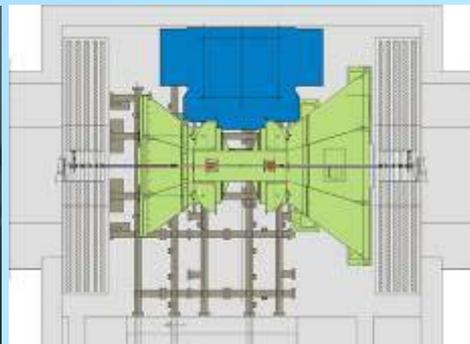
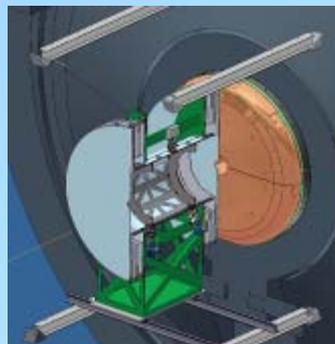
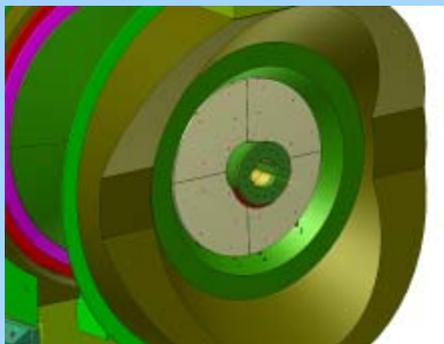


PHENIX WEEKLY PLANNING

TECHNICAL SUPPORT NO-0



4/8/2010
Don Lynch

Ongoing Tasks for Run 10

Task

Start Date

End Date

Install rack components in RPC3 N racks

in progress

6/1/2010

Attach cables to RPC3 N racks and to Detector $\frac{1}{2}$ octants

in progress

6/1/2010

Send mass flowmeters out for recalibration (DC/PC, MuID, TOF.W)

In Progress

?

AH Crane 110 switch for lockout

In Progress

6/30/09

PHENIX Startup Checklist Status

Item

Responsibility

Status

Item 1: ESRC relevant items completed

Wood Stairs

Phillips

Post Start

Update Work procedures

Cirnigliaro, Lynch

Almost Done

Item 4: HBD Mock Up

Lynch

After Run 10

Item 11: Fire Pull Box

Phillips

Post Start

Item 12: Dumb Waiter

Lynch

Done??

4/8/2010

TECHNICAL SUPPORT NO-0

This Week

VTX Support frame design is in progress

Maintenance access yesterday:

- RPC3N electronics work
- RPC3N gas exhaust completed
- HBD blower failure-replaced
- HBD compensating resistor
- ERT ROC replaced
- Water cooling switched to chiller



VTX Cooling analyses: Done except for big wheels

Absorber design concept done. Final drawings in progress

Prep for 2010 shutdown

Future upgrades support



Next Week:

- No scheduled maint.
 - Next scheduled maintenance access Wed. 4/21
- Run 10 tech support as necessary
- Future upgrade support as necessary
- Continue VTX support structure design
- Complete VTX thermal design calculations
- Complete RPC absorber design
- 2010 summer shutdown prep continues:
 - VTX & BP assembly/installation parts & fixtures procurement & fabrication
 - RPC3 S assembly/installation fixtures parts & fixtures procurement & fabrication

TECHNICAL SUPPORT NO-0

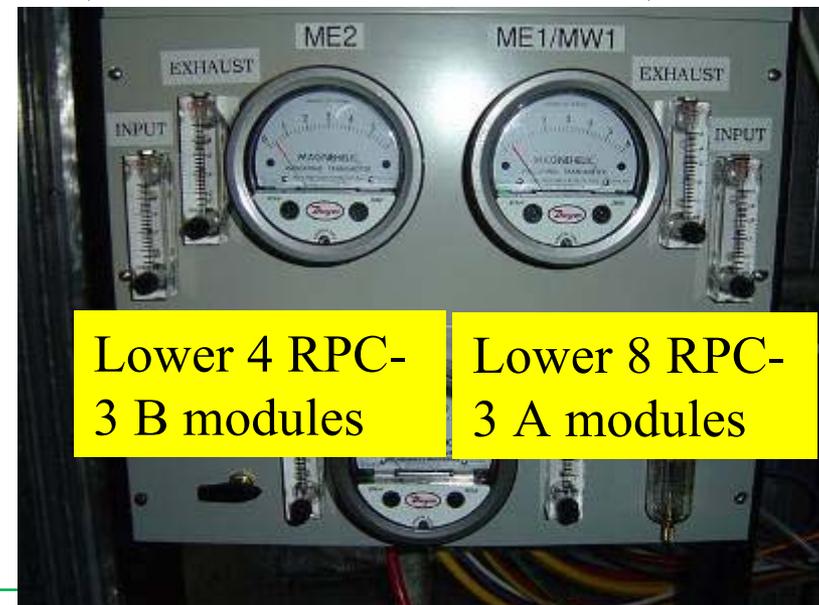
Young Jin



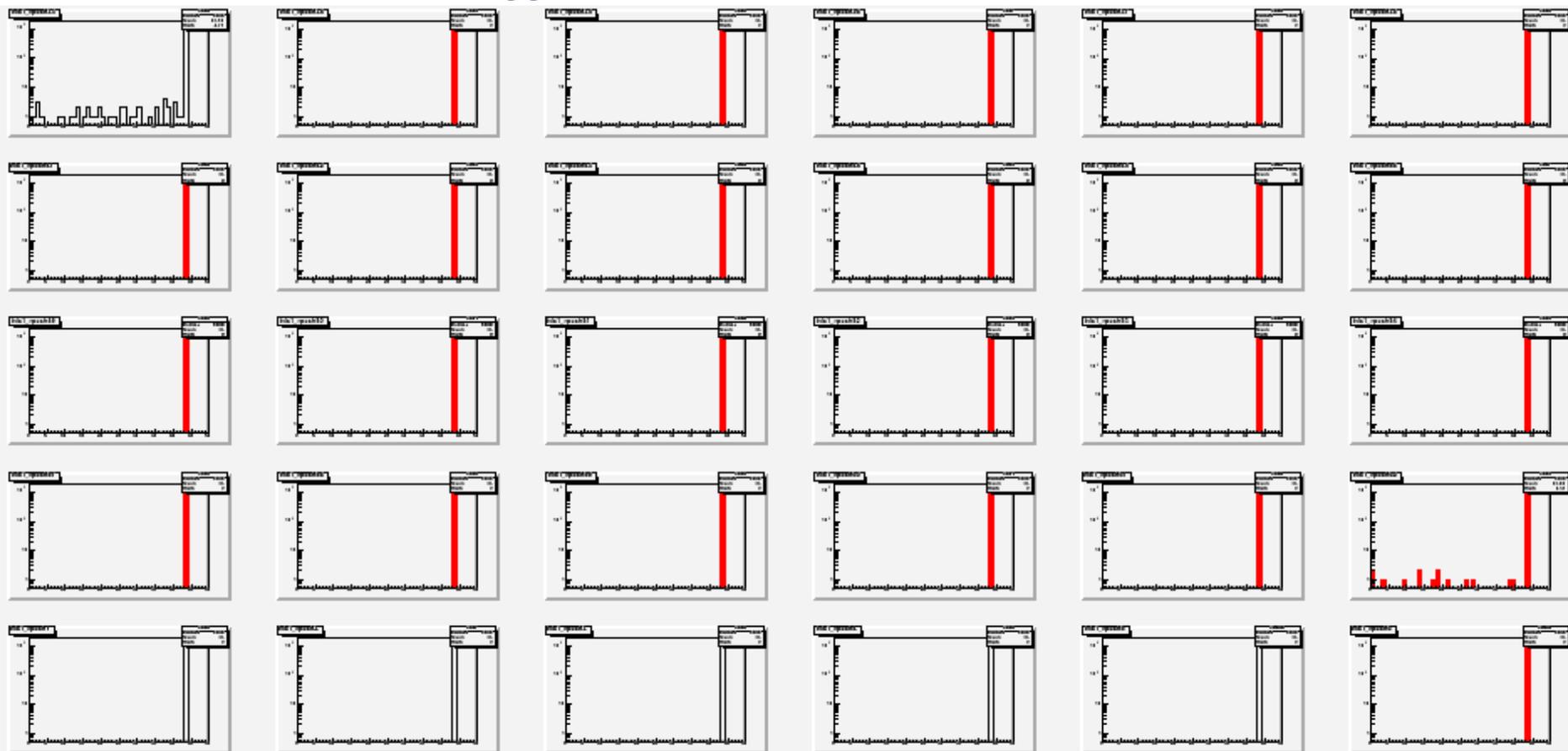
ILLINOIS
UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN



- Completed connection of gas lines from distribution panels to $\frac{1}{2}$ octants
 - During Run-10, flow humidified nitrogen into $\frac{1}{2}$ octants
 - No gas leakage, good impedance matching among modules
 - ❖ Require hard piping for exhaust line for mixed gas
 - Will be done next access (?)
- Installed H.V distribution boxes in Tunnel
 - ✓ Need to install H.V power supply crate at electronics rack
 - ✓ Need to connect H.V cables from H.V power supplies to H.V distribution boxes and from H.V distribution boxes to $\frac{1}{2}$ octants (H.V cables are all in hand)



- Completed Signal and L.V cable installation for 6 ½ octants
 - Installation for other ½ octants will be done next three accesses
 - ✓ Tested connections for electronics (FEEs ↔ TDCs ↔ Local DAQs)
- Chi will install and test Trigger boards next week



- Take cosmic ray data during the last 2 weeks of Run-10 with MuTr and MuID
 - 11 GeV runs from May 25th to June 6th
 - Check detector performance (e.g. full electronics readout chain, H.V stability, dark current, noise rate, ground, cosmic ray background, etc.)

January							February							March						
Su	Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa
					1	2		1	2	3	4	5	6		1	2	3	4	5	6
3	4	5	6	7	8	9	7	8	9	10	11	12	13	7	8	9	10	11	12	13
10	11	12	13	14	15	16	14	15	16	17	18	19	20	14	15	16	17	18	19	20
17	18	19	20	21	22	23	21	22	23	24	25	26	27	21	22	23	24	25	26	27
24	25	26	27	28	29	30	28							28	29	30	31			
31																				

April							May							June						
Su	Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa
				1	2	3						1			1	2	3	4	5	
4	5	6	7	8	9	10	2	3	4	5	6	7	8	6	7	8	9	10	11	12
11	12	13	14	15	16	17	9	10	11	12	13	14	15	13	14	15	16	17	18	19
18	19	20	21	22	23	24	16	17	18	19	20	21	22	20	21	22	23	24	25	26
25	26	27	28	29	30		23	24	25	26	27	28	29	27	28	29	30			
							30	31												

10 weeks @ 200 GeV
 4 weeks @ 62 GeV
 1.5 weeks @ 39 GeV
 0.5 weeks @ 2/3 study
 4 weeks @ 7 GeV
 2 weeks @ 11 GeV
 0.5 weeks @ 5 GeV study

- Take cosmic ray data during the last 2 weeks of Run-10 with MuTr and MuID
 - 11 GeV runs from May 25th to June 6th (Julia told me that TOF.W will be off)
 - Check detector performance (e.g. full electronics readout chain, H.V stability, dark current, noise rate, ground, cosmic ray background, etc.)
- 1. We want to have Freon gas to RPCs to check H.V connections when all H.V cables connected (by May 5th)
 - Noise rate and dark current
- 2. After H.V test, need to flow mixed gas as soon as available
 - Idea: using TOF.W gas system
 - a. TOF.W H.V off and taking over TOF.W gas system for RPCs
 - Can be operated up to 8 ½ octants
 - b. TOF.W H.V off and taking over TOF.W gas system for RPCs + install RPC mass flow controllers (Rob asked quotation)
 - Can be operated full ½ octants
- ◆ This commissioning will give us enough experience to save time for RPC-3 South integration and commissioning → will be ready to take data from RPCs at both Muon Arms for Run-11

