DSG Contributions to NPS Status

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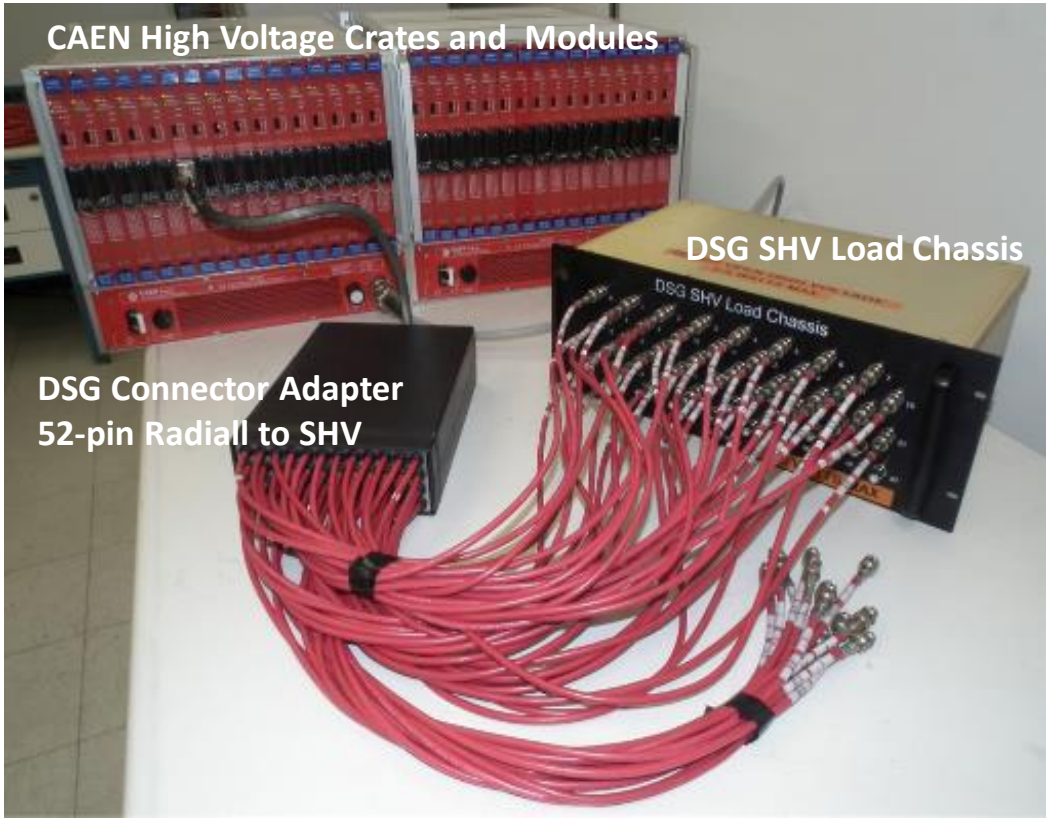
DSG Contributors

- Testing & Analysis
  - Aaron Brown, Pablo Campero, George Jacobs, Marc McMullen
- Fabrication
  - Mindy Leffel
- EPICS Controls & Monitoring System
  - Mary Ann Antonioli, Aaron Brown, Brian Eng, Tyler Lemon
- Environment Monitoring & Interlock System
  - Peter Bonneau, Tyler Lemon

