

HOUSTON LIGHTING AND POWER COMPANY  
SOUTH TEXAS PROJECT  
ELECTRIC GENERATING STATION  
PLANT PROCEDURES MANUAL

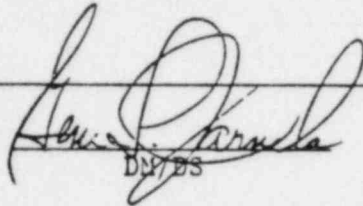
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NON SAFETY-RELATED

Operation of the Tennelec LB5100 Automatic  
Alpha/Beta Counter

PRP5-20-32  
Rev. 0  
Page 1 of 6

APPROVED:

  
DSE/ES

NA  
DATE APPROVED

11/7/83  
DATE EFFECTIVE

Field changes to this procedure must be approved by Radiological Services.  
This procedure is not described in the FSAR.

1.0 Purpose and Scope

- 1.1 This procedure outlines the steps required to operate the Tennelec LB5100 Alpha/Beta Unit.
- 1.2 Unless otherwise indicated operation of the Tennelec will be in accordance with instructions outlined in References 7.1 and 7.2 of this procedure.

2.0 Prerequisites

- 2.1 Routine operations will be performed on a calibrated standardized instrument. (See Reference 7.3 of this procedure.)
- 2.2 Equipment required.
  - 2.2.1 Texas Instruments Silent 700 ASR.
  - 2.2.2 P-10 gas and regulator apparatus.
  - 2.2.3 APT RS232 switch.
  - 2.2.4 Stainless steel planchet.
  - 2.2.5 Appropriate alpha/beta sources.

3.0 Precautions

- 3.1 Assure adequate cleaning of planchets, planchet holders, slide assembly, etc.

*Handwritten:* 10/10/83

3.2 Use care when loading and counting unsealed sample and sources.

#### 4.0 Procedure

4.1 An instrument check using an alpha/beta source and a background is required prior to use or on a weekly basis.

4.1.1 Check LB5100 settings for P-10 tank conditions. Refer to Alpha/Beta Calibration/Standardization Form (-01) for previous settings in the calibration/standardization and operation conditions sections of the QC Log. Any deviation from the calibration/standardization condition must be noted, dated, and initialed in the information and maintenance section of the Tennelec QC Log.

NOTE: P-10 GAS SHOULD BE CHANGED BEFORE  
REACHING 400 PSI.

4.1.2 Perform an alpha/beta source check. Complete this step by referring to the control charts and/or control tables in the alpha and beta check sections of the Tennelec QC Log.

4.1.3 If the alpha/beta source check fails, repeat the test.

4.1.4 If the alpha/beta source check fails twice, contact the cognizant Health Physicist and do not proceed with the analysis.

4.1.5 If the alpha/beta source check initially fails, but passes a second and third check, continue with this procedure.

4.1.6 Perform an instrument background check. Complete this step by referring to the Background Check Log in the background section of the Tennelec QC Log.

4.1.7 If the background check fails, repeat the test.

4.1.8 If the background check fails twice, contact the cognizant Health Physicist and do not proceed with any analysis.

4.1.9 If the background check initially fails and passes a second and third check, the instrument is considered operational.

4.1.10 All instrument checks, passed or failed, require logging.

4.1.11 When an instrument has failed and has been evaluated and acted upon, comments should be made in the information and maintenance sections and/or appropriate check log sections of the QC Log.

## 4.2 Operating Instructions

- 4.2.1 Turn the switch of the APT RS232 to the Tennelec LB5100 position.
- 4.2.2 Silent 700 printer toggles must be in the "on line" positions.
- 4.2.3 Toggles must be in the "Power On" and "Speed Low" positions.
- 4.2.4 Place the Record/Playback toggle into the record position for the cassette of interest.
- 4.2.5 Press Rewind toggle and wait for End light (red) to appear.
- 4.2.6 Press Load toggle and wait for the Ready light (red) to appear.
- 4.2.7 Record Control: Check to see that the Tape Format toggle is in the continuous position. Place the record control toggle into "ON" position.

NOTE: RED LIGHT IS ON.