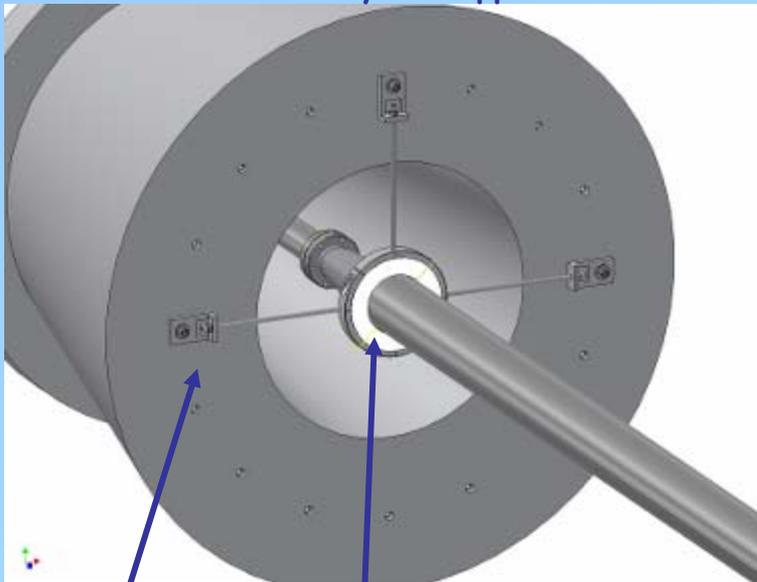
2010 Tasks

Start Date End Date

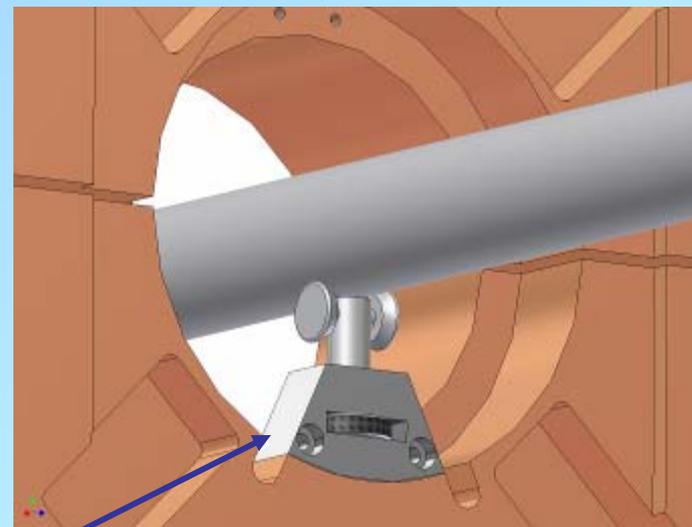
Run 10	In progress	6/21
VTX Installation Plan (Final)	In progress	5/31
RPC3S Installation Plan (Final)	In progress	5/31
Receive New Beampipe	Done	Done
Design Beam pipe supports	Done	Done
Update RPC3 N design for RPC3 S	Done	Done
Design support structure, alignment scheme for VTX	In progress	3/31
Specify and procure electronics racks and support equipment for VTX	In progress	5/31
Fabricate beam pipe supports	In progress	5/1
Beampipe NEG coating (CERN)	4/15?	5/31?
Fabricate/procure parts for RPC3 S installation	In progress	5/1
Fabricate/procure parts for VTX installation	In progress	6/1
End of run 10	6/23	6/23
End of Run Party	~6/25	~6/25
Prep IR for shutdown	6/1	7/1
Complete unfinished business for MuTrgr FEE & RPC3 North	6/23	8/1
Install Beam pipe	7/1	9/1
Install VTX	8/1	11/1
Install RPC3 South	6/23	11/1
2010 Shutdown Other Tasks	6/23	12/1

TECHNICAL SUPPORT 2010

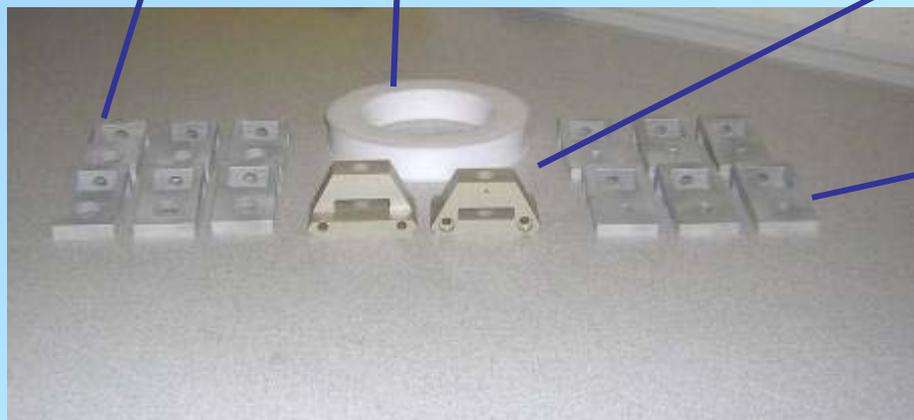
South BBC Cavity BP support



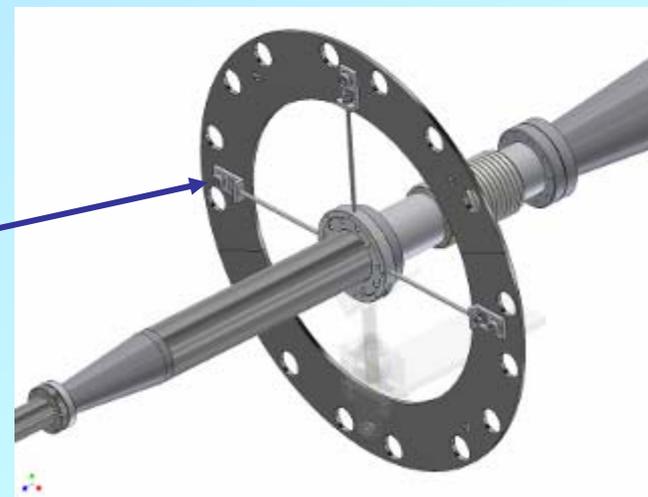
CM central BP supports (2 req'd)



TECHNICAL SUPPORT NO-0

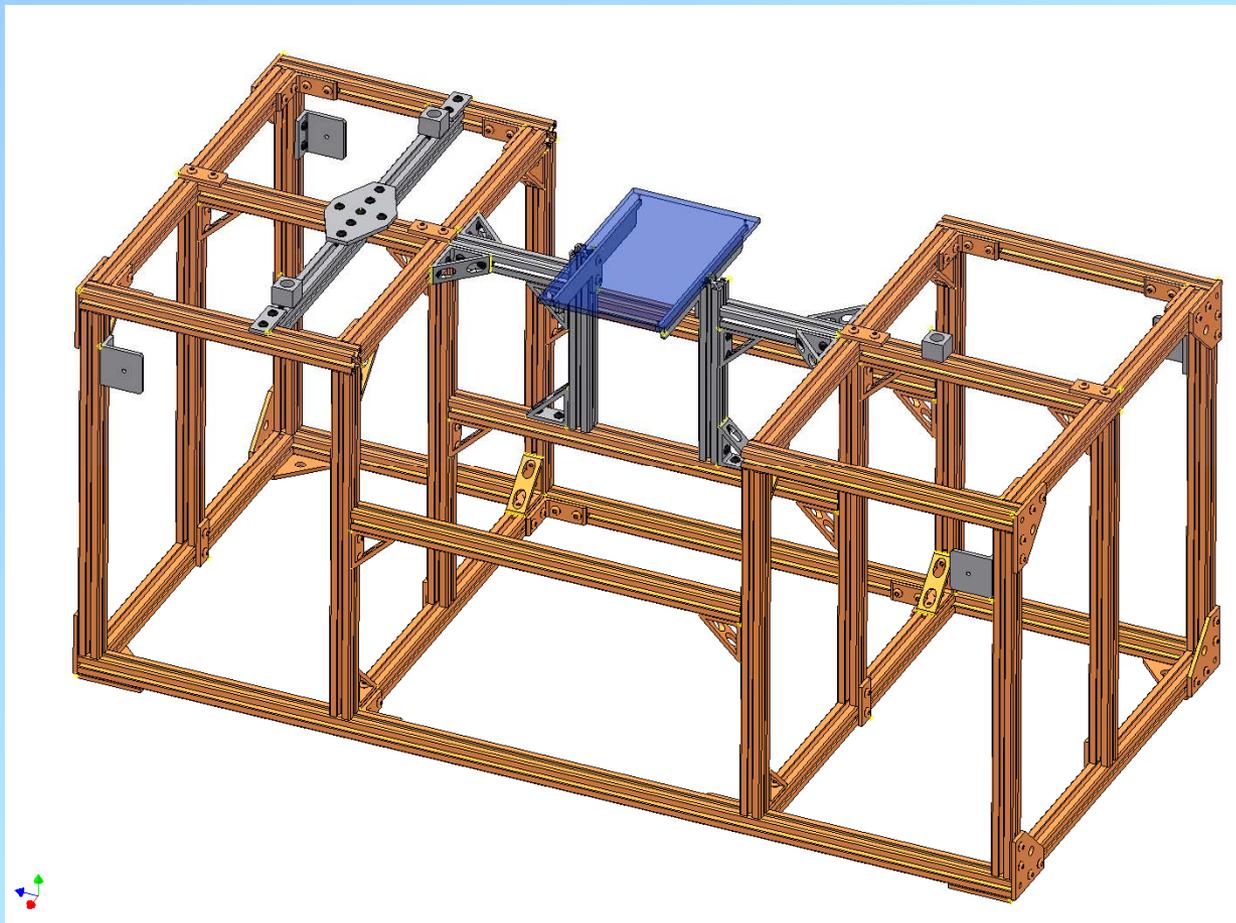


BP support components from CS



North MPC Cavity BP support

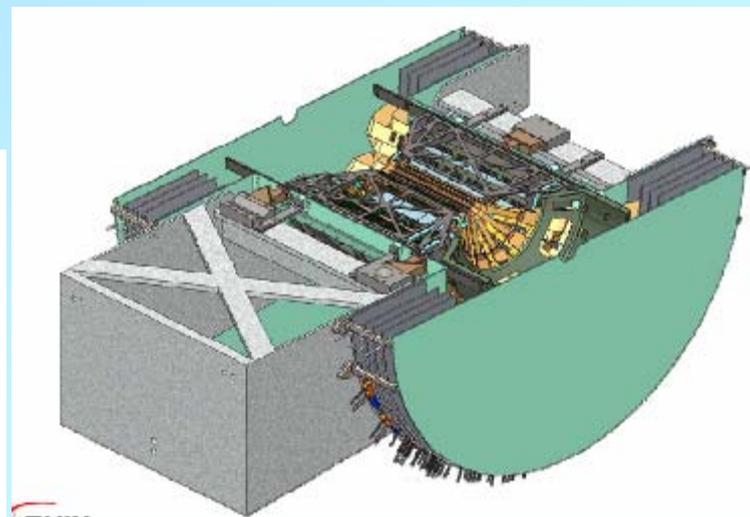
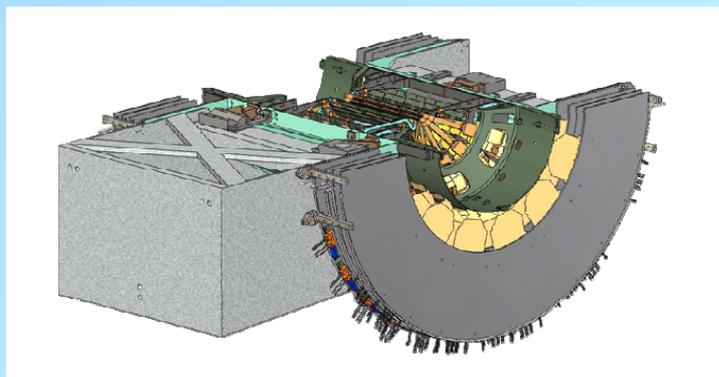
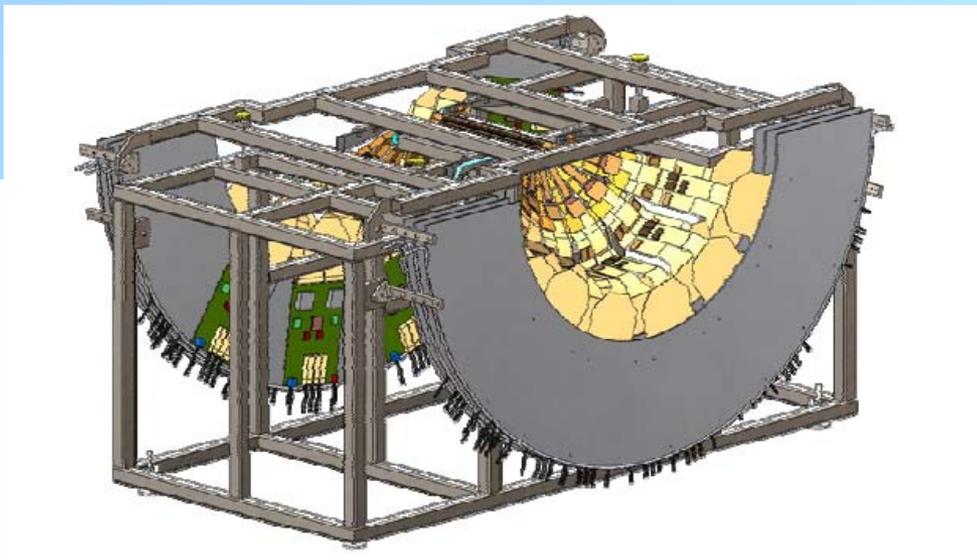
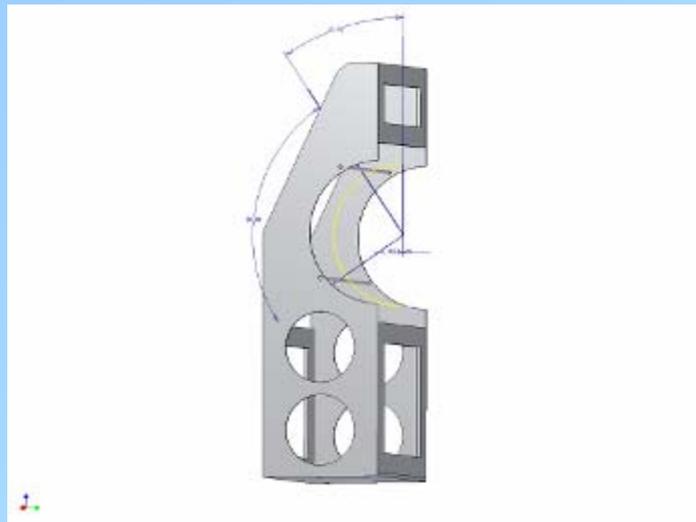
VTX Assembly Fixture (3 others are similar)

