

PHENIX WEEKLY PLANNING



3/18/2010
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??

3/18/2010

TECHNICAL SUPPORT NO-O

This Week

VTX assembly and handling fixtures re-design for 80-20 done

VTX Support frame is on deck for design

Run Support:

Access on Tuesday

Gas alarms

Other

RPC3S $\frac{1}{2}$ octant reference survey in progress (~3 done)

VTX Cooling analyses: parameters set.

Absorber design parameters:?

Prep for 2010 shutdown

Future upgrades support

Next Week:

- Next scheduled maint. Wed. 3/24
 - Tasks ?
- Run 10 tech support as necessary
- 2010 summer shutdown prep continues
- Future upgrade support as necessary
- $\frac{1}{2}$ octant pre-survey
- VTX assembly fixtures procurement & fabrication
- VTX support structure design
- VTX thermal design calculations
- RPC absorber design

2010 Tasks

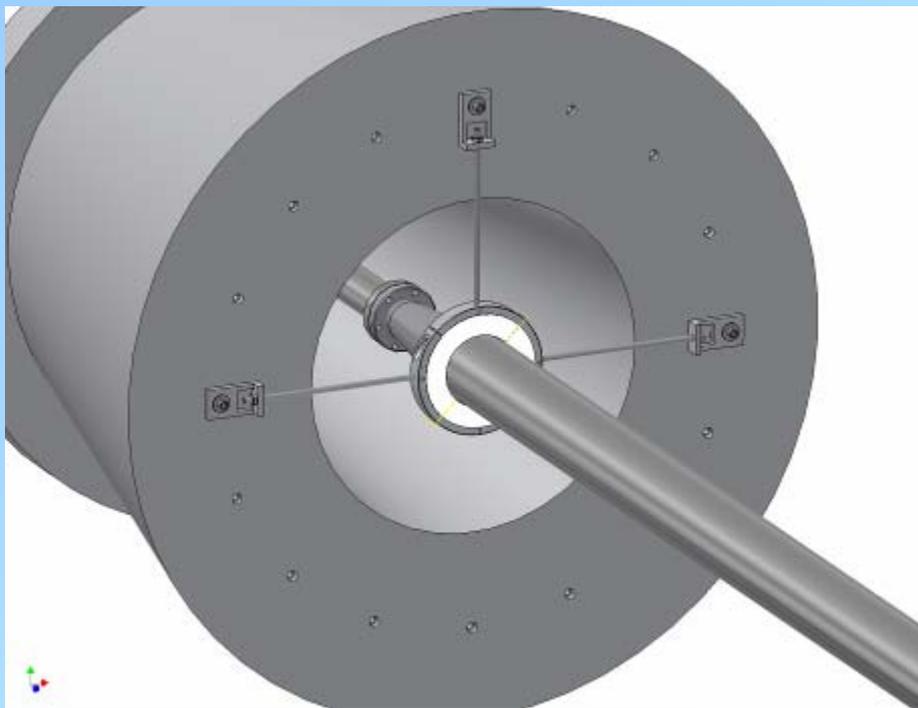
Start Date End Date

Run 10	In progress	6/1
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)	3/15	5/1
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

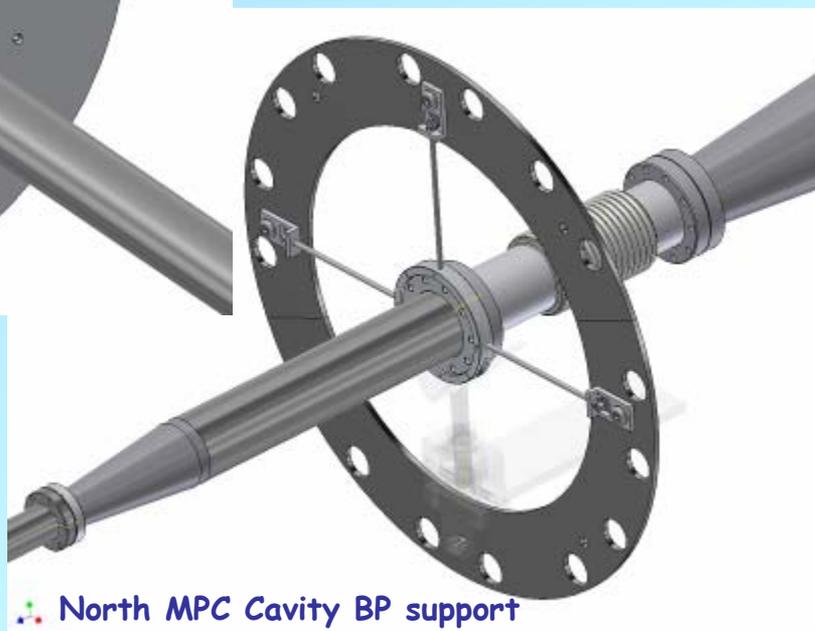
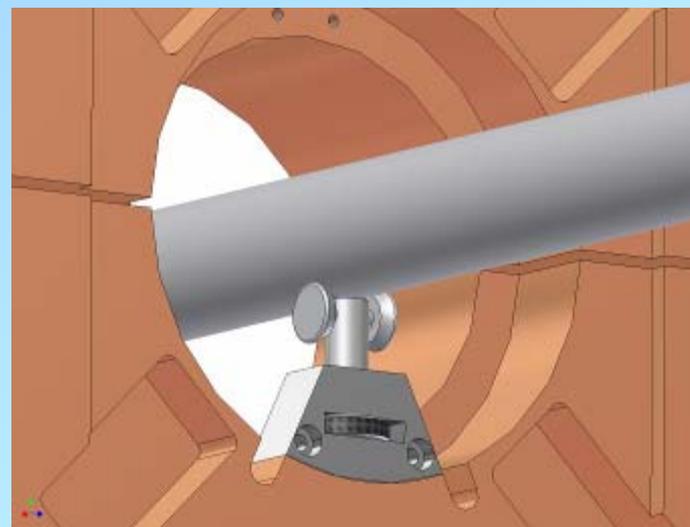
TECHNICAL SUPPORT 2010

3/18/2010

South BBC Cavity BP support