Testing & Analysis

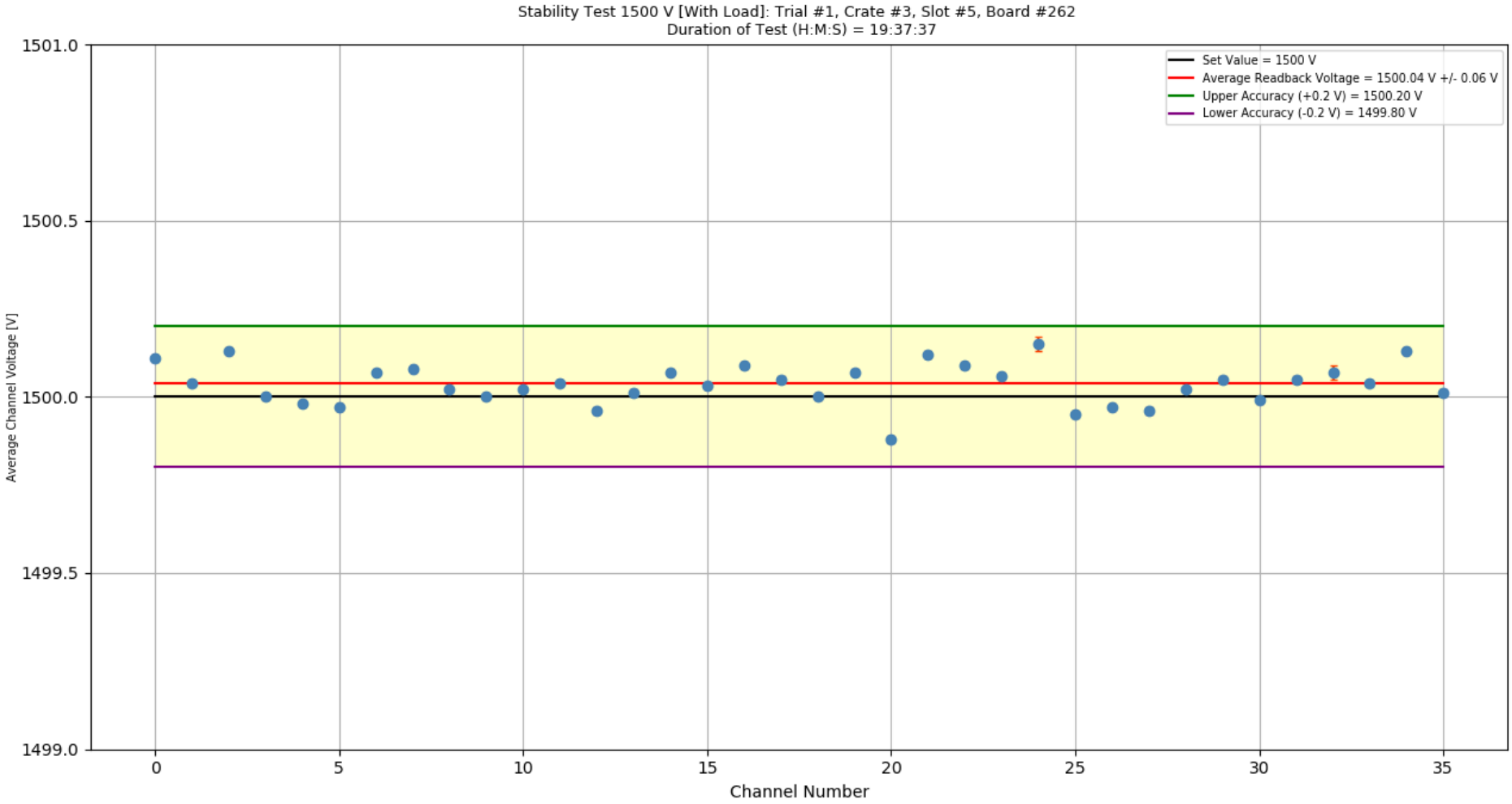
- Testing 34 (A7030TN) CAEN HV modules and two SY4527 crates
  - Using GECO 2020
    - All modules tested
    - Three defective modules
  - Using EPICS server (in progress)
    - 18 of 34 modules tested
- Stability test details
  - Applied voltage: 1500 V
  - Resistive load: 2 MΩ
  - Duration: 24 hours



