

MOLLER Spectrometer Test Lab work update

10/28/2024

Space increased again

- CDET moved out
- DOE Tour Friday ~noon, they remarked on nice progress
- Shower Max Counter assembled
 - Procedure developed
 - ePAS written and approved



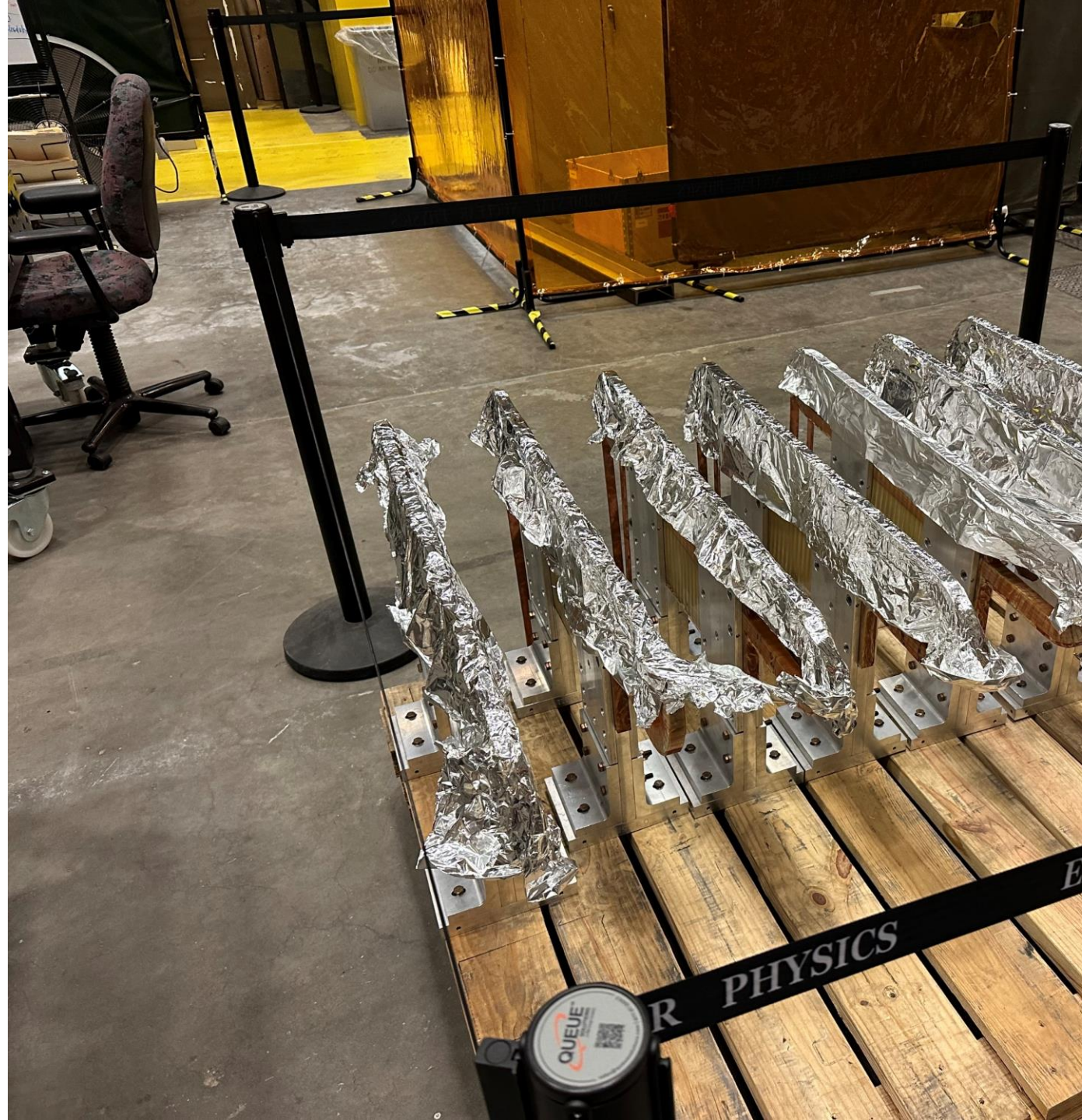
New Power Source

- Big Bertha secured (thanks to Hall D)
- Provides
 - 120V
 - 208V 3phase
 - 480V 3phase



