Outline

- PASS/FAIL tests from SVAC
  - Changing definitions
- E2E Trigger rate tests
  - Some implementation details

E2E tests – Trigger & Data Flow

- What are they ?
  - 1 out 4 recommended tests by the End-to-end Test committee
    - They take the longest time as far as data taking is concerned (~ 1 week)
  - Tests using cosmic rays (focus on that for today's talk)
    - The key is to create a baseline run used for reference to compare distributions
    - Comparisons to be made from runs with different instrument conditions
- When are the they done?
  - When 2 and 16 towers and the LAT are in the grid
    - Get as much experience as we can with EM2 and 1 tower
- Pass/Fail Criteria (TBR – see next slides)
  - Conditional Pass (integration continues if passes the following criteria)
    - Trigger and Data Flow system does not hang
    - No transport errors
    - Data is analyzable (Quick look – automated reports)
  - Final "Pass/Fail" Criteria (Detailed analysis)
    - Muon distributions should not change when comparing data with and without high rate triggers
      - » Need to choose which distributions to look and which cuts to use
      - » Not straightforward because it involves SAS reconstruction

PASS/FAIL criteria revisited

- After discussions with Steve, Bill and Pat we realized that semantics can kill us …
  - Pass/Fail has a well defined meaning for aerospace
    - we should minimize confusion by NOT using it for SVAC activities
  - For the E2E tests in this talk the real pass/fail criteria should be
    - No hangs
    - No transport errors
    - Data is analyzable
  - Data analyzability means
    - Instrument is working OK
      - Will most likely be already addressed by the online through the I&T scripts
        - » Who is defining the distributions that we will be plotting?
        - » Can we have a presentation in this meeting and in the VRVS analyses meeting?
      - SVAC will provide a cross check offline using automated reports
  - Cosmic ray data will be reconstructed using SAS software
    - This is part of the detailed analysis effort
    - turnaround time is 2 weeks (TBR as we get more experience)
    - Automated Reports at the end of each run will be produced at the RECON level (as an added bonus) but will NOT used to determine pass or fail

E2E Trigger Rate test

- What is it?
  - A test that overlays a Poisson distribution of external triggers at different rates on the top of the regular LAT triggers
- When do we need to implement?
  - EM2 (Aug 20)
    - Need TKR & CAL & ACD if possible
    - Need to evaluate if criteria for hanging and transport errors should be more loose to allow "graceful recoveries"
    - Test phase debugging hardware and test
    - Debugging phase for SAS software and implementation of quick look reports
  - First tower (Sep 12)
    - First real test with hardware and SAS software
    - Use it as a learning curve
    - Evaluate quick look report
    - Evaluate turnaround time for final pass/fail criteria (1 or 2 weeks)
  - Two towers (Sep 12)
    - This is when we do the real test for the first time

One of the tests - E2E Trigger rate test

- When do we need to implement?
  - EM2 (Aug 20)
    - Need TKR & CAL & ACD if possible
    - Need to evaluate if criteria for hanging and transport errors should be more loose to allow “graceful recoveries”
    - Test phase debugging hardware and test
    - Debugging phase for SAS software and implementation of quick look reports
  - First tower (Sep 21)
    - First real test with hardware and SAS software
    - Use it as a learning curve
    - Evaluate quick look report
    - Evaluate turnaround time for final pass/fail criteria (~ 2 weeks)
  - Two towers (Oct 12)
    - This is when we do the real test for the first time

Infrastructure for Trigger rate test

- Need a pattern generator for trigger rates
  - JJ and Mike suggested that we get a hardware generator
    - Software may have glitches and needs time to implement and test
    - Hardware provides more flexibility in the testing program (i.e. turn a knob and get different rate)
- Implementation Tasks
  - Research to get the right generator (led by Gary in coordination with JJ and Mike?)
    - Needs to happen ASAP if we want to make it for the EM2, especially if there is lead time in getting the hardware and testing it
    - Need ~ 3K from I&T Particle Tests budget
    - May have TTL output which needs to be changed to LVDS, so some work may be needed
  - Implement interface to GASU
    - Mike is working on it and believes will be available for EM2 (Aug 20 time frame)
    - May require one day of work at most one day from Online to get the functionality implemented (seems straightforward, but Ric is the one who has a say on it…)
  - How to record the configuration?
    - Need to capture which rate we dialed in and make this propagate into the electronic log book for the data runs
    - This is usually done by parsing XML files from online into ORACLE database
      - » If it is not in the online output we can not see it !
    - Not sure how to solve this one…
  - Who coordinates this implementation to ensure all pieces are there for EM2?