The LST High Voltage System

LST Readiness Review

May 5, 2004

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This presentation will cover

- High Voltage Power Supply
- High Voltage Cable
- HV Connector
- HV Box (tube end)
- HV Board (HV capacitor, wire signals)
LST High Voltage Power Supplies

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High Voltage Power Supplies

4 HV channels
80 Current Monitor Channels
320 Outputs (80 LST tubes)

CANbus Interface
Ethernet Interface

External Signals & Interlocks

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Requirements

• 3 HV supplies per sextants
  - 6 for 2004
  - 18 total (+ spares)

• “Hospital” to re-condition bad LST tubes
<table>
<thead>
<tr>
<th>Component</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanics</td>
<td>25 units ready</td>
</tr>
<tr>
<td>Digital Board</td>
<td>25 units ready</td>
</tr>
<tr>
<td>HV Mother board</td>
<td>20 units ready, 30 assembled</td>
</tr>
<tr>
<td>Current monitor</td>
<td>800 units ready, 1200 assembled</td>
</tr>
<tr>
<td>Backpanel</td>
<td>23 units assembled</td>
</tr>
<tr>
<td>Complete HV</td>
<td></td>
</tr>
<tr>
<td>Power Supplies</td>
<td>7</td>
</tr>
</tbody>
</table>
System Architecture (BaBar)

Re-use RPC CAEN 127 System
- 1 A328 (10 KV, 2 mA, dual channel) pod per OSU HVPS
- RPC uses 3 A328 modules per sextant
- We will use 3 OSU HVPS per sextant
- Interlock allows HVPS box to disable corresponding A328 module

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High Voltage Cable

• Purchased multi-wire HV cable from Kerpen
• First shipment (2 sextants) at Colorado State (CSU)
• 2nd Shipment arrived in Oakland
• Cable assembly at CSU
  – Banana plugs on power supply end (available)
  – In-line HV connector (prototype)
  – HV PC board (available)
HV Connector (Dave Warner at CSU)

- Injection Mold designed, samples available
- Passed electric safety committee
- Final mold complete

- ~10 cable assemblies by mid-may
- Cable production will follow module arrival schedule
  - ½ sextant June 1st
  - ½ sextant mid-June
  - 1 sextant July 1st
HV Box

- Injection mold designed and parts ordered
- Expected to arrive at Ohio State May 5
- Will go to CSU for conformal coating/potting
HV PC Board

- HV Capacitors in hand
- 1500 PC boards in hand
- 400 PC boards assembled
- 100 PC boards tested
- automatic test setup ready
- will go to CSU for potting and final assembly
HV Software

- **Complete HV application implemented**
  - server for built in microcontroller
  - Qt and Ethernet/TCPI P based User Interface
  - Built in support for QC operation
    - database
    - LST tube conditioning
    - long term test

- **CANbus interface tested**
  - works with BaBar IOC
  - sufficient bandwidth (50ms to readout one HV supply)

- **To do:**
  - replace tcpip interface in server with CANbus
  - EPICS panels, User Interface
HV Win Screen Shots
Summary

- All components of the High Voltage system are in production
- All components will be tested in CEH as part of the ongoing QC effort
- Ready for installation in August