SC1 Coils

- Fully clamped and sanded
- 7 of 7 High potted w/o Belly plates



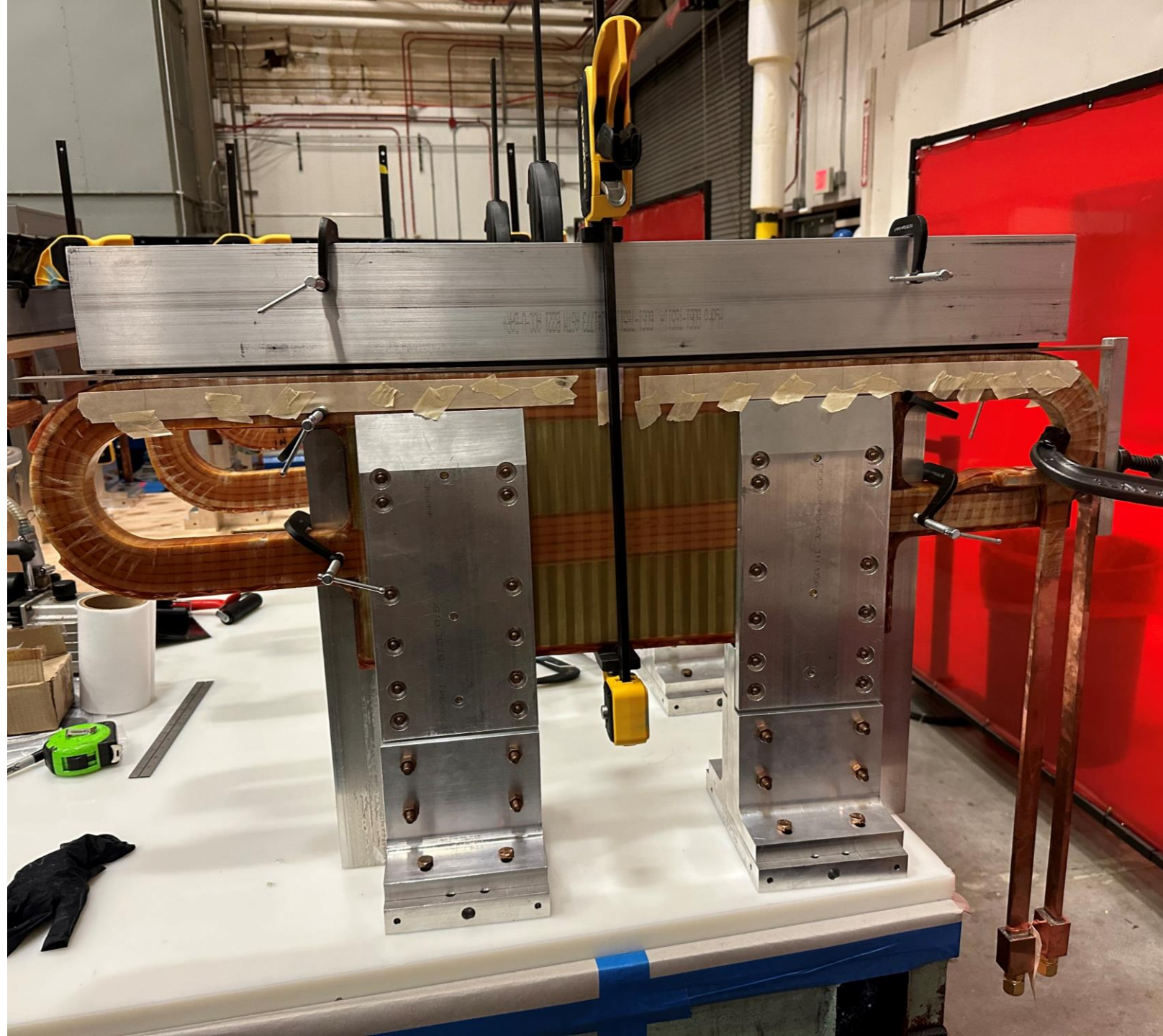
SC2 Coils Fully clamped

- Fully clamped and sanded
- Belly plates positioned with spacer wires
- 2 of 7 hi-potted



SC2 coil zoom

- Ready to Hi-pot and then epoxy on BP and TB
- Note
 - Z stop
 - Tape holding wires
 - Foam putting even pressure on BP
 - Tooling Balls not installed here.



Hi-Pot Data

- All up to 1500V (not logged in logbook)
- At 500V peak leakage current 0.3micro amp
- Beyond 500V the leakage current dropped off (possibly due to coil drying out?)