Test stand

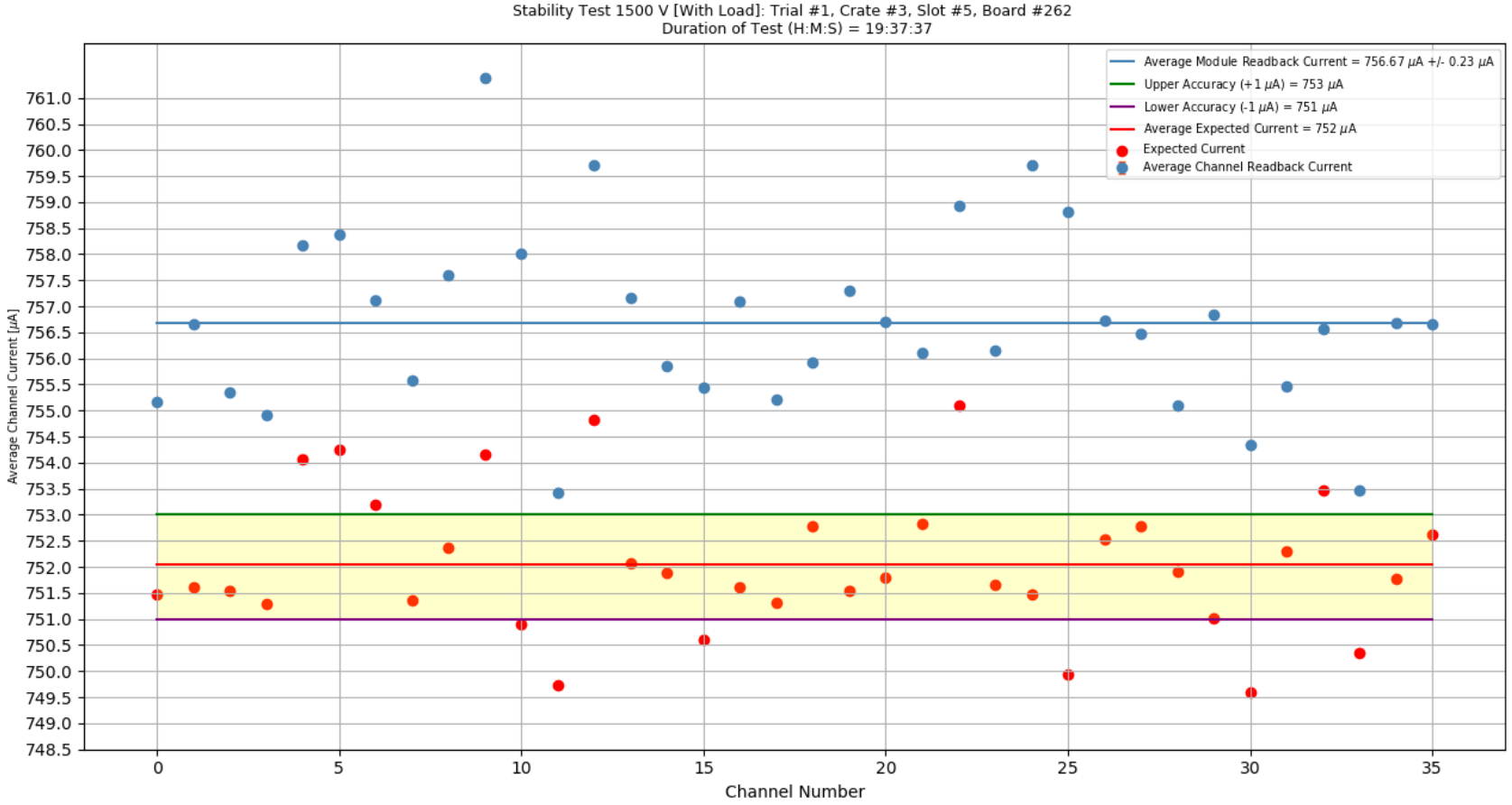
Testing & Analysis (cont'd)

- Average readback voltage of each channel of module #262
  - All channels within manufacturer's specifications

