND FOR APPROVAL ; ( ) REJECT

(18) PRB NUMBER : 85-18 ; DATE OF PRB MEETING : 01/10/85

(19) PRB SECRETARY's SIGNATURE : J L Elt

TLB

HNP - 9
Rev: 26

IVAN ALLEN CO. ATLANTA RFJ-11

IVAN ALLEN CO. ATLANTA RFJ-11

(CONTINUATION SHEET)

(2) PROCEDURE NO. : HNP - 8106 (3) SHEET 2 of 5

(4) REVISION NUMBER OF CURRENT PROCEDURE : 5

(15) REASON FOR REQUEST : The reason for requesting a revision of this procedure is for the purpose of updating the ± 3 Sigma Data so that the procedure can be more easily understood and followed.

PROCEDURE REVISION REQUEST

(CONTINUATION SHEET)

(2) PROCEDURE NO. : HNP - 8106 (3) SHEET 3 of 5

(4) REVISION NUMBER OF CURRENT PROCEDURE : 5

(16) DESCRIPTION OF CHANGES : #1) F5g: Delete Section for using graph. #2) Change Section F5h Note to. If Count rate is greater than or less than ± 3 Sigma for three Consecutive Counts, then A new Chi-Square test must be performed. Record the results by entering "yes or "No" in the ± 3 Sigma Column of Data Package 1 (Data sheet 1) #3) G5e. Delete Section for developing a graph for daily Calibration Check.

SAFETY EVALUATION

(1) PROCEDURE NO. : HNP - 3106 (2) SHEET 4 of 5

(3) REVISION NUMBER OF CURRENT PROCEDURE : 5 (N/A IF FOR NEW PROCEDURE)

(4) PROCEDURE TITLE : Mini-Scaler Model MS-2

(5) TYPE OF DOCUMENT TO WHICH THIS EVALUATION APPLIES : ( ) NEW PROCEDURE

(✓) PROCEDURE REVISION

(6) DOES THIS DOCUMENT CHANGE THE MODE OF OPERATION OR INTENT AS DESCRIBED IN THE FSAR? ( ) YES ; (✓) NO

(7) DOCUMENT : ( ) INVOLVES AN UNREVIEWED SAFETY QUESTION

( ) REQUIRES A TECH. SPECS. CHANGE BEFORE THE DOCUMENT CAN BE USED; IF SO, RECORD THE ASSOCIATED DoCR NUMBER : _____

(✓) NEITHER

(8) DOES THE IMPLEMENTATION OF THIS DOCUMENT REPRESENT AN UNREVIEWED SAFETY QUESTION? ( ) YES ; (✓) NO

(9) GIVE THE BASIS FOR THE DETERMINATION OF WHETHER OR NOT THE IMPLEMENTATION OF THIS DOCUMENT REPRESENTS AN UNREVIEWED SAFETY QUESTION :

The revision of this document does not represent an unreviewed safety question because it only represents a change from using a graph of the Chi-Square data to the use of a data column. Also, the section for 3 Consecutive Counts only represents that the MS-2 will not be placed out of service for more than one day instead of possibly 3 days

SAFETY EVALUATION
(CONTINUED)

(1) PROCEDURE NO. : HNP - 5104 (2) SHEET 1 of 1

(3) REVISION NUMBER OF CURRENT PROCEDURE : 5 (N/A IF FOR NEW PROCEDURE)

(10) THE IMPLEMENTATION OF THIS DOCUMENT (DOES / DOES NOT) CONSTITUTE AN UNREVIEWED SAFETY QUESTION AS EXPLAINED BELOW:

1. THE PROBABILITY OF OCCURRENCE AND THE CONSEQUENCES OF AN ACCIDENT OR MALFUNCTION OF EQUIPMENT IMPORTANT TO SAFETY (ARE / ARE NOT) INCREASED ABOVE THOSE ANALYZED IN THE FSAR DUE TO THE IMPLEMENTATION OF THIS DOCUMENT BECAUSE: This revision only provides a change in the Method of presenting the Chi-Square data and will not increase the probability of an accident or malfunction of Equipment important to safety.

2. THE POSSIBILITY OF AN ACCIDENT OR MALFUNCTION OF A DIFFERENT TYPE THAN ANALYZED IN THE FSAR (DOES / DOES NOT) RESULT FROM THE IMPLEMENTATION OF THIS DOCUMENT BECAUSE: This revision only provides deletion of a graph by entering data in a column and doesnot invdue any conditions which are not monitored in Radiation protection procedures

3. THE MARGIN OF SAFETY AS DEFINED IN TECHNICAL SPECIFICATIONS (IS / IS NOT) REDUCED DUE TO THE IMPLEMENTATION OF THIS DOCUMENT BECAUSE: The revision only involves deletion of a graph and is monitored by Current Radiation Protection Procedures

(11) SAFETY EVALUATION PERFORMED BY : Kenny Hudson 11/21/84

(12) SAFETY EVALUATION REVIEWED BY : [signature] 11-23-84 / /

(13) DEPARTMENT MANAGER APPROVAL : P W Zavadoski 1/3/85

MINI-SCALER MODEL MS-2

A. PURPOSE

To ensure that the instrument is calibrated properly and to provide operation guides for the user.

B. FREQUENCY

1. Daily Chi Square check

2. Quarterly Calibration

C. REFERENCE

Mini-Scaler Model MS-2 technical manual. TDC #0524M

D. SAFETY

Observe radiation protection procedures.

E. DESCRIPTION OF INSTRUMENT

The Mini-scaler system consists of a variable high voltage supply, charge sensitive input amplifier, single channel pulse height analyzer, six decade scaler, and timer. It is designed for practically any scintillation, Geiger Mueller, or proportional detector and can be powered by either 110 VAC or 7.5-14 VDC.

F. DESCRIPTION OF CONTROLS AND CONNECTORS

1. External

   a. Detector - Connection to detector MHV series coaxial.

   b. H.V. Adjust - Ten turn calibrated dial for setting and changing high voltage.

   c. Threshold - Ten turn calibrated dial for setting and changing baseline sensitivity.

   d. Window - Ten turn calibrated dial for setting and changing range of pulse heights to be counted.

   e. In - Out Switch - Switch to select gross counting (OUT) or PHA (IN).

   f. Test - Switch to insert test signal into scaler.

g. Timed - Stop - Man - Switch to select counting mode.

h. Reset - Start Switch to reset all appropriate circuitry to zero and start a counting sequence.

i. Count Time In Minutes - Switches to select desired counting time

j. Power - Switch to supply power to instrument. (Rear Panel)

k. Battery - Connector for plugging in external battery. (Rear Panel)

2. Internal

a. Gain (Amplifier Board) - Control for adjusting gain of amplifier.

b. Time (Timer Board)- Control to calibrate time base when operating with external battery

c. Rate Meter Calibration (Rate Meter Board)-Controls to calibrate meter reading

G. OPERATION OF INSTRUMENT

NOTE

Two MS-2 instruments will normally be connected to an HP210 probe (G.M.) mounted on a shielded sample holder. The other MS-2 will be connected to a gas flow proportional detector mounted in a sample holder and will be calibrated for alpha counting.

1. Be sure that the instrument calibration is current.

2. Turn Power Switch to ON.

3. Position Timed - Stop - Man switch to counting mode desired.

4. Position Count Time In Minutes switches to counting time desired.

5. Press Reset-Start switch and release. Instrument should begin counting.

6. Daily Calibration

a. Set Test Switch to ON.

b. Set Timed-Stop-Man. Switch to MAN. Units should begin to count. Record results in Man. CK column of Data Sheet 1.

c. Set Timed-Stop-Man switch to TIMED.

d. Set Count Time In Minutes switches to 1 and X1. Press Start-Reset switch and release. Units should stop counting after 60 seconds, registering 3580-3600 counts. Record on Data Sheet 1.

e. Turn Test switch to OFF.

f. Perform a 10 minute background count and record the background counts in C.P.M. on Data Sheet 1.

g. Place a radioactive standard in position for counting and count for 5 minutes. Record results on Data Sheet 1 in C.P.M.

NOTE

For instruments with Geiger-Mueller detector use Tc-99m beta source ($\simeq 10^4$ dpm) centered in a S.S. planchet. For instrument with gas flow proportional detector, a Pu^{239} alpha source ($\simeq 10^4$ dpm) centered in a S.S. planchet and placed on top counting shelf.

h. The reading should be within $\pm$ 3 sigma of the source's known count rate.

NOTE

If count rate is greater than or less than $\pm$ 3 sigma for three consecutive counts, then a new Chi-Square Test must be performed. Record the results by entering "YES" or "NO" in the $\pm$ 3 sigma column of Data Package 1 (Data Sheet 1).

i. Calculate the counter efficiency and record on Data Sheet 1.

$$\text{efficiency} = \frac{\text{Net C.P.M.}}{\text{D.P.M.}} \times 100$$

H. CALIBRATION OF INSTRUMENT

1. GM Detectors

a. Adjust H.V. Adjust to operation voltage of the detector being used. Refer to technical manual Figure 2-3.

CAUTION

Do not over-voltage the GM tube. (900 volts)

b. Connect detector.

c. Set Threshold to 10.00.

d. Set Window In-Out switch to OUT.

e. Push Start-Reset switch and expose detector to a check source.

2. Scintillation detectors - gross counting smears.

a. Connect detector.

b. Set Threshold to 5.00 and Window In-out Switch to OUT.

c. With the detector exposed to a radiation source of the isotope to be counted, run a plateau of counts vs. High Voltage setting (See Figure 2-4 of technical manual).

d. Remove radiation source and repeat step H.2.c for background.

e. Set H.V. Adjust to a point on the plateau within the first one third of the slope of the plateau.

3. Scintillation detectors - Pulse height analysis.

a. Turn H.V. Adjust to 0.00 and Window In-Out switch to IN.

b. Expose detector to a gamma field of known energy.

c. Adjust Threshold to the desired knob reading for the energy being used.

d. Set Window to 25% of Threshold.

e. Plot a curve of counts vs. high voltage. (See Figure 2-5 of technical manual).

f. Adjust H.V. Adjust for the peak reading.

g. To optimize window width, plot several curves of counts vs. threshold with wider and narrower windows and choose the one best suited. (See Figure 2-6 of technical manual). Adjust H.V. Adjust to obtain the maximum reading at the Threshold dial reading selected.

4. Proportional Detectors

a. Set the Threshold control to 2.50 and the Window In-Out to OUT.

b. Plot a curve of counts vs high voltage with the detector exposed to an alpha source (Pu-239)(See Figure 2-7 of technical manual).

c. Remove the source from the instrument detector and plot a background curve. (See Figure 2-7 of technical manual).

d. Adjust H.V. Adjust for a point on the plateau within the first one third of the slope of the plateau. (See Figure 2-7 of technical manual).

5. Chi-Square Test (Quarterly test)

a. Perform a one minute background count and record the background counts in BKG CPM on Data Sheet 2.

b. Place a radioactive standard in position for counting. Use the same standards which will be used in the daily calibration.

c. Count the source for one minute duration twenty times and record net counts on Data Sheet 2.

d. Calculate chi-square. If results are between 7 and 35, the instrument should be functioning properly.

e. Calculate 1σ, 2σ, and 3σ error.

NOTE

The computer program CHI Square may be used to determine Chi-Square data.

PROCEDURE DATA PACKAGE

DOCUMENT NO: HNP-8106-1

SERIAL NO: R06-

MPL NO: _____

RTYPE: G15.14

XREF: _____

TOTAL SHEETS: 2

FREQUENCY: Monthly

COMPLETED BY: _____

DATE COMPLETED: _____

I HAVE REVIEWED THIS DATA PACKAGE FOR COMPLETENESS AND AGAINST ACCEPTANCE CRITERIA IN ACCORDANCE WITH HNP-830.

ACCEPTABLE _____ UNACCEPTABLE _____

REVIEWED BY: _____

DATE REVIEWED: _____

REMARKS: _____

FIGURE 1
Page 1 of 2

DATA SHEET 1
MS-2 DAILY CALIBRATION

MONTH _____ 19___

SOURCE: _____/ SER. NO. _____
ACTIVITY _____ DPM

INST. M.P.L. NO.: 021-N

COUNTING TIME: BACKGROUND - 10 MINUTES
SOURCE - 5 MINUTES
FREQ. TEST - 1 MINUTE

SOURCE COUNT RATE ($\bar{n}$) = _____ CPM*
$\bar{n} + 3\sigma$ = _____ CPM*
$\bar{n} - 3\sigma$ = _____ CPM*

DAY	DATE	MAN. CK. (✓)	FREQUENCY COUNTS	BKG. (C.P.M)	SOURCE (C.P.M.)	NET (C.P.M)	EFF	WITHIN ± 3 SIGMA	REMARKS	COMPLETE BY

* FROM DATA SHEET 2 (CHI SQUARE TEST)

FIGURE 1
Page 2 of 2

PROCEDURE DATA PACKAGE

DOCUMENT NO: HNP-8106-2

SERIAL NO: R06-

MPL NO: _____

RTYPE: G15.14

XREF: _____

TOTAL SHEETS: 2

FREQUENCY: Quarterly

COMPLETED BY: _____

DATE COMPLETED: _____

I HAVE REVIEWED THIS DATA PACKAGE FOR COMPLETENESS AND AGAINST ACCEPTANCE CRITERIA IN ACCORDANCE WITH HNP-830.