MOELLER COILS: HI-POT TEST
 10/24/2024 MCD 85
 WIRE V71 NDC HI-POT SAFETY TEST: MOELLER COILS SEQUENCE 1
 SET-01: BASE 1 = SUPPORT BASE CLOSEST TO COIL LEADS
 BASE 2 = SUPPORT BASE FURTHER TO COIL LEADS
 BELLY 1 = BELLY CLOSEST TO TEST LEADS
 BELLY 2 = BELLY FARTHEST AWAY FROM TEST LEADS
 TL1 = TEST OUTER TEST LEAD
 TL2 = INNER TEST LEAD
 1ST STEP IN SEQUENCE = 25V
 ONLY VOLTAGE W/ LEAKAGE CURRENT NOTED

SC1-02: CONTINUITY: TL1-TL2 = 0.1 Ω
 TL1-BASE1 = 0.1
 TL1-BASE2 = 0.1
 TL1-BASE1 500V = 0.1 μ A
 TL1-BASE2

SC1-03: CONTINUITY: TL1-TL2 = 0.3 Ω
 TL1-BASE1 = 0.1
 TL1-BASE2 = 0.1
 w/ FOIL COVER ON: 51.0 μ A BEFORE 25V TEST FAILED; REMOVED FOIL COVER + REPEATED
 TL1-BASE1: 500V = 0.1 μ A
 TL1-BASE2: 500V = 0.1 μ A
 ALL BASES: 500V = 0.1 μ A

SC1-04: CONTINUITY: TL1-TL2 = 0.3 Ω
 TL1-BASE1 = 0.1
 TL1-BASE2 = 0.1
 THEN BASE1-BASE2 CONNECTED FOR HI-POT \sim 0.3 Ω ; FOIL REMOVED
 TL1-BASE 1/2: 500V = 0.2 μ A

SC1-05: CONTINUITY: TL1-TL2 = 0.2 Ω
 TL1-BASE1 = 0.1
 TL1-BASE2 = 0.1
 THEN BASE1-BASE2 CONNECTED FOR HI-POT \sim 0.2 Ω ; FOIL REMOVED
 TL1-BASE 1/2: 500V = 0.2 μ A

SC1-06: CONTINUITY: TL1-TL2 = 0.7 Ω
 TL1-BASE1 = 0.1
 TL1-BASE2 = 0.1
 BASE1+BASE2 CONNECTED FOR HI-POT \sim 0.8 Ω ; FOIL REMOVED
 TL1-BASE 1/2: 500V = 0.1 μ A

MOELLER COIL HI-POT CONT.
 10/24/2024 MCD 85

SC1-09: CONTINUITY: TL1-TL2 = 0.6 Ω
 TL1-BASE1 = 0.1
 TL2-BASE2 = 0.1
 TL1-TL2 = 0.4 Ω ; FOIL REMOVED
 CONNECTED BASE1-BASE2 = 0.4 Ω
 TL1-BASE 1/2: 500V = 0.1 μ A

SC1-10: CONTINUITY: TL1-TL2 = 0.5 Ω
 TL1-BASE1 = 0.1
 TL2-BASE2 = 0.1
 CONNECTED BASE1-BASE2 = 0.4 Ω ; FOIL REMOVED
 TL1-BASE 1/2: 25V = 0.1 μ A
 50V = 0.1 μ A
 100V = 0.1 μ A
 250V = 0.1 μ A
 500V = 0.2 μ A