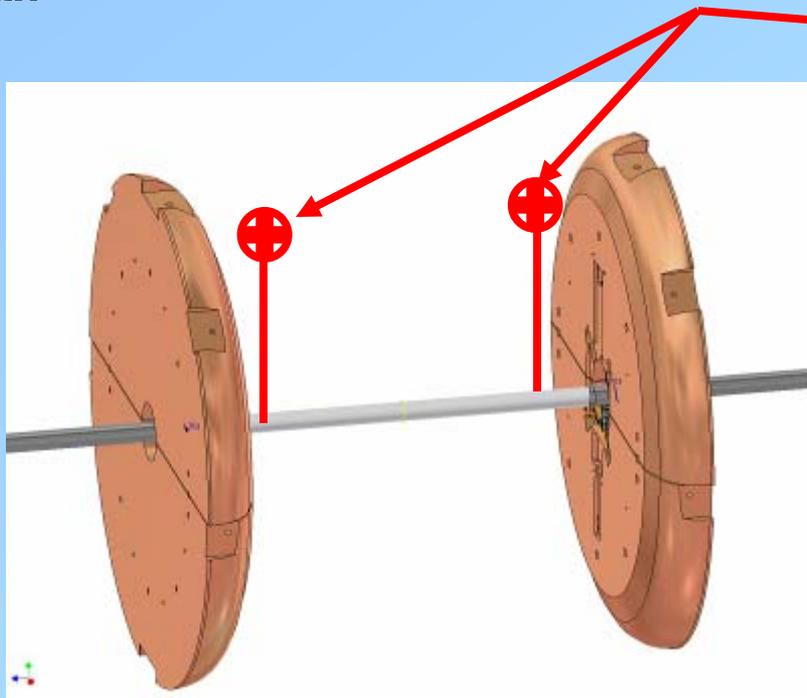


TECHNICAL SUPPORT NO-0

VTX Support Structure Base
Assembly Design In Progress
Fixtures being re-designed at
PHENIX

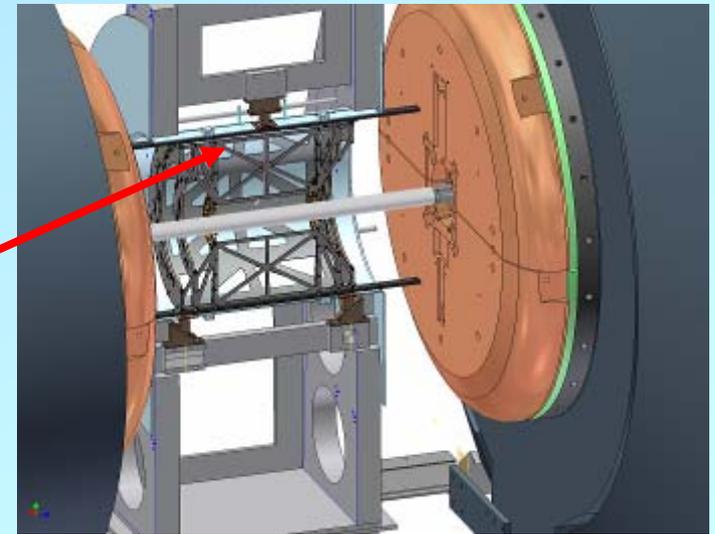
TECHNICAL SUPPORT NO-0



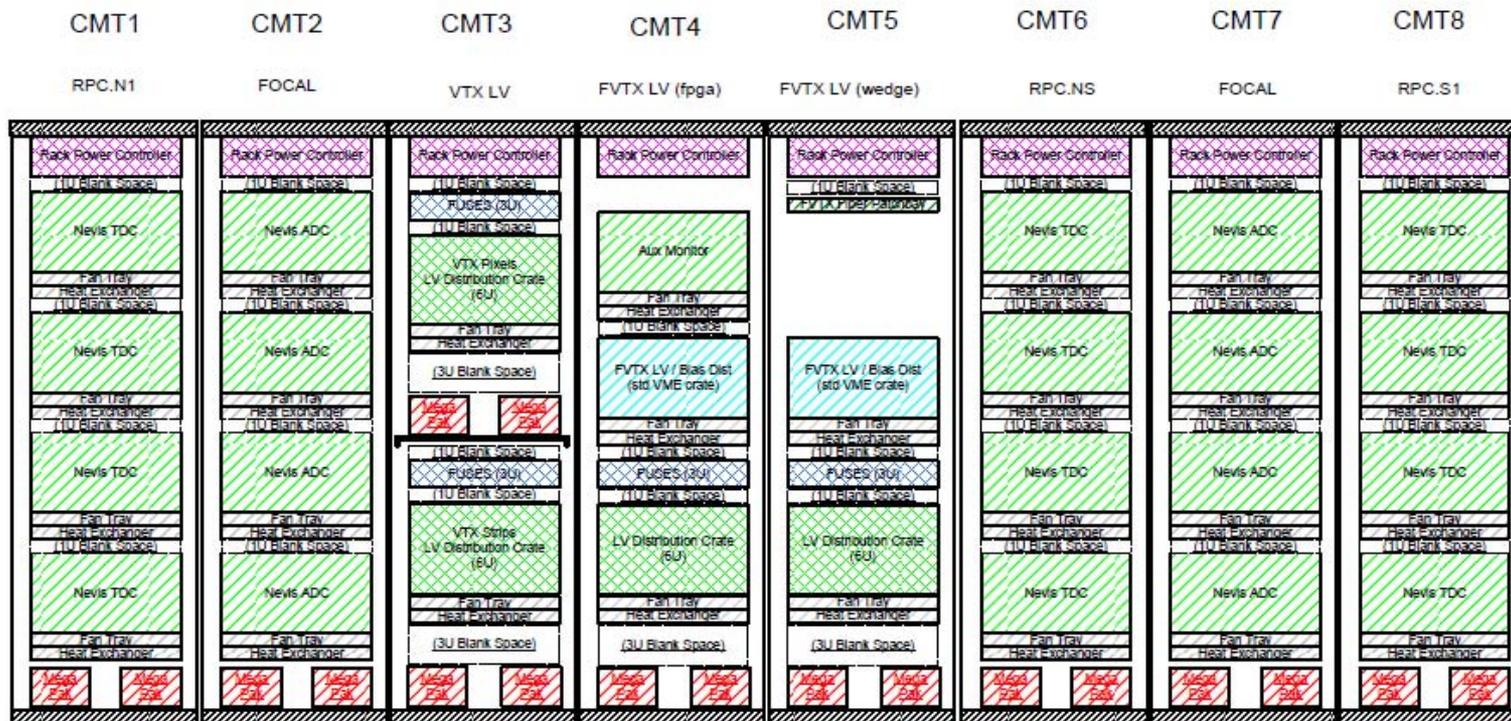


Survey Targets and fixtures TBD
Must be able to align BP to req'd
radial and angular accuracy
without VTX and with VTX in
clamshells open configuration.

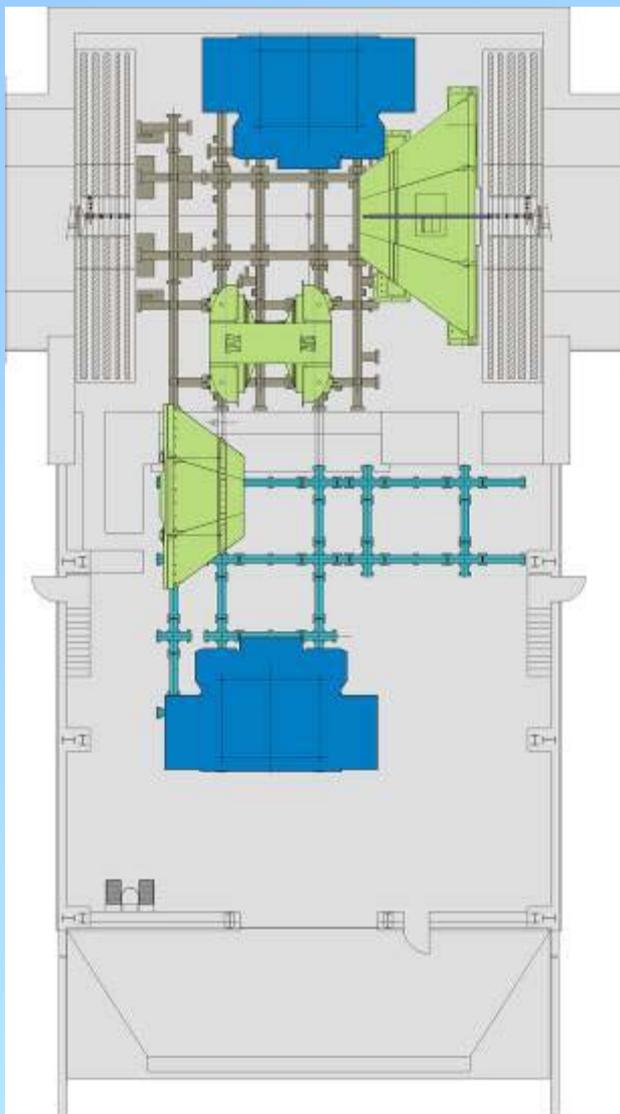
$\frac{1}{2}$ of VTX
detector support
structure



PHENIX Bridge Racks



S. Boose
3/26/2010

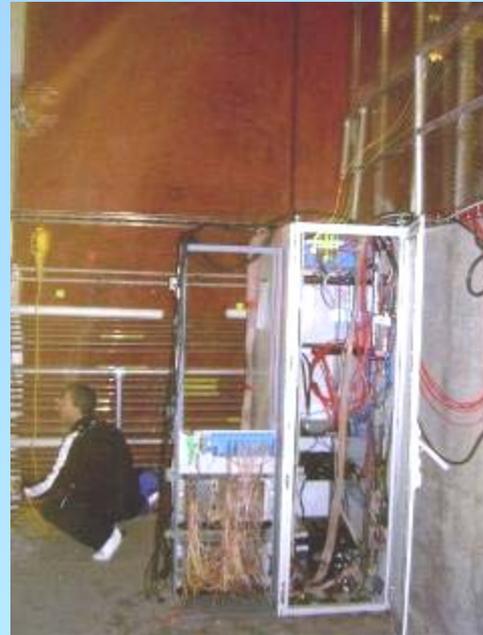


Major PHENIX Components during shutdown when Old beampipe is out and new beampipe is ready to go in. Approximately last week in July.

