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C-A OPERATIONS PROCEDURES MANUAL

12.49 TR-4 55 Degree Line Startup

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Hand Processed Changes

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Approved: _____ *Signature on File* _____
Collider-Accelerator Department Chairman Date

C. Carlson

12.49 TR-4 55 Degree Line Startup

1. Purpose

The purpose of this procedure is to define the sequence of activities required to start up the TR-4 55 degree beam line.

2. Responsibilities

It is the responsibility of the person or persons executing this procedure to observe all safety rules.

3. Prerequisites

The person or persons executing this procedure shall have all formal training required of a TVDG Operator.

4. Precautions

None

5. Procedure

Checklist (when indicated by “___” initial step upon completion)

- 5.1 Perform the steps outlined in [C-A-OPM 12.36 “Setup for Target Room Operation”](#).

Initial

- 5.2 ___ Verify that the Fast Valve controller is plugged in and powered ON.
- 5.3 ___ Verify that the 3 Ion Pumps are On and open to the beam line.
- 5.4 ___ Verify that the 2 Cryo Pumps are On, Cold and open to the beam line.
- 5.5 ___ Verify that the Chamber Cryo Pump is On and Cold.
- 5.6 ___ Verify that the appropriate PMT aperture mask is installed in the Diagnostic Chamber.
- 5.7 ___ Turn down all PMT power supplies to less than 500 on the dial and turn on each supply. Turn on the NIM Bin power if necessary.
- 5.8 ___ Verify that the Diagnostic Chamber is at vacuum and reset PMT HV interlock in SEFG rack if necessary.

- 5.9 ___ Set the Switcher to LEFT deflection and the switcher gaussmeter to NOR.
- 5.10 ___ Turn off the target room quads.
- 5.11 ___ Verify that the Radiation Monitor is connected, working and properly located.
- 5.12 ___ Remove the Beam Plug.
- 5.13 ___ Verify that the TR-4 computer and ancillary equipment is in working order.
- 5.14 ___ Connect and test the intercom.
- 5.15 ___ Verify that the Wall Faraday Cup goes in and out and, using a calibrated current source, verify that it reads correctly on the meter in rack 16.
- 5.16 ___ Verify that the SEFG cup is connected to the meter in the SEFG rack in TR-4 and that the TV camera produces a picture of this meter on the control room monitor above rack 17.
- 5.17 ___ Connect the steerer, sweeper power supply, control box, pickup coils and sweeper signal generator.
- 5.18 ___ Verify the integrity of the wall foils and insure that the correct wall foil is in place. Mark the foil position on the reference card at the Energy Detector box in the Accelerator Room and in the Control Room.
- 5.19 ___ Turn on the MCA, preamp power supply, HV detector bias supply, amplifier and reference pulser and verify that the calibrator signal can be seen on the MCA at the correct channel. Mark the reference card in the control room with the detector being used.
- 5.20 ___ Determine the status of the previously used beam line. If the previously used beam line is not to be used in the near future, shut down all unnecessary systems related to that beam line.
- 5.21 MCA/Beam Energy Monitor Setup - Turn-on and Calibration
 - 5.21.1 Turn the MCA ON (switch on rear panel) and allow several minutes for warmup.
 - 5.21.2 Turn Preamp Power Supply ON.

- 5.21.3 Turn NIM Bin in Rack 17 ON.
- 5.21.4 Turn HV Power Supply in NIM Bin ON. Set to about 120 VDC.
- 5.21.5 On the MCA front panel, press YES twice.
- 5.21.6 On the MCA front panel, insure that COLLECT is OFF (press if necessary to turn off) then press PRESET.
- 5.21.7 Enter 99999 on the KeyPad then press STORE then YES.
- 5.21.8 Compare the front panel settings of the 571 Amplifier with the settings listed on the reference card. Correct those settings to agree with those on the card if necessary.
- 5.21.9 Compare the front panel settings of the Reference Pulser with the settings listed on the reference card. Correct those settings to agree with those on the card if necessary.
- 5.21.10 Turn COLLECT ON if necessary by pressing the COLLECT button (COLLECT on when light in COLLECT button is on).
- 5.21.11 Turn Reference Pulser ON by setting Toggle Switch to 90 Hz.
- 5.21.12 Adjust 571 Amplifier Gain to bring signal in on channel 500.
- 5.21.13 Turn Reference Pulser OFF by setting Toggle Switch to OFF.

5.22 Operation

Note:

In order for the Energy Monitor to work properly, the correct Wall Foil must be in place when the beam energy is measured. The Tandem Program can recommend an appropriate wall foil if required. The actual thickness of the wall foil used should appear in the Wall Foil thickness box in the Tandem Program.

- 5.22.1 Set the MCA to COLLECT (COLLECT button light ON).
- 5.22.2 Insure that the beam whose energy is to be measured appears on the Wall Cup. More beam will produce more counts and thus speed the measurement. If low beam currents are being used, energy measurements may take several minutes.
- 5.22.3 Turn the Shutter Timer Knob located in Rack 17, to Minimum.

- 5.22.4 Press the Shutter Open Button.
- 5.22.5 Observe the MCA screen for indications of beam. If no beam is observed, and beam is on the Wall Cup, increase the Shutter Timer setting by turning the shutter Timer Knob clockwise and/or increase the beam current.
- 5.22.6 When beam is observed on the MCA screen, locate the Cursor at the approximate center of the beam signal using the SCAN control on the front panel of the MCA.
- 5.22.7 Read the Channel Number at the lower left corner of the screen.
- 5.22.8 Using the Tandem Program "MCA Channel/Energy" window, enter the Channel Number as read in step 5.22.7 above. Read the Beam Energy in the program window.
- 5.22.9 Compare the measured energy with the energy predicted by the computer. The measured energy should be within approximately 5% of the predicted energy.

6. Documentation

- 6.1 The “___” (lines) in the procedure are for place-keeping only. This procedure is not a record.

7. References

None

8. Attachments

None