



Shutdown Update

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for the DØ Collaboration

18 May 2006

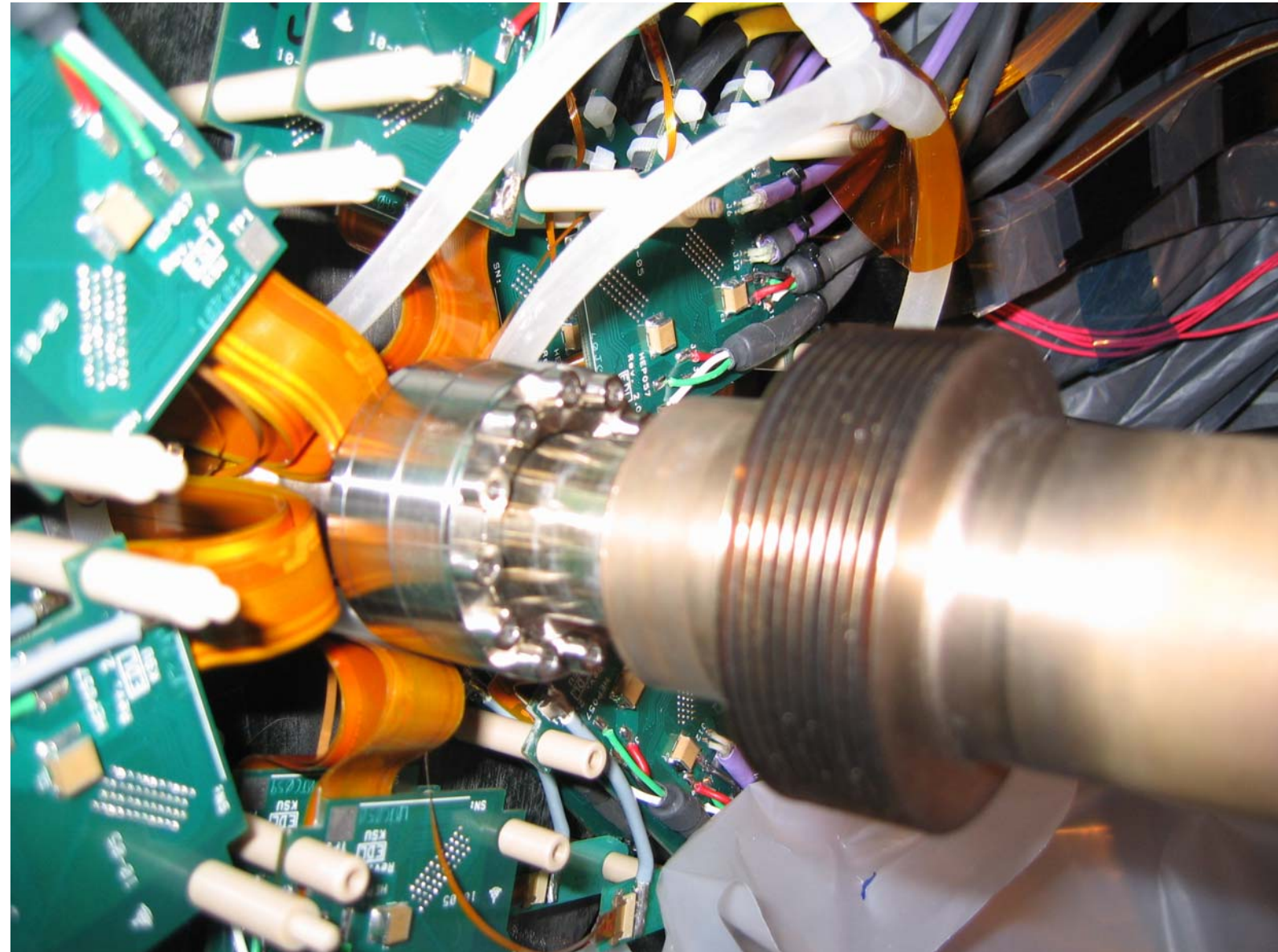


Week 9

- Layer 0
 - Complete evaluation of Layer 0 readout performance
 - All SVX4 chips have been successfully readout with the sensors biased
 - Connect spool pieces and leak check joints
 - Re-install south inner H disk
- Level 1 Calorimeter Trigger
 - Delivery of lower skew LVDS cables complete
 - Continue installing LVDS cables
 - Test transmission from ADF to TAB
 - Continue firmware debugging/development/verification
- Level 1 Central Track Trigger
 - Finish connecting outputs to L1CalTrk and L1Muon
- Luminosity Monitors
 - Re-install and re-cable