This is the optimal point for DC, MuTr Station 1, and/or RPC absorber work. Potential work in these areas is still under review by PM.

Note: Absorber installation to be done during this period. MuTr station 1 work shall be limited to work in situ (i.e. station 1 will not be removed). Similarly DC/PC1 work will be limited to work which can be accomplished with the DC in situ, although, if requested, it may be possible to translate the DC on its mounting rails to allow limited access to DC/PC1 electronics.

TECHNICAL SUPPORT NO-0



New Beampipe Pre-Shutdown Prep

TECHNICAL SUPPORT NO-0

<u>Task</u>	<u>Due By</u>	<u>NOTES</u>
Design central beam pipe and new transition sections	Done	
Order beampipe	Done	Brush Wellman
Order new design transitions	Done	CAD
Order replacements for existing transitions and spools	Done	CS
Conceptual and mechanical design beampipe supports	Done	Done
Beampipe fabrication	Done	Done
Receive bp and all beampipe sections	Done	CAD
Beampipe Installation Review (Preliminary)	Done	Done
Bp and sections acceptance tests and inspection	In Progress	
Send beampipe to CERN for NEG Coating	4/15/2010?	
Fabricate beampipe supports	5/31/2010	In Progress
Receive bp back at BNL	5/31/2010?	May be delayed
Memorial Day: Lab Holiday	5/31/2010	Enjoy the weekend
Choreograph removal of old beampipe and installation of new (final)	6/1/2010	
Final acceptance and inspection bp and sections	6/15/2010	
Test and inspect beampipe supports	6/15/2010	
Beampipe Installation Review (Final)	6/15/2010	

VTX Subassembly, Top Assembly, Installation and Integration Prep

TECHNICAL SUPPORT NO-0

<u>Task</u>	<u>Due By</u>	<u>NOTES</u>
Design assembly workspace, tools and fixtures	Done	Fixtures designed by PHENIX →
Fabricate/prepare assembly workspace, tools and fixtures	Done	Fixtures designed by PHENIX Done →
Receive, inspect, test, rework and qualify assembly tools and fixtures	Done	Fixtures designed by PHENIX Done →
Design assembly workspace, tools and fixtures	Done	VTX Group →
Fabricate assembly workspace, tools and fixtures	Done	(PHENIX) →
Conceptual and mechanical design of installation, structural support and detector alignment	4/2/2010	In Progress →
Installation Review (ESRC)	~4/15/2010	After analyses done →
Beampipe & VTX Installation Work Permits	5/31/2010	→
Memorial Day: Lab Holiday	5/31/2010	Enjoy the weekend →
Subassemblies complete ready for integration into hemispheres	6/30/2010	→
Receive, inspect, test, rework and qualify assembly tools and fixtures, electronics racks and support	6/30/2010	VTX Group →
Fabricate/procure detail components for installation, support and alignment, including station 1 work platforms	6/30/2010	→
Design & fabricate fixtures, techniques and mockups for installation and alignment	6/30/2010	→
4 th of July Holiday	7/5-7/6/2010	Enjoy the long weekend →
Receive & inspect components (installation, support & alignment)	7/15/2010	→
Assemble Hemispheres	7/15/2010	→
Mock installations/alignments, bench tests	7/31/2010	↓

4/8/2010

RPC3 Pre Shutdown Prep

TUESDAY
 WEDNESDAY
 THURSDAY
 FRIDAY
 SATURDAY
 SUNDAY

<u>Task</u>	<u>Due By</u>	<u>NOTES</u>
Review RPC3 North for Lessons Learned	Done	
Make a list of all purchased and fabricated parts	Done	
Place order for CS fabricated parts	Done	
Implement design improvements for RPC3 South	Done	
Receive and inspect 1/2-octant shells	Done	Pre-survey in progress
Order raw materials for PHENIX fabricated parts	4/15/2010	In Progress
Order purchased parts for RPC3 South	4/15/2010	In Progress
Prepare Installation Plan	4/30/2010	In Progress
pre-survey 1/2 octant shells	Done	Done
Fabricate PHENIX parts	5/14/2010	In Progress
Receive and inspect CS fabricated parts	5/28/2010	In Progress
Memorial Day: Lab Holiday	5/31/2010	Enjoy the weekend
Prepare work permit for installation	6/1/2010	
Receive purchased parts	6/4/2010	
Assemble, test and burn-in 1/2 octants	6/18/2010	In progress
Pre-Assemble base components at PHENIX	6/18/2010	

Start of Shutdown

TECHNICAL SUPPORT NO-0

<u>Task</u>	<u>Due By</u>	<u>NOTES</u>
DAQ Tests	6/4/2010	
Purge Gas From Detectors	6/8/2010	
Remove BP Collar	6/22/2010	As early as possible after 6/1
Move MMS south	6/22/2010	As early as possible after 6/1
Prep EC for move to EC	6/22/2010	As early as possible after 6/1
End of Run 10	6/23/2010	
EOR Party	~6/25/2010	
Close North and South BP gate valves and lock closed for until new BP is installed	6/24/2010	
Open and disassemble wall	6/24/2010	
Remove EC ladder and fold platforms	6/30/2010	→
Move EC to AH	6/28/2010	→
Install cart	6/28/2010	→
Move Collars to AH	6/30/2010	→
Install decking	6/30/2010	→
Install Manlift	6/30/2010	→
Remove RPC2 Prototype, support brackets, cabling & Piping	6/29/2010	→
Remove MMS east vertical lampshade	6/30/2010	→ If Necessary (permit needed)

Beampipe De-installation

TECHNICAL SUPPORT 2010

<u>Task</u>	<u>Due By</u>	<u>NOTES</u>
4th of July Holiday & Floating Holiday	7/5&7/6/2010	Enjoy
Remove HBD's and HBD cables Remove RXNP's and cables	7/9/2010	Concurrent with Start of shutdown tasks
Remove MPC's	7/16/2010	Concurrent w MPC's
Remove BBC's	7/16/2010	Concurrent with BBC's
Position MMS for Vacuum break	7/19/2010	
Install Temporary supports for old BP	7/19/2010	Supports TBD
Break vacuum on north side of MMS	7/19/2010	
Remove south bellows	7/19/2010	
Move MMS north, remove spool and south3-5 transition	7/20/2010	
Move the MMS south & Prep MMS for move to AH	7/23/2010	Begin MMS prep with shutdown start
Move CM south, remove north bellows	7/23/2010	
Move old Be bp south into MMS and move CM north	7/23/2010	
Move MMS to shutdown park position	7/23/2010	
Remove old Be BP	7/23/2010	
Move CM south and east	7/23/2010	
Remove north 3 to 5 transition	7/23/2010	

4/8/2010

New Beampipe installation

PHENIX

TECHNICAL SUPPORT NO-0

<u>Task</u>	<u>Due By</u>	<u>NOTES</u>
Prepare north 3 to 5 transition for installation with roller guides, bakeout wrap and thermocouples	7/23/2010	CAD
Prep CM North and South for Absorber and install	8/13/2010	(Install if absorber rec'd)
Install north 3 to 5 transition in MMN	8/13/2010	
Install new Be pipe in CM on temp supports	8/17/2010	
Move CM back to beamline & connect new Be BP to 1-5/8 transition and bellows and north 3-5 transition	8/17/2010	
Move CM to run position	8/18/2010	
Prealign Be/Alum pipe with transitions attached on new BP supports At MPC north, BBC south and north nosecone	8/19/2010	
Prepare south 3 to 5 transition for installation with roller guides, bakeout wrap and thermocouples	8/19/2010	
Install south 3 to 5 transition, bellows and 1-5/8 to 3" transition in MMS	8/20/2010	
Move MMS back into IR on beamline	8/20/2010	
Move CM south, slide Transition assembly in MMS north and connect to new Be BP	8/20/2010	
Move CM and MMS north and install south spool. Leak check. Move MMS South	8/27/2010	
Install temporary bakeout supports	8/27/2010	
Install bakeout blankets and monitoring	8/27/2010	
Labor Day Lab Holiday	9/6/2010	Enjoy
Bakeout New BP and activate NEG coating	9/10/2010	How Long?
Leak check BP	9/10/2010	
Re-install MPC's including Cables and services Re-install BBC's including Cables and services	9/24/2010	Concurrent efforts
Move CM to run position	9/24/2010	
Final alignment of new BP	10/1/2010	

4/8/2010

VTX Installation, VTX Services and Electronics



TECHNICAL SUPPORT NO-0

<u>Task</u>	<u>Due By</u>	<u>NOTES</u>
Install and align VTX rail attachment hardware to CM	10/1/2010	Install during bakeout? →
Install and align VTX rails parallel to beam line	10/8/2010	→
Install and align VTX rails perpendicular to beam line	10/8/2010	→
Install and align west half detector module	10/15/2010	→
Install and align east half detector module	10/22/2010	→
Thanksgiving and Black Friday Holiday	11/25 & 11/26/2010	Enjoy
Install mechanical support structures for VTX services and electronics	10/29/2010	Concurrent Effort →
Install Cable trays	10/29/2010	→
Install racks	10/29/2010	→
Install chiller	10/29/2010	→
Install cables, plumbing	10/29/2010	→
Connect cables and plumbing	10/29/2010	V →
Test and commission	12/1/2010	↓

RPC3 South Prep, Early Shutdown



TECHNICAL SUPPORT NO-0

<u>Task</u>	<u>Due By</u>	<u>NOTES</u>
Remove wiring, walkovers, FCAL and scintillator hardware that would otherwise interfere with installation	7/2/2010	PHENIX →
4th of July Holiday	7/5 & 7/6/2010	Enjoy →
Remove/relocate shielding	7/9/2010	Riggers →
Remove crystal palace & vapor barrier	7/16/2010	CAD →
Inspect Gap 5 south for legacy items/problems	7/23/2010	→
Address legacy items/problems as convenient prior to shutdown start	7/30/2010	→
Install lighting & relocate sensors as necessary	8/6/2010	Electrician →
Temporarily relocate, re-position or otherwise address interfering piping, cable trays	8/20/2010	PHENIX (w/ CAD Help?), Electrician →
Remove RPC prototype	8/20/2010	→
Pre-survey ½ octant reference points	8/27/2010	Surveyors →
Drill and tap ½ octant and rotating piston mounting points	8/31/2010	→
Build/install access and work platforms for walk on top of MuID steel including stairs from MMS eyebrow	8/31/2010	Carpenters →
Final cleaning and prep of gap 5 for grouting	9/3/2010	→
Labor Day Lab Holiday	9/6/2010	Enjoy →
Pre-installation orientation meeting with masons and riggers	9/7/2010	→
Position lifting equipment in tunnel	9/10/2010	Riggers →
Move east and west base structures into south tunnel and assemble on east and west sides of pedestal respectively. Include translation control fixtures	9/10/2010	Riggers & PHENIX techs →

RPC3 South Installation



TECHNICAL SUPPORT NO-0

<u>Task</u>	<u>Due By</u>	<u>NOTES</u>
Install and align base structures on east and west sides of gap 5	9/14/2010	
Prepare for grouting	9/15/2010	
Install grout	9/16/2010	
Install pitch control rails on pedestal and gap 5 east & west inner walls	9/17/2010	
Install upper suspension support hardware	9/17/2010	
Install $\frac{1}{2}$ octants, 2 at a time in accordance with work plan/work permit		
<i>Transport $\frac{1}{2}$ octants 2 at a time from RPC factory to south tunnel on angled transport carts</i>		
<i>Transfer $\frac{1}{2}$ octants from angled transport carts one at a time to temporary free standing and re-orienting roller fixture (fore and aft wheels and axel)</i>		
<i>Lift (and re-orient if appropriate) $\frac{1}{2}$ octant and install into base structure, previously installed $\frac{1}{2}$ octant or upper suspension hardware as appropriate per work plan</i>		
<i>Pre-align each $\frac{1}{2}$ octant as installed</i>		
<i>Perform electrical integrity tests before proceeding to next pair of $\frac{1}{2}$ octants</i>		
<i>After all $\frac{1}{2}$ octants are in place and tested, join east and west halves of full south station 3 detector and align to survey markers</i>	10/15/2010	Riggers & PHENIX Techs