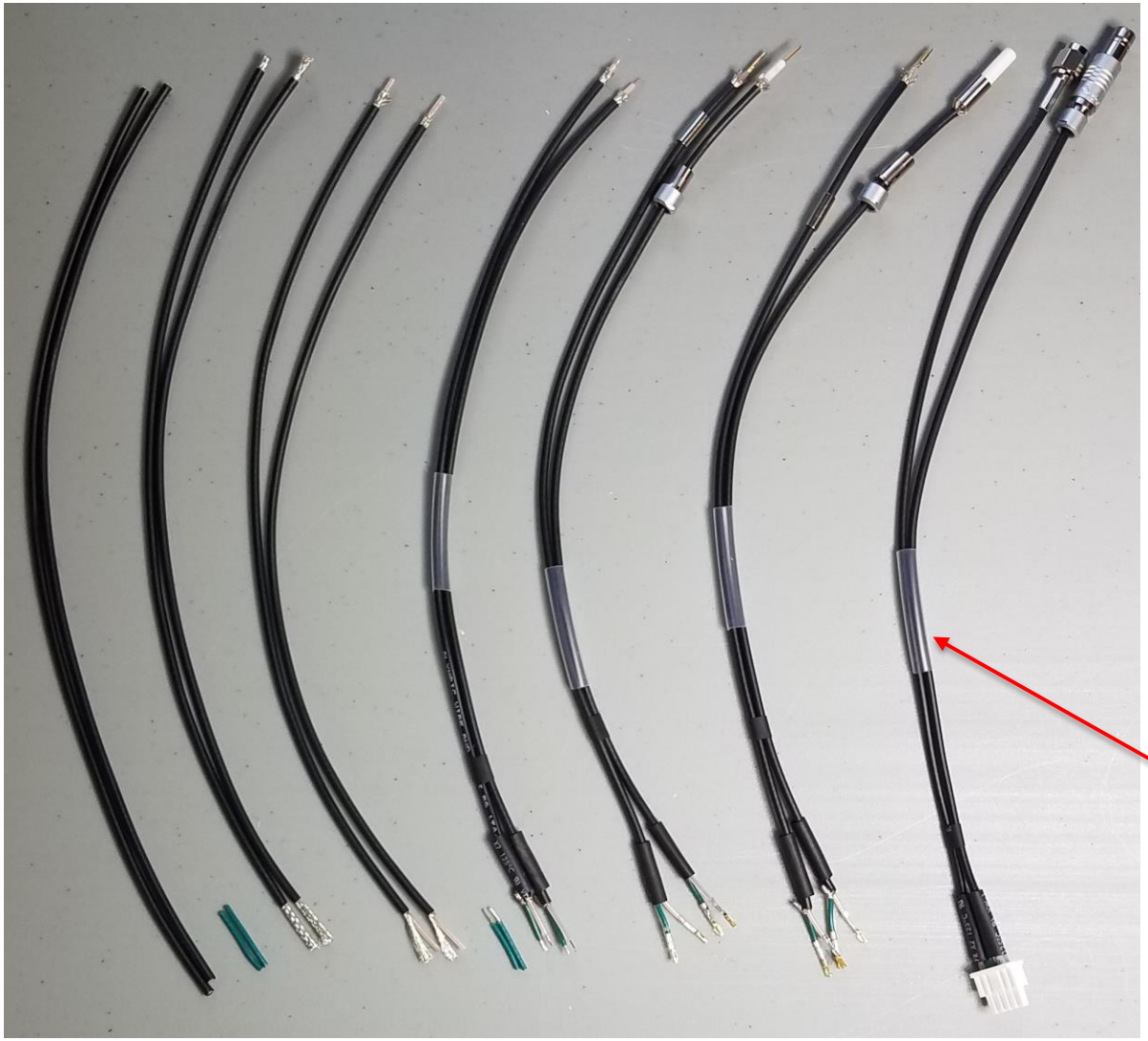


Testing & Analysis (cont'd)

- Average readback current of each channel of module #262
  - All channels above expected current value
  - Discrepancy between expected and readback is due to readback (~1%)
  - Spread of readback values ($\Delta I/757\ \mu A$) ~ 1%



Fabrication: HV Divider Cables



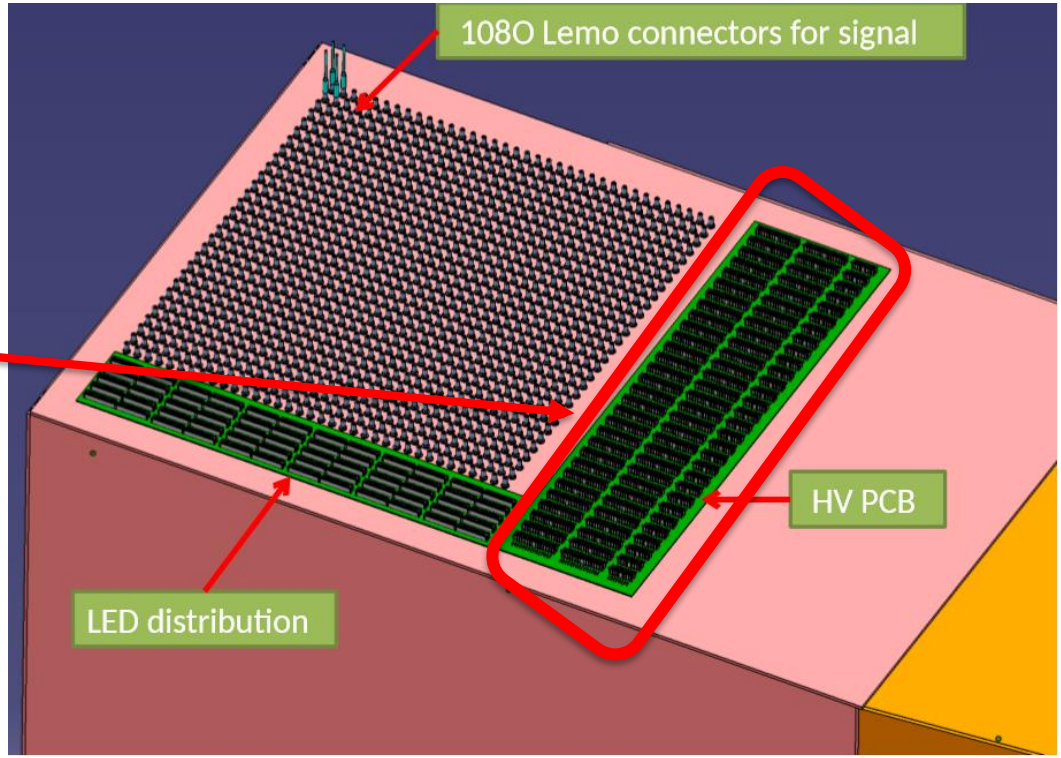
Cable fabrication sequence: left to right