ACCEPTABLE _____ UNACCEPTABLE _____

REVIEWED BY: _____

DATE REVIEWED: _____

REMARKS: _____

FIGURE 2
Page 1 of 2

DATA SHEET 2
CHI-SQUARE TEST

DATE: _____ MS-2 M.P.L. NO. D21-N
SOURCE: _____
COUNT TIME _____ / _____ MIN SOURCE SER. NO. _____
H.V. SETTING _____ BKG. CPM _____

RUN NO.	n*	$n-\bar{n}$	$(n-\bar{n})^2$
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
SUM (Σ)			

$\bar{n} = \frac{\Sigma n}{20} =$ _____ $\bar{n} + \tau =$ _____
$\bar{n} + 2\tau =$ _____
$\bar{n} + 3\tau =$ _____

χ^2 (Chi-Square) $= \frac{\Sigma(n-\bar{n})^2}{\bar{n}} =$ _____

$\Sigma(n-\bar{n})$ must be zero

χ^2 must be between 7 & 35

$\sigma = \pm\sqrt{\bar{n}} =$ _____ $\bar{n} - \sigma =$ _____
$2\sigma =$ _____ $\bar{n} - 2\sigma =$ _____
$3\sigma =$ _____ $\bar{n} - 3\sigma =$ _____

COMPLETED BY:	DATE

*n - net counts

FIGURE 2
Page 2 of 2

GEORGIA POWER COMPANY

HATCH NUCLEAR PLANT

PROCEDURE

Geiger Counter E-400 Operation and Calibration
PROCEDURE TITLE

HNP-8107
PROCEDURE NUMBER

Lab
RESPONSIBLE SECTION

SAFETY RELATED (X) NON-SAFETY RELATED ( )

REV.	DESCRIPTION	APPROVED DEPT. MANAGER	APPROVED GENERAL MANAGER	DATE
6	Pages 1-4 & 6	W B Kibler for RWZ	[signature]	2/9/85

HNP-9

(1) NEED BY DATE : 12/31/84

PROCEDURE REVISION REQUEST

(2) PROCEDURE NO. : HNP - 8107 (3) SHEET 1 of 5

(4) REVISION NUMBER OF CURRENT PROCEDURE : 5

(5) PROCEDURE TITLE : Geiger Counter E-400 Operation + Calibration

(6) REQUESTED BY : Charles J. Hart (SIGNATURE) 12/6/84 (DATE)

(7) LIST ANY QA TRACER NUMBERs BEING ADDRESSED : N/A

(8) PRG REVIEW : M.R. Wright (SIGNATURE) 12/20/84 (DATE)

(9) PRESENT STATUS : (✓) SAFETY RELATED ; ( ) NON-SAFETY RELATED

(10) THE ABOVE STATUS IS BEING CHANGED: ( ) YES, TO N/A ; (✓) NO

(11) TRAINING REQUIREMENTS (FOR ADMINISTRATIVE PROCEDURES ONLY) :

(12) DEPARTMENT MANAGER ENDORSEMENT : R.W. Zavadoski (SIGNATURE) 1/11/85 (DATE)

(13) IF QA TRACER(S) APPLICABLE, INDICATE REVIEW BY QA REP. : N/A

MARKED-UP COPY OF CURRENT PROCEDURE MUST BE ATTACHED TO THIS FORM!!

(14) REVIEW BY DOCUMENT CONTROL CLERK: (SIGNATURE) / / (DATE)

(17) PRB DISPOSITION : ( ) N/A ; (✓) RECOMMEND FOR APPROVAL ; ( ) REJECT

(18) PRB NUMBER : 85-19 ; DATE OF PRB MEETING : 1/17/85

(19) PRB SECRETARY's SIGNATURE : J Celt

PROCEDURE REVISION REQUEST

(CONTINUATION SHEET)

(2) PROCEDURE NO. : HNP - 8107 (3) SHEET 2 of 5

(4) REVISION NUMBER OF CURRENT PROCEDURE : 5

(15) REASON FOR REQUEST : This revision is necessary to conform to procedure HNP 9's section I. Data package 1 is revised because of unnecessary form length with respect to times used. Ex: Rather than using one Data sheet for 4 quarters, it is completed with each quarterly calibration.

PROCEDURE REVISION REQUEST

(CONTINUATION SHEET)

(2) PROCEDURE NO. : HNP - 8107 (3) SHEET 3 of 5

(4) REVISION NUMBER OF CURRENT PROCEDURE : 5

(16) DESCRIPTION OF CHANGES : Section B. Frequency is introduced into procedure. Sections on safety + Reference material are in proper sequence as per HNP-9. Addition of the Frequency section necessitates all succeeding sections change to the next ordered letter of the alphabet. Section C References has numeral deleted. Data Package 1 excludes unnecessary form length previously explained on (15) of this procedure request ~~form~~ package.

SAFETY EVALUATION

(1) PROCEDURE NO. : ENP - 8107 (2) SHEET 4 of 5

(3) REVISION NUMBER OF CURRENT PROCEDURE : 5 (N/A IF FOR NEW PROCEDURE)

(4) PROCEDURE TITLE : Geiger Counter E-400 Operation and Calibration

(5) TYPE OF DOCUMENT TO WHICH THIS EVALUATION APPLIES : ( ) NEW PROCEDURE
(✓) PROCEDURE REVISION

(6) DOES THIS DOCUMENT CHANGE THE MODE OF OPERATION OR INTENT AS DESCRIBED IN THE FSAR? ( ) YES ; (✓) NO

(7) DOCUMENT : ( ) INVOLVES AN UNREVIEWED SAFETY QUESTION

( ) REQUIRES A TECH. SPECS. CHANGE BEFORE THE DOCUMENT CAN BE USED; IF SO, RECORD THE ASSOCIATED DoCR NUMBER : _____

(✓) NEITHER

(8) DOES THE IMPLEMENTATION OF THIS DOCUMENT REPRESENT AN UNREVIEWED SAFETY QUESTION? ( ) YES ; (✓) NO

(9) GIVE THE BASIS FOR THE DETERMINATION OF WHETHER OR NOT THE IMPLEMENTATION OF THIS DOCUMENT REPRESENTS AN UNREVIEWED SAFETY QUESTION :

The implementation of this document represents no unreviewed safety questions since the intent and mode of execution concur with the previous revision.

SAFETY EVALUATION
(CONTINUED)

(1) PROCEDURE NO. : HNP - 8107 - 5 (2) SHEET 5 of 5

(3) REVISION NUMBER OF CURRENT PROCEDURE : 5 (N/A IF FOR NEW PROCEDURE)

(10) THE IMPLEMENTATION OF THIS DOCUMENT ~~(DOES~~ / DOES NOT) CONSTITUTE AN UNREVIEWED SAFETY QUESTION AS EXPLAINED BELOW:

1. THE PROBABILITY OF OCCURRENCE AND THE CONSEQUENCES OF AN ACCIDENT OR MALFUNCTION OF EQUIPMENT IMPORTANT TO SAFETY ~~(ARE~~ / ARE NOT) INCREASED ABOVE THOSE ANALYZED IN THE FSAR DUE TO THE IMPLEMENTATION OF THIS DOCUMENT BECAUSE:

   There are no changes in the intent or mode of execution of this document from that previously reviewed.

2. THE POSSIBILITY OF AN ACCIDENT OR MALFUNCTION OF A DIFFERENT TYPE THAN ANALYZED IN THE FSAR ~~(DOES~~ / DOES NOT) RESULT FROM THE IMPLEMENTATION OF THIS DOCUMENT BECAUSE:

   No additional work or equipment operation is implemented due to this revision.

3. THE MARGIN OF SAFETY AS DEFINED IN TECHNICAL SPECIFICATIONS ~~(IS~~ / IS NOT) REDUCED DUE TO THE IMPLEMENTATION OF THIS DOCUMENT BECAUSE:

   There is no change in, or addition to work performed or equipment used ~~as~~ from previous revision.

(11) SAFETY EVALUATION PERFORMED BY : Mr. Charles J. Hartt 12/6/84

(12) SAFETY EVALUATION REVIEWED BY : [signature] 12/5/84

(13) DEPARTMENT MANAGER APPROVAL : R.W. Zawadski 12/11/84

LB

GEIGER COUNTER E-400 OPERATION AND CALIBRATION

A. PURPOSE

To establish a standard technique for operation and calibration of the model E-400 geiger counter.

B. FREQUENCY

1. Operation of counters: As needed
2. Calibration of counters: Quarterly

C. REFERENCES

1. Geiger Counter Model E400 Technical Manual TDC #0540M
2. Eberline checkout procedures

D. SAFETY

Observe radiation protection procedures.

E. TEST EQUIPMENT

1. Coaxial connection cable
2. HP-177B Detector or equivalent
3. Gamma source with mR/hr intensities of each decade

F. DESCRIPTION OF INSTRUMENT

1. The E-400 is a portable, battery operated instrument used for the measurement of gamma and the detection of beta radiation. It has a geiger tube detector, and the count rate is read out by the Eberline Lin-Log presentation.
2. The range of the scale is 0 to 200 mR/hr calibrated to an appropriate gamma field. The scale has four decades which are 0.2, 2, 20, and 200 mR/hr respectively. A battery check position is also provided on the scale.
3. The battery pack uses five standard D size batteries of any type commercially available.

G. DESCRIPTION OF CONTROLS

1. External controls
   a. Switch - Three position switch turns instrument OFF, ON, or Battery Check.

b. High Voltage Adjustment - Controls the magnitude of high voltage applied to the detector. Clockwise rotation increases voltage.

c. Phone - For connection of headset, speaker, or external scaler.

d. Detector Connector - For connection to the detector.

2. Internal Controls

a. Calibration Controls - Four controls to adjust the meter reading to agree with gamma field intensity at detector.

b. Sensitivity Control - 20 turn control mounted on P-202 card adjusts the input sensitivity.

H. OPERATION OF INSTRUMENT

1. Ensure that instrument calibration sticker is current.

2. To start instrument turn the switch to BATT. The left pointer (Black) should read in the green area. Release the switch, and it will return to the ON position. If the black pointer did not read in the BATT OK area then tag the instrument out with a To Shop Tag.

3. Operation Check

a. With the probe removed from the check source the background should be less than 0.5 mR/hr.

b. Hold the Check Source against the sensitive portion of the detector and ensure that the instrument responds properly (i.e. within $\pm$ 20% of expected reading of source).

NOTE

The position of the source will vary the instrument reading.

4. Read the pointer that is on scale. The black pointer is read up to 2 mR/hr above which it disappears from view and the red pointer is read. Fluctuation of the pointer is normal.

5. When using the earphones a click will be heard for each event counted. Using a SK-1 speaker, only one-half the number of events will be heard.

6. When surveying a general area for gamma radiation with the HP-177B Geiger-Muller Detector, the probe should be held parallel to the source of radiation and at waist level. For beta detection, open the beta window and hold the detector as close as possible to the surface being surveyed. Now close the beta window and monitor the surface again. When no significant difference is seen in the needle deflection with the beta window open and the beta window closed, the radiation should be reported as gamma only. When significant differences are seen in the needle deflection with the beta window open and the beta window closed, beta radiation is present. For true beta dose rate, obtain an RO-2A or RO-3A or equivalent type instrument.

7. To shut off the instrument, move the switch to the OFF position.

I. QUARTERLY CALIBRATION OF INSTRUMENT

1. Turn control switch to BATT position and ensure that the left pointer (Black) reads in the green area. If the pointer does not read in the green area the batteries must be replaced.

2. Place the detector with beta window closed, in a gamma field of about 0.15 mR/hr, 1.5 mR/hr, 15 mR/hr and 140 mR/hr successively and check readings. Record readings on Data Package 1 (the Instrument Calibration Data Sheet) in As Found column.

3. If readings are not within ± 20% of the gamma field proceed to step I.5.

4. If readings are within ± 20% of field, turn switch OFF, complete Figure 1, replace the calibration sticker with a new one bearing the test date and when the instrument is next due for its quarterly calibration.

NOTE

Even though the instrument is ± 20% of calibration points every effort should be made to make it read as close as possible to the calibration points.

5. Remove the instrument from the case and remove the High Voltage supply card from the instrument. Connect a mini-pulser at the spring connector (junction R8 and C2) and set the mini-pulser for negative pulses at 10 millivolt amplitude. Adjust sensitivity control pot (located on P-202) for optimum setting of 10 millivolts. Replace High Voltage supply card.

6. Connect electrostatic voltmeter at spring connector and adjust high voltage to around 900 volts. Note electrostatic voltmeter MPL number in the REMARKS section of the Instrument Calibration Data Sheet (Data Package 1).

7. Connect the detector cable to the High Voltage connector using either an EIC Model SK-1006 adapter or shielded clip leads. Turn R3 and R5 to the maximum clockwise position.

8. Place the detector in a gamma field of about .15 mR/hr and turn R_2 until the instrument reading corresponds to 0.15 ± 20% mR/hr and record on Data Package 1 (the Instrument Calibration Data Sheet) in the As Left column.

9. Place the detector in a gamma field of about 1.5 mR/hr and turn R_3 down until the instrument reading corresponds to the actual dose rate ± 20% mR/hr and record the reading on Data Package 1 (the Instrument Calibration Data Sheet) in the As Left column.