RPC3 South Integration

TECHNICAL SUPPORT NOTES

<u>Task</u>	<u>Due By</u>	<u>NOTES</u>
Final survey	10/22/2010	Surveyors
Install new cable trays and piping supports	10/29/2010	Electrician, earlier if possible
Re-install MuID wiring and pipes	11/5/2010	
Re-install MuID gas rack	11/30/2010	
Install south thermal/vapor barrier	11/19/2010	CAD
Thanksgiving and Black Friday Holiday	11/25 & 11/26/2010	Enjoy
Re-install shielding	11/30/2010	Riggers
Commissioning and final acceptance tests	11/30/2010	RPC Group
Install RPC3 HV, LV and signal wiring and gas lines	11/30/2010	
Install RPC3 South gas distribution rack	11/30/2010	
Install RPC3 South environmental controls (heaters and thermostats)	11/30/2010	Electrician

Shutdown 2010 Other Work

TECHNICAL SUPPORT NO-0

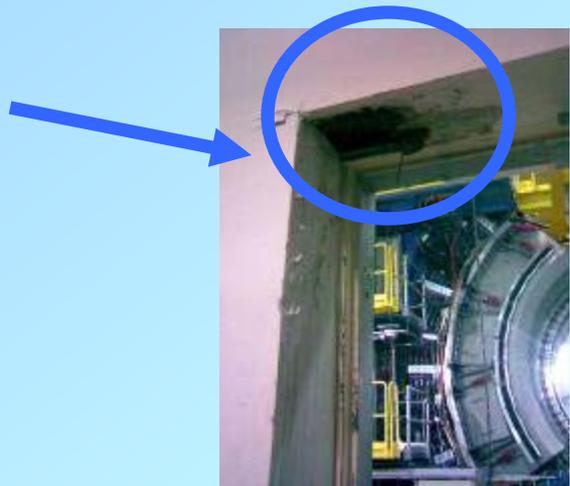
<u>Task</u>	<u>Due By</u>	<u>NOTES</u>
RPC3 North unfinished business	7/15/2010	Electronics and cabling, grounding issues, environmental controls
MuTrigger FEE unfinished business	7/15/2010	MMS cable trays, →
RHIC Summer Sunday Tour	8/15/2010	During bakeout →
Other subsystem maintenance and repair	11/1/2010	TBD →
Gas System maintenance, repair, upgrade	11/1/2010	→
Bridge Electrical support upgrade	11/1/2010	Support for 4 full racks in 2010, 4 more (8 total) in future →
PHENIX Infrastructure maintenance, repair, upgrade	11/1/2010	TBD →
DC/PC maintenance/repair	11/15/2010	FEM and wire troubleshooting and repairs, major efforts will require longer shutdon →
Thanksgiving and Black Friday Holiday	11/25 & 11/26/2010	Enjoy
Rack Room upgrade	11/30/2010	TBD →
Future upgrade support	11/30/2010	RPC1, RPC absorbers, FVTX, FOcal, other TBD →
Prepare for Run 11	11/30/2010	Normal end of shutdown tasks, typically taking 3-4 weeks
Run 11 Start	12/1/2010	
End of Shutdown Party	~12/3/2010	

4/8/2010

2009 Building Maintenance Issues

TECHNICAL SUPPORT NO-0

- Roof leaks in utility bathroom at northwest corner behind tech offices, over door between rack room and assembly hall and over door between control room and elect. ass'y room.



- General maintenance for Trailer Offices (in progress)
- Trailer Office Modifications planning in progress (new exterior siding?)
- New roof leaks in laser room and IR (southeast corner)



- **Flooding in AH/ Driveway heaving**



PHENIX Procedure Review Current Status:

147 Procedures Identified

84 Made Inactive (not currently in use, will require revision to re- activate if and when necessary, available for reference purposes)

10 CAD procedures relevant to PHENIX, all are current and up-to- date.
(CAD web access to these documents is not up to date)

42 PHENIX approved procedures.

1 is currently under review
41 are current and up-to-date

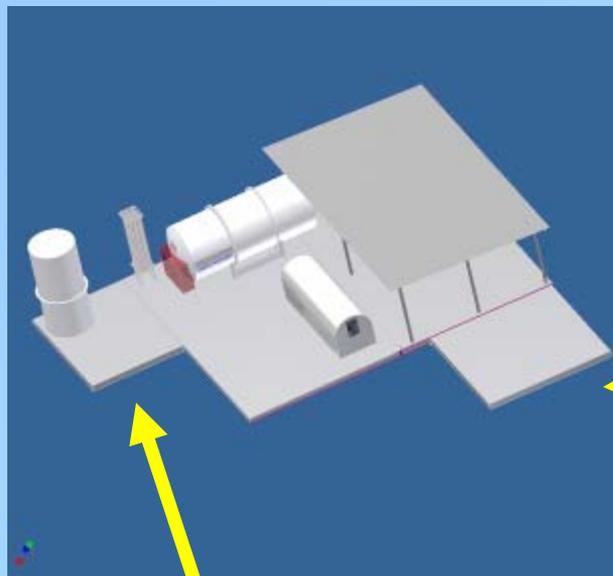
11 Proposed/Draft Procedures (never previously formalized)

Web retrieval of latest procedures now available from PHENIX Internal:

http://www.phenix.bnl.gov/WWW/INTEGRATION/ME&Integration/DRL_procedures.htm

Nothing new to report this week.

New Argon Dewar and Empty Gas Bottle Storage Area



Pad for Empty Gas Bottles



Pad for argon Dewar

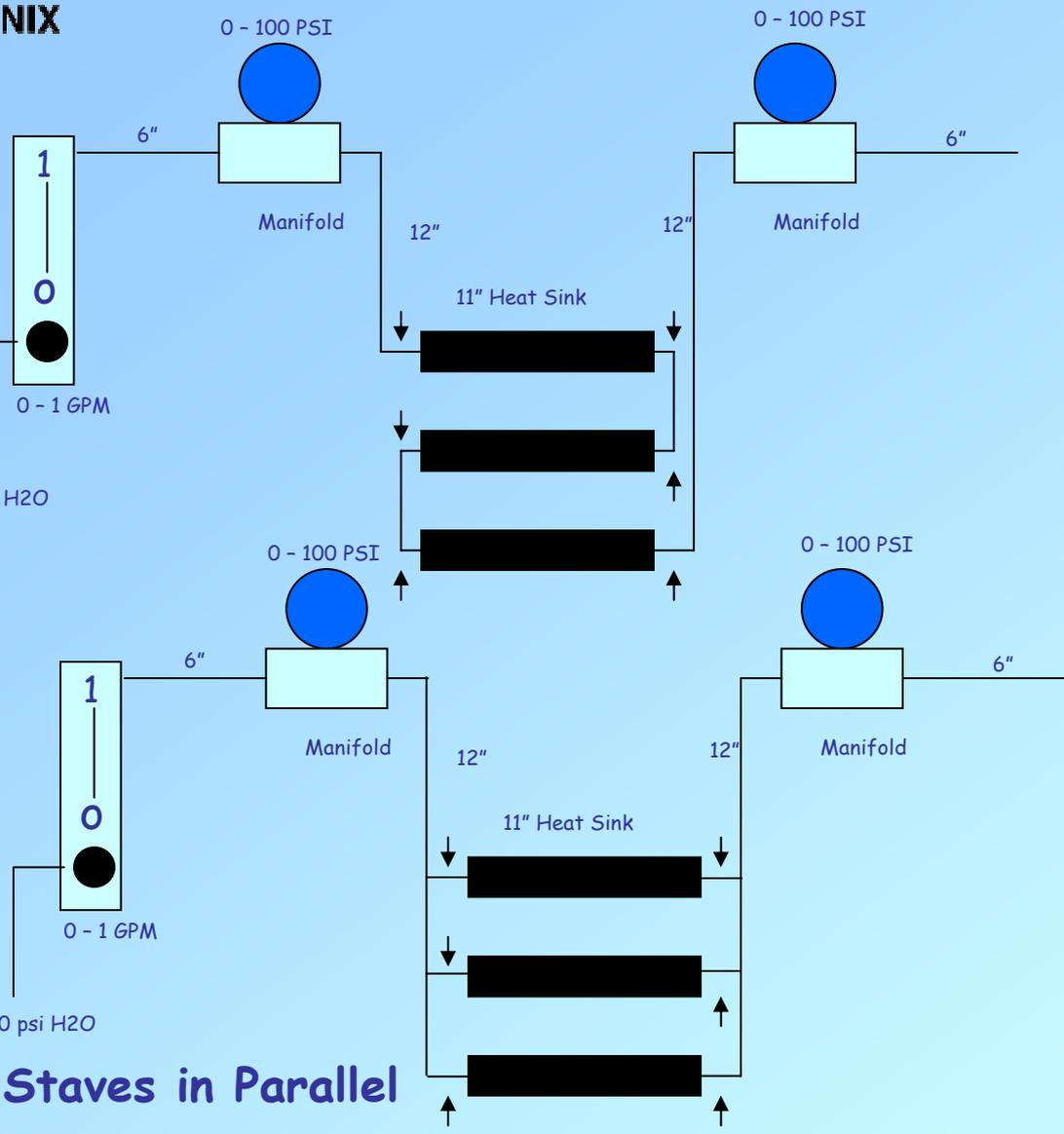


PO for material to fill cracks is in progress. PO for Ar Dewar installation and rental is in progress

BNL Tests: 3 Staves in Series



TECHNICAL SUPPORT NO. 3



3 Staves in Parallel

4/8/2010

↓ = Choke Point

Tests indicate that the choke points in the system are the 45 deg bends in the plastic barbed fittings on the stove heat sinks (see below)

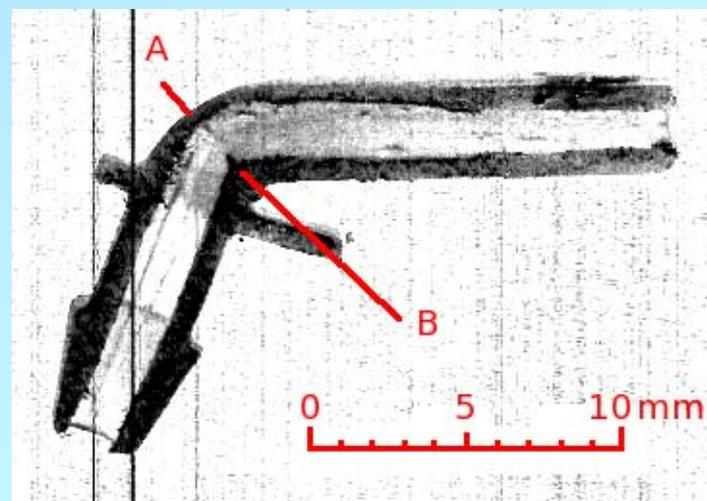
Obstruction (cross-section A - B) can't be filed or cut out very easily without doing damage to the fitting.

