

# CDC Scrutineer Talk

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# Scrutineer?

## **scrutineer**

n. a scrutinizer; specifically, an examiner of votes, as at an election.

## **scrutinizer**

n : a careful examiner; someone who inspects with great care

# Strategy

- Assume role of a skeptical reviewer
- Present list of questions/concerns not covered in Design Report and in DocDB
- Please add to my list!

## But first...

- I find the project in good shape
- Confidence in CMU to solve remaining problems
- Only concern is effectiveness of  $dE/dx$  in magnetic field, with real preamps, etc.

# Skeptical Reviewer's Concerns

- Conceptual
- Performance
- Mechanical
- Services (gas, electrical, hv, etc.)
- Onboard electronics
- Reconstruction and Analysis

# Conceptual

- No VTX implies need for re-optimization of STC/CDC/FDC geometry
- New Cerenkov implies reevaluation of  $dE/dx$  requirements
- Is prototype plan adequate...need more?  
In B field?
- Why not resistive wires?
- If  $dE/dx$  not needed skip ADCs? Or drift?

# Performance

- Look at other gases? CO<sub>2</sub> - long pulse, pile-up?
- Understand aging better
- Understand Lorentz angle effects better
- Effect of breakdown, broken wire?
- Verify  $dE/dx$  works in B field
- Gain variations vs  $V$ , wire sag, gas purity, etc.
- Cross talk – straws, preamps, via HV, etc.
- Rate effects –  $V$  sag, preamps, x-talk, heat, signal pile-up, etc.

# Mechanical

- Verification of matl's, glue, techniques
- Glue lifetime – radiation damage, etc.
- Failure mode analysis
- How to repair? Time? Replace wire?
- Survey, align requirements? Plan?
- Supports, stability, deflections, vibration?
- QC (clean,glue,crimp,tension) – students?
- Al vs Cu vs Au? mylar vs kapton?
- Metal coating thickness, skin depth?
- Are compound angle problems under control?
- Interfaces, keep out zones, installation plan?



# Services

- Gas distrib, uniform flow, purity, cleaning?
- Room for cables, services? Mass?
- HV dist, granularity, currents, cable type?
- Discharges - HV cap, resistor size calc?
- Power, heat, noise, shielding, grounding?
- Is temperature rise a problem? Gas flow rate?

# Onboard Electronics

- Preamp design?
- Preamp mounting, power, heat, x-talk?
- Cable type, quality, thickness, max length?
- Signal shape variations? Shaping?

# Reconstruction and Analysis

- Calib plan – special runs? Survey reqs?
- Pat rec – spiraling tracks, bad straws, showers, event pileup, x-talk, ambiguities,
- Track fitting – mult. scatt,  $dE/dx$ , Kalman filter?
- What if no tagger info?

# Conclusions

- CDC project in good shape
  - Some open questions
  - Some tests still needed
- CMU headed in the right direction
  - Seem to have enough time, people, \$\$?
- “Reviewer’s” questions should be satisfied by adequate documentation of past work, and planned future work