10. Place the detector in a gamma field of about 15 mR/hr and turn R_4 until the reading corresponds to the actual dose rate ± 20% mR/hr and record the reading on Data Package 1 (the Instrument Calibration Data Sheet) in the As Left column.

11. Place the detector in a gamma field of about 140 mR/hr and turn R_5 until the reading corresponds to the actual dose rate ± 20% mR/hr and record the reading on Data Package 1 (the Instrument Calibration Data Sheet) in the As Left column.

12. If the instrument performs within ± 20% of the gamma field readings, the calibration is complete. Turn instrument OFF.

13. Remove the high voltage adapter, place the instrument back in its case and proceed to step I.4.

14. If the instrument cannot be calibrated initiate repairs.

15. After repairs of instrument go to step I.5.

PROCEDURE DATA PACKAGE

DOCUMENT NO: HNP-8107-1

SERIAL NO: R06-

MPL NO: _____

RTYPE: G15.14

XREF: _____

TOTAL SHEETS: 2

FREQUENCY: Quarterly

COMPLETED BY: _____

DATE COMPLETED: _____

I HAVE REVIEWED THIS DATA PACKAGE FOR COMPLETENESS AND AGAINST ACCEPTANCE CRITERIA IN ACCORDANCE WITH HNP-830.

ACCEPTABLE _____ UNACCEPTABLE _____

REVIEWED BY: _____

DATE REVIEWED: _____

REMARKS: _____

FIGURE 1
Page 1 of 2

DATA PACKAGE 1

INSTRUMENT CALIBRATION DATA SHEET

INSTRUMENT E-400 _____, LOCATION _____

MPL NO. _____

CALIB. SOURCE	ACTUAL COUNT RATE	ACTUAL DOSE RATE	INSTRUMENT READINGS DATE: CALIB. BY: AS FOUND	AS LEFT
Cs-137	N/A	0.15 mR/hr	mR/hr	mR/hr
	N/A	1.5 mR/hr	mR/hr	mR/hr
	N/A	15 mR/hr	mR/hr	mR/hr
	N/A	140 mR/hr	mR/hr	mR/hr
H.V. POWER SUPPLY SENS. SET			(CIRCLE HV. PS. SENS	
MAINT. PERFORMED				
REMARKS				

FIGURE 1
Page 2 of 2

GEORGIA POWER COMPANY

HATCH NUCLEAR PLANT

PROCEDURE

Radiation Monitor RM-14 Operation and Calibration
PROCEDURE TITLE

HNP-8114
PROCEDURE NUMBER

Lab
RESPONSIBLE SECTION

SAFETY RELATED (X) NON-SAFETY RELATED ( )

REV.	DESCRIPTION	APPROVED DEPT. MANAGER	APPROVED GENERAL MANAGER	DATE
11	Pages 1-5 & 7	WB Kirkley for RWZ	Maury Nix	2/9/85 CRC MRL

(1) NEED BY DATE : 12/31/84

PROCEDURE REVISION REQUEST

(2) PROCEDURE NO. : HNP - 8114 (3) SHEET 1 of 5

(4) REVISION NUMBER OF CURRENT PROCEDURE : 10

(5) PROCEDURE TITLE : Radiation Monitor RM-14 Operation and Calibration

(6) REQUESTED BY : Charles D. Hart (SIGNATURE) 12/6/84 (DATE)

(7) LIST ANY QA TRACER NUMBERs BEING ADDRESSED : N/A

(8) PRG REVIEW : W. R. Albright (SIGNATURE) 12/20/84 (DATE)

(9) PRESENT STATUS : (✓) SAFETY RELATED ; ( ) NON-SAFETY RELATED

(10) THE ABOVE STATUS IS BEING CHANGED: ( ) YES, TO _____ ; (✓) NO

(11) TRAINING REQUIREMENTS (FOR ADMINISTRATIVE PROCEDURES ONLY) : _____

(12) DEPARTMENT MANAGER ENDORSEMENT : Vernon D. Rencurrel (SIGNATURE) 12/20/84 (DATE)

(13) IF QA TRACER(S) APPLICABLE, INDICATE REVIEW BY QA REP. : N/A

MARKED-UP COPY OF CURRENT PROCEDURE MUST BE ATTACHED TO THIS FORM!!

(14) REVIEW BY DOCUMENT CONTROL CLERK: _____ (SIGNATURE) _____ (DATE)

(17) PRB DISPOSITION : ( ) N/A ; (✓) RECOMMEND FOR APPROVAL ; ( ) REJECT

(18) PRB NUMBER : 85-1 ; DATE OF PRB MEETING : 1/7/85

(19) PRB SECRETARY's SIGNATURE : _____

HNP - 9
Rev. 26

PROCEDURE REVISION REQUEST

(CONTINUATION SHEET)

(2) PROCEDURE NO. : HNP - 9114 (3) SHEET 2 of 5

(4) REVISION NUMBER OF CURRENT PROCEDURE : 10

(15) REASON FOR REQUEST : This revision is necessary to conform to procedure HNP-9's section I., Data Package 2 is revised because of ~~unecess~~ unnecessary form length with respect to times used. Ex: Rather than using one Data sheet for annual calibrations, it is completed with individual calibration. The source use to check the instruments is changed

PROCEDURE REVISION REQUEST

(CONTINUATION SHEET)

(2) PROCEDURE NO. : HNP - 8114 (3) SHEET 3 of 5

(4) REVISION NUMBER OF CURRENT PROCEDURE : 10

(16) DESCRIPTION OF CHANGES : Section B., Frequency is introduced into the procedure to comply with Format Guidelines in HNP-9 Subsequently all sucessive sections move down one letter in alphabetical order. Section E. 2. changes to reflect New Check source. Data package 1 excludes unnecessary form length previously explained in (15) of this procedure request package.
Changed "verify" to "ensure" throughout procedure [illegible] paragraph C. 1. d. for clarity. Changed [illegible] "monitor" to RM-1[illegible] at 4. 8. d.

SAFETY EVALUATION

(1) PROCEDURE NO. : HNP - 8114 (2) SHEET 4 of 5

(3) REVISION NUMBER OF CURRENT PROCEDURE : 10 (N/A IF FOR NEW PROCEDURE)

(4) PROCEDURE TITLE : Radiation Monitor RM-14 Operation and Calibration

(5) TYPE OF DOCUMENT TO WHICH THIS EVALUATION APPLIES : ( ) NEW PROCEDURE
(✓) PROCEDURE REVISION

(6) DOES THIS DOCUMENT CHANGE THE MODE OF OPERATION OR INTENT AS DESCRIBED IN THE FSAR? ( ) YES ; (✓) NO

(7) DOCUMENT : ( ) INVOLVES AN UNREVIEWED SAFETY QUESTION

( ) REQUIRES A TECH. SPECS. CHANGE BEFORE THE DOCUMENT CAN BE USED; IF SO, RECORD THE ASSOCIATED DoCR NUMBER : _____

(✓) NEITHER

(8) DOES THE IMPLEMENTATION OF THIS DOCUMENT REPRESENT AN UNREVIEWED SAFETY QUESTION? ( ) YES ; (✓) NO

(9) GIVE THE BASIS FOR THE DETERMINATION OF WHETHER OR NOT THE IMPLEMENTATION OF THIS DOCUMENT REPRESENTS AN UNREVIEWED SAFETY QUESTION :

The implementation of this document represents no unreviewed safety questions since the intent and mode of execution concur with the previous revision.

SAFETY EVALUATION
(CONTINUED)

(1) PROCEDURE NO. : HNP - 9114 (2) SHEET 5 of 5

(3) REVISION NUMBER OF CURRENT PROCEDURE : 10 (N/A IF FOR NEW PROCEDURE)

(10) THE IMPLEMENTATION OF THIS DOCUMENT (~~DOES~~ / DOES NOT) CONSTITUTE AN UNREVIEWED SAFETY QUESTION AS EXPLAINED BELOW:

1. THE PROBABILITY OF OCCURRENCE AND THE CONSEQUENCES OF AN ACCIDENT OR MALFUNCTION OF EQUIPMENT IMPORTANT TO SAFETY (~~ARE~~ / ARE NOT) INCREASED ABOVE THOSE ANALYZED IN THE FSAR DUE TO THE IMPLEMENTATION OF THIS DOCUMENT BECAUSE: There are no changes in the intent or mode of operation of this document from that previously reviewed.

2. THE POSSIBILITY OF AN ACCIDENT OR MALFUNCTION OF A DIFFERENT TYPE THAN ANALYZED IN THE FSAR (~~DOES~~ / DOES NOT) RESULT FROM THE IMPLEMENTATION OF THIS DOCUMENT BECAUSE: No additional work or equipment operation is implemented due to this revision.

3. THE MARGIN OF SAFETY AS DEFINED IN TECHNICAL SPECIFICATIONS (~~IS~~ / IS NOT) REDUCED DUE TO THE IMPLEMENTATION OF THIS DOCUMENT BECAUSE: There is only a change in the source used as a check source from the previous implementation of this procedure.

(11) SAFETY EVALUATION PERFORMED BY : M. Charles D. Hart 12/6/84

(12) SAFETY EVALUATION REVIEWED BY : James E. Collins 12/21/84

(13) DEPARTMENT MANAGER APPROVAL : [illegible] 12/[illegible]/84

LG

RADIATION MONITOR RM-14 OPERATION AND CALIBRATION

A. PURPOSE

To establish a standard technique for operation and calibration of the Model RM-14 radiation monitor.

B. FREQUENCY

1. Operation of counters: As needed

2. Calibration of counters: Semi Annual

C. REFERENCES

1. Radiation Monitor Model RM-14 Technical Manual

2. Minipulser Procedure HNP-8116

3. Eberline Checkout Procedures

D. SAFETY

Observe radiation protection procedures.

E. TEST EQUIPMENT

1. Minipulser with coaxial cable and capacitor with rating greater than 1KV

2. RM-14 CS-137 Check Source

F. DESCRIPTION OF INSTRUMENT

The RM-14 is a small, compact count rate meter operated by AC power or a battery which is continuously trickle charged while the unit is plugged into the A.C. line. Battery condition is checked by front panel control.

The monitor is intended primarily for use with a Geiger-Mueller detector, but with slight modifications, can be used with appropriate scintillation detectors.

The instrument presents a meter-reading of counts-per-minute (CPM) in three linear ranges. They are 0 to 500 CPM; 0 to 5000 CPM; 0 to 50,000 CPM. In areas having a very high count rate, it is possible to saturate the instrument. For example, as the detector approaches the surface to be monitored, the meter will read full scale on the highest count rate. Then as the detector is moved still closer to the surface, the meter reading may drop off to zero. A speaker assembly with volume control is incorporated as part of the instrument.

The meter has an adjustable, high limit contact which will sound an alarm when the meter reading reaches the limit.

G. DESCRIPTION OF CONTROLS

1. External Controls

a. Switch: The Power and Range Selector Switch is contained in one assembly. Power is applied to the instrument any time the Selector Switch is in any position except OFF. The position of this switch also provides the meter multiplier function.

b. Power Lamp: A power light is provided for positive indication that AC power is being applied to the instrument.

c. Response Toggle Switch: A switch to set response time either Fast or Slow for best compromise between speed and fluctuation for the particular usage.

d. Reset Switch: The Reset Switch (push button type) is used to bring the meter reading to zero rapidly and to turn off the alarm.

e. Volume Control: A continuously variable control is provided for the adjustment of the audio output. This control may vary the output from no audible output to a high level.

f. Detector: Connection to detector. BNC series coaxial.

g. Alarm Set: Controls point on meter scale that alarm will actuate. Numbers 1 thru 5 correspond to whole increments on meter scale.

h. A.C. Power Connector: AC Power Connector is a Polarized Recessed Male Connector.

i. Recorder Connector: Connection for external fifty microamp recorder.

j. Test On Switch: The Test On Switch is to ensure that the instrument functions properly. When the instrument is put on AC and Test On Switch to ON, it should read 3600 CPM on the meter face.

2. Internal Controls

a. Calibration Controls: One control for each range which individually calibrates that range to agree with input count rate.

b. Alarm Set Calibrate: Control to set correlation between alarm set and meter reading at alarm point.

H. OPERATION OF INSTRUMENT

NOTE

If the Range Selector Switch must be on higher scale than X1 because of background, consideration must be given toward moving the instrument or shielding the detector to lower the background.

1. Check the instrument for physical damage.

2. Check instrument and ensure that the calibration due date has not expired.

3. Connect the proper detector to the detector connection.

4. Plug the AC power connector into 115V, 60Hz line and ensure that the AC ON light is on.

5. Turn the switch to BATT position and ensure that the meter indicates in the BATT OK area, if not recharge the instrument batteries.

6. Establish the average background count rate.

7. Set the Range Selector Switch to the scale which will allow the alarm point to be set at the full scale value of that range. Set the alarm point to approximately full scale value for the range the instrument is operating at, except as noted below.

NOTE

If the instrument is located at a control point where it is being used for whole body frisking, or at exit doors, the ALARM point should be set at 100 $\pm$ 20 CPM over the background count rate.

8. Instrument Check. (Weekly during normal plant operation. Twice per week during refueling, maintenance and extended shutdowns).