Barbed fitting glued to ends of carbon fiber heat sink

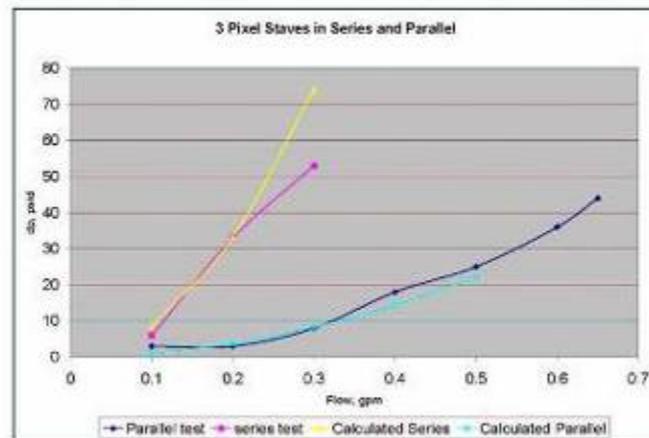
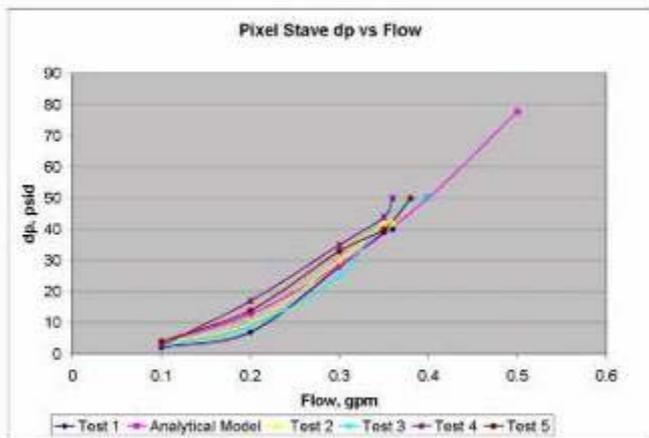


Cut away view of fitting showing choke point

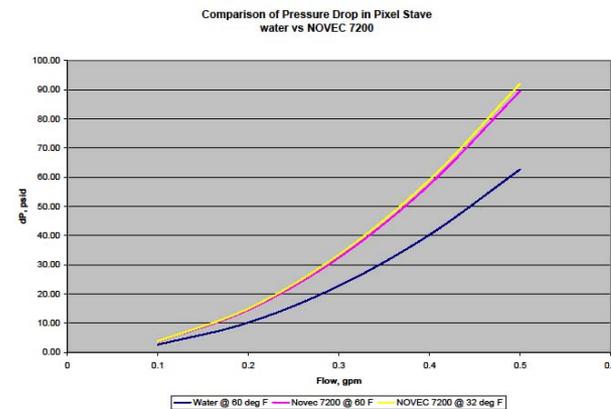
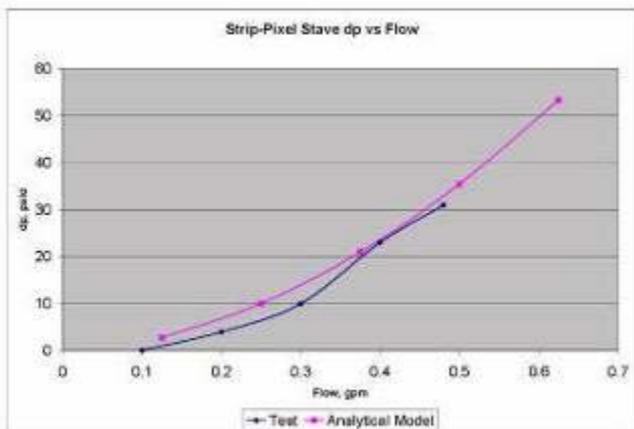
(Image courtesy of Hubert)



TECHNICAL REPORT NO-0



Test Results used to adjust pixel analytical flow model for choke point only. Strip pixel model required no adjustment.



In order to find an acceptable configuration and set of flow parameters a completely new set of flow and thermal calculations for the pixel staves, strip-pixel staves and FVTX disks 1-4 was set up.

The specifications fixed for the analyses were as follows:

Maximum inlet pressure: 20 psig

Maximum pixel sensor temperature: 20°C

Maximum strip-pixel sensor temperature: 0°C

Maximum FVTX disk sensor temperature: 20°C

Maximum pressure drop between external inlet manifold and external outlet manifold: 10 psid

Electronics heatloads

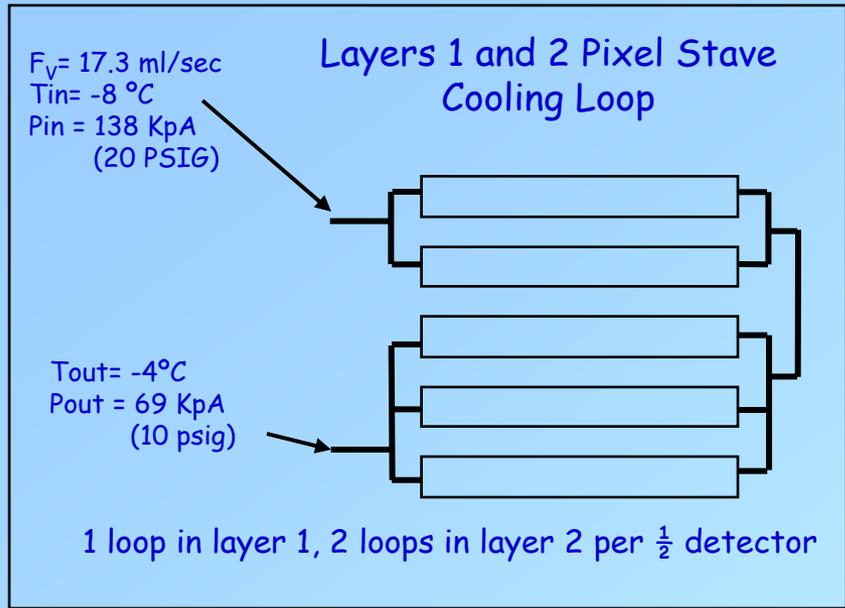
Additional input for the calculations: estimate ambient heat gain for detector is distributed among all cooling loops as a ~ 35% increase in sensor heat load. (Based on conservative ambient heat gain analysis.)

Temperature rise from cooling circuit wall temperature to sensor is derived from HYTEC thermal analyses: scaled from FEA calculation specified heat loads to tabulated (spreadsheet heatloads) and scaled again for 35% ambient load allowance described above. It is assumed that the FEA analyses

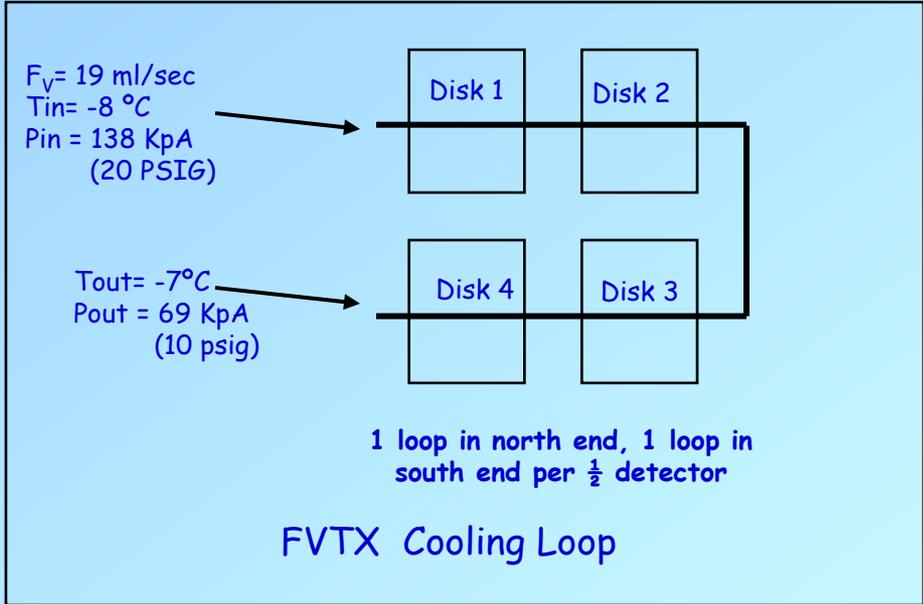
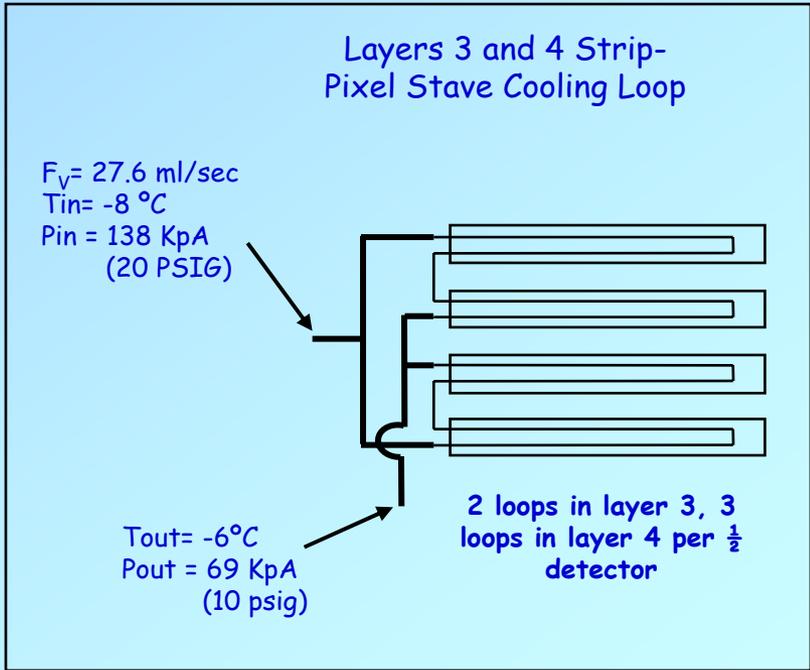
Flow calculations for FVTX based on available information in FEA, tabulating spreadsheet and flow diagrams provided by HYTEC. Calculations should be considered as design requirements for future FVTX design work to assure appropriate flow balancing.

Flow calculations were iterated until flows were balanced by pressure drop among all parallel loops and maximum exit temperatures for all loops met above requirements

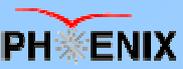
The FVTX exit flow will be channeled through an external heat exchanger to precool N2 flow to the detector gas enclosures. This will be established empirically during VTX installation and the results provided to FVTX for final thermal/flow design refinements after VTX installation this summer.