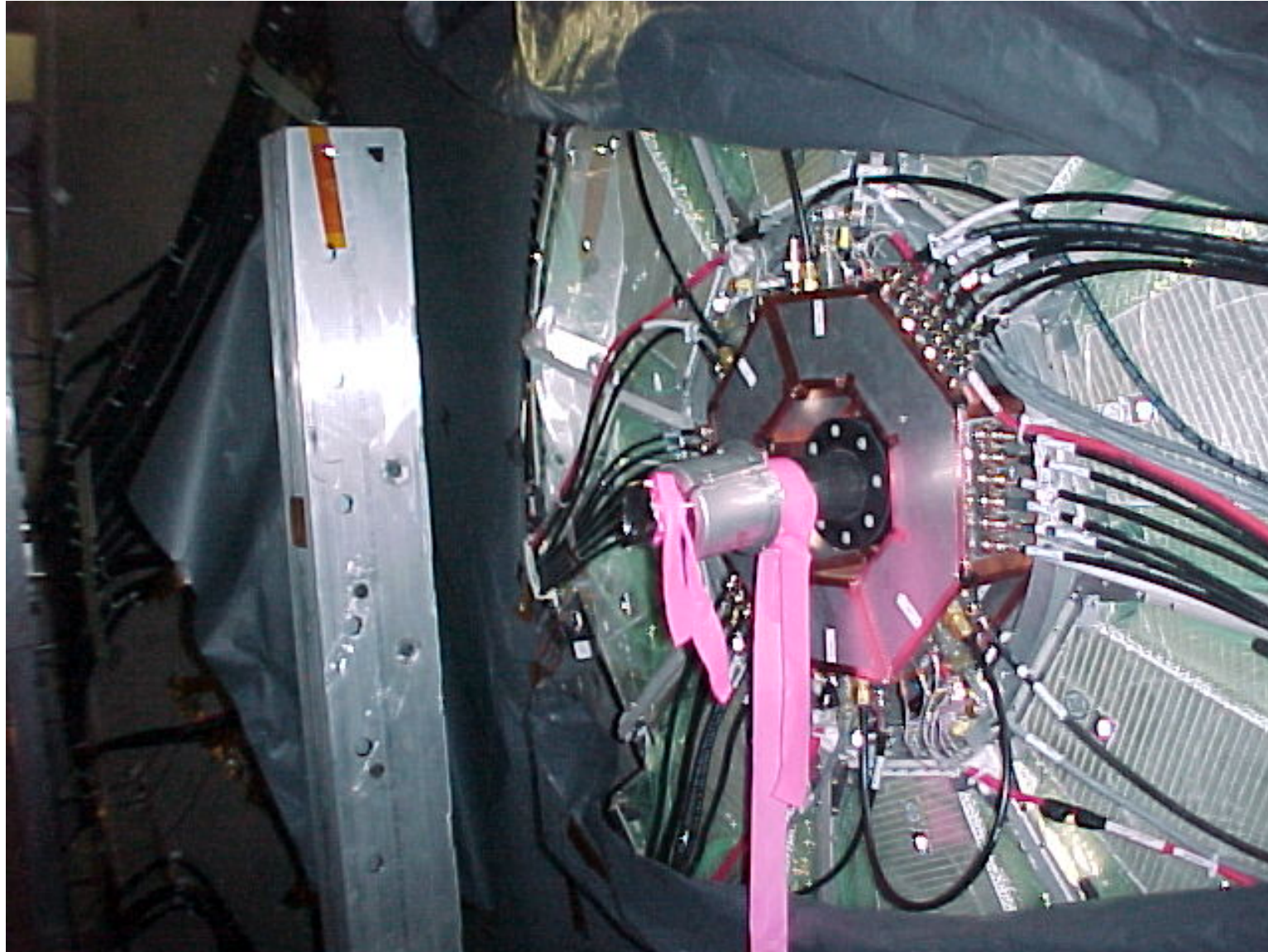


Spool piece connected to Be beam pipe



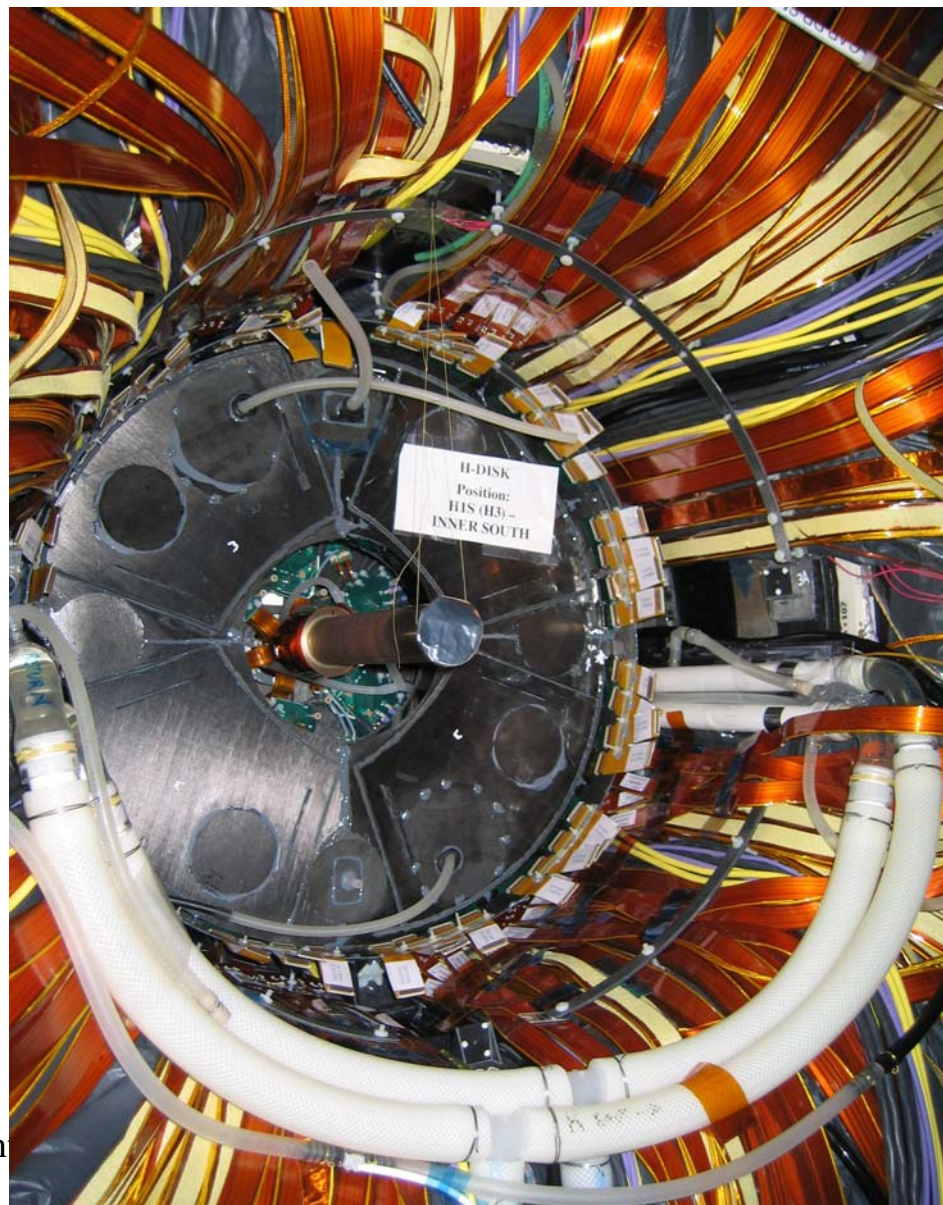
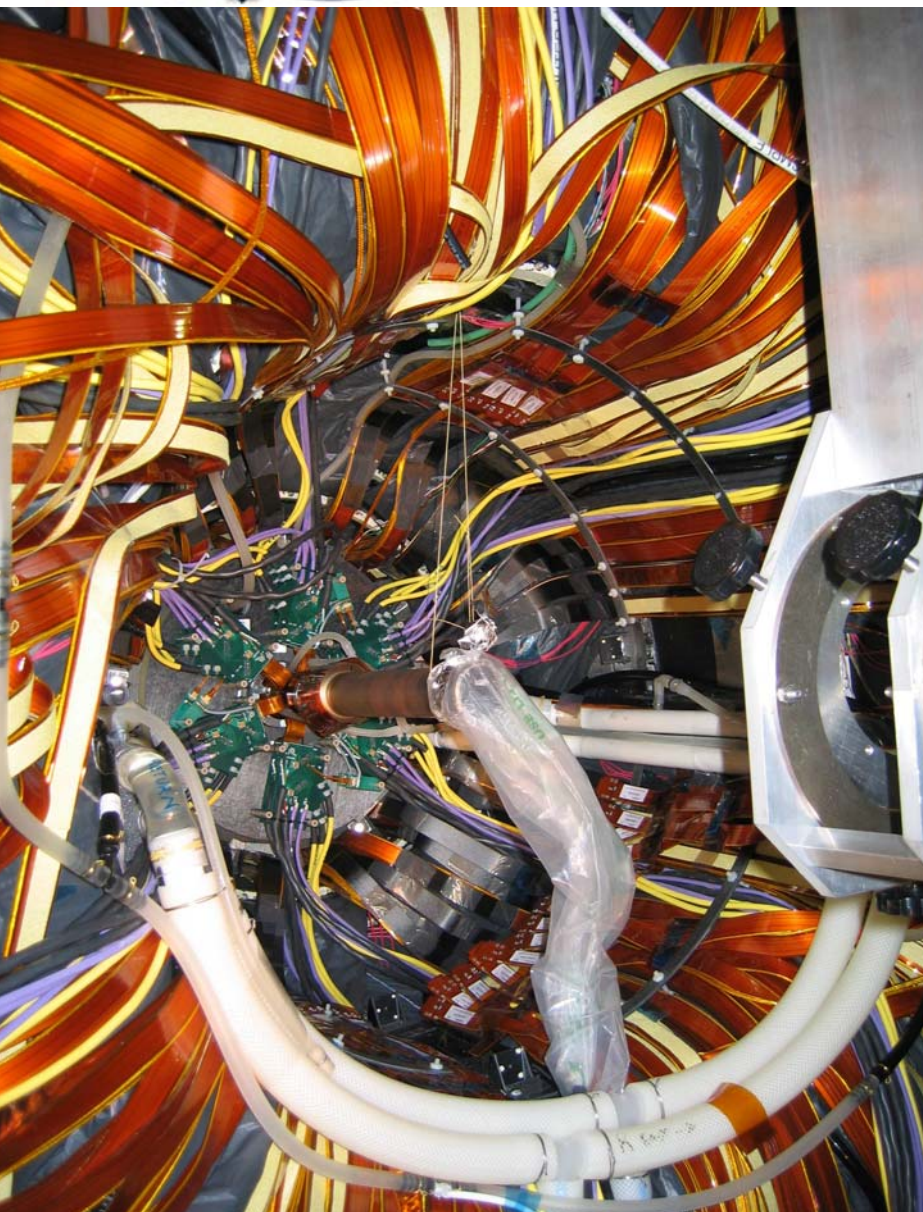