Use the following steps with Data Package 2:

a. Record instrument's location and instrument's serial number on Data Package 2.

b. Establish the background count rate and record.

c. Turn range selector switch to BATT and ensure that the meter reads within the BATT OK region. Turn range selector switch back to appropriate scale.

d. Place RM-14 monitor check source near detector and ensure that the alarm point is set approximately fullscale except as noted at H.7 for the range that the instrument is operating at. Adjust alarm set point, if necessary, and record a check under ALARM CHECK on Data Package 2.

e. Operate the Reset Switch and observe that the meter reading drops off toward zero and that alarm turns off. Record indication under RESET CHECK on Data Package 2.

f. Turn range selector to X100 range and response toggle switch to FAST response. Place the check source in contact with the detector face or window. Always place the source on the face where the webbing will have the least effect on the count rate.

g. Ensure that the meter indication is approximately the value of the background plus the value of the source ± 20%. Record indication on Data Package 2.

I. CALIBRATION OF INSTRUMENT (Semi Annual)

1. Turn Range Switch to BATT., the meter should read to the BATT OK region. If not, plug instrument into 115 VAC outlet and let batteries charge until they check properly.

2. Couple Minipulser to Detector Inlet connector using a capacitor with a 1 KV or higher rating.

3. Turn Selector Switch to X1 on the RM-14.

4. Adjust Minipulser to a pulse height of 100 millivolts and a frequency of 200 CPM and 400 CPM. Record scale readings on Data Package 1 in the As Found column.

5. Repeat step I.3 and I.4 for X10 range and 2K CPM and 4K CPM. Record on Data Package 1.

6. Repeat step I.3 and I.4 for X100 range and 20K CPM and 40K CPM.

7. If readings are within ± 20% of the Minipulser frequency, connect the HP-210 probe to the RM-14 and perform an instrument check as in step H.8. Record meter reading on Data Package 1 in the As Left column. Proceed to step I.17.

NOTE

Even though the instrument is ± 20% of calibration points every effort should be made to make it read as close as possible to the calibration point.

8. If readings are not within ± 20% of the Minipulser frequency proceed to step I.9.

9. Connect the Minipulser as in step I.2.

10. Turn Selector Switch to X1 on the RM-14.

11. Adjust Minipulser to a pulse height of 100 millivolts and a frequency of 400 cpm.

12. Adjust the Calibration Control X1 inside instrument until the meter reading agrees with the Minipulser frequency. Record reading on Data Package 1 in the As Left column.

13. Repeat steps I.11 and I.12 for X10 and X100 ranges and 4,000 CPM and 40,000 CPM respectively.

14. Repeat step I.7.

15. If the instrument can not be calibrated initiate repairs.

16. Repeat steps I.7 - I.17 when instrument is repaired.

17. If the instrument checks out properly, complete Data Package 1, replace the calibration sticker with a new one bearing this test date and when the instrument is due for its next routine semi annual calibration.

PROCEDURE DATA PACKAGE

DOCUMENT NO: HNP-8114-1

SERIAL NO: R11-

MPL NO: _____

RTYPE: G15.14

XREF: RM-14

TOTAL SHEETS: 2

FREQUENCY: Semi Annual

COMPLETED BY: _____

DATE COMPLETED: _____

I HAVE REVIEWED THIS DATA PACKAGE FOR COMPLETENESS
AND AGAINST ACCEPTANCE CRITERIA IN ACCORDANCE WITH HNP-830.

ACCEPTABLE _____ UNACCEPTABLE _____

REVIEWED BY: _____

DATE REVIEWED: _____

REMARKS: _____

FIGURE 1
Page 1 of 2

DATA PACKAGE 1

INSTRUMENT CALIBRATION DATA SHEET

INSTRUMENT PM-14 LOCATION _____

MPL NUMBER _____

S.N. _____

CALIB. SOURCE	ACTUAL COUNT RATE	ACTUAL DOSE RATE	INSTRUMENT READINGS DATE: CALIB. BY: AS FOUND	AS LEFT
MP-1	200 CPM	N/A	CPM	CPM
SN-	400 CPM	N/A	CPM	CPM
	2000 CPM	N/A	CPM	CPM
	4000 CPM	N/A	CPM	CPM
	20000 CPM	N/A	CPM	CPM
	40000 CPM	N/A	CPM	CPM
CS-137	16K to			
8 uci	24 Kcpm	N/A	CPM	CPM
	SENS. SET		(CIRCLE) SENS.	
MAINT. PERFORMED				
REMARKS:				

NOTE

Semi Annual Calibration.

FIGURE 1
Page 2 of 2

PROCEDURE DATA PACKAGE

DOCUMENT NO: HNP-8114-2

SERIAL NO: R11-

MPL NO: _____

RTYPE: G15.14

XREF: N/A

TOTAL SHEETS: 2

FREQUENCY: Weekly

COMPLETED BY: _____

DATE COMPLETED: _____

I HAVE REVIEWED THIS DATA PACKAGE FOR COMPLETENESS AND AGAINST ACCEPTANCE CRITERIA IN ACCORDANCE WITH HNP-830.

ACCEPTABLE _____ UNACCEPTABLE _____

REVIEWED BY: _____

DATE REVIEWED: _____

REMARKS: Unit #1 & 2

FIGURE 2
Page 1 of 2

DATA PACKAGE 2

RM-14 RADIATION MONITOR INSTRUMENT CHECK

DATE: _____ UNIT NUMBER _____

LOCATION	INST. SER. NUMBER	BKG CPM	(NOTE 2) SOURCE CPM	TODAY'S INST. READING W/SOURCE CPM	RESET CHECK	ALARM CHECK	ACCEPTED BY (NOTE 1)
			16 K to 24 K				
			16 K to 24 K				
			16 K to 24 K				
			16 K to 24 K				
			16 K to 24 K				
			16 K to 24 K				
			16 K to 24 K				
			16 K to 24 K				
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			16 K to 24 K				
			16 K to 24 K				
			16 K to 24 K				
			16 K to 24 K				
			16 K to 24 K				
			16 K to 24 K				

NOTE 1: WHEN UNACCEPTABLE, NOTE IN THIS COLUMN AND REPORT TO LABORATORY FOREMAN OR DESIGNATED ALTERNATE.

NOTE 2: ACCEPTANCE CRITERIA FOR SOURCE CPM SHOULD BE BETWEEN 16K-24K CPM ABOVE BACKGROUND AT LOCATION.

_____
LABORATORY FOREMAN

FIGURE 2
Page 2 of 2

GEORGIA POWER COMPANY

HATCH NUCLEAR PLANT

PROCEDURE

Geiger Counter Model E-120 Operation and Calibration
PROCEDURE TITLE

HNP-8120
PROCEDURE NUMBER

Lab
RESPONSIBLE SECTION

SAFETY RELATED (X) NON-SAFETY RELATED ( )

REV.	DESCRIPTION	APPROVED DEPT. MANAGER	APPROVED GENERAL MANAGER	DATE
5	Pages 1-4 and 6	WB Kibley for RWL	Harvey Nix	2/9/85 PRC MRL

(1) NEED BY DATE : 12/31/84

PROCEDURE REVISION REQUEST

(2) PROCEDURE NO. : HNP - 8120 (3) SHEET 1 of 5

(4) REVISION NUMBER OF CURRENT PROCEDURE : 4

(5) PROCEDURE TITLE : Geiger Counter Model E-120 Operation and Calibration

(6) REQUESTED BY : Charles J. Hart (SIGNATURE) 12/7/84 (DATE)

(7) LIST ANY QA TRACER NUMBERs BEING ADDRESSED : N/A

(8) PRG REVIEW : D. L. Wright (SIGNATURE) 12/26/84 (DATE)

(9) PRESENT STATUS : (✓) SAFETY RELATED ; ( ) NON-SAFETY RELATED

(10) THE ABOVE STATUS IS BEING CHANGED: ( ) YES, TO ____ ; (✓) NO

(11) TRAINING REQUIREMENTS (FOR ADMINISTRATIVE PROCEDURES ONLY) : ____

(12) DEPARTMENT MANAGER ENDORSEMENT : R W Zavadoski (SIGNATURE) 1/3/85 (DATE)

(13) IF QA TRACER(S) APPLICABLE, INDICATE REVIEW BY QA REP. : ____

MARKED-UP COPY OF CURRENT PROCEDURE MUST BE ATTACHED TO THIS FORM!!

(14) REVIEW BY DOCUMENT CONTROL CLERK: ____ (SIGNATURE) ____ (DATE)

(17) PRB DISPOSITION : ( ) N/A ; (✓) RECOMMEND FOR APPROVAL ; ( ) REJECT

(18) PRB NUMBER : 85-13 ; DATE OF PRB MEETING : 1/11/85

(19) PRB SECRETARY's SIGNATURE : T Elt

HNP - 9
Rev. 26

PROCEDURE REVISION REQUEST

(CONTINUATION SHEET)

(2) PROCEDURE NO. : HNP - 8120 (3) SHEET : 2 of 5

(4) REVISION NUMBER OF CURRENT PROCEDURE : 4

(15) REASON FOR REQUEST : To change the format to comply with HNP-9
To reflect change in check source ~~of~~ used.

PROCEDURE REVISION REQUEST

(CONTINUATION SHEET)

(2) PROCEDURE NO. : HNP - 8120 (3) SHEET 3 of 5

(4) REVISION NUMBER OF CURRENT PROCEDURE : 4

(16) DESCRIPTION OF CHANGES : Section B. FREQUENCY is introduced into procedure. sections SAFETY + REFERENCE are placed in correct order as per HNP-9. Addition of the Frequency section necessitates all succeeding sections to change to the following letter in order of alphabet.

SAFETY EVALUATION

(1) PROCEDURE NO. : HNP - 8120 (2) SHEET 4 of 5

(3) REVISION NUMBER OF CURRENT PROCEDURE : 4 (N/A IF FOR NEW PROCEDURE)

(4) PROCEDURE TITLE : Geiger Counter Model E-120 Operation and Calibration

(5) TYPE OF DOCUMENT TO WHICH THIS EVALUATION APPLIES : ( ) NEW PROCEDURE
(✓) PROCEDURE REVISION

(6) DOES THIS DOCUMENT CHANGE THE MODE OF OPERATION OR INTENT AS DESCRIBED IN THE FSAR? ( ) YES ; (✓) NO

(7) DOCUMENT : ( ) INVOLVES AN UNREVIEWED SAFETY QUESTION

( ) REQUIRES A TECH. SPECS. CHANGE BEFORE THE DOCUMENT CAN BE USED; IF SO, RECORD THE ASSOCIATED DoCR NUMBER : _____

(✓) NEITHER

(8) DOES THE IMPLEMENTATION OF THIS DOCUMENT REPRESENT AN UNREVIEWED SAFETY QUESTION? ( ) YES ; (✓) NO

(9) GIVE THE BASIS FOR THE DETERMINATION OF WHETHER OR NOT THE IMPLEMENTATION OF THIS DOCUMENT REPRESENTS AN UNREVIEWED SAFETY QUESTION :

The implementation of this document represents no unreviewed safety question because the revision is to comply with HNP-9 Section I. dealing with Format. which does not create any unreviewed safety questions.

SAFETY EVALUATION
(CONTINUED)

(1) PROCEDURE NO. : HNP - 8120 (2) SHEET : 5 of 5

(3) REVISION NUMBER OF CURRENT PROCEDURE : 4 (N/A IF FOR NEW PROCEDURE)

(10) THE IMPLEMENTATION OF THIS DOCUMENT (~~DOES~~ / DOES NOT) CONSTITUTE AN UNREVIEWED SAFETY QUESTION AS EXPLAINED BELOW:

1. THE PROBABILITY OF OCCURRENCE AND THE CONSEQUENCES OF AN ACCIDENT OR MALFUNCTION OF EQUIPMENT IMPORTANT TO SAFETY (~~ARE~~ / ARE NOT) INCREASED ABOVE THOSE ANALYZED IN THE FSAR DUE TO THE IMPLEMENTATION OF THIS DOCUMENT BECAUSE:
   There is no change in the intent or mode of execution of this document from that previously reviewed.

2. THE POSSIBILITY OF AN ACCIDENT OR MALFUNCTION OF A DIFFERENT TYPE THAN ANALYZED IN THE FSAR (~~DOES~~ / DOES NOT) RESULT FROM THE IMPLEMENTATION OF THIS DOCUMENT BECAUSE:
   No additional work or equipment operation is implemented due to this revision.

3. THE MARGIN OF SAFETY AS DEFINED IN TECHNICAL SPECIFICATIONS (~~DO~~ / IS NOT) REDUCED DUE TO THE IMPLEMENTATION OF THIS DOCUMENT BECAUSE:
   There is no change in the mode of execution from the previous revision. The only changes are check source used + Format guide lines so as to comply with HNP-9

(11) SAFETY EVALUATION PERFORMED BY : M Charles Hart 12/7/84

(12) SAFETY EVALUATION REVIEWED BY : [illegible] 12/7/84

(13) DEPARTMENT MANAGER APPROVAL : [illegible] 12/8/84

GEIGER COUNTER MODEL E-120 OPERATION AND CALIBRATION

A. PURPOSE

To provide instructions for operation and calibration of the model E-120 portable survey meter with a Geiger-Muller type detector, normally used with a HP-260 hand probe.

B. FREQUENCY

1. Operation of counter: as needed.

2. Calibration of counter: semi annual.

C. REFERENCES

1. Geiger Counter Model E-120 Technical Manual, TDC #0517M

2. Mini-Pulser Procedure HNP-8116

D. SAFETY

Observe radiation protection procedures.