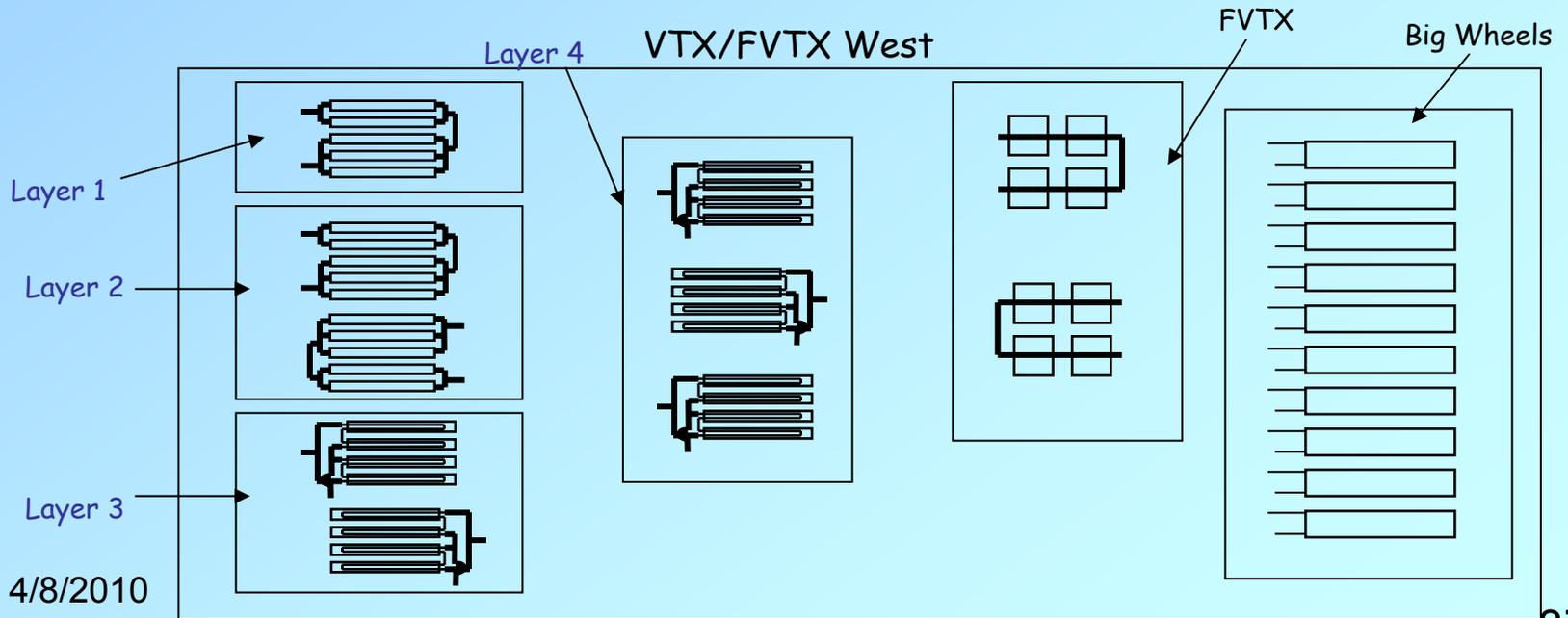
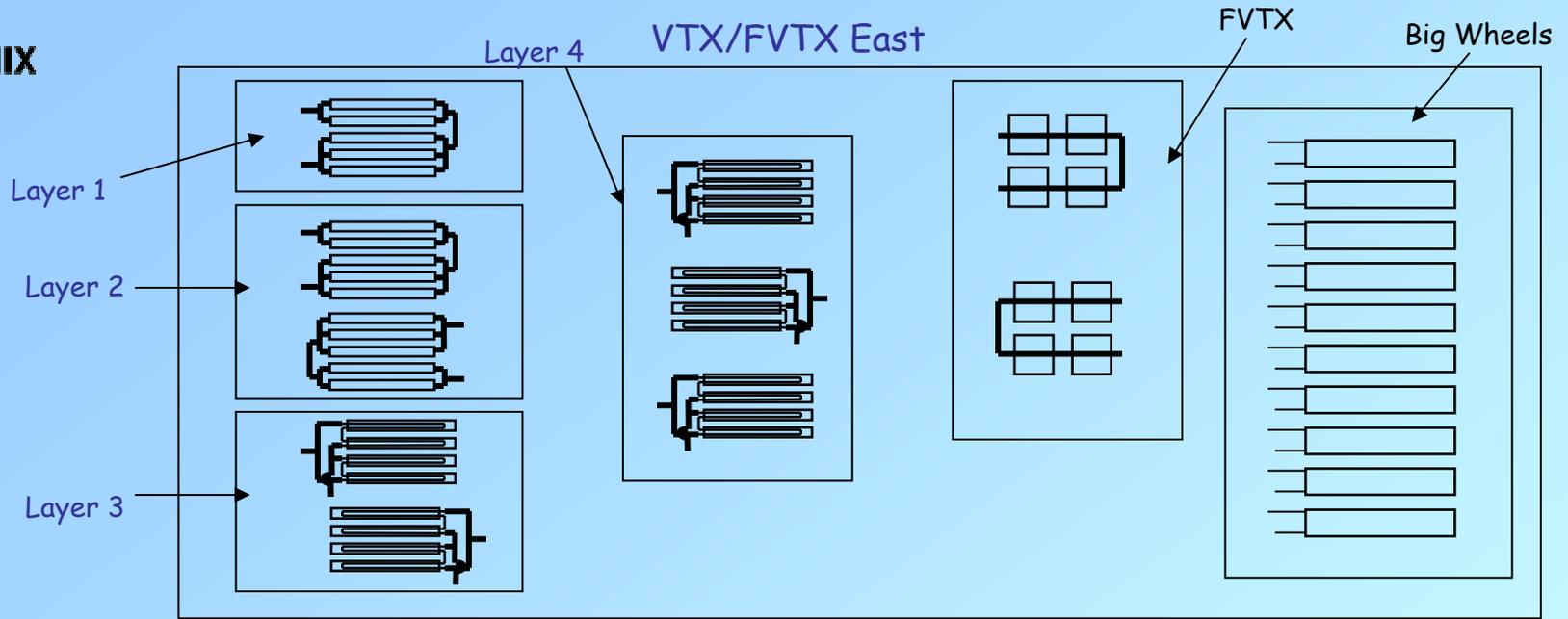
New internal loop designs which meet design requirements



Current Proposed Flow Concept



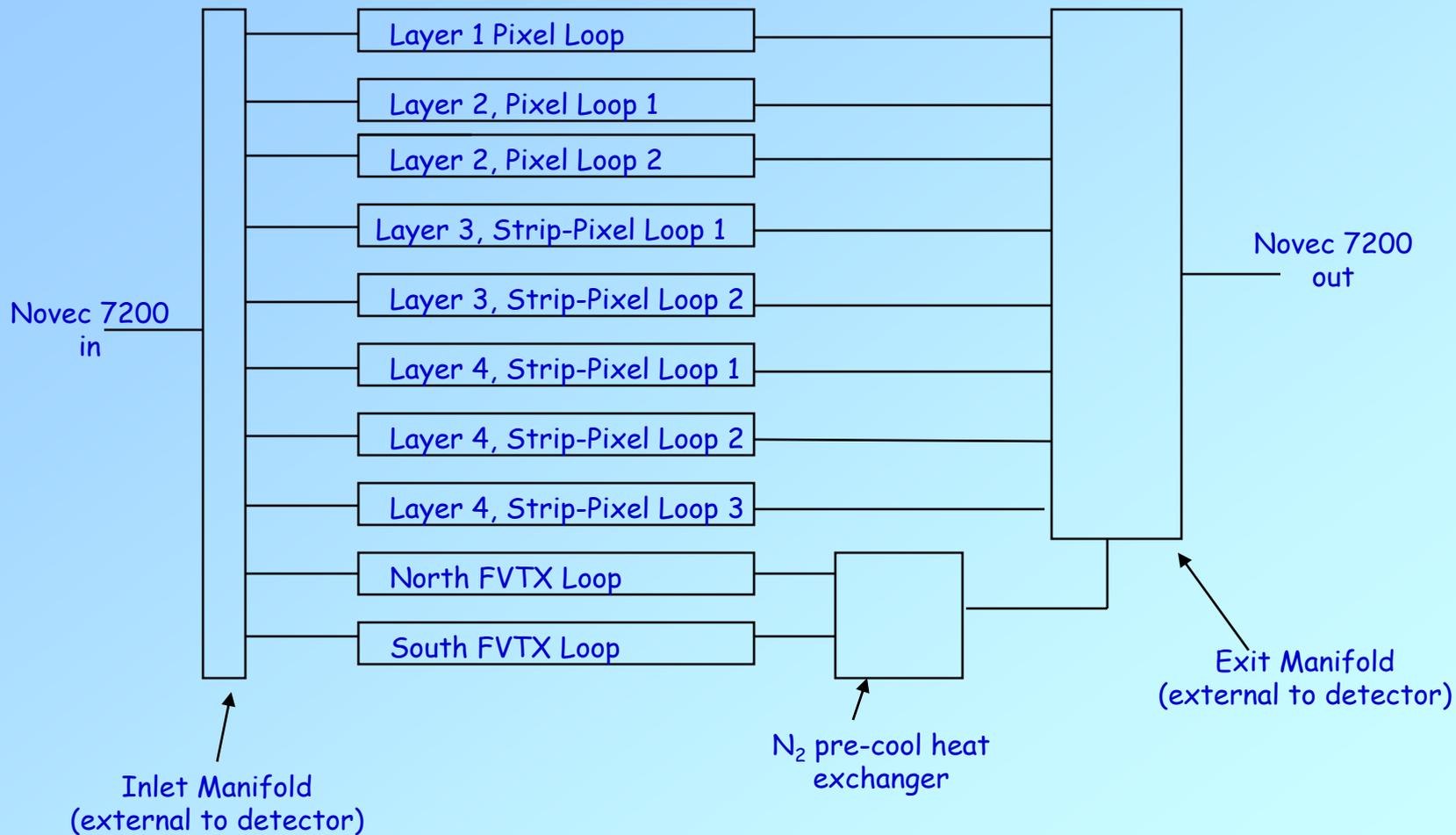
TECHNICAL SUPPORT NO-0



4/8/2010

VTX/FVTX Flow Schematic, $\frac{1}{2}$ detector

TECHNICAL SUPPORT NO-0



VTX/FVTX Thermal Calculation Summary



TECHNICAL SUPPORT 2010

Layer	Coolant	Number of loops/layer	# Circuits in parallel per loop	# of passes in series per loop	Fluid Inlet Temperature		Inlet Pressure		Flow rate in circuit		Total flow rate in loop	
					°F	°C	psig	kPa	gpm	ml/sec	gpm	ml/sec
1	Novec 7200	1	3*	2	17.5	-8.	20	137.895	0.137	8.64	0.274	17.29
2	Novec 7200	2	3*	2	17.5	-8.	20	137.895	0.137	8.64	0.274	17.29
3	Novec 7200	2	2	2	17.5	-8.	20	137.895	0.219	13.82	0.438	27.63
4	Novec 7200	3	2	2	17.5	-8.	20	137.895	0.212	13.38	0.424	26.75
FVTX	Novec 7200	2	1	4	17.5	-8.	20	137.895	0.3	18.93	0.3	18.93

Layer	Total Loop Heat Load		Fluid Outlet Temperature		Loop Pressure drop		Maximum Sensor Temperature		Notes
	BTU/hr	Watts	°F	°C	psid	kPa	°F	°C	
1	450	132	25.1	-3.9	10.0	68.9	67.1	19.5	2 circuits in 1st pass, 3 circuits in 2nd pass
2	450	132	25.1	-3.9	10.0	68.9	66.7	19.3	
3	340	100	21.1	-6.1	10.0	68.9	31.5	-0.3	
4	392	115	21.8	-5.7	10.0	68.9	32.2	0.1	
FVTX	500	146	25.2	-3.8	10*	68.9	65.8	18.8	* includes Disk 1 through 4 in series and N2 pre-cool heat exchanger

Inlet and Return Piping Calculations & Requirements

After determining internal flow requirements, the inlet and exit piping requirements were analyzed with the following results:

Flow: ~7.5 gpm

Piping length: 100 feet each, inlet and outlet

Inlet and outlet ambient heat gain: 1.4 kW (total for inlet and outlet assumes moderately insulated piping)

Pipe size: 1 inch ID

Piping pressure drop: 8.45 psid inlet and same for outlet (maximum allowed 10 psid both sides)

VTX/FVTX Chiller Requirements (not including "Big Wheels")

Coolant: Novec 7200

Flow rate: 7.5 gpm

Coolant Supply Temp.: -9°C

Coolant Supply Pressure: 30 psig

Capacity: ~4 kW

VTX/FVTX Chiller Requirements ("Big Wheels")