Installed Luminosity Monitor





Re-installing South Inner H Disk



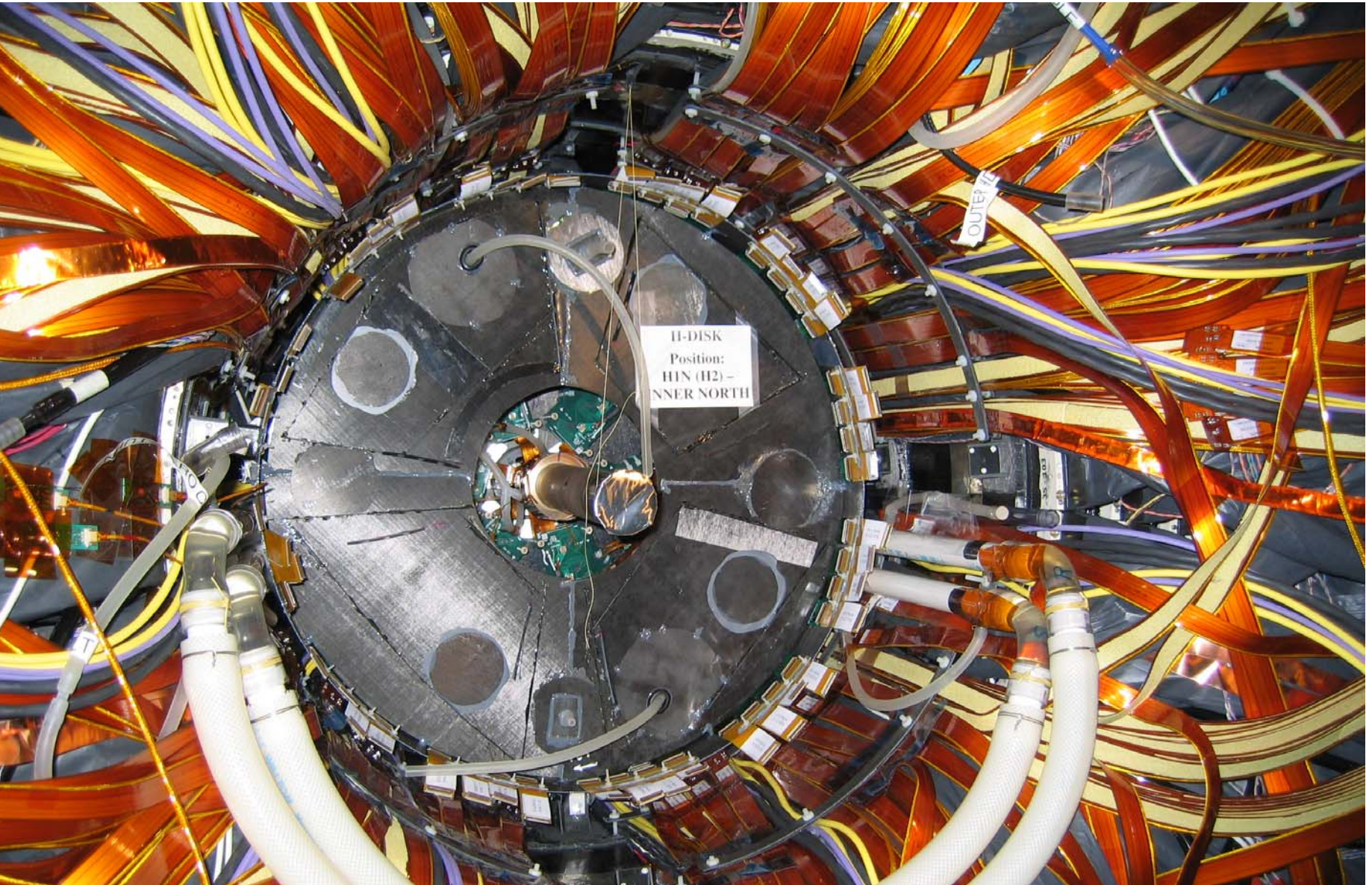


Week 10

- Site Wide Power Outage (and Recovery)
 - Two BLS power supplies and CFT pulser failed to recover
- Layer 0
 - Re-install north inner H disks
 - Re-cable inner H disks and connect up cooling
 - Verify inner H disk readout
 - More inner H disks channels appear to be functional now than when disks were dismantled in March (due to the hard work of the installation & readout teams)
 - Install beam pipe support
 - Make spool to EC beam pipe joint
 - Prepare to close out tracker bores
 - Insulate ends of bore
 - Install tedlar membranes
- Level 1 Calorimeter Trigger
 - Complete LVDS cable installation
 - Test transmission from ADF to TAB
 - Continue firmware debugging/development/verification
- Level 1 Central Track Trigger
 - Refining monitoring tools
 - Exercising trigger system
- AFEII
 - Delivery of first five bare production boards
- Detector Maintenance
 - Test SAM upgrade
 - Improve grounding of north side A Layer PDTs (requires scaffolding installation)