- 650 cables of 1100 fabricated

Fabrication: Multi-conductor HV Cables

- Fabricating thirty-four 140' multi-conductor cables
- Procuring wires, connectors, and tools
- Researching connectors rated for 1100 V operations

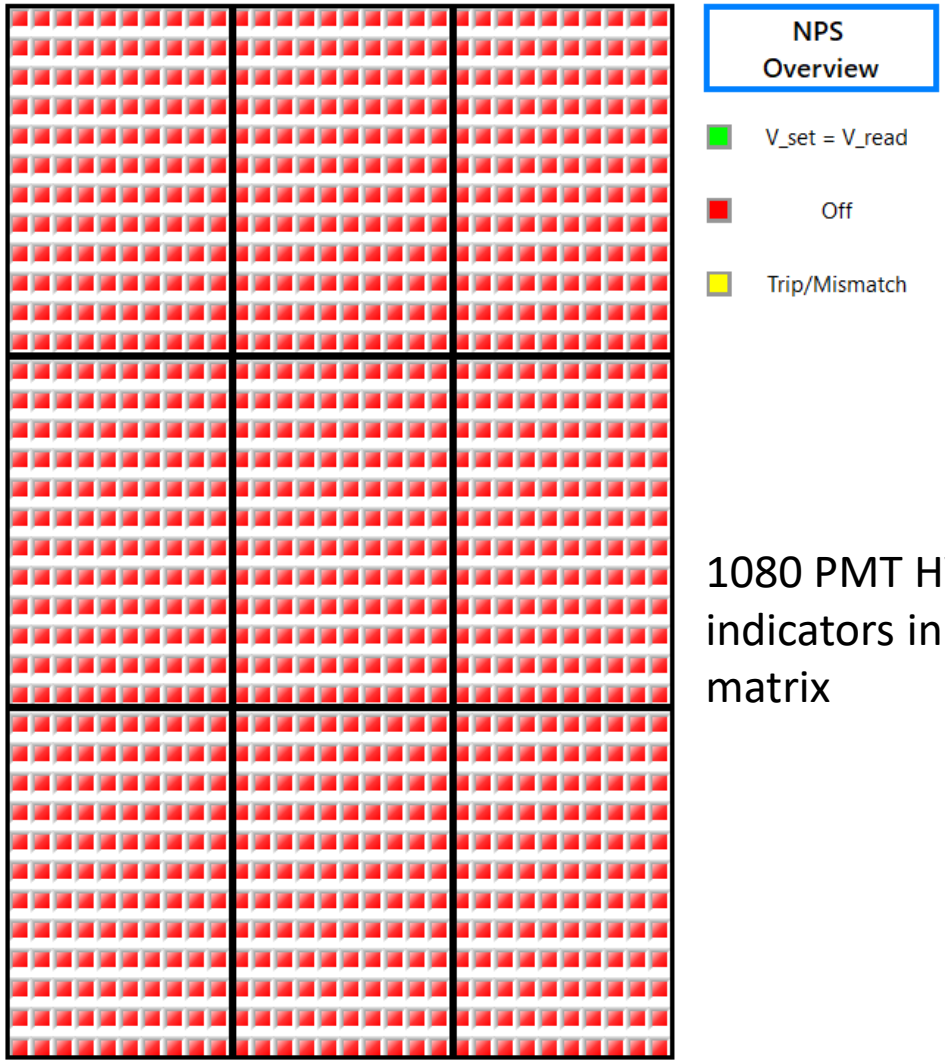
Mates for these connectors need to be rated for 1100 V operations.



Frame for NPS

EPICS Controls & Monitoring System

- Developing EPICS CSS-BOY screens
  - Overview Screen
  - Environmental Readback Screens
  - Chiller Temperature and Flow Screens



NPS Overview Screen

1080 PMT HV indicators in a 3x3 matrix

EPICS Controls & Monitoring System (cont'd)