Coolant: Ethylene Glycol/Water 60/40

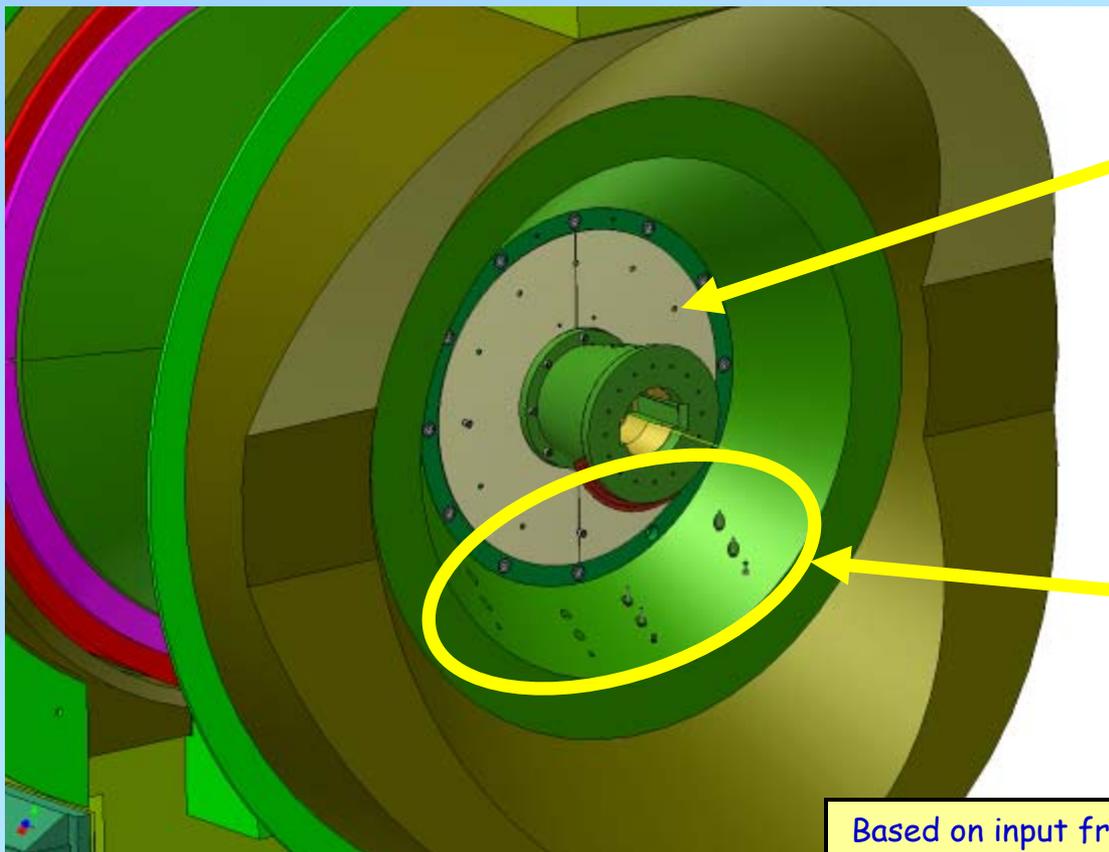
Flow rate: TBD gpm

Coolant Supply Temp.: TBD °C

Coolant Supply Pressure: TBD psig

Capacity: ~2.5 kW

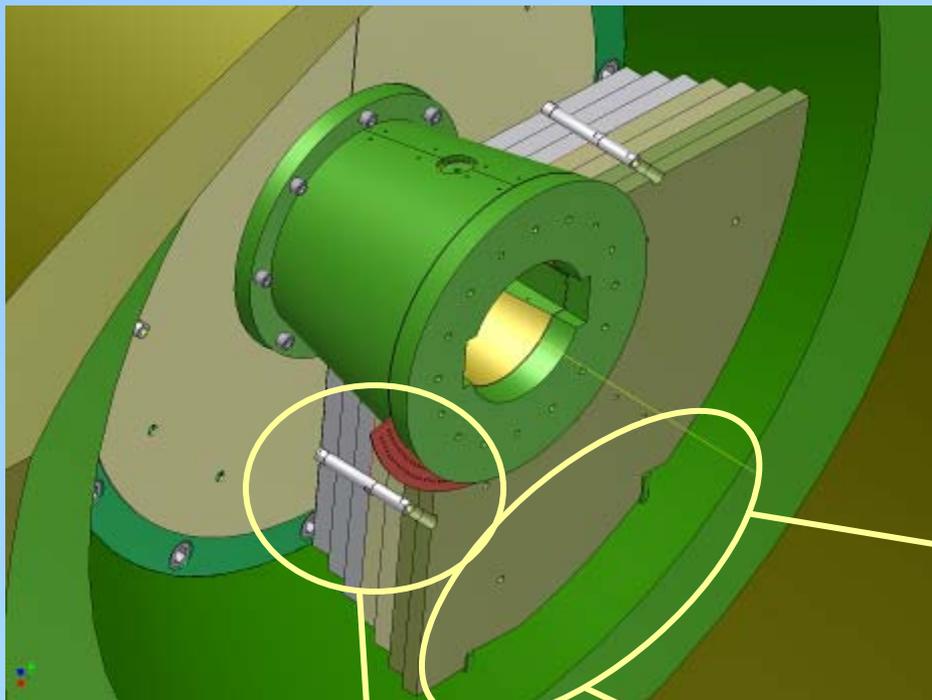
RPC Absorber Design Plan Presented to RPC group and approved, Detail design drawings in progress to be completed by 4/14/2010



~ 1/8" th plate in 2 halves to shim out and compensate for existing prominent bolt heads. Holes in plates to allow access to existing M24 tapped holes.

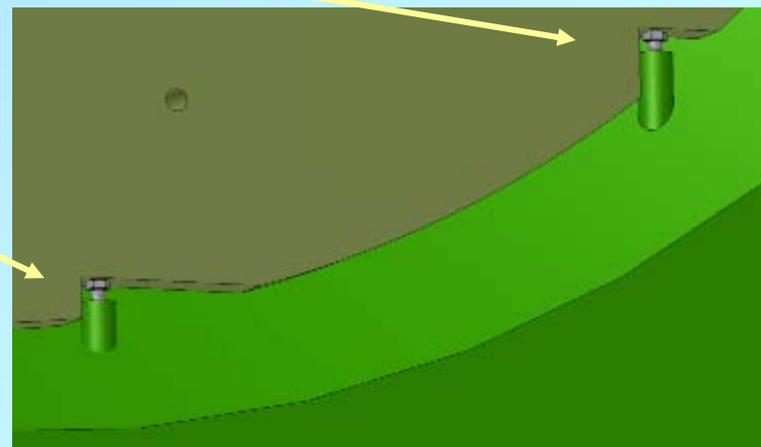
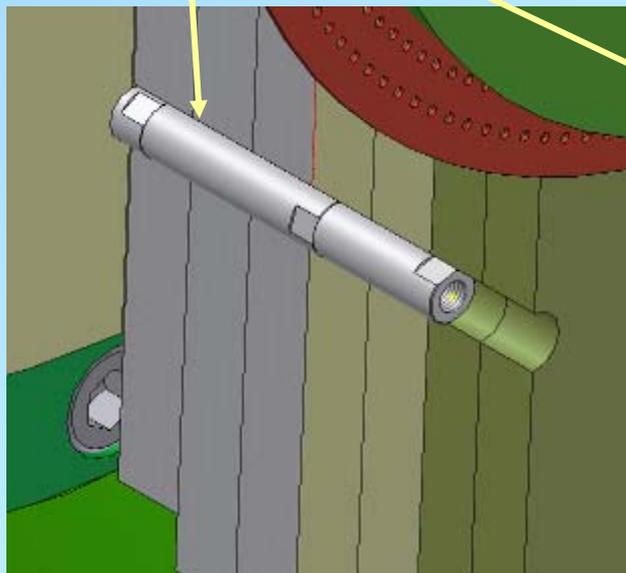
~~Spotface, drill and tap lower side of central outer cavity surface for absorber supports~~

Based on input from PHENIX techs we will design welded bosses to support absorber plates instead of spotface, drill & tap



RPC Absorber Final Design

- Welded & tapped vertical support bossess
- 3 stage positioning rod



Material Procurement Info

We need a total of 56 $\frac{1}{4}$ cylindrical 310 Stainless Steel plates (28 for each side) for the north and south absorbers, with inner radius, outer radius and thickness as shown in the drawing on the next slide.

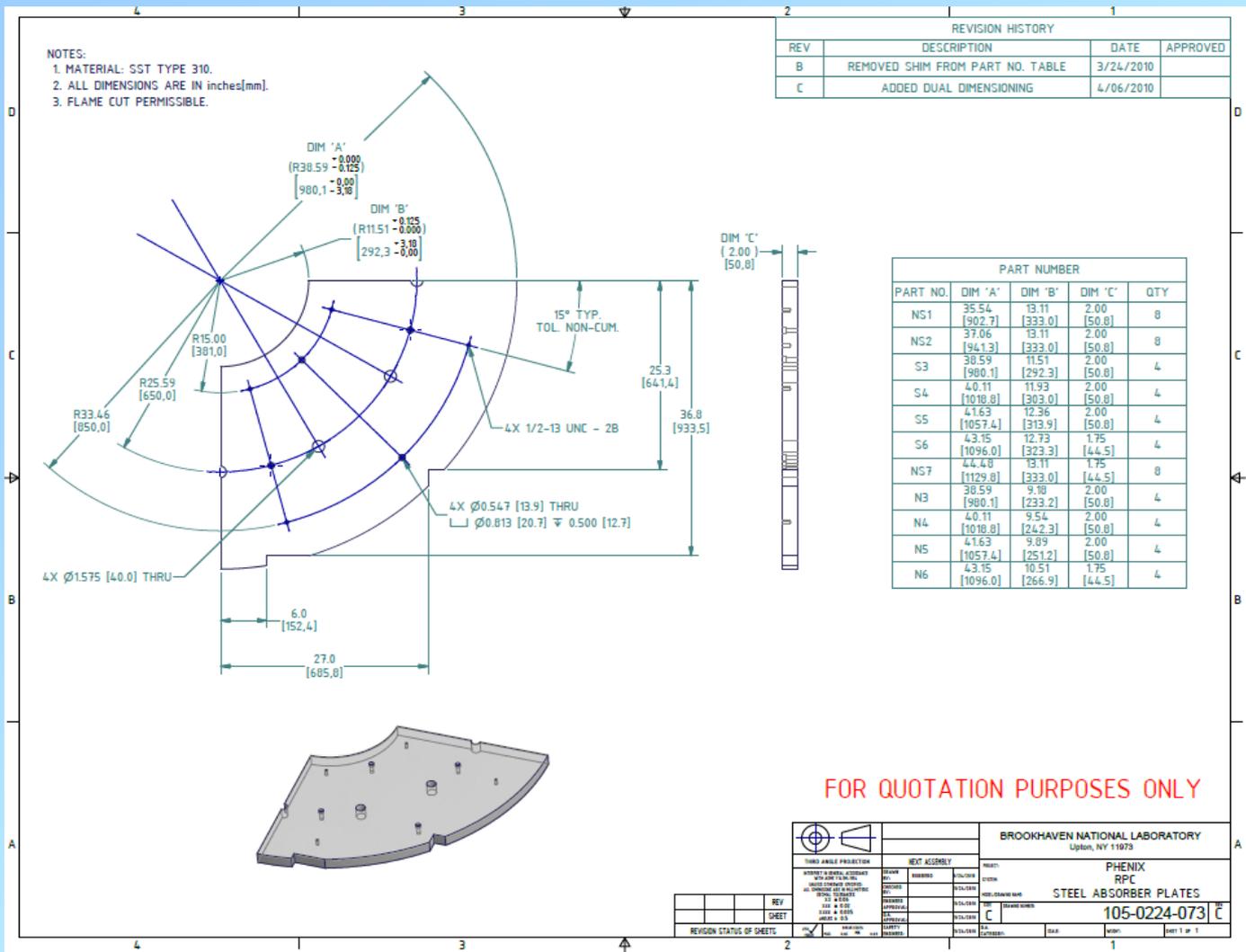
We also need 4 half cylindrical .25" plates of 310 stainless steel for the shims.
(Note: preliminary drawing shows $\frac{1}{4}$ cylindrical shims, needs to be corrected.)

Weight Calculations for absorber $\frac{1}{4}$ cylindrical plates

	Density	Outer Radius	Inner Radius	angle	thickness	area	volume	weight
	lb/cu ft	In	In	deg	In	sq in	cu in	lb
NS1	0.29	35.54	13.11	90	2	857.0	1714.1	497.1
NS2	0.29	37.06	13.11	90	2	943.7	1887.4	547.4
S3	0.29	38.58	11.5	90	2	1065.1	2130.3	617.8
S4	0.29	40.11	11.93	90	2	1151.8	2303.6	668.0
S5	0.29	41.63	12.36	90	2	1241.2	2482.3	719.9
S6	0.29	43.15	12.73	90	1.75	1335.1	2336.4	677.6
NS7	0.29	44.48	13.11	90	1.75	1418.9	2483.1	720.1
N3	0.29	38.58	9.18	90	2	1102.8	2205.6	639.6
N4	0.29	40.11	9.54	90	2	1192.1	2384.2	691.4
N5	0.29	41.63	9.89	90	2	1284.3	2568.6	744.9
N6	0.29	43.15	10.51	90	1.75	1375.6	2407.3	698.1
Shim	0.29	31.5	13.11	180	0.25	1288.6	322.2	93.4

Preliminary design specification for procurement of absorber plates. Final design drawings are in progress

TECHNICAL DRAWING NO-0



1 If a serious injury occurs:

- a) Pull the Fire Alarm Box in the area so that the Fire Department knows exactly where you are located since their fire alarm system shows the location of the pull box.
- b) Call x2222 or 911 on a BNL phone or 344-2222 or 344-911 on a cell phone. Tell the person who answers the phone that the emergency is not a fire but an injury and answer any question that they ask.

2. Sent request to Monday Memo asking why they don't open the gate between Star and PHENIX when the north gate is open.
3. CAD safety observation: using chair instead of a step ladder, question about LOTO.

Improper use of chairs and other items put to questionable use to avoid

TECHNICAL SUPPORT NO-0



There I Fixed It

Where To Find PHENIX Engineering Info

TECHNICAL SUPPORT 2010

50 Working days until the start of the 2010 shutdown!



Links for the weekly planning meeting slides, archives of past meeting slides, long term planning, pictures, videos and other technical info can be found on the PHENIX Engineering web site:

http://www.phenix.bnl.gov/WWW/INTEGRATION/ME&Integration/DRL_SSint-page.htm