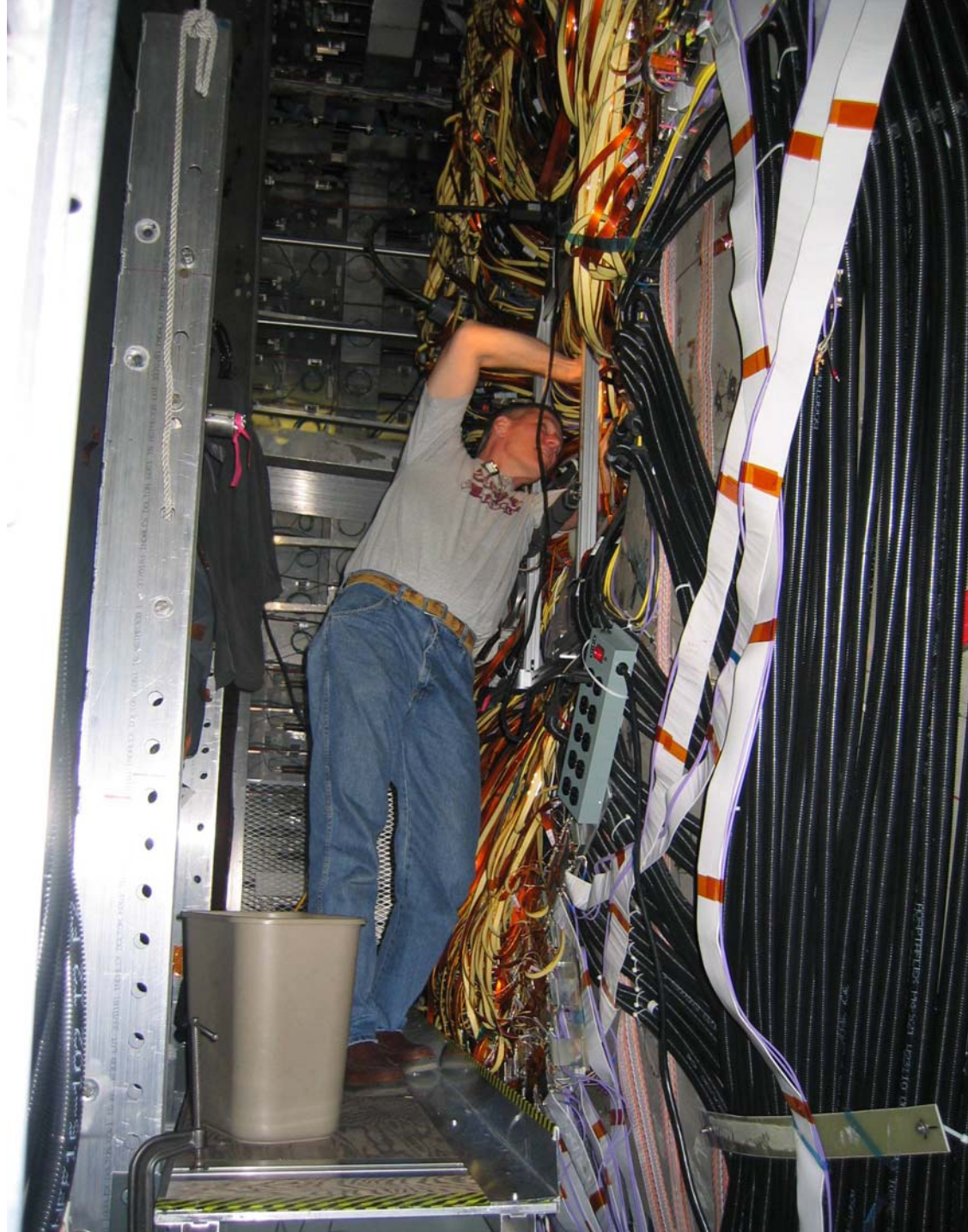


North Inner H Disk Installed





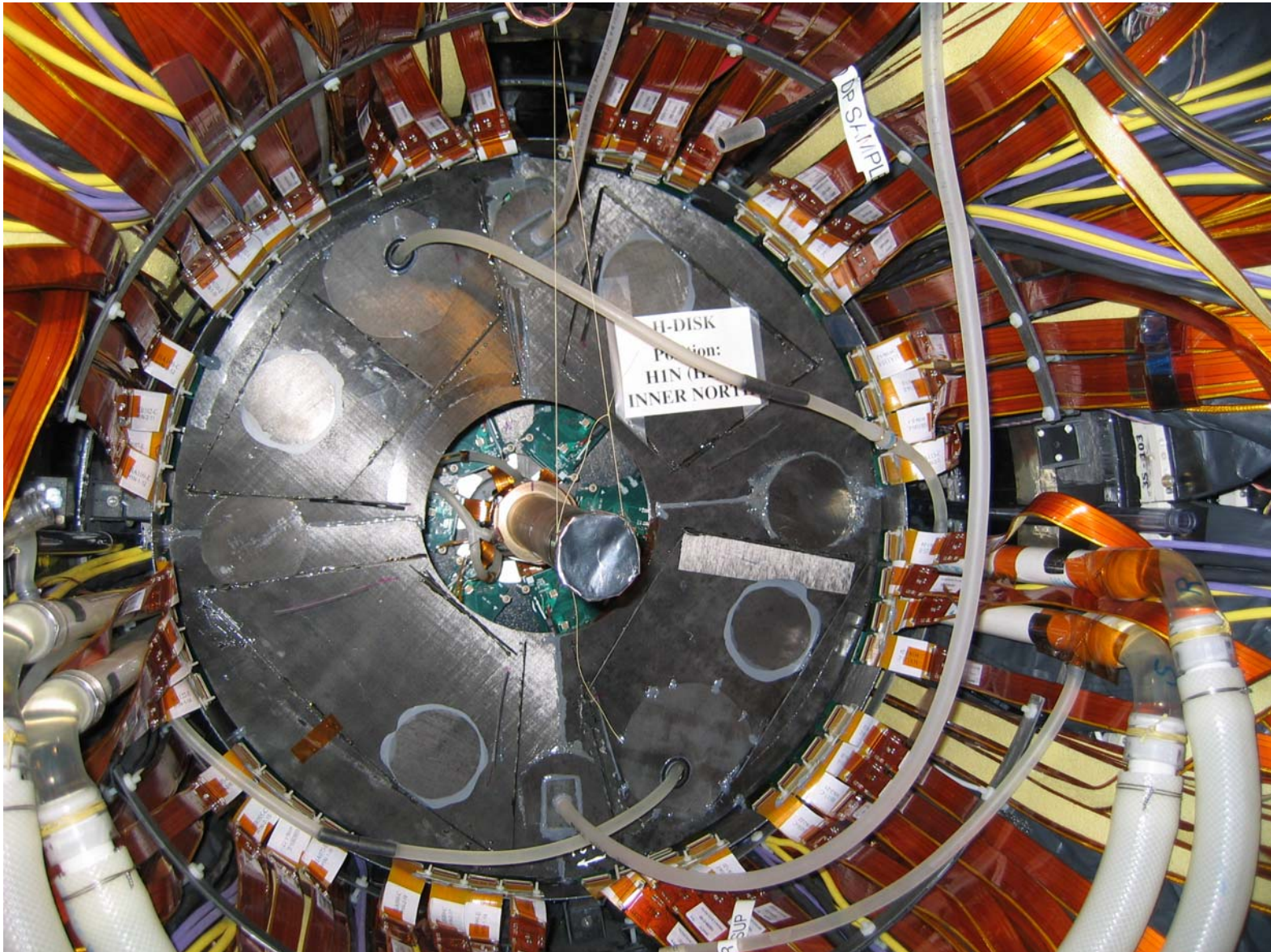
- Dave Butler installing cables on the North Inner H disk



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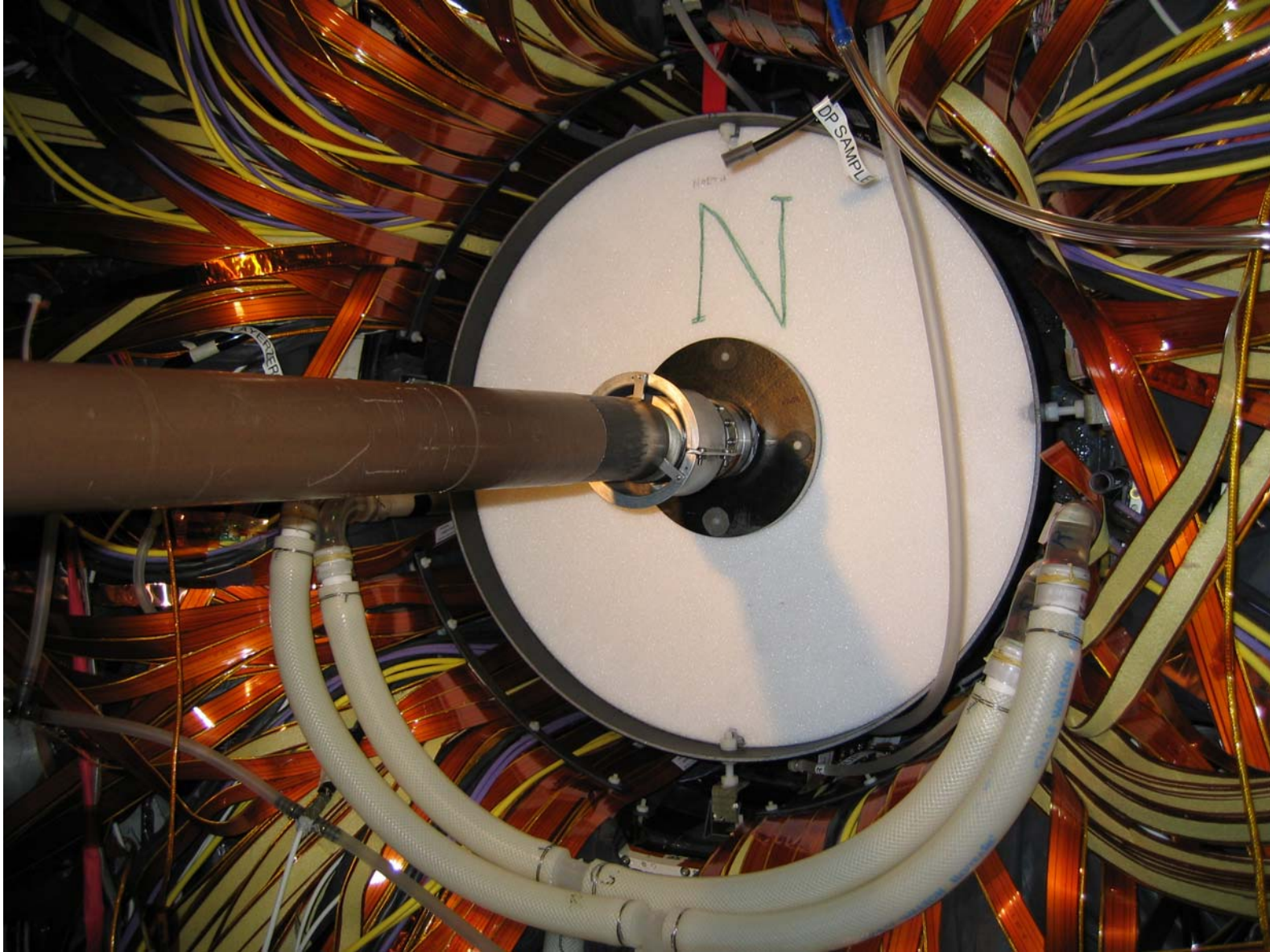


North inner H disk cabled (again)