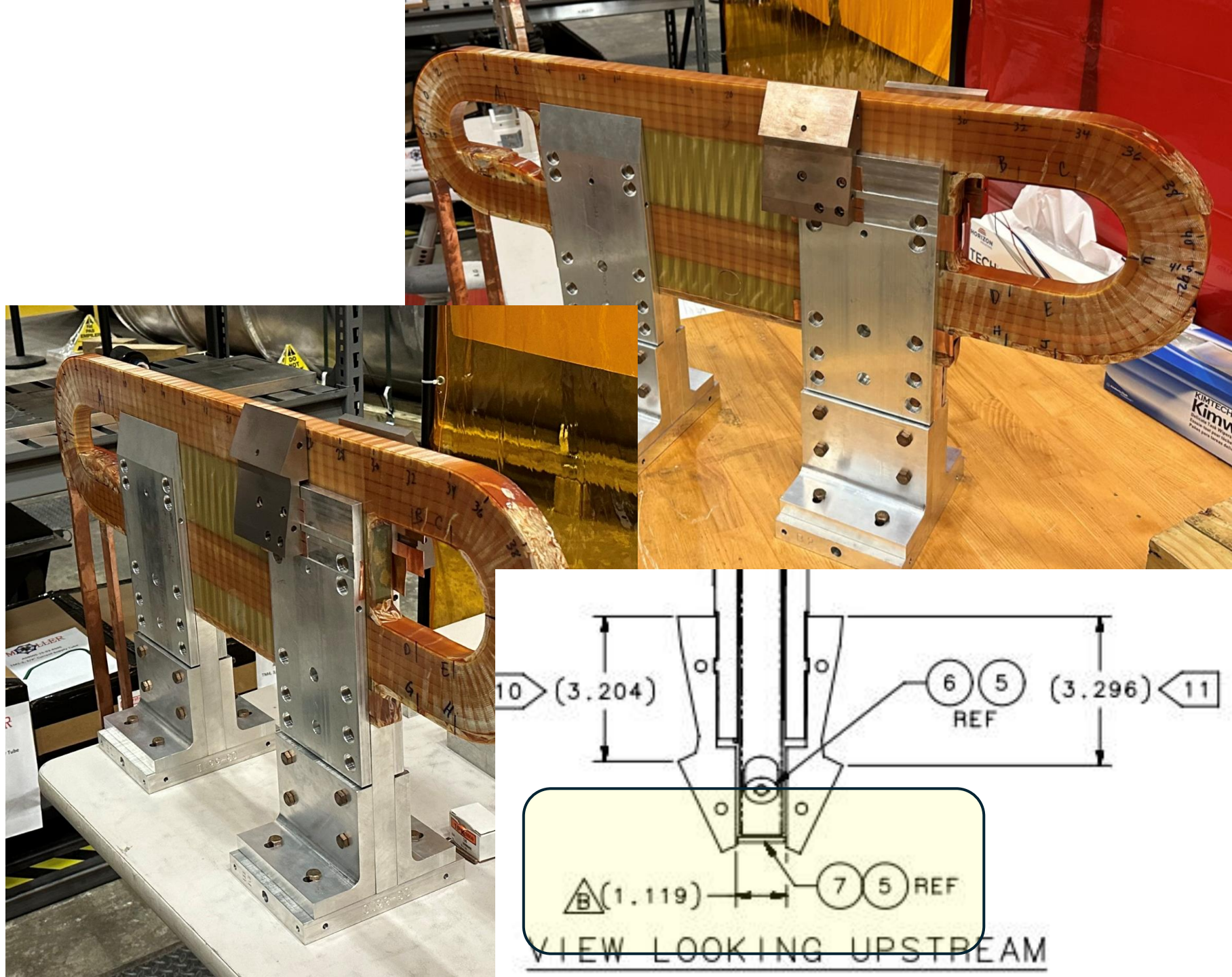
SC2-01: CONTINUITY:
 CHANGED MAX CURRENT FROM 50 μ A TO 5 μ A PER PG.

SC2-02: CONTINUITY: TL1-TL2 = 0.2 Ω ; TL1-BELLY1 = 0.1
 TL1-BASE1 = 0.1; TL2-BELLY2 = 0.1
 TL1-BASE2 = 0.1
 CONNECTED-BASE1+BASE2 = 0.3 Ω
 TL1-BASE1: ϕ LEAKAGE CURRENT @ ALL VOLTAGES
 TL1-BELLY1: ϕ LEAKAGE CURRENT @ ALL VOLTAGES
 TL1-BELLY2:

SC2-03: CONTINUITY: TL1-TL2 = 0.4 Ω
 TL1-BASE1 = 0.1
 TL1-BASE2 = 0.1
 TL1-BELLY1 = 0.1
 TL1-BELLY2 = 0.1
 CONNECTED BASE1-BASE2 = 0.3 Ω
 TL1-BASE1: ϕ LEAKAGE CURRENT @ ALL VOLTAGE
 TL1-BELLY1: ϕ LEAKAGE CURRENT @ ALL VOLTAGE
 TL1-BELLY2: 250V = 0.1 μ A