E. TEST EQUIPMENT

1. Mini-Pulser with coaxial cable.

2. RM-14 Cs-137 check source.

F. DESCRIPTION OF INSTRUMENT

1. The E-120 is a portable battery operated instrument used for the detection and measurement of beta or gamma radiation. It has a geiger tube detector and the count rate is read out on a linear scale.

2. The full range of the instrument is 50 mR/hr or 70 K CPM.

3. The battery pack uses two standard D size batteries of any type commercially available.

G. DESCRIPTION OF CONTROLS

1. External controls

   a. Switch - Five position switch turns instrument OFF, BATT, XO.1, X1, and X10 scales.

b. Response - Controls response time of meter to most desirable compromise between speed and fluctuation for the particular range.

c. Reset - Discharges integrating capacitor, bringing meter to zero rapidly.

d. Phone - Pulse output for use with earphone, speaker or external scaler.

2. Internal controls

Calibration controls - one control for each range which individually calibrates that range to agree with the Mini-pulser input.

H. OPERATION OF INSTRUMENT

1. Ensure that the instrument calibration is current.

2. To start instrument turn the switch to the BATT position. The meter should indicate within the BATT OK area, if not tag the instrument out with a TO SHOP tag.

3. Place a check source in a repeatable position adjacent to the detector and move the switch to the X10 scale. Compare reading on the meter to the correct value of the source. Using an 8 microcurie CS 137 check source reading should be between 20,000 & 40,000 cpm. If instrument does not read within above values, tag it out with a TO SHOP tag.

4. Push the RESET button and the reading should drop to zero rapidly, then climb back to the source reading in step 2 when the RESET is released. The RESPONSE may be adjusted to get the most desirable compromise between speed of response and meter fluctuation.

5. Interpretation of readings:

NOTE

All E-120's are calibrated to read in C.P.M. unless otherwise stated on the instrument case.

a. The meter reading must be multiplied by the scale multiplier to obtain the proper reading. The fluctuation of the meter is normal and is caused by the random nature of radioactive decay.

b. The E-120, used with an HP-210 or HP-260 probe, has been calibrated using a mini-pulser (pulse generator) and should be used principally for contamination survey work. They should NOT be used to measure dose rates.

I. CALIBRATION OF INSTRUMENT

1. Remove the instrument from the case.

2. Turn the control switch to BATT position and check battery condition. Replace if necessary.

3. Connect the Mini-pulser into the probe connector.

4. Set Mini-pulser for negative pulses at 0.25 volt amplitude.

5. Set the Mini-pulser to 400 cpm, 4,000 cpm, and 40,000 cpm successively and check and record readings on Instrument Calibration Data Sheet (Figure 1) in the As Found column.

6. If readings are within ± 5% of full scale, turn instrument OFF, remove Mini-pulser cable, place instrument in case, reconnect detector and cable, and proceed to step I.12.

NOTE

	± 5% of full scale
X 0.1 scale	35 cpm
X 1 scale	350 cpm
X 10 scale	3500 cpm

7. If reading are not within ± 5% proceed to Step I.8.

8. Set the Mini-pulser to 400 cpm and adjust the X0.1 control for 400 cpm on the meter.

9. Set the Mini-pulser to 4,000 cpm and adjust the X1 control for 4,000 cpm on the meter.

10. Set the Mini-pulser to 40,000 cpm and adjust the X10 control for 40,000 cpm on the meter.

11. Proceed to step I.5 but record readings in the As Left column of Figure 1 if readings are now acceptable. If instrument cannot be calibrated, initiate repairs and repeat Section I.

12. Place the RM-14 check source on contact with the detector, reading should be about 20,000 cpm. Record results in the As Found column and, if within ± 20% of actual count rate, record also in the As Left column. Count rate of the RM-14 check source is about 20,000 cpm contact with G.M. detector.

NOTE

Normal wide fluctuation in the meter is normal with the instrument on X.1 scale.

13. If results in I.12 are not within the limits specified, replace GM detector and repeat.

14. If the instrument checks out properly, complete Instrument Calibration Data Sheet, replace calibration sticker with a new one bearing the test date and when the instrument is due for its next routine semi annual calibration.

PROCEDURE DATA PACKAGE

DOCUMENT NO: HNP-8120-1

SERIAL NO: R05-

MPL NO: D21-N

RTYPE: G15.14

XREF: N/A

TOTAL SHEETS: 2

FREQUENCY: Quarterly

COMPLETED BY: _____

DATE COMPLETED: _____

I HAVE REVIEWED THIS DATA PACKAGE FOR COMPLETENESS AND AGAINST ACCEPTANCE CRITERIA IN ACCORDANCE WITH HNP-830.

ACCEPTABLE _____ UNACCEPTABLE _____

REVIEWED BY: _____

DATE REVIEWED: _____

REMARKS: _____

FIGURE 1
Page 1 of 2

DATA PACKAGE 1
INSTRUMENT CALIBRATION DATA SHEET

INSTRUMENT EBERLINE E-120 LOCATION _____

MPL NUMBER D21-N

			INSTRUMENT READING	
CALIB. SOURCE	ACTUAL COUNT RATE	ACTUAL COUNT RATE (CPM)	DATE:	
			CALIB. BY:	
			AS FOUND (CPM)	AS LEFT (CPM)
MINI PULSER	400 CPM	N/A		
SN	4000 CPM	N/A		
	40,000 CPM	N/A		
PORTAL MONITOR				
CHECK SOURCE		10K to 24K		
		SENS. SET	(CIRCLE)	SENS.
MAINT. PERFORMED				
REMARKS				

FIGURE 1
Page 2 of 2

GEORGIA POWER COMPANY

HATCH NUCLEAR PLANT

PROCEDURE

Regulated Air Sampler Model RAS-1
Operation and Calibration
PROCEDURE TITLE

HNP-8128
PROCEDURE NUMBER

Lab
RESPONSIBLE SECTION

SAFETY RELATED ( ) NON-SAFETY RELATED (X)

REV.	DESCRIPTION	APPROVED DEPT. MANAGER	APPROVED GENERAL MANAGER	DATE
2	Pages 1 and 2	J B Kibler for CW2	Harry Nix	2/9/85

PRC
MR

RECEIVED
JAN 11 1985
PROCEDURE SECTION

(1) NEED BY DATE : 12/31/84

PROCEDURE REVISION REQUEST

(2) PROCEDURE NO. : HNP - 8128 (3) SHEET 1 of 5

(4) REVISION NUMBER OF CURRENT PROCEDURE : 1

(5) PROCEDURE TITLE : Regulated Air Sample - Model RAS-1 Operation + Calibration

(6) REQUESTED BY : Charles J Hart (5) 12/7/84
SIGNATURE x2445 DATE

(7) LIST ANY QA TRACER NUMBERs BEING ADDRESSED : N/A

(8) PRG REVIEW : W.K. Wright 12/27/84
SIGNATURE DATE

(9) PRESENT STATUS : ( ) SAFETY RELATED ; (✓) ~~NON-SAFETY~~ RELATED (12-MW 1/11/85)

(10) THE ABOVE STATUS IS BEING CHANGED: ( ) YES, TO N/A ; (✓) NO

(11) TRAINING REQUIREMENTS (FOR ADMINISTRATIVE PROCEDURES ONLY) : _____

(12) DEPARTMENT MANAGER ENDORSEMENT : R.J. Zavadoski 1/10/85
SIGNATURE DATE

(13) IF QA TRACER(S) APPLICABLE, INDICATE REVIEW BY QA REP. : N/A

MARKED-UP COPY OF CURRENT PROCEDURE MUST BE ATTACHED TO THIS FORM!!

(14) REVIEW BY DOCUMENT CONTROL CLERK: _____ / /
SIGNATURE DATE

(17) PRB DISPOSITION : ( ) N/A ; ( ) RECOMMEND FOR APPROVAL ; ( ) REJECT

(18) PRB NUMBER : _____ ; DATE OF PRB MEETING : / /

(19) PRB SECRETARY's SIGNATURE : _____

PROCEDURE REVISION REQUEST

(CONTINUATION SHEET)

(2) PROCEDURE NO. : HNP - 8128 (3) SHEET 2 of 5

(4) REVISION NUMBER OF CURRENT PROCEDURE : 1

(15) REASON FOR REQUEST : TO Comply with HNP-9 section I.E.
TO properly identify C.2.e of procedure by MPL No.#

PROCEDURE REVISION REQUEST

(CONTINUATION SHEET)

(2) PROCEDURE NO. : HNP - 8128 (3) SHEET 2 of 5

(4) REVISION NUMBER OF CURRENT PROCEDURE : 1

(16) DESCRIPTION OF CHANGES : Section B. FREQUENCY is introduced into procedure. Sections SAFETY and REFERENCES are placed in order of format as per HNP-9. Addition of the Frequency section necessitates all succeeding sections to change to the following letter in order of alphabet.

LD

REGULATED AIR SAMPLER MODEL RAS-1
OPERATION AND CALIBRATION

A. PURPOSE

To establish a standard technique for the operation and calibration of Low Volume Air Samplers.

B. FREQUENCY

1. Operation of air sampler: As needed

2. Calibration of air sampler: Semi Annual

C. REFERENCES

1. HNP-8013 Airborne Radioactivity Concentration Determination

2. Merriam Flow Meter, D-40-N007 Instruction Book TDC 2077M

D. SAFETY

Observe Radiation Protection Procedures.

E. TEST EQUIPMENT

1. Merriam Flow Meter - With Gauge

F. DESCRIPTION OF INSTRUMENT

The RAS-1 is used for sampling air throughout the plant for particulate and radioiodine airborne radioactivity. The regulated air pump offers a constant air flow, while depositing particulate on a 47 mm glass fiber filter then through an iodine cartridge for iodine collection.

G. DESCRIPTION OF CONTROLS AND CONNECTORS

None

H. OPERATION OF INSTRUMENT

1. Be sure the sampler bears a current calibration sticker.

2. Remove the outer ring by turning it counterclockwise and install a 47 mm glass fiber filter paper in the holder. Replace outer ring securely.

3. Open the charcoal cartridge holder and place an iodine cartridge into the holder, making certain to note the direction of sample flow through the cartridge.

4. The sample LOCATION, DATE and TIME ON should be written on the iodine cartridge and on an air sample envelope.

5. Plug the sampler in and turn it on, allowing a two minute warm-up time. Read the rotameter (center of the ball) and multiply the flow in L.P.M. times the correction factor for that instrument. Record this initial flow rate (L.P.M.) on the air sample envelope.

6. When the sample is complete, note the final reading on the rotameter (center of the ball) in L.P.M. and multiply it by the instruments correction factor. Record the TIME OFF and the final flow rate on the iodine cartridge and the air sample envelope.

7. Place filter and cartridge in the air sample envelope and return both samples to the Health Physics Office for counting.

8. Take the AVERAGE flow rate between the initial and final flow rates, as the sample flow rate in L.P.M., and complete Figure 2 of HNP-8013 using the appropriate formulas given on the bottom for the calculations and follow instructions as found in HNP-8013.

I. CALIBRATION

1. Place filter paper and charcoal in sampler as though preparing to take a sample, making sure that the cartridge holder and the filter paper retaining ring are tightened together.

2. Plug the sampler in and turn the pump on, allowing a minimum warm-up time of two minutes.

3. Press the rubber adaptor provided on the Merriam Flow Meter up tight against the filter paper on the sample head.

4. Observe the magnehelic gauge reading in inches of water and record reading on Data Package 1. Remove adaptor from sample head.

5. Using the prepared graphs for the merriam flow meter, convert inches of water to L.P.M. and record this value on Data Package 1.

6. Observe the rotameter reading (center of the ball) and record this reading on Data Package 1 in L.P.M.

7. Complete Data Package 1, dividing the magnehelic reading (L.P.M.) by the rotameter reading (L.P.M.), to get the correction factor for that low volume air sampler. Place a tag on the sampler bearing its correction factor.

8. Replace the calibration sticker with a new one bearing the test date and the date of its next routine semi-annual ± 21 day calibration.

9. Complete Data Package 2 and place in Health Physics Office in the Low Volume Air Sample Log Books (I and II).

PROCEDURE DATA PACKAGE

DOCUMENT NO: HNP-8128-1

SERIAL NO: R02

MPL NO: _____

RTYPE: G15.14

XREF: _____

TOTAL SHEETS: 2

FREQUENCY: SEMI ANNUAL

COMPLETED BY: _____

DATE COMPLETED: _____

I HAVE REVIEWED THIS DATA PACKAGE FOR COMPLETENESS AND AGAINST ACCEPTANCE CRITERIA IN ACCORDANCE WITH HNP-830.