- HV readback screen
- 30 x 36 grid of voltage and current readback for each PMT

PMT located in Column -4, Row -4 from the origin

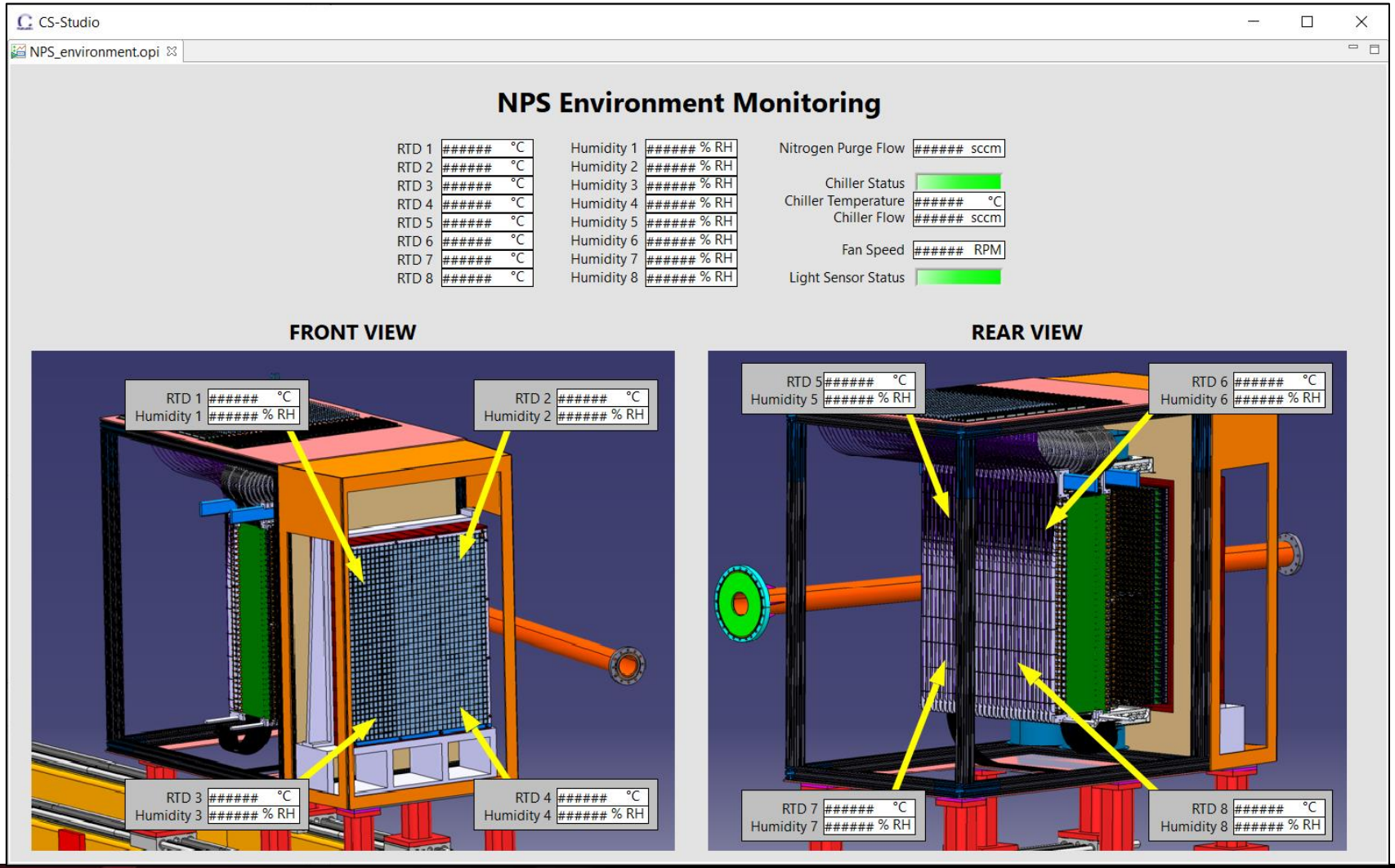
Environment Monitoring & Interlock System

- System monitors and interlocks (if needed) humidity, gas flow, temperature, chiller status, and fan speed
- Sends information to EPICS
- Researching sensors

Signal Type	Sensor	Qty	Location	Measurement Range	Manufacturer Part #	Comments
Temperature (Crystals)		126	Crystal Array	°C		Researching
Temperature (Electronics)		8	Detector Internal	°C		
Temperature (Ambient)		2	External ambient	°C		
Humidity (Electronics)		8	Detector Internal	0 - 100% RH		
Humidity (Ambient)		2	External ambient	0 - 100% RH		
N2 Flow meter		1		slm		
Fan Speed		4	Electronics Zone Heat exchanger	RPM		Heat Exchanger: Lytron 6320G3SB
Fan Speed		?	Crystals zone Array Heat exchanger	RPM		Researching
Flow	Chiller	1	Electronics Zone		Kodiak RC006G03BG3	RS232 Interface to Chiller
Pressure		1				
Set Readback Temperature		1				
Coolant Temperature		1				
Status		1				
Flow	Chiller	1	Crystal Array Zone		?	Researching
Pressure		1				
Set Readback Temperature		1				
Coolant Temperature		1				
Status		1				
Light Sensor		2	NPS Frame			Researching
Coolant Leak Sensor		1				