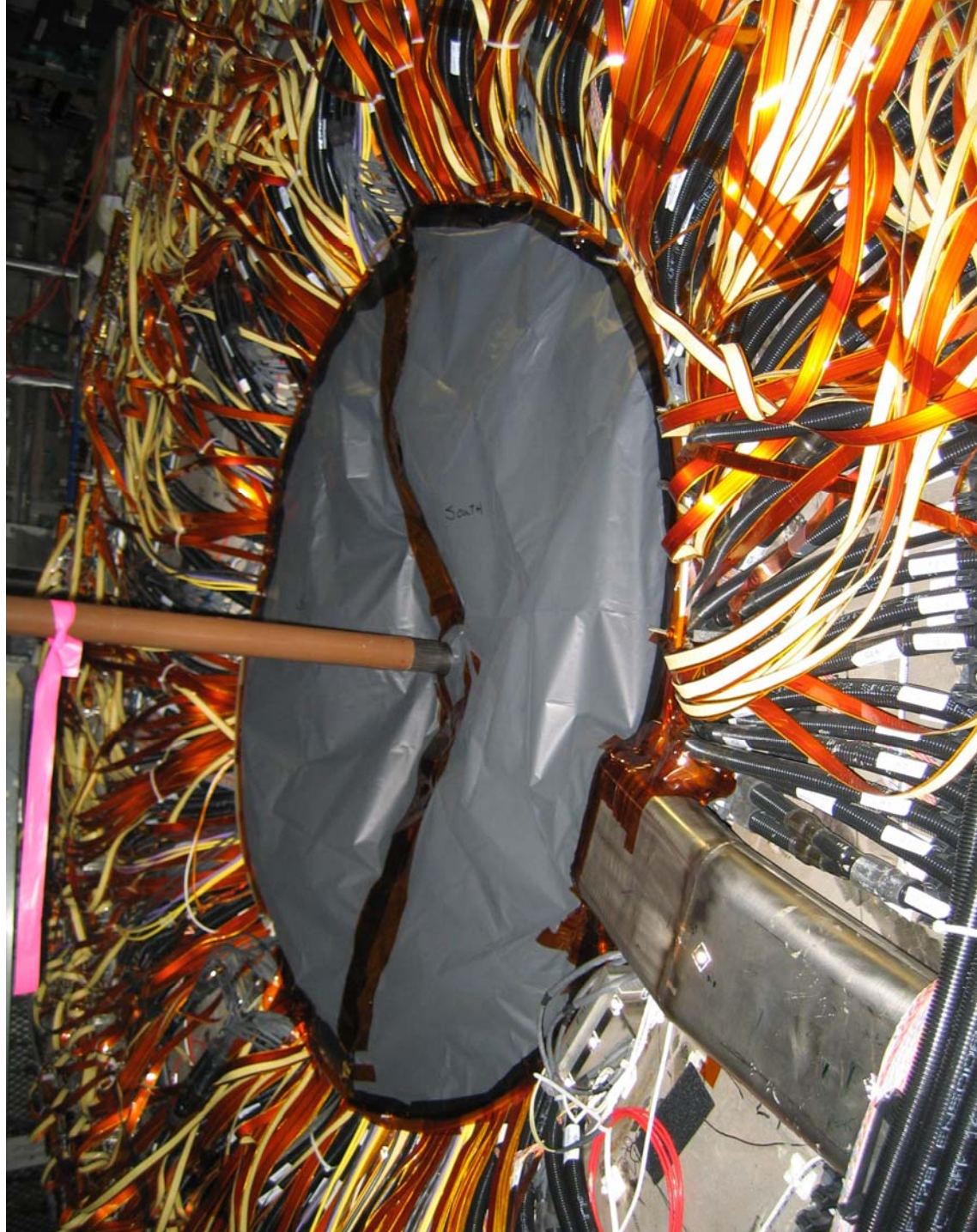


Beam pipe support installed



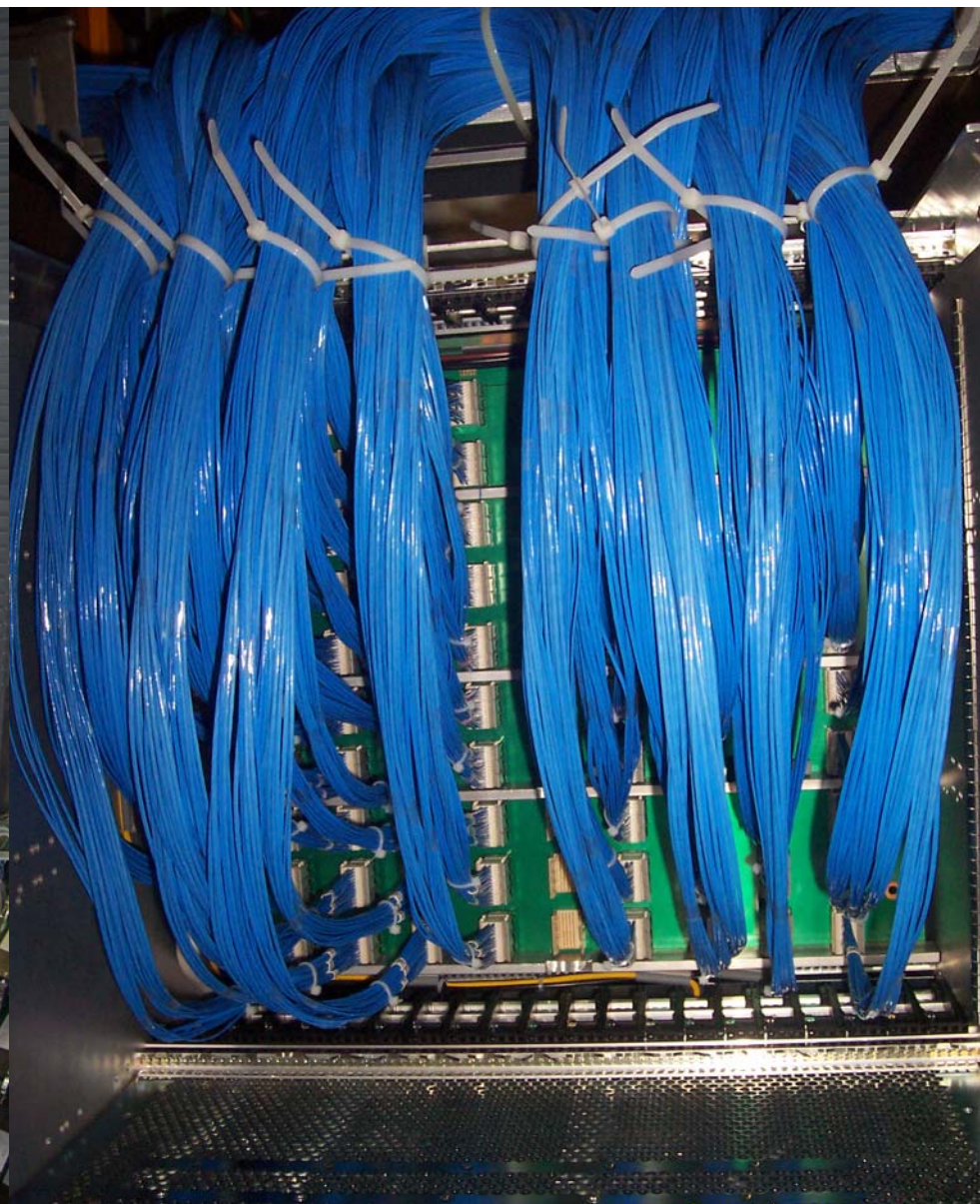


- View of south end of Central Cryostat with tedlar membrane in place



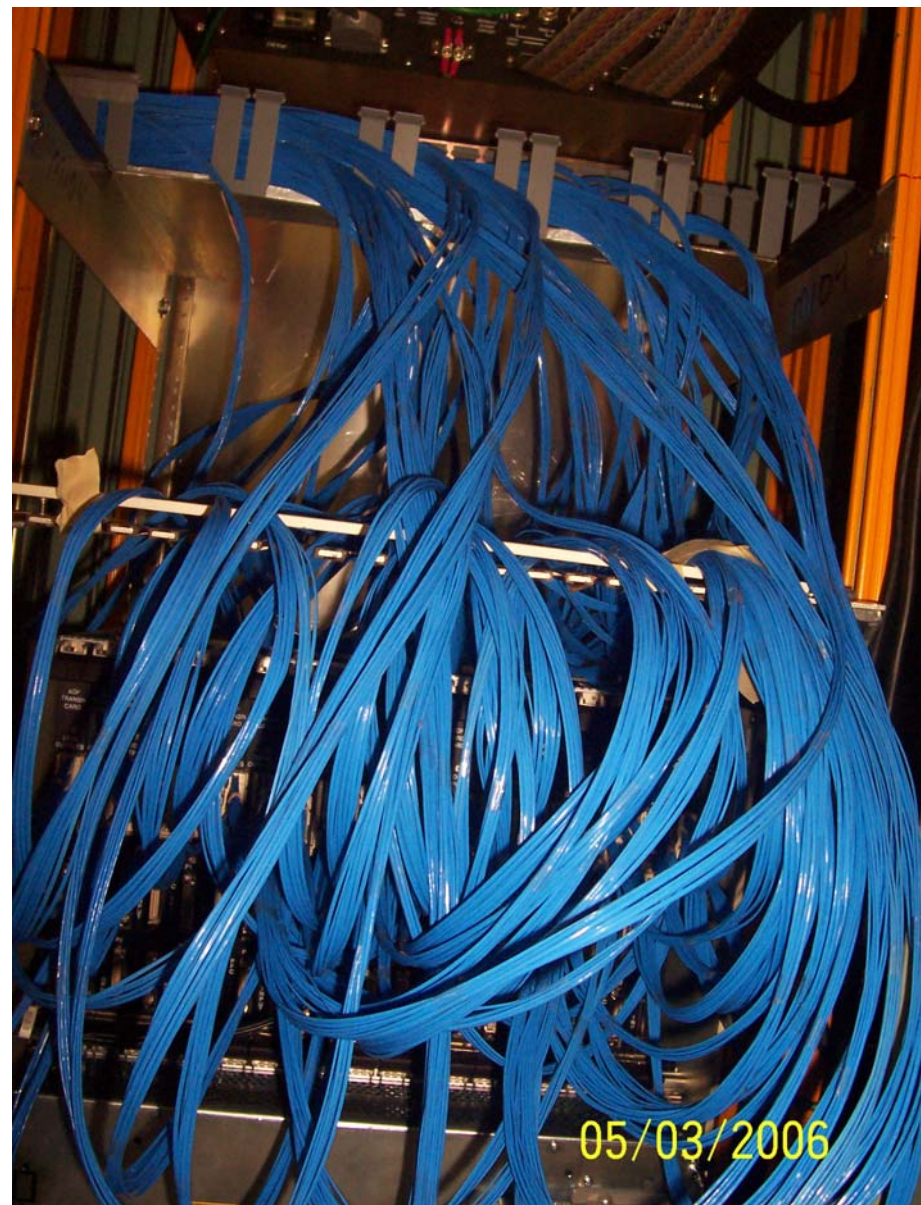


L1 Cal Trigger (TAB/GAB crate)