- 4.2.8 Load properly identified samples in series from the right side of the assembly starting from the bottom up.
- 4.2.9 Make certain stainless steel weights are in place on the slide assembly prior to operating.
- 4.2.10 Under routine counting conditions, the following systematic loading procedure should be adhered to. Routine counting time for all environmental samples will be 100 minutes.
- 4.2.11 The first 2 positions will be blank. There will be no corresponding number on the sample holder.
- 4.2.12 The third position will always be reserved for a source used for an instrument check. The sample holder will be marked "#1."
- 4.2.13 The fourth sample holder will be reserved for a background, and the holder will be marked "#2."
- 4.2.14 Sample holders marked "#3-#7" will be utilized for actual samples. (If 5 samples are not available to count, make the last counted sample in series a background.)

- 4.2.15 The sample holder marked "#8" will be reserved for a background if preceded by 5 sample analyses.
- 4.2.16 Always end a series of analysis with a background.
- 4.2.17 When powering the unit up, initialization is accomplished by typing Shift 1 Return on the Silent 700 or by switching the LB5100 from the initialize mode to the run mode.
- 4.2.18 For initialization, the following sequence is printed. Operator entries are underlined as an example.
- |    |  |   |
|----|--|---|
| a) | Initialize                                 | Completed as in Step 4.2.17.  |
| b) | Enter Time PS(XXXXX.XX MIN.)<br><u>100</u> | Requests time preset in hundredths of a minute. User enters a time preset of 1.0 minute (maximum 99999.99).                   |
| c) | Enter A PS(CNTS)<br><u>999999</u>          | Requests channel A preset in counts. User enters 999,999 (maximum allowed is 9,999,999).                                      |
| d) | Enter B PS(CNTS)<br><u>5678904</u>         | Requests channel B preset in counts. User enters 5,678,904 (maximum is 9,999,999).  |
| e) | Enter BKG A(XXXXX.XX CPM)<br><u>14</u>     | Requests counts per minute to be subtracted from channel A. User enters .14 CPM background subtract for 0 gives no subtract). |
| f) | Enter BKG B(XXXXX.XX CPM)<br><u>95</u>     | Requests counts per minute to be subtracted from channel A. User enters .95 CPM background subtract for channel B.            |

Operation of the Tennelec LB5100 Automatic  
Alpha/Beta Counter

PRP5-ZO-32  
Rev. 0  
Page 5 of 6

- g) Enter Ka(XXXX.XXX)  
550
- Requests denominator for next to last column (0 is default). User enters .550 (maximum size is 9999.999). (This entry is used as the counting efficiency - alpha.)
- h) Enter Kb(XXXX.XXX)  
550
- Requests denominator for last column (0 is default). User enters .550 (maximum is 9999.999). (This entry is used as the counting efficiency - beta.)
- 4.2.19 Carefully remove all samples, sources, or backgrounds from the slide assembly. .
- 4.2.20 Log all samples out of the counting area and into long or short term storage.
- 4.2.21 Transferring Data From the Silent 700 to the HP-9845
- 4.2.21.1 Turn the switch of the APT RS232 to the HP-9845 position.
- 4.2.21.2 Place the printer toggle into the "Hi" speed position.
- 4.2.21.3 The data will be transferred and analyzed using the program named "TENNEL" on the HP-9845.

5.0 Acceptance Criteria

- 5.1 Source and background counts must fall within control chart limits.

6.0 Documentation

- 6.1  $\alpha$  and  $\beta$  source checks will be documented in the Tennelec QC Log.
- 6.2 Instrument background check will be documented in the Tennelec QC Log.
- 6.3 Calibration/standardization documentation will be found in the Tennelec QC Log.

Operation of the Tennelec LB5100 Automatic  
Alpha/Beta Counter

PRP5-ZO-32  
Rev. 0  
Page 6 of 6

- 6.4 All records pertinent to operating of the Tennelec according to this procedure will be found in the Tennelec QC Log.

7.0 References

- 7.1 Tennelec Instruction Manual - Operating Instructions LB5100  
7.2 Tennelec Instructions Manual - LB5100 Low Background Counting System  
7.3 PRP5-ZI-32 (Calibration/Standardization of the Tennelec  
α/β Counters)  
7.4 PRP-10-ZL-22 (Quality Control of Radiological Services Laboratory  
Equipment)

8.0 Support Documents

None