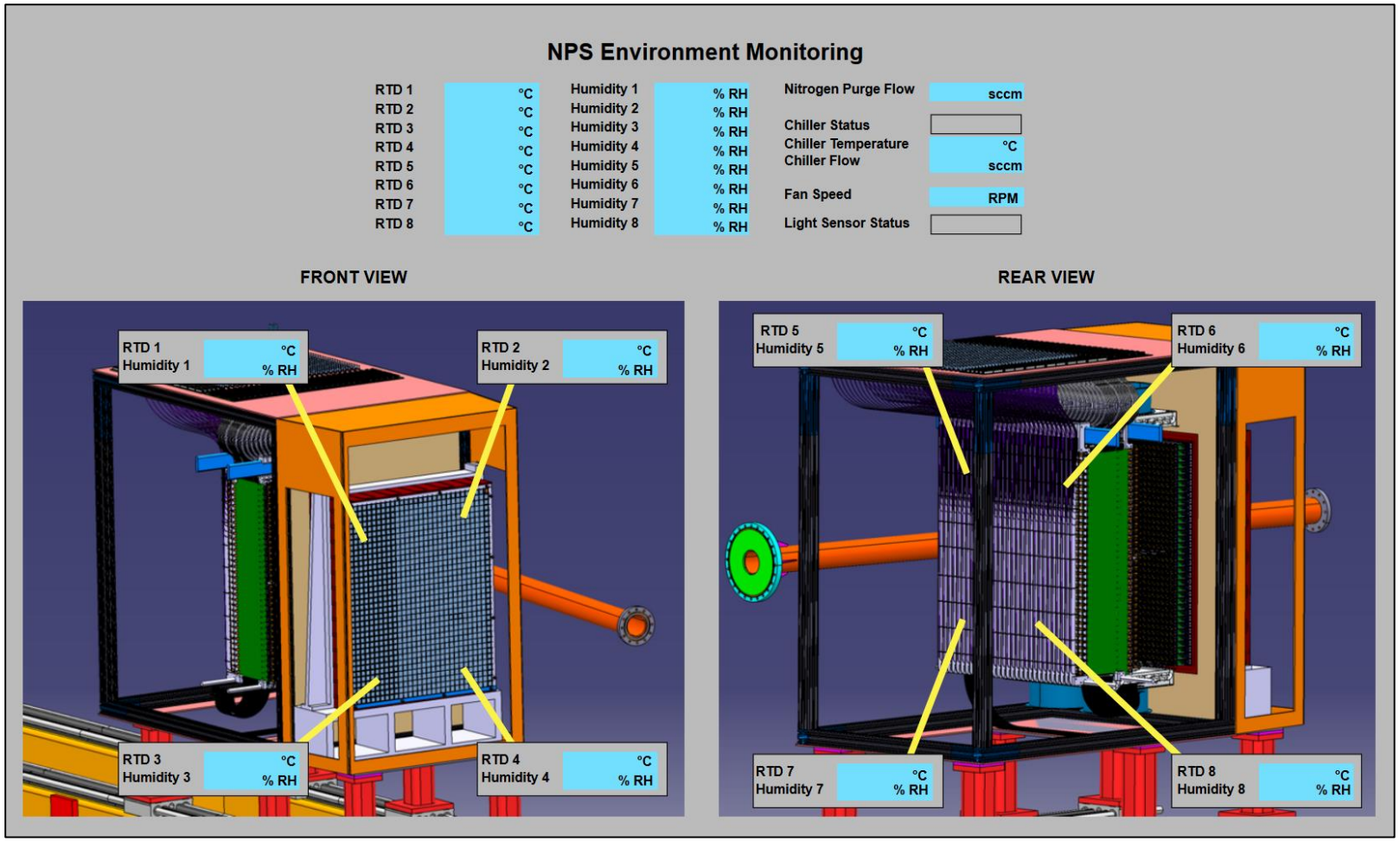
Environment Monitoring & Interlock System (cont'd)

- CSS-BOY screen can accommodate any number of sensors



Environment Monitoring & Interlock System (cont'd)

- WEDM for remote monitoring via JLab EPICSWEB
- WEDM screen copy of CSS-BOY screen