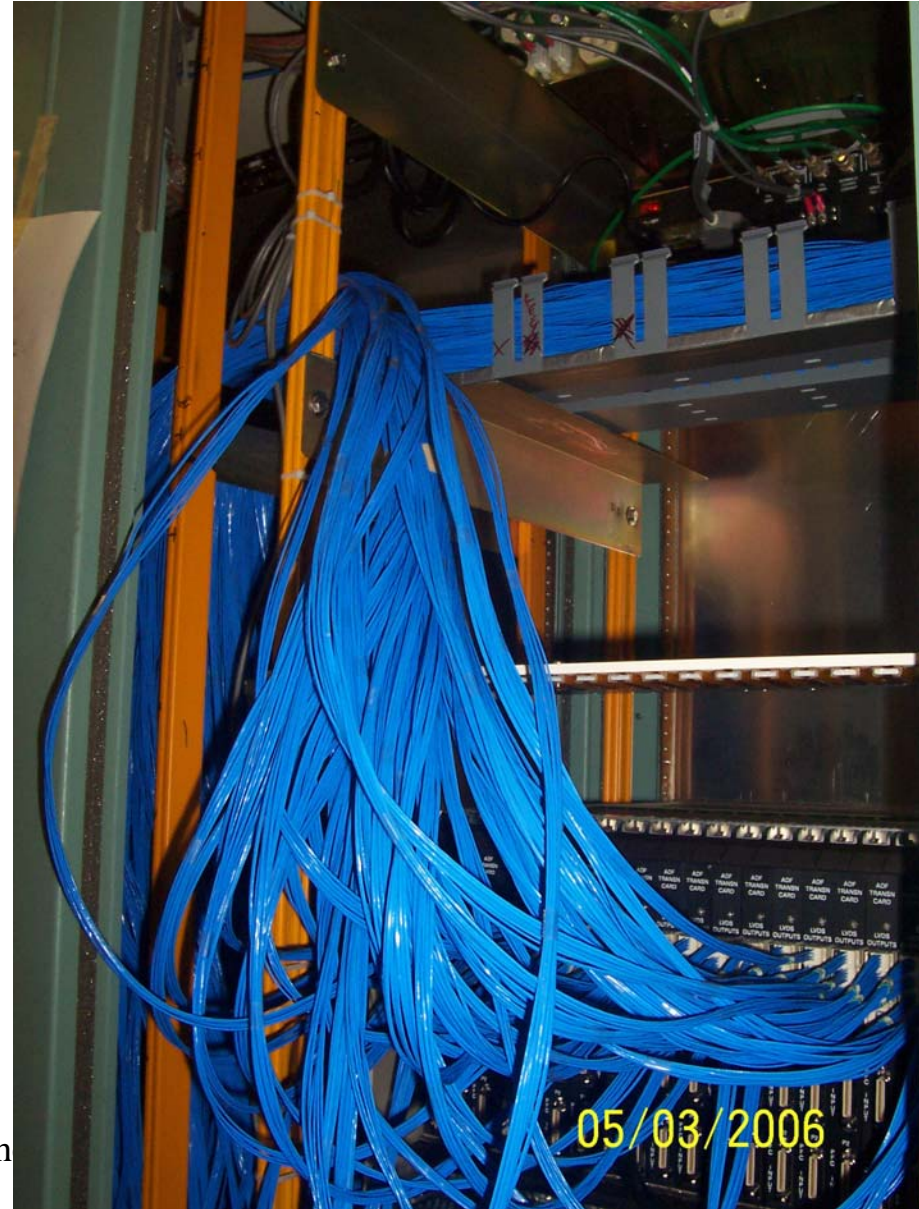




L1 Cal Trigger (ADF Crates)

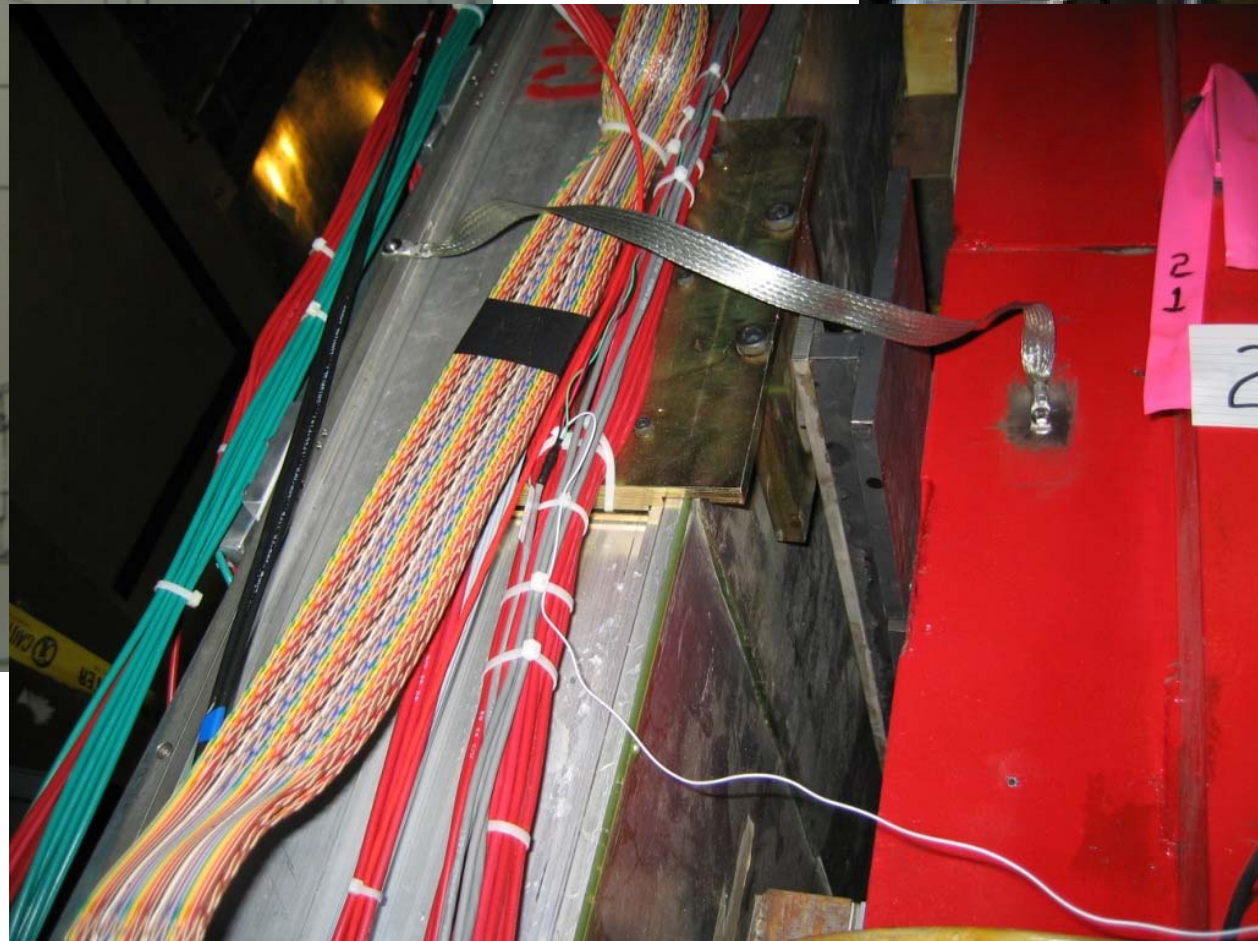
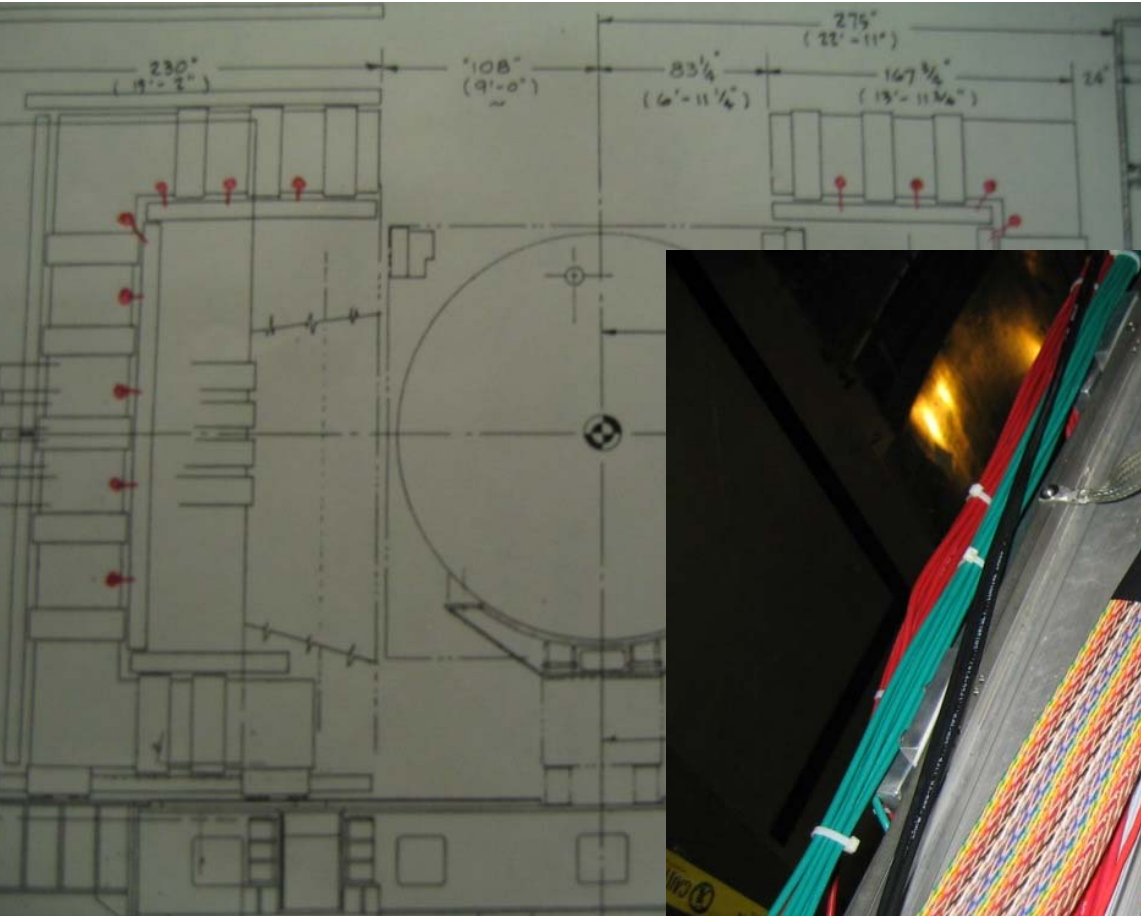


