

# KAON-LT Pre-beam Checklist

August 17, 2018

## Several days before beam:

1. Make sure WC gases are turned on, that there is a sufficient supply of WC gas bottles, and that there is plenty of alcohol in the bubbler. Contact Joe Beaufait if we need to order more gas.
2. Verify installation of small angle downstream beam pipe, and that it is at vacuum.
3. Check the water level on the beam dump diffuser.
4. Verify certification of HMS rotation to  $10.50^\circ$ . Limit switches set?
5. Verify certification of SHMS rotation to  $5.50^\circ$ . Limit switches set?
6. Procedures on who to call and when need to access hall when going to smallest angle for both spectrometers need to be clarified. Steve Lassiter?
7. Procedures on who to call for beam dump steering studies when SHMS is put at small angle need to be clarified with Program Deputy and Jay Benesch.
8. Verify that SHMS Dipole Polarity switch works.
9. Confirm that Simona has repaired misc. hodoscope channels.
10. Set HMS Gas Cerenkov pressure to less than 0.5 atm (if window has been replaced). Otherwise, it should be filled with 1.0 CO<sub>2</sub>.
11. Set SHMS Heavy Gas Cerenkov pressure to 1.0 atm.
12. Confirm aerogel index of refraction in SHMS Aerogel Cerenkov -  $n=1.011$ .
13. Complete all arrangements for exchange of SHMS Aerogel trays during experiments, i.e. extra trays stored safely in hall, all required tools available and in safe place, etc.
14. Check that the air conditioning in the HMS and SHMS detector huts are working and that the white plastic barrel on the beamline side of the HMS carriage (containing air conditioning drain water) is emptied.
15. Verify that HMS and SHMS are under good vacuum.
16. Confirm receipt of target configuration note from D. Meekins for 8 cm LH2 target,  $\pm 4$  cm thick ( $\sim 250$  mg/cm<sup>2</sup>) aluminum dummy targets, and  $z = 0$  carbon ( $\sim 170$  mg/cm<sup>2</sup>) target.
17. Verify LH2 target is cooled down, fan on in standby mode and target controls switched upstairs.
18. Verify that the pivot handrails have been removed.
19. Verify that TV cameras for cryotarget and spectrometer angles are working.
20. Check that the BCM temperature is regulating to  $110^\circ$  F. (?)

21. Both BCMs should be set for 10-80  $\mu\text{A}$ . (??)
22. DJM needs to calibrate the Unser monitor. (??)
23. Confirm with Brad Sawatzky that wiring for HMS ELREAL trigger in coin daq has been set up.
24. Take a cosmic run and look for problems.
25. Replay software set up and ready to go, both  $K^+$  and Heep versions – Richard.
26. Prepare and install scripts needed for checkout and replay, such as:
  - (a) Set gates on FADC reference time.
  - (b) Set FADC gates on detectors. Then run it to verify FADC gates on hodoscopes.
  - (c) Set FADC/TDC timing windows (typically 10-100 ns), to formulate what are considered ‘good’ hits in hall.c replay.
  - (d) Online monitor of FADC pedestals. Then do a golden run with cosmics, for comparison when beam is running.
  - (e) Coincidence trigger checkout.
27. Find most recent calibration constants for: calorimeters, hodoscope beta, drift chambers, SHMS aerogel, gas Čerenkovs.
28. Confirm SHMS gate and HMS+SHMS coincidence window widths, FADC thresholds.
29. Check list of must-have scaler channels, to ensure any detector-level rates you may want for ‘offline’ modelling of deadtimes are in the data stream.

**Last shift before beam:**

1. All spectrometer magnets on to correct polarity and cycled to initial values. Spectrometers also at initial angles.
2. Check that no new obstructions have appeared since the spectrometer angles were certified. For example, ladders, RadCon survey ropes, etc.
3. Double-check HMS Gas Cerenkov pressure.
4. Double-check SHMS Heavy Gas Cerenkov pressure.
5. Verify there are no obstructions between the detectors (ie, no WC covers, no dangling cables, etc.) on both spectrometers.
6. Verify there are no unusual obstructions between the scattering chamber and the spectrometer front windows. Make sure any protective windows on the scattering chamber have been removed.
7. Verify that the HMS and SHMS focal plane shutters are open.
8. Lock up the hall.
9. Clean up the counting house. Make sure all computers, consoles, and printers are alive and well.
10. Take a cosmic run and look for problems.