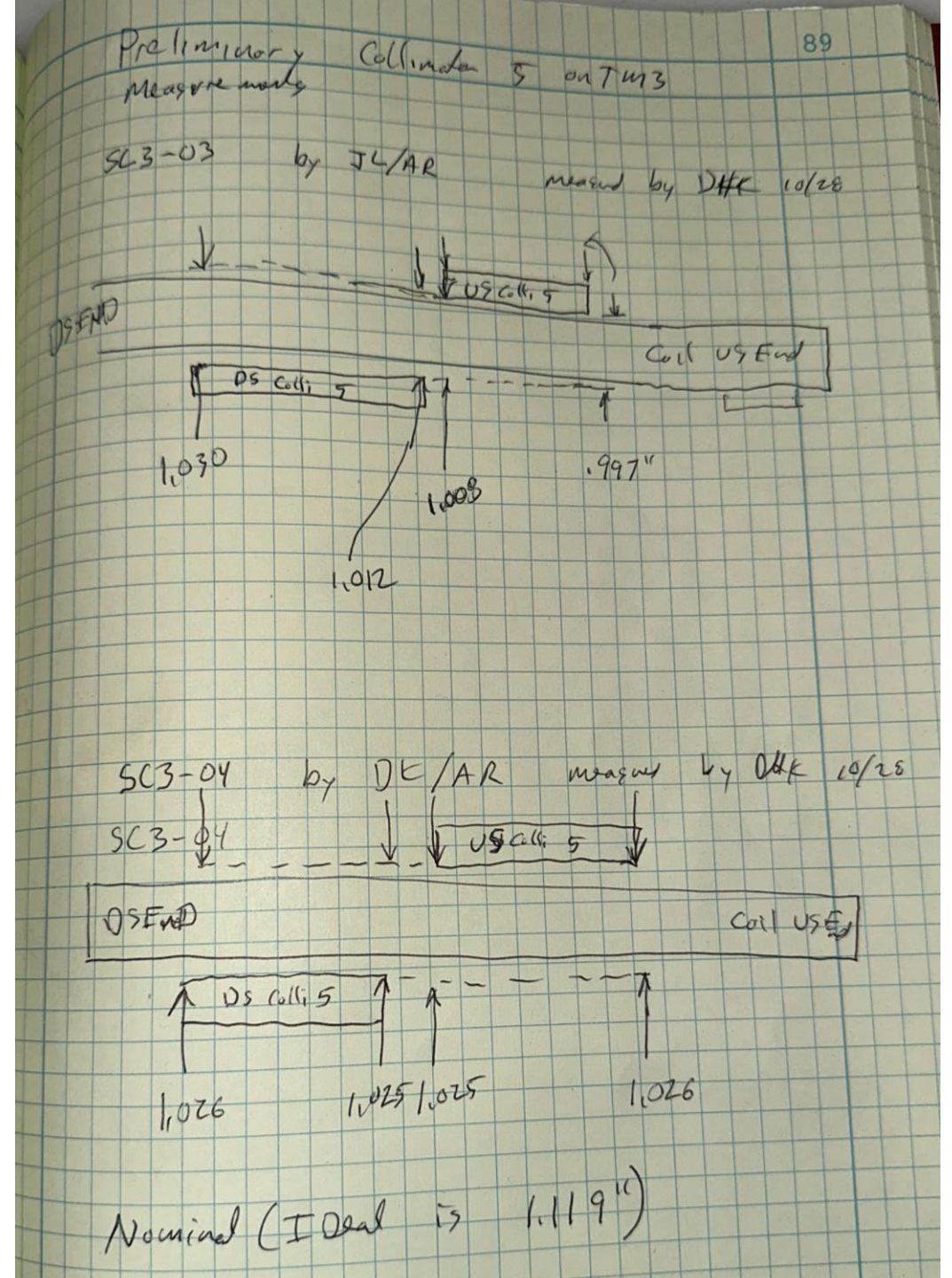
TM3 coils

- Coils not yet pinned or clamped
- These require epoxy for cooling the collimators
- We Dry fit two coils to understand the process and accuracy
 - One with Collimator spacing 0.998" to 1.030" (needs review)
 - One with Collimator spacing 1.125 to 1.126" (pretty good)
 - Nominal is 1.119"
 - Shim sizes used at collimator were 0.010" and 0.021"
 - Shim size 0.016" is available ~200\$



Measurements in detail on TM3 coils

- We need to know the accuracy in width and precision in yaw for the Collimator 5's.
 - My thought is we can easily get to $\pm .010''$ (0.25mm) but with the uncertainty of coil conductor placement, slight bow in coils, and actual coil positioning accuracy we might want to do better, and $\pm 0.006''$ should be possible. So if it is agreed we should order the 0.016'' foil too.



Water Header

- Setting up
- Purpose is to remove flux prior to leak testing
- Requires 208V 3phase



Water headers

- Inlets and outlets of coils connected.
- Working to get mains connected to flushing system



DOE Tour - Friday November 25, 2024

- Toured Hall A (DK presented MOLLER)
- Toured the TL MOLLER area (DK Presented current progress and hardware including the 3d model)
- Tour included
 - Jlab Folks
 - Lab director
 - COO
 - AD for Physics and Facilities
 - Others
 - DOE folks
- They were impressed with our progress