Ginth





Improving A Layer PDT Grounds



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Week 11

- Upgraded Silicon Microstrip Tracker
 - Dry and cool silicon
 - Turn on entire SMT
 - Checkout Layer 0 noise with Run IIa SMT powered
 - Verify SMT readout status
 - Attempt recovery of Run IIa SMT HDIs
- Level 1 Calorimeter Trigger
 - Wrap-up transmission tests from ADF to TAB
 - Complete pleated foil cable installation
 - Continue firmware debugging/development/verification
- Level 1 Central Track Trigger
 - Testing of L1Muon and L1 Cal Track outputs
 - Continue refining monitoring tools
 - Continue exercising trigger system
- Detector Maintenance
 - Selected replacement of ICD PMTs in the west cathedral
 - Begin TFW firmware mods for latency shift (3×132 nsec delay)
 - Complete COBO modifications
- Initial online test of L2 splitting/ORing



Week 12

- Upgraded Silicon Microstrip Tracker
 - Readout testing and verification in progress
 - currently in better condition than before shutdown
 - Investigating a few HV issues (attributed to HV distribution changes)
 - Cosmic ray tests of upgraded SMT readout in progress
 - Upgraded L1 CTT is serving as trigger in cosmic ray tests
 - Noise tests of Upgraded SMT readout performed
- Level 1 Calorimeter Trigger
 - Firmware development and testing
 - Attempt recovery of individual input channels
- Level 1 Central Track Trigger
 - Testing of L1Muon and L1 Cal Track outputs
 - Continue refining monitoring tools and exercising trigger system
- Detector Reconfiguration
 - Reconfigure detector in preparation for beam pipe installation
 - Install SNEG beam pipes (AD support)
 - Leak check beam pipes (AD support)
 - Begin activating SNEGs (assuming leak checking is successful)
 - Open EFs to resume cathedral access (and install BLMs)



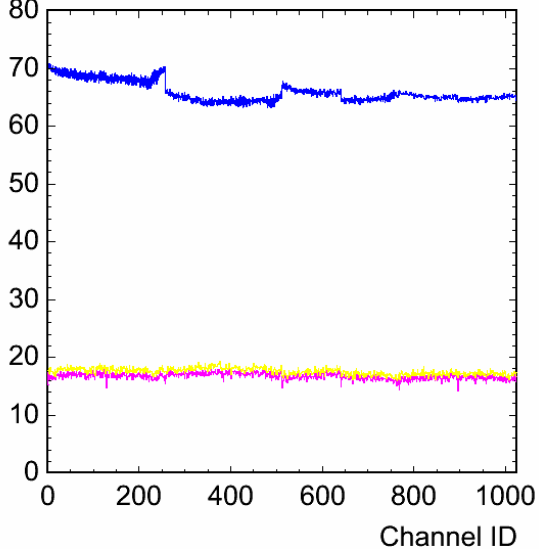
Layer 0 Performance at DØ

- All 96 SVX4 chips reading out
 - The chip which caused trouble at SiDet was also initially reluctant to perform at DØ, but has been behaving well lately
 - Readout is error free
 - ~15 to 20 bad channels (out of total of 12,288 channels)
 - Signal to noise is ~15 to 1 (or better)
- Bias currents are low
 - One pinhole developed during biasing at DØ
- No significant coherent noise detected
 - Tested before and after connection of Tevatron beampipe

