Safety Review of TOF Test Area

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BNL

Outline:
• Review of Run-7 Test Area
• Only changes w.r.t. Run-7:
  -- Number of trays
  -- Unistrut structure
• Unistrut structure, and rated load limits
• Near-term goals
• General testing plan

all supplies, cabling, and electronics already reviewed
no changes since Run-7
Run-7 Test Area

South side of WAH
5 trays on two large tables, plus 3rd table for scope, computer, THUB, etc.... trays un-covered

Gas from TOFgas system, tap in w/ polyflow, route under STAR to test area...
HV from TOFhv system, two cables from supply to HVdistbox, then short cables to tray...
  HV control and monitoring from GUI on tofcontrol machine...
LV from TOFlv system, one cable from supply to test area...

LV power only to one tray at a time
  LV left on only long enough to collect noise rates (~1hr), then turned off
no water cooling
Replace three large tables with one unistrut structure....

eight levels, max 4 trays per level
1 5/8” steel unistrut, 1/2”-13 bolts
max 32 trays, each 75 lbs, so maximum 2400 lbs of trays on structure
top row may be out of reach - probably not used

Structure to be hard-tied to the south platform (STSG guidance)
Structure to be ground-strapped to south platform ground (STSG guidance)
Each level has 3 beams and 4 trays → 300 lbs/row
actual load = 100 lbs per beam
span is 40”

w/ safety factor = 2.5, max rated load ~ 1000 lbs

Vertical distance between levels is 10”
300 lbs and 6 columns → 50 lbs/column/row

w/ safety factor = 2.5, max load is 3450 lbs for a 24” unbraced height.
Initial Goals

**mechanical**
- reassemble test-stand, and mechanically attach to edge of south platform
- install trays on test stand
- all trays are tested covered this time (different from run-7 test area setup)

**gas distribution**
- same as Run-7, except now have TOFgas system fan-out panels on North Platform
tap 5-6 lines out and 5-6 lines return from gas distribution panels in 2nd floor North
deploy polyflow running underneath STAR
- 5-6 trays per supply&return loop.

**HV**
- New cables arriving monday (final & same as run-7)
- Supply now on first floor of south platform (final & same supply as run-7)
- 3 HV distboxes at test area (final & same as run-7)
  - each provides HV to 8 trays

**Grounding**
- green wire everywhere
  - from grounding post on each tray to south platform (loop as for CTB)
  - from each HV distbox to south platform
  - from test stand unistrut to south platform

Next Goals

**LV**
- use final cabling and supply (now in rack row 1B South)
- one cable for entire test stand
  - only one tray at a time is LV-powered
Overview of Installation and Testing Schedule

June 29
30 TOF trays arrive at BNL
Llope, Biritz, Kajimoto, Ruan are initial work crew. Eppley also onsite periodically. Llope/Eppley are STSG liaison.

Week of June 30
- Re-assemble test stand, mechanical attachment to South platform
- Unpack trays from truck and boxes
- Load trays A, B, 6, TOFr5 (& some CTB if possible) into truck + empty boxes, truck returns to Texas.
- Make gas system connections
- Make hv connections
- Install all grounding straps
  - Get approval for gas flow (freon-only) and HV power up
- Trays sit for several days just flowing gas. Monitoring is automatic at tofgas station in mixing room

Other goals:
- Discuss ideas re: installation fixture with Scheblein, Christie, etc
- Finalize locations for HV distboxes on endrings, finalize West locations first
- Discuss/review the plan and budget for the final water cooling system
- Discuss/review the plan and budget for the TPC support fixture

Week of July 7
- Power up HV, carefully collect & study current flow data over several days
- Make LV connection to supply (if necessary), route cable to test area under STAR
- Make canbus & data connections to THUB and laptop/tofcontrol
  - Get approval for LV power up

  LV power to one tray at a time
  - Collect noise rates, search for dead channels, data corruption, etc

Early August
- Begin installation of first batch of trays in positions 19-50 West, skipping positions behind TPC support arms
- Install THUB at 8 o’clock west
- Remove (Run-7) trays in positions 76-80 (some electronics need to be replaced)

Mid September
- Next batch of 30 trays arrives
- Repeat same test suite in test stand at south side of WAH (2 weeks)
- Complete West ring of TOF trays (requires TPC support fixture)
- Install THUB at 2 o’clock West

Depending on RHIC schedule, then move on to the East ring