ACCEPTABLE _____ UNACCEPTABLE _____

REVIEWED BY: _____

DATE REVIEWED: _____

REMARKS: _____

FIGURE 1
Page 1 of 2

DATA PACKAGE 1

RAS CALIBRATION SHEET

M.P.L. NUMBER _____ SERIAL NUMBER _____

MAGNEHELIC _____ INCHES OF WATER

_____ LPM

ROTAMETER _____ LPM

* CORRECTION FACTOR: _____

TEST EQUIPMENT USED: MPL _____ (FLOW METER)

MAINTENANCE PERFORMED: _____

_____

_____

LOCATION: _____ CALIBRATED BY: _____

DATE: _____

* CORRECTION FACTOR = $\frac{\text{MAGNEHELIC READING IN L.P.M.}}{\text{ROTAMETER READING IN L.P.M.}}$

PROCEDURE DATA PACKAGE

DOCUMENT NO: HNP-8128-2

SERIAL NO: R02

MPL NO: _____

RTYPE: G15.14

XREF: _____

TOTAL SHEETS: 2

FREQUENCY: SEMI ANNUAL

COMPLETED BY: _____

DATE COMPLETED: _____

I HAVE REVIEWED THIS DATA PACKAGE FOR COMPLETENESS AND AGAINST ACCEPTANCE CRITERIA IN ACCORDANCE WITH HNP-830.

ACCEPTABLE _____ UNACCEPTABLE _____

REVIEWED BY: _____

DATE REVIEWED: _____

REMARKS: _____

FIGURE 2
Page 1 of 2

DATA PACKAGE 2

RAS FLOW RATE LOG

SERIAL NUMBER	*CORRECTION FACTOR	LOCATION	REMARKS

* CORRECTION FACTOR X ROTAMETER READING IN L.P.M. = ACTUAL FLOW RATE IN L.P.M.

FIGURE 2
Page 2 of 2

GEORGIA POWER COMPANY

HATCH NUCLEAR PLANT

PROCEDURE

Beta Counter Model BC-4
PROCEDURE TITLE

HNP-8136
PROCEDURE NUMBER

Lab
RESPONSIBLE SECTION

SAFETY RELATED (X)   NON-SAFETY RELATED (   )

REV.	DESCRIPTION	APPROVED DEPT. MANAGER	APPROVED GENERAL MANAGER	DATE
3	Pages 1-3 & 5	WR Kirkley for RWZ	Harvey Nix	2/1/85 PRC MRW

(1) NEED BY DATE : 1/1/86

PROCEDURE REVISION REQUEST

(2) PROCEDURE NO. : MNP - 8136 (3) SHEET 1 of 5

(4) REVISION NUMBER OF CURRENT PROCEDURE : 2

(5) PROCEDURE TITLE : Beta Counter Model BC-4

(6) REQUESTED BY : [signature] X2485 or 2232 — SIGNATURE — DATE 12/1/85

(7) LIST ANY QA TRACER NUMBERs BEING ADDRESSED : N/A

(8) PRG REVIEW : [signature] — SIGNATURE — DATE 12/2/85

(9) PRESENT STATUS : (✓) SAFETY RELATED ; ( ) NON-SAFETY RELATED

(10) THE ABOVE STATUS IS BEING CHANGED: ( ) YES, TO _____ ; (✓) NO

(11) TRAINING REQUIREMENTS (FOR ADMINISTRATIVE PROCEDURES ONLY) : N/A

(12) DEPARTMENT MANAGER ENDORSEMENT : RW Zavadoski — SIGNATURE — DATE 12/3/85

(13) IF QA TRACER(S) APPLICABLE, INDICATE REVIEW BY QA REP. : N/A

MARKED-UP COPY OF CURRENT PROCEDURE MUST BE ATTACHED TO THIS FORM!!

(14) REVIEW BY DOCUMENT CONTROL CLERK: [signature] — SIGNATURE — DATE 12/4/85

(17) PRB DISPOSITION : ( ) N/A ; (✓) RECOMMEND FOR APPROVAL ; ( ) REJECT

(18) PRB NUMBER : 85-13 ; DATE OF PRB MEETING : 12/5/85

(19) PRB SECRETARY's SIGNATURE : [signature]

LD

(CONTINUATION SHEET)

(2) PROCEDURE NO. : HNP - 5136 (3) SHEET 2 of 5

(4) REVISION NUMBER OF CURRENT PROCEDURE : 2

(15) REASON FOR REQUEST : The reason for requesting a revision of this procedure is for purpose of explaining the ± 3 sigma data in the procedure so it can be more easily understood and followed.

PROCEDURE REVISION REQUEST

(CONTINUATION SHEET)

(2) PROCEDURE NO. : HNP - [illegible] (3) SHEET 2 of 5

(4) REVISION NUMBER OF CURRENT PROCEDURE : 2

(16) DESCRIPTION OF CHANGES : #1.) F.S.A. [illegible]

[illegible] graph [illegible]

#2.) Change section [illegible] to read [illegible] is greater or less than [illegible] counts, then a [illegible] must be [illegible] Record Data [illegible] entering [illegible] on the [illegible] Data Sheet 1).

#3.) G.A.C. Delete section [illegible] developing graph of daily calibration checks.

SAFETY EVALUATION

(1) PROCEDURE NO. : HNP - 8136 (2) SHEET 1 of 1

(3) REVISION NUMBER OF CURRENT PROCEDURE : 7 (N/A IF FOR NEW PROCEDURE)

(4) PROCEDURE TITLE : BETA COUNTER MODEL BC-4

(5) TYPE OF DOCUMENT TO WHICH THIS EVALUATION APPLIES : ( ) NEW PROCEDURE

(X) PROCEDURE REVISION

(6) DOES THIS DOCUMENT CHANGE THE MODE OF OPERATION OR INTENT AS DESCRIBED IN THE FSAR? ( ) YES ; (X) NO

(7) DOCUMENT : ( ) INVOLVES AN UNREVIEWED SAFETY QUESTION

( ) REQUIRES A TECH. SPECS. CHANGE BEFORE THE DOCUMENT CAN BE USED; IF SO, RECORD THE ASSOCIATED DoCR NUMBER : _____

(X) NEITHER

(8) DOES THE IMPLEMENTATION OF THIS DOCUMENT REPRESENT AN UNREVIEWED SAFETY QUESTION? ( ) YES ; (X) NO

(9) GIVE THE BASIS FOR THE DETERMINATION OF WHETHER OR NOT THE IMPLEMENTATION OF THIS DOCUMENT REPRESENTS AN UNREVIEWED SAFETY QUESTION :

The revision of this document does not represent an unreviewed safety question because it only represents a change from using a graph for the change factor to the use of a factor column. Also the section for 3 consecutive counts only represents that the unit will not be placed out of service for more than the duty restored of possibly 2 days.

SAFETY EVALUATION
(CONTINUED)

(1) PROCEDURE NO. : HNP 8136 (2) SHEET 5 of 5

(3) REVISION NUMBER OF CURRENT PROCEDURE : 1 (N/A IF FOR NEW PROCEDURE)

(10) THE IMPLEMENTATION OF THIS DOCUMENT ~~(DOES~~ / DOES NOT) CONSTITUTE AN UNREVIEWED SAFETY QUESTION AS EXPLAINED BELOW:

1. THE PROBABILITY OF OCCURRENCE AND THE CONSEQUENCES OF AN ACCIDENT OR MALFUNCTION OF EQUIPMENT IMPORTANT TO SAFETY ~~(ARE~~ / ARE NOT) INCREASED ABOVE THOSE ANALYZED IN THE FSAR DUE TO THE IMPLEMENTATION OF THIS DOCUMENT BECAUSE:

This procedure only provides instructions for the method of showing the closure date and will not increase the probability of an accident or malfunction important to safety

2. THE POSSIBILITY OF AN ACCIDENT OR MALFUNCTION OF A DIFFERENT TYPE THAN ANALYZED IN THE FSAR ~~(DOES~~ / DOES NOT) RESULT FROM THE IMPLEMENTATION OF THIS DOCUMENT BECAUSE:

This procedure revision only provides deletion for developing a graph and does not involve any conditions which are not monitored in Radiation Protection Procedures

3. THE MARGIN OF SAFETY AS DEFINED IN TECHNICAL SPECIFICATIONS ~~(IS~~ / IS NOT) REDUCED DUE TO THE IMPLEMENTATION OF THIS DOCUMENT BECAUSE:

The revision only involves deletion of a graph and is monitored in current Radiation Protection Procedures.

(11) SAFETY EVALUATION PERFORMED BY : [signature] 11/21/85

(12) SAFETY EVALUATION REVIEWED BY : [signature] 11-22-85 11/21/85

(13) DEPARTMENT MANAGER APPROVAL : [signature] 11/21/85

LB

BETA COUNTER MODEL BC-4

A. PURPOSE

To insure the instrument is calibrated properly and to provide operation instructions for the user.

B. FREQUENCY

1. Daily Chi-Square Check

2. Quarterly Calibration

C. REFERENCE

BETA COUNTER MODEL BC-4 Technical Manual TDC #0516M

D. SAFETY

Observe radiation protection procedures.

E. DESCRIPTION OF INSTRUMENT

The Model BC-4 Beta Counter is a system consisting of a two-inch detector, high voltage power supply, pulse amplifier, timer and six decade readout. All circuits are solid state with use of integrated circuits.

F. DESCRIPTION OF CONTROLS

1. EXTERNAL

   a. Count Mode - Selects timed or manual counting mode.

   b. Reset-Start - Resets all appropriate circuitry to zero and starts a timed counting sequence.

   c. Count Time In Minutes - Selects desired counting time.

   d. Power - Supplies power to the instrument.

   e. 115 or 230 VAC Switch - Selects either 115V, 60 Hz, or 230V, 50 Hz. (Set to 115V, 60 Hz)

2. INTERNAL

   a. Time Base (Timer Board) - Control for adjusting time base of the timer when instrument is used with a battery.

G. OPERATION OF INSTRUMENT

1. Be sure the instrument calibration is current.

2. Turn Power Switch to ON.

3. Position Count Mode switch to desired mode.

4. Position Count Time In Minutes switch to counting time desired.

5. Press Reset-Start switch and release. Instrument should begin counting.

6. Daily Calibration.

   a. Set Count Mode switch to Manual. Instrument should begin to count. Record results in Man. CK column of Data Package 1 (Data Sheet 1).

   b. Set Count Mode switch to TIMED.

   c. Perform a 10 minute background count and record the background counts in C.P.M. on Data Package 1 (Data Sheet 1).

   d. Place a radioactive standard in position for counting and count for 5 minutes. Record results on Data Package 1 (Data Sheet 1) in C.P.M.

NOTE

A TC-99m beta source centered in a stainless steel plachet should be used.

   e. If count rate is greater or less than 3 sigma in 3 consecutive counts, then a new chi-square must be performed. Record results by entering yes or no in the ± 3 sigma column of Data Package 1 (Data Sheet 1).

   f. Calculate the counter efficiency for the geometry in step d and record on Data Package 1 (Data Sheet 1).

$$\text{Efficiency} = \frac{\text{Net C.P.M.}}{\text{D.P.M.}} \times 100$$

H. CALIBRATION OF INSTRUMENT

1. Adjust H.V. to 900 Volts. Refer to technical manual.

CAUTION

Do not over-voltage the GM tube. (900 volts)

2. Chi-Square test (Quarterly test).

   a. Perform a one minute background count and record the background counts in BKG. CPM on Data Package 2 (Data Sheet 2).

   b. Place a radioactive standard in position for counting. Use the same standard which will be used in the daily calibration.

   c. Count the source for one minute durations twenty times and record net count results on Data Package 2 (Data Sheet 2).

   d. Calculate chi-square. If results is between 7 and 35, the instrument should be functioning properly.

   e. Calcualte 1σ , 2σ and 3σ error.

PROCEDURE DATA PACKAGE

DOCUMENT NO: HNP-8136-1

SERIAL NO: R03-

MPL NO: _____

RTYPE: G15.14

XREF: _____

TOTAL SHEETS: 2

FREQUENCY: Monthly

COMPLETED BY: _____

DATE COMPLETED: _____

I HAVE REVIEWED THIS DATA PACKAGE FOR COMPLETENESS AND AGAINST ACCEPTANCE CRITERIA IN ACCORDANCE WITH HNP-830.

ACCEPTABLE _____ UNACCEPTABLE _____

REVIEWED BY: _____

DATE REVIEWED: _____

REMARKS: _____

FIGURE 1
Page 1 of 2

DATA PACKAGE 1

BC-4 DAILY CALIBRATION

DATA SHEET 1

Month_____19__

SOURCE: _____ SER. NO. _____

ACTIVITY _____DPM INST. M.P.L. NO: D21-____

COUNT TIME: BACKGROUND - 10 Minutes
SOURCE - 5 Minutes

SOURCE COUNT RATE ($\bar{n}$)=____CPM*
$\bar{n} + 3\sigma$ = _____CPM*
$\bar{n} - 3\sigma$ = _____CPM*

DAY	DATE	MAN CK.	BKG. C.P.M.	SOURCE C.P.M.	SOURCE NET C.P.M.	EFF.	WITHIN ± 3 SIGMA	REMARKS	DONE BY
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									
26									
27									
28									
29									
30									
31									

* FROM DATA SHEET 2 (CHI SQUARE TEST)

FIGURE 1
Page 2 of 2

PROCEDURE DATA PACKAGE

DOCUMENT NO: HNP-8136-2

SERIAL NO: R03-

MPL NO: _____

RTYPE: G15.14

XREF: _____

TOTAL SHEETS: 2

FREQUENCY: Quarterly

COMPLETED BY: _____

DATE COMPLETED: _____

I HAVE REVIEWED THIS DATA PACKAGE FOR COMPLETENESS AND AGAINST ACCEPTANCE CRITERIA IN ACCORDANCE WITH HNP-830.