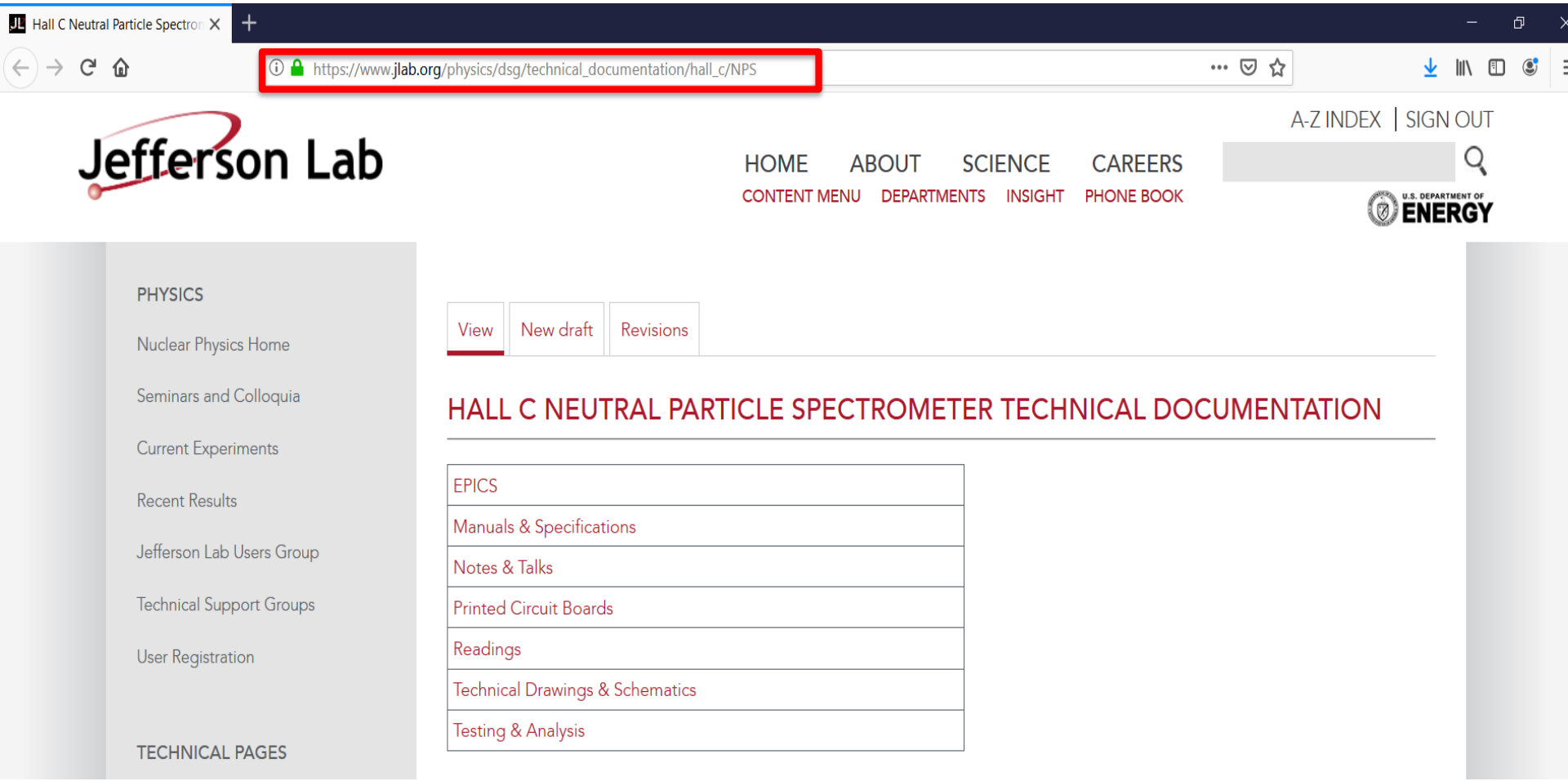


Current Work

- Testing & Analysis
  - CAEN HV system SY4527 crate and A7030TN modules
    - Interface with EPICS
    - Verify module specifications
- Fabricating cables
- Developing EPICS Controls & Monitoring System
- Investigating sensors and instrumentation for Environment Monitoring & Interlock System

DSG Website

- NPS section of DSG Hall C Technical Documentation
- Page updated as progress is made



Conclusion

- **DSG is actively participating in the NPS project**
  - Testing & Analysis of CAEN crates and modules
  - Fabricating and testing HV cables
  - Developing EPICS Controls & Monitoring System
  - Developing Environment Monitoring & Interlock System

- **Significant progress**

Thank You