1 Target Boiling Test Runplan

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At the completion of the tests ensure that the data has been logged and all relevant information is written in the Halog. Close the target JT slowly to the necessary level to complete the next test/run plan.

Total time estimate: 8 hours

1.1 Pre-Test Plan Checks

- Ensure that the sieve slit has been removed from the front of the HRS (both left and right arms).
- Ensure that the spectrometers and DAQ are working and setup for electrons.
- With beam energy of 8.8 GeV we will have to perform the tests in the deep inelastic kinematics.
- Ensure that a target position scan has been performed and that the target ladder position is correct.
- Perform a BCM calibration using the standard procedure.
- While the BCMs are calibrated, the target JT may be opened to give a coolant flow of 25 g/s. Allow the heater and PID loop to adjust to the new refrigerant load.
- Ensure that a raster calibration had been performed.
- Check the beam size on spot++.
- Set the raster for 2×2 mm^2.
- Double check raster size on hole target.
- Use both spectrometers for all settings.
- Ensure that at least 30 μA of stable beam is available.
- Ensure DAQ deadtime $< 2\%$. Adjust prescale factors as necessary to achieve the desired deadtime.

1.2 Spectrometer Settings

In the table, the spectrometer angle and momentum settings are listed. If you are increasing the momentum of the spectrometer, make sure that the cycling procedure has been followed for the Q2 and Q3 magnets.

Spectrometer	Angle [degrees]	Momentum [GeV/c]
Left HRS	43.0	0.85
Right HRS	48.75	0.85

1.3 Carbon Target Current Scan

The carbon target does not boil so we should see no change in normalized rate on the carbon target. Using both left and right spectrometers, take 12K electron events (LHRS statistics) or 1.5-hour runs at each current setting, whichever is shorter. The current settings are: 10, 25, 45, and 60 μA.

- Time estimate: **3 hours**.
- Perform online analysis to ensure good quality data.
- 60 μA may not be possible depending on beam stability.
- Ensure raster size is 2×2 mm^2.
- Deadtime $< 2\%$.
- A GMp expert will determine when enough statistics have been accumulated.

1.4 Aluminum Dummy

Background from the aluminum windows will be present in the data. We will need at least one good run with the 15-cm aluminum dummy target. Take a run with 25k electron events or 30 minutes (whichever is longer) on the aluminum dummy target. The beam current should be 40 μA. The raster should be 2×2 mm^2. The dead time should be prescaled to $<$ 2%. Time estimate: **0.5 hours**.

1.5 LH2 current scan

Ensure that the Prechecks have been performed prior to starting these procedures.

In all cases, ensure that the computer dead time is less than 2% by properly setting the prescales. Ensure that the loop 3 fan is at 60 Hz. Ensure that the raster is 2×2 mm^2. Take the following data in the left and right arms with no run being less than 5 minutes or longer than 1 hour. A GMp expert will determine when enough statistics have been accumulated. Go as high in current as is reasonably possible given beam conditions. At each current setting, ensure that the target heater PID and temperature are stable and appropriate headroom on the heater power is available. If 60 μA is not available, then the runs with fan frequency at 30 Hz and 45 Hz should be performed at the highest beam current that MCC can deliver. Time estimate: **2.5 hours**.

- 21K events at 10 μA (40 minutes)
- 21K events at 20 μA (20 minutes)
- 21K events at 30 μA (15 minutes)
- 21K events at 40 μA (10 minutes)
- 21K events at 50 μA (8 minutes)
- 21K events at 60 μA (7 minutes)
- 21K events at 60 μA, 30 Hz Fan speed, raster: 2×2 mm^2 (7 minutes)
- 21K events at 60 μA, 45 Hz Fan speed, raster: 2×2 mm^2 (7 minutes)