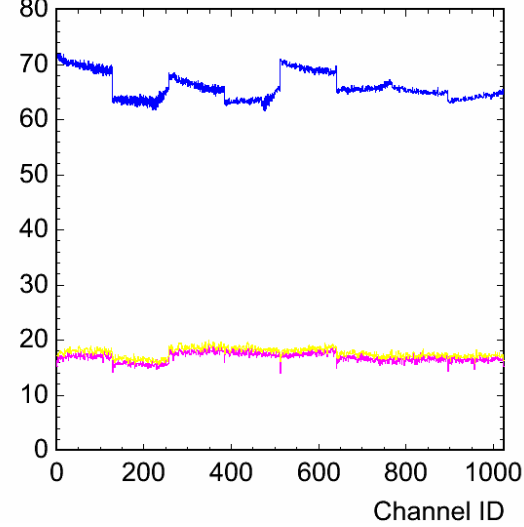


Pedestal and (10x) Noise Distributions

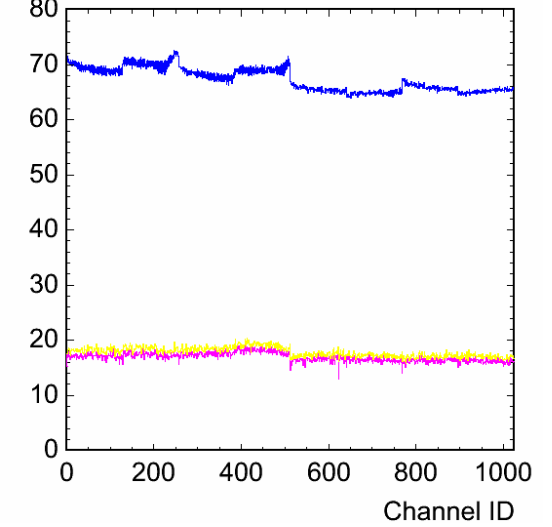
North, Sector 1



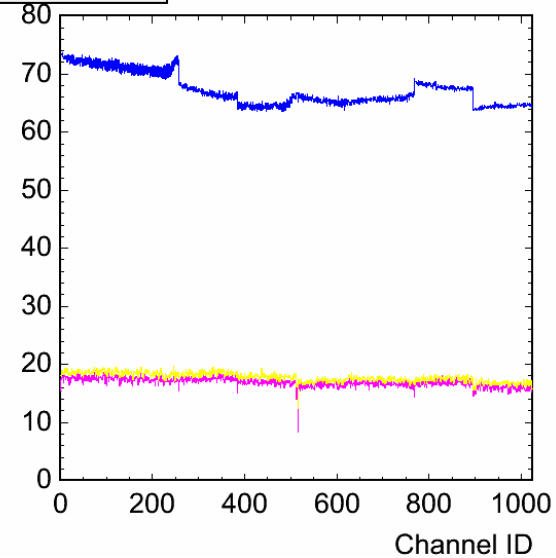
North, Sector 2



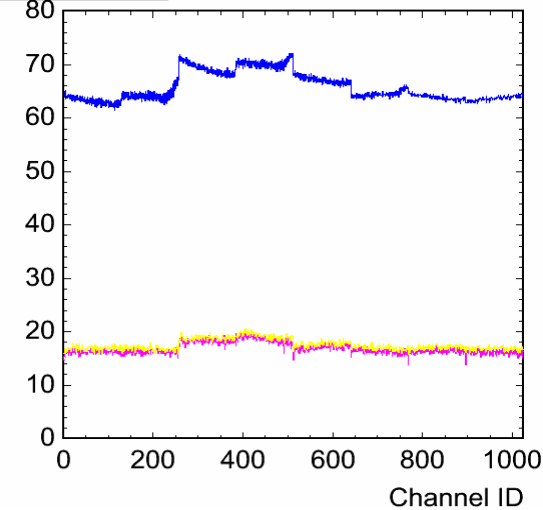
North, Sector 3



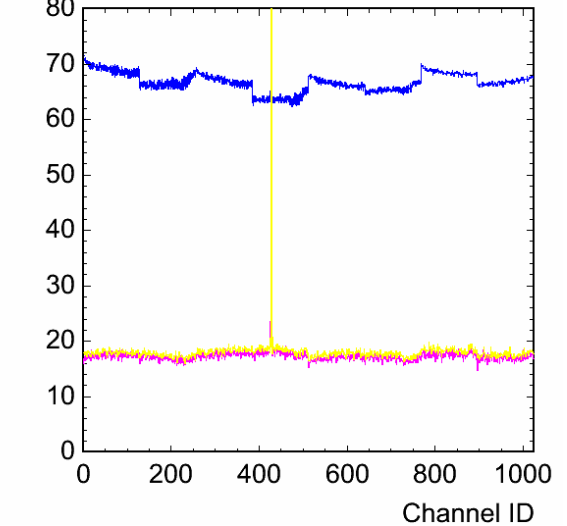
North, Sector 5



North, Sector 4



North, Sector 6





Layer 0 Installation Milestones

ID	TASK NAME	Actual	Current Forecast	Pre-Shutdown Forecast	Milestone Dates
2	Beginning of RunIIb Tevatron Shutdown	2/23/06		2/27/06	2/27/06
28	Detector Open, Ready for Access	3/1/06		3/2/06	3/07/06
34	RunIIa Be Beam Pipe Disconnected	3/3/06		3/7/06	3/9/06
47	H Disks Removed	3/15/06		3/17/06	3/23/06
56	RunIIa Be Beam Pipe Removed	3/21/06		3/27/06	3/31/06
75	Layer 0 Tooling and Mounts Ready	4/5/06		4/10/06	4/17/06
79	Layer 0 Installed (including junction card mounts)	4/7/06		4/12/06	4/19/06
91	RunIIb Be Pipe Connected, Layer 0 Cabled	4/26/06		4/26/06	5/03/06
94	Inner H Disks Re-Installed (including cabling)	5/4/06		5/2/06	5/9/06
99	Silicon Cold and Ready for Technical Commissioning	5/9/06		5/5/06	5/12/06
103	Complete Technical Commissioning of Silicon	5/12/06		5/11/06	5/18/06
118	Detector Closed for Tevatron Resumption		5/31/06	6/02/06	6/4/06



L1 Cal and L1 CTT Installations

ID	TASK NAME	Actual	Current Forecast	Pre-Shutdown Forecast
2	Beginning of RunIIb Tevatron Shutdown	2/23/06		2/27/06
	Level 1 Calorimeter Trigger Upgrade			
158	Retire Run IIa L1 Cal Trigger Electronics	3/6/06		3/6/06
172	Complete Clean-out of L1 Cal Trigger Racks	3/9/06		3/29/06
180	L1 Cal Trigger Racks Ready for Trigger Installation	3/20/06		4/13/06
189	L1 Cal Trigger Ready for Technical Commissioning	5/10/06		5/10/06
	Level 1 Central Track Trigger Upgrade			
206	DFEA Crates Extracted	3/13/06		3/13/06
213	DFEA2 Installation Complete	4/25/06		4/4/06
217	L1 CTT Technical Commissioning Complete		5/26/06	5/17/06

Switched order of some installation and verification operations to optimize cable access

Ongoing recovery of a few individual output channels to L1 Muon and L1 Cal Track

		Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1 2	14-May		Remove gap hardware Close ECs, EFs	Repair two PDT wires Install SNEGs and begin pumpdown SMT cosmics	100 AFEII bare boards delivered Extract wire from PDT Leak check SMT noise studies SMT cosmics?	Online test of L2 splitting/ORing? Extract wire from PDT Install heat tape on SNEGs Activate SNEGs Open EFs Install BLMs	South side A Layer PDT grounding Activate SNEGs ICD maintenance CAL preamp PS maintenance	
1 3	21-May	Begin detect or verification	Tevatron cooldown begins Survey EC ICD maintenance Detector checkout Resume captain coverage on evening shifts	ICD maintenance Detector checkout	Close East CF and monitor for noise Close pit access door Detector checkout	Tevatron cold AFEII bare board production complete TFW unavailable for installation of new latency? Close West CF and EF's Detector checkout	L1CTT Technical Commissioning Complete Install scaffolding in SW corner for PDT 232 Remove SNEG heaters Install veto counters Close clamshells Test new latency? Survey Detector Centerbeam Detector checkout	Extract wires from PDT 232
1 4	28-May		lab holiday	AFEII bare board production complete Take down scaffolding in SW corner? Survey Detector CenterBeam Search and secure collision hall AD safety system tests Detector checkout Test magnet power supplies	StickMic Survey Detector checkout Supervised Access Ends	Collision Hall Secure		
1 5	4-Jun	shut down ends						



Approaching End of Shutdown

- Friday May 19
 - Complete SNEG activation
 - Resume ICD maintenance activities
 - Detector checkout
- Monday May 22
 - Detector checkout
 - Survey End Calorimeters after closing (AMG support-5169)
- Tuesday May 23
 - Detector checkout
- Wednesday May 24
 - Close east CF and monitor for calorimeter noise
- Thursday May 25
 - Close west CF and EFs
- Friday May 26
 - Rollout nose pieces and close clam shells
 - VStar Survey detector centerbeam (AMG support-5318)
- Tuesday May 30
 - VStar Survey detector centerbeam (AMG support-5318)
 - Search and secure collision hall during early evening for safety system tests and power on tests of solenoid and toroid (AD ops support)
- Wednesday May 31
 - Closing EF, CF stick mic survey (AMG support-5317)



Summary

- Shutdown involves substantial parallel efforts to install Run IIb upgrades of the DØ detector and make a smooth transition to commissioning and operations
- Need to complete the shutdown activities in a safe and timely manner
 - 61 weekdays days into 69 weekday shutdown (88% complete)
 - Most major shutdown activities wrapping up or completed
 - No major upgrade related surprises detected (yet)
 - Tevatron beampipe pumpdown in progress
 - Upgraded SMT status
 - Layer 0 is installed and reading out
 - Run IIa SMT currently believed to be in better condition than before shutdown
 - Cosmic ray tests in progress
 - Upgraded L1 CTT is serving as trigger in cosmic ray tests
 - L1 Cal trigger installation complete and in the technical commissioning phase
 - Collaborators continue to make important contributions
 - Second shift support and activities have been very valuable in maintaining schedule
 - Lab is providing significant support for these activities
 - Thanks to AD, CD, PPD & TD for their important contributions to this effort
- Aim to commission upgrades (and recover from the shutdown) efficiently to ensure that the post-shutdown data is as fruitful as possible
 - Addressing these challenges in a timely manner requires significant contributions from the lab and a broad range of collaborators