ACCEPTABLE _____ UNACCEPTABLE _____

REVIEWED BY: _____

DATE REVIEWED: _____

REMARKS: _____

FIGURE 2
Page 1 of 2

DATA PACKAGE 2

CHI-SQUARE TEST

DATA SHEET 2

DATE: _____ BC-4 M.P.L. NO. _____

SOURCE: _____

COUNTE TIME _____ MIN SOURCE SER. NO. _____

H. V. SETTING _____ BKG CPM _____

RUN NO.	n*	$n-\bar{n}$	$(n-\bar{n})^2$
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
SUM (Σ)			

* NET COUNTS

$\bar{N} = \frac{\Sigma n}{20} =$

$\Sigma(n-\bar{n})$ must be zero

$\sigma = \pm \sqrt{\bar{n}} =$ _____

$2\sigma =$ _____

$3\sigma =$ _____

χ^2 (Chi-Square) $= \frac{\Sigma(n-\bar{n})^2}{\bar{n}} =$

χ^2 must be between 7 & 35

COMPLETED BY: _____ DATE _____

$\bar{n} + 1\sigma =$ _____
$\bar{n} + 2\sigma =$ _____
$\bar{n} + 3\sigma =$ _____

$\bar{n} - 1\sigma =$ _____
$\bar{n} - 2\sigma =$ _____
$\bar{n} - 3\sigma =$ _____

GEORGIA POWER COMPANY

HATCH NUCLEAR PLANT

PROCEDURE

Portable Battery-Powered Low Volume Air Samplers
PROCEDURE TITLE

HNP-8138
PROCEDURE NUMBER

Lab
RESPONSIBLE SECTION

SAFETY RELATED (X) NON-SAFETY RELATED ( )

REV.	DESCRIPTION	APPROVED DEPT. MANAGER	APPROVED GENERAL MANAGER	DATE
1	DELETED - NO REPLACEMENT	L. E. Kelly for RWM	J. H. Miller, Jr.	6-19-85

HNP-9
BT

Draft

(1) NEED BY DATE : 1/31/85

PROCEDURE REVISION REQUEST

(2) PROCEDURE NO. : HNP - 8138 (3) SHEET 1 of 5

(4) REVISION NUMBER OF CURRENT PROCEDURE : 1

(5) PROCEDURE TITLE : Portable, Battery-Powered Low Volume Air Sampler

(6) REQUESTED BY : Charles P. Hart (mu) SIGNATURE ; 1/14/85 DATE

(7) LIST ANY QA TRACER NUMBERs BEING ADDRESSED : N/A

(8) PRG REVIEW : M. A. Thadani SIGNATURE ; 1/9/85 DATE

(9) PRESENT STATUS : (X) SAFETY RELATED ; ( ) NON-SAFETY RELATED

(10) THE ABOVE STATUS IS BEING CHANGED: ( ) YES, TO _____ ; (✓) NO

(11) TRAINING REQUIREMENTS (FOR ADMINISTRATIVE PROCEDURES ONLY) : _____

(12) DEPARTMENT MANAGER ENDORSEMENT for RW Zavadoski SIGNATURE ; 1/10/85 DATE

(13) IF QA TRACER(S) APPLICABLE, INDICATE REVIEW BY QA REP. : N/A

MARKED-UP COPY OF CURRENT PROCEDURE MUST BE ATTACHED TO THIS FORM!!

(14) REVIEW BY DOCUMENT CONTROL CLERK: Eleanor Carter SIGNATURE ; 1/17/85 DATE

(17) PRB DISPOSITION : ( ) N/A ; (✓) RECOMMEND FOR APPROVAL ; ( ) REJECT

(18) PRB NUMBER : 85-24 ; DATE OF PRB MEETING : 1/24/85

(19) PRB SECRETARY's SIGNATURE : Tom Hoppard

PROCEDURE REVISION REQUEST

(CONTINUATION SHEET)

(2) PROCEDURE NO. : HNP - 8138 (3) SHEET 2 of 5

(4) REVISION NUMBER OF CURRENT PROCEDURE : 1

(15) REASON FOR REQUEST : Delete Procedure

PROCEDURE REVISION REQUEST

(CONTINUATION SHEET)

(2) PROCEDURE NO. : HNP - 8138 (3) SHEET 3 of 5

(4) REVISION NUMBER OF CURRENT PROCEDURE : 1

(16) DESCRIPTION OF CHANGES : Delete entire procedure

SAFETY EVALUATION

(1) PROCEDURE NO. : HNP - 8138 (2) SHEET 4 of 5

(3) REVISION NUMBER OF CURRENT PROCEDURE : 1 (N/A IF FOR NEW PROCEDURE)

(4) PROCEDURE TITLE : Portable Battery-Powered Low Volume Air Samplers

(5) TYPE OF DOCUMENT TO WHICH THIS EVALUATION APPLIES : ( ) NEW PROCEDURE

(✓) PROCEDURE REVISION

(6) DOES THIS DOCUMENT CHANGE THE MODE OF OPERATION OR INTENT AS DESCRIBED IN THE FSAR? ( ) YES ; (✓) NO

(7) DOCUMENT : ( ) INVOLVES AN UNREVIEWED SAFETY QUESTION

( ) REQUIRES A TECH. SPECS. CHANGE BEFORE THE DOCUMENT CAN BE USED; IF SO, RECORD THE ASSOCIATED DoCR NUMBER : _____

(✓) NEITHER

(8) DOES THE IMPLEMENTATION OF THIS DOCUMENT REPRESENT AN UNREVIEWED SAFETY QUESTION? ( ) YES ; (✓) NO

(9) GIVE THE BASIS FOR THE DETERMINATION OF WHETHER OR NOT THE IMPLEMENTATION OF THIS DOCUMENT REPRESENTS AN UNREVIEWED SAFETY QUESTION :

This document is not and will not be implemented. The sampler is obsolete

SAFETY EVALUATION
(CONTINUED)

(1) PROCEDURE NO. : HNP - 8138 (2) SHEET 5 of 5

(3) REVISION NUMBER OF CURRENT PROCEDURE : 1 (N/A IF FOR NEW PROCEDURE)

(10) THE IMPLEMENTATION OF THIS DOCUMENT ~~(DOES~~ / DOES NOT) CONSTITUTE AN UNREVIEWED SAFETY QUESTION AS EXPLAINED BELOW:

1. THE PROBABILITY OF OCCURRENCE AND THE CONSEQUENCES OF AN ACCIDENT OR MALFUNCTION OF EQUIPMENT IMPORTANT TO SAFETY ~~(ARE~~ / ARE NOT) INCREASED ABOVE THOSE ANALYZED IN THE FSAR DUE TO THE IMPLEMENTATION OF THIS DOCUMENT BECAUSE: This procedure is no longer implemented. The sampler is obsolete.

2. THE POSSIBILITY OF AN ACCIDENT OR MALFUNCTION OF A DIFFERENT TYPE THAN ANALYZED IN THE FSAR (~~DOES~~ / DOES NOT) RESULT FROM THE IMPLEMENTATION OF THIS DOCUMENT BECAUSE: It will no longer be implemented.

3. THE MARGIN OF SAFETY AS DEFINED IN TECHNICAL SPECIFICATIONS ~~(IS~~ / IS NOT) REDUCED DUE TO THE IMPLEMENTATION OF THIS DOCUMENT BECAUSE: It will not be implemented.

(11) SAFETY EVALUATION PERFORMED BY : Charles D Hart 1/4/85

(12) SAFETY EVALUATION REVIEWED BY : W H Rogers 1/7/85

(13) DEPARTMENT MANAGER APPROVAL : R W Zavadoski 1/10/85

GEORGIA POWER COMPANY

HATCH NUCLEAR PLANT

PROCEDURE

Operation of Waste Separation & Temporary Storage Facility
PROCEDURE TITLE

HNP-8430
PROCEDURE NUMBER

Lab
RESPONSIBLE SECTION

SAFETY RELATED (X) NON-SAFETY RELATED ( )

REV.	DESCRIPTION	APPROVED DEPT. MANAGER	APPROVED GENERAL MANAGER	DATE
4	Pages 1, 5-6 & 10-12	RW Zavadoski	Harvey Nix	9/12/84
5	Pages 1 thru 11	WB Kibley for RWZ	Harvey Nix	2/9/85 PRC mtg

(1) NEED BY DATE : 1/1/85

PROCEDURE REVISION REQUEST

(2) PROCEDURE NO. : HNP - [illegible] (3) SHEET 1 of 5

(4) REVISION NUMBER OF CURRENT PROCEDURE : 14

(5) PROCEDURE TITLE : [illegible] of Waste Separation & Temporary Storage Facility

(6) REQUESTED BY : [signature] SIGNATURE 11/26/84 DATE

(7) LIST ANY QA TRACER NUMBERS BEING ADDRESSED : [illegible]

(8) PRG REVIEW : [signature] SIGNATURE 12/27/84 DATE

(9) PRESENT STATUS : ( ) SAFETY RELATED ; ( ) NON-SAFETY RELATED

(10) THE ABOVE STATUS IS BEING CHANGED: ( ) YES, TO _____ ; (✓) NO

(11) TRAINING REQUIREMENTS (FOR ADMINISTRATIVE PROCEDURES ONLY) : _____

(12) DEPARTMENT MANAGER ENDORSEMENT : [signature] SIGNATURE 1/11/85 DATE

(13) IF QA TRACER(S) APPLICABLE, INDICATE REVIEW BY QA REP. : [signature] [illegible]

MARKED-UP COPY OF CURRENT PROCEDURE MUST BE ATTACHED TO THIS FORM!!

(14) REVIEW BY DOCUMENT CONTROL CLERK: _____ SIGNATURE / / DATE

(17) PRB DISPOSITION : ( ) N/A ; (✓) RECOMMEND FOR APPROVAL ; ( ) REJECT

(18) PRB NUMBER : 85-1 ; DATE OF PRB MEETING : 1/7/85

(19) PRB SECRETARY's SIGNATURE : _____

PROCEDURE REVISION REQUEST

(CONTINUATION SHEET)

(2) PROCEDURE NO. - HNP - 5-1-15 (3) SHEET 2 of 5

(4) REVISION NUMBER OF CURRENT PROCEDURE : 14

(15) REASON FOR REQUEST : To update the procedure to include a semiannual [illegible] of project waste at the WSTSF. To place an administrative limit on length of storage of these wastes.

PROCEDURE REVISION REQUEST

(CONTINUATION SHEET)

(2) PROCEDURE NO. HMP - [illegible] (3) SHEET 3 of 5

(4) REVISION NUMBER OF CURRENT PROCEDURE : C4

(16) DESCRIPTION OF CHANGES : Limit on highest average reading for B-25

[illegible] from [illegible] contact to [illegible] @ [illegible]

[illegible]

[illegible]

[illegible] of present radwaste is changed from

[illegible] (?) personnel report. The old daily data

[illegible] this information is replaced with a [illegible]

[illegible]

[illegible] employing [illegible] from page [illegible]

SAFETY EVALUATION

(1) PROCEDURE NO. : HNP - 5431 (2) SHEET 1 of 5

(3) REVISION NUMBER OF CURRENT PROCEDURE : 21 (N/A IF FOR NEW PROCEDURE)

(4) PROCEDURE TITLE : Control of Waste Separation & Temporary Storage Facility

(5) TYPE OF DOCUMENT TO WHICH THIS EVALUATION APPLIES : ( ) NEW PROCEDURE

(✓) PROCEDURE REVISION

(6) DOES THIS DOCUMENT CHANGE THE MODE OF OPERATION OR INTENT AS DESCRIBED IN THE FSAR? ( ) YES ; (✓) NO

(7) DOCUMENT : ( ) INVOLVES AN UNREVIEWED SAFETY QUESTION

( ) REQUIRES A TECH. SPECS. CHANGE BEFORE THE DOCUMENT CAN BE USED; IF SO, RECORD THE ASSOCIATED DoCR NUMBER : _____

(✓) NEITHER

(8) DOES THE IMPLEMENTATION OF THIS DOCUMENT REPRESENT AN UNREVIEWED SAFETY QUESTION? ( ) YES ; (✓) NO

(9) GIVE THE BASIS FOR THE DETERMINATION OF WHETHER OR NOT THE IMPLEMENTATION OF THIS DOCUMENT REPRESENTS AN UNREVIEWED SAFETY QUESTION :

The implementation of this procedure represents No unreviewed safety question because the changes involved disposal of radwaste storage and the changes of documentation not the handling of the waste

SAFETY EVALUATION
(CONTINUED)

(1) PROCEDURE NO. : HNP - 5121C (2) SHEET 5 of 5

(3) REVISION NUMBER OF CURRENT PROCEDURE : 14 (N/A IF FOR NEW PROCEDURE)

(10) THE IMPLEMENTATION OF THIS DOCUMENT (~~DOES~~ / DOES NOT) CONSTITUTE AN UNREVIEWED SAFETY QUESTION AS EXPLAINED BELOW:

1. THE PROBABILITY OF OCCURRENCE AND THE CONSEQUENCES OF AN ACCIDENT OR MALFUNCTION OF EQUIPMENT IMPORTANT TO SAFETY (~~ARE~~ / ARE NOT) INCREASED ABOVE THOSE ANALYZED IN THE FSAR DUE TO THE IMPLEMENTATION OF THIS DOCUMENT BECAUSE:
This is a change in the method of record keeping [illegible]

2. THE POSSIBILITY OF AN ACCIDENT OR MALFUNCTION OF A DIFFERENT TYPE THAN ANALYZED IN THE FSAR (~~DOES~~ / DOES NOT) RESULT FROM THE IMPLEMENTATION OF THIS DOCUMENT BECAUSE:
There is no new waste or equipment handling due to this procedure.

3. THE MARGIN OF SAFETY AS DEFINED IN TECHNICAL SPECIFICATIONS (~~IS~~ / IS NOT) REDUCED DUE TO THE IMPLEMENTATION OF THIS DOCUMENT BECAUSE:
Only the manner in which the paperwork is done is changed. Hence the [illegible]

(11) SAFETY EVALUATION PERFORMED BY : [signature] 11/26/85

(12) SAFETY EVALUATION REVIEWED BY : [signature] 1/5/85

(13) DEPARTMENT MANAGER APPROVAL : [signature] 1/11/85

L6

OPERATION OF WASTE SEPARATION AND TEMPORARY STORAGE FACILITY

A. PURPOSE

The purpose of this procedure is to provide instructions in the operation of the waste separation and temporary storage facility.

B. FREQUENCY

Not applicable to this procedure.

C. REFERENCES

1. HNP-8012 Radiation & Contamination Surveys
2. HNP-8016 Shipment of Radioactive Material
3. HNP-8028 Release Surveys for Trash and Materials Leaving Operating Buildings

D. SAFETY

1. Observe Radiation Protection Procedures.
2. Observe Georgia Power, SAFETY, Section "O".

E. SPECIAL EQUIPMENT

1. Appropriate survey instruments.
2. Appropriate protective clothing.
3. Appropriate signs, placards, and labels.

F. DETERMINATION OF MATERIALS TO BE TRANSFERRED TO THE WASTE SEPARATION AND TEMPORARY STORAGE FACILITY (WS-TSF)

1. All waste transferred to the WS-TSF will be transported in such a manner as to prevent the release of contamination to the environs during transport.
2. Liquids should not be transferred to the WS-TSF. Transfer of any liquids must be approved by the H.P. Supervisor or his designee.
3. Each bag or piece of material should be surveyed by a Health Physics Technician prior to leaving the operating buildings. HNP-8028.
4. There should be no external surface contamination on the container. Also, no waste reading in excess of 50 mr/hr contact will be transferred to the WS-TSF without the approval of the Health Physics Supervisor or his designee.

5. Each container or piece of material must be labeled with a Radioactive Material label containing the following information:

   a. A general description of the waste

   b. Surface contamination results

   c. Highest contact dose rates

   d. Date

   e. Surveyor's name

NOTE

Any material with a contact dose rate greater than 50 mr/hr must be taken to the Unit II radwaste trash compacting area on the R/W 132' elevation, unless exempted per Paragraph F.4.

G. TRANSFER OF WASTE TO THE WASTE SEPARATION AND TEMPORARY STORAGE FACILITY (WS-TSF)

1. Material shall be transported to the WS-TSF by truck or other appropriate means. The vehicle will be loaded in an area designated by a Health Physics Foreman or Supervisor.

2. During the loading, transporting, and unloading of waste from the vehicle, the vehicle shall be posted "Radioactive Material" on the front rear and each side of the vehicle.

3. After the loading of waste onto the transport vehicle has been completed, the vehicle shall be locked and sealed and shall remain locked and sealed, until the commencement of unloading at the WS-TSF. If transport vehicle is a flat bed trailer, locks and seals do not apply.

4. The vehicle shall be surveyed prior to leaving the protected area. Dose rates outside the vehicle should be within limits specified in D.O.T. regulations. If not, notify the Lab Supervisor for approval to proceed with the transfer. Survey results will be documented on Figure 1 of HNP-8012.

5. The vehicle should travel unimpeded and by the quickest route to the WS-TSF. There shall be no unauthorized stops along the way. Emergency stops (such as mechanical failure, flat tire, etc.) shall require the immediate notification of a Health Physics Foreman.

6. After the vehicle has been unloaded, a survey shall be performed. The interior of the vehicle or the surface of the flat bed trailer will be smeared for surface contamination. Survey results will be logged on Figure 1 of procedure HNP-8012.

H. RECEIPT OF WASTE AT THE WASTE SEPARATION AND TEMPORARY STORAGE FACILITY

1. Upon receipt of waste at the WS-TSF, all waste should be separated or classified according to dose rate and type of waste.

2. Waste reading less than 5 mr/hr should be set aside for processing by the waste separation facility. Waste reading greater than 5 mr/hr should be prepared for shipment for burial.

3. Non-compactable waste should be set aside for packing B-25 shipping containers or equivalent.

4. Compactable contaminated waste should be set aside for compacting.

5. All bags containing waste should be opened and investigated for salvageable protective clothing and equipment.

NOTE

Any deviation from the above guides requires approval from a Health Physics Foreman or Supervisor.

I. WASTE SEPARATION

1. Bags of waste reading less than 5 mr/hr contact should be opened and the waste should be placed on the waste sorting tables for inspection.

2. All waste shall be scanned with an RM-14/HP-210 probe or an E-120 or equivalent. Waste found to be reading 100 cpm above background at one half inch will be considered contaminated and will be processed as Radioactive Waste. The remaining material will be placed in green plastic bags and sent to the landfill as non-contaminated trash.

3. Before any clean waste is released to the landfill, each bag is to be checked with a micro-R meter or a PRM-4A/SPA-3. This check is to be performed at the landfill by an ANSI qualified H.P. Any bag of clean trash reading greater than two times background will be returned to the waste separation facility for reprocessing.

4. A written log will be kept of all materials leaving the WS-TSF as non-contaminated trash. This log should contain:

   a. Date

   b. Time

   c. Number of bags of trash

   d. Type of trash

   e. Surveyor's name

   f. Instrument serial number

J. PROCESSING OF RADIOACTIVE WASTE

1. All radioactive waste packaged for shipment will be in an appropriate DOT shipping container. When compacting in a B-25 box, place all material greater than 20 mr/hr in the center of the box in order to limit the surface dose rates. The highest average reading should not exceed 500 mr/hr @/meter from the box.

2. All shipping containers will be labeled with a radioactive materials sticker and the following information:

   a. I.D. number

   b. General description of contents

   c. Highest contact dose rate

   d. Container contamination levels

   e. Gross weight

   f. Date packaged and surveyor's name

3. Containers should be numbered consecutively with the numbers preceded by HNP and the year.

   Example: HNP-85-1
   HNP-85-2

4. Radioactive LSA stickers will be placed on two opposite sides of each container.

5. Containers should be stored in such a way as to limit exposure and allow easy access.

NOTE

When containers are shipped, the containers that were packaged first should be shipped first.

K. ROUTINE SURVEYS

1. Routine contamination and radiation surveys will be performed at least once per day during manning of the facility or following any event which might cause a change in conditions. Survey results are to be logged on Figure 1, 2, or 3 of HNP-8012.

L. RADIATION AND CONTAMINATION CONTROL

1. Personnel working in the WS-TSF will be required to wear pocket dosimeters and TLDs at all times.

2. Radiation Work Permits will be administered in accordance to HNP-8008.

3. All exits from contaminated areas will have step-off pads. Any person exiting a contaminated area must perform a whole body fr .

NOTE

Any material leaving or taken out of the WS-TSF must be surveyed by an H.P. staff person.

4. The storage area will be inspected monthly for signs of container deterioration or leakage. Appropriate corrective action will be taken if damaged containers are found. Documentation will be on Data Sheet 1 of Data Package 2.

5. Any water that accumulates in the floor sump will be sampled and analyzed by Health Physics. If the liquid contains radioactive material other than natural radioactivity, it will be transferred to the radwaste system for processing. When liquid is found, the source should be identified and stopped.

6. When the building is not in use, Health Physics will perform a survey of the building interior on a weekly basis.

7. No materials may be stored within 18 inches of the overhead fire sprinkler system.

8. Fans used at the WS-TSF must be positioned such that they do not blow air from a contaminated area into a non-contaminated area.

9. Daily inspect the magnehelic gauge for the HEPA unit associated with the waste sorting tables ventilation system. If the gauge is reading $\geq$ 1.5 inches of water, change out HEPA filter and prefilter. Document daily inspection of magnehelic gauge on Data Package 3.

M. SEMI ANNUAL RADWASTE INVENTORY REPORT

A semi annual report is necessary to assure that radwaste is not stored at the facility for more than two years. Any waste found during inventory which has a "packaged date" greater than 6 months should be shipped for burial before the next semi annual report due date. Semi annual inventory will be conducted during the first and seventh month each year. Data Package 1 will be used to complete this report.

PROCEDURE DATA PACKAGE

DOCUMENT NO: HNP-8430-1

SERIAL NO: R05-

MPL NO: N/A

RTYPE: G15.14

XREF: N/A

TOTAL SHEETS: 5

FREQUENCY: As Required

COMPLETED BY: _____

DATE COMPLETED: _____

I HAVE REVIEWED THIS DATA PACKAGE FOR COMPLETENESS AND AGAINST ACCEPTANCE CRITERIA IN ACCORDANCE WITH HNP-830.

ACCEPTABLE _____ UNACCEPTABLE _____

REVIEWED BY: _____

DATE REVIEWED: _____

REMARKS: _____

FIGURE 1
Page 1 of 5

DATA PACKAGE 1
Data Sheet 1

RAD WASTE INVENTORY

I. B-25 BOXES

BOX NUMBER	DATE PACKAGED	STORAGE LOCATION

NOTE: All packages w/dates ≥ 6 months in age should be shipped off site prior to the next semi annual report.

FIGURE 1
Page 2 of 5

DATA PACKAGE 1 (CONT)
Data Sheet 1 (cont)

RAD WASTE INVENTORY

II. 55 GAL. DRUMS (TRASH)

DRUM NUMBER	DATE PACKAGED	STORAGE LOCATION

NOTE: All packages w/dates ≥ 6 months in age should be shipped off site prior to the next semi annual report.

FIGURE 1
Page 3 of 5

DATA PACKAGE 1 (CONT)
Data Sheet 1 (cont)

RAD WASTE INVENTORY

III. ABSORBED SOLIDIFIED OIL

DRUM NUMBER	DATE PACKAGED	STORAGE LOCATION

NOTE: All packages w/dates $\geq$ 6 months should be shipped off site prior to the next semi annual report.

FIGURE 1
Page 4 of 5

DATA PACKAGE 1 (CONT)
Data Sheet 1 (cont)

RAD WASTE INVENTORY

TYPE WASTE _____

NUMBER	DATE PACKAGED	STORAGE LOCATION

NOTE: All packages w/dates $\geq$ 6 months of age should be shipped off site prior to the next semi annual report.

FIGURE 1
Page 5 of 5

PROCEDURE DATA PACKAGE

DOCUMENT NO: HNP-8430-2

SERIAL NO: R05-

MPL NO: _____

RTYPE: G15.14

XREF: _____

TOTAL SHEETS: 2

FREQUENCY: As Required

COMPLETED BY: _____

DATE COMPLETED: _____

I HAVE REVIEWED THIS DATA PACKAGE FOR COMPLETENESS AND AGAINST ACCEPTANCE CRITERIA IN ACCORDANCE WITH HNP-830.

ACCEPTABLE _____ UNACCEPTABLE _____

REVIEWED BY: _____

DATE REVIEWED: _____

REMARKS: _____

FIGURE 2
Page 1 of 2

DATA PACKAGE 2
Data Sheet 1

STORAGE AREA MONTHLY INSPECTION SHEET

INSPECTOR: _____ DATE: _____

	ACCEPTABLE	UNACCEPTABLE
TRASH OR DEBRIS BUILDUP (ADDITIONAL EMPHASIS AROUND WORK AREAS)	_____	_____
DETERIORATION OF CONTAINERS (i.e. RUST, HOLES, ETC.)	_____	_____
PROPER POSTING WHERE APPLICABLE	_____	_____
DOSE RATES ARE WITHIN LIMITS POSTED	_____	_____
SPILLS (WATER OR OIL)	_____	_____
GENERAL CLEANLINESS	_____	_____

NOTE

IF UNACCEPTABLE, NOTIFY AN HP FOREMAN IMMEDIATELY.

REMARKS: _____

_____

_____

_____

_____

_____

FIGURE 2
Page 2 of 2

PROCEDURE DATA PACKAGE

DOCUMENT NO: HNP-8430-3

SERIAL NO: R05-

MPL NO: _____

RTYPE: G15.14

XREF: _____

TOTAL SHEETS: 2

FREQUENCY: As Required

COMPLETED BY: _____

DATE COMPLETED: _____

I HAVE REVIEWED THIS DATA PACKAGE FOR COMPLETENESS AND AGAINST ACCEPTANCE CRITERIA IN ACCORDANCE WITH HNP-830.

ACCEPTABLE _____ UNACCEPTABLE _____

REVIEWED BY: _____

DATE REVIEWED: _____

REMARKS: _____

FIGURE 3
Page 1 of 2

DATA PACKAGE 3

MAGNEHELIC SURVEILLANCE

DATE	PERFORMED BY	MAGNEHELIC* READING	REMARKS

* Gauge should indicate $<$ 1.5 inches of water, if gauge indicates $\geq$ 1.5 inches of water, then the HEPA filter and prefilter should be changed. Indicate change out in remarks.

FIGURE 3
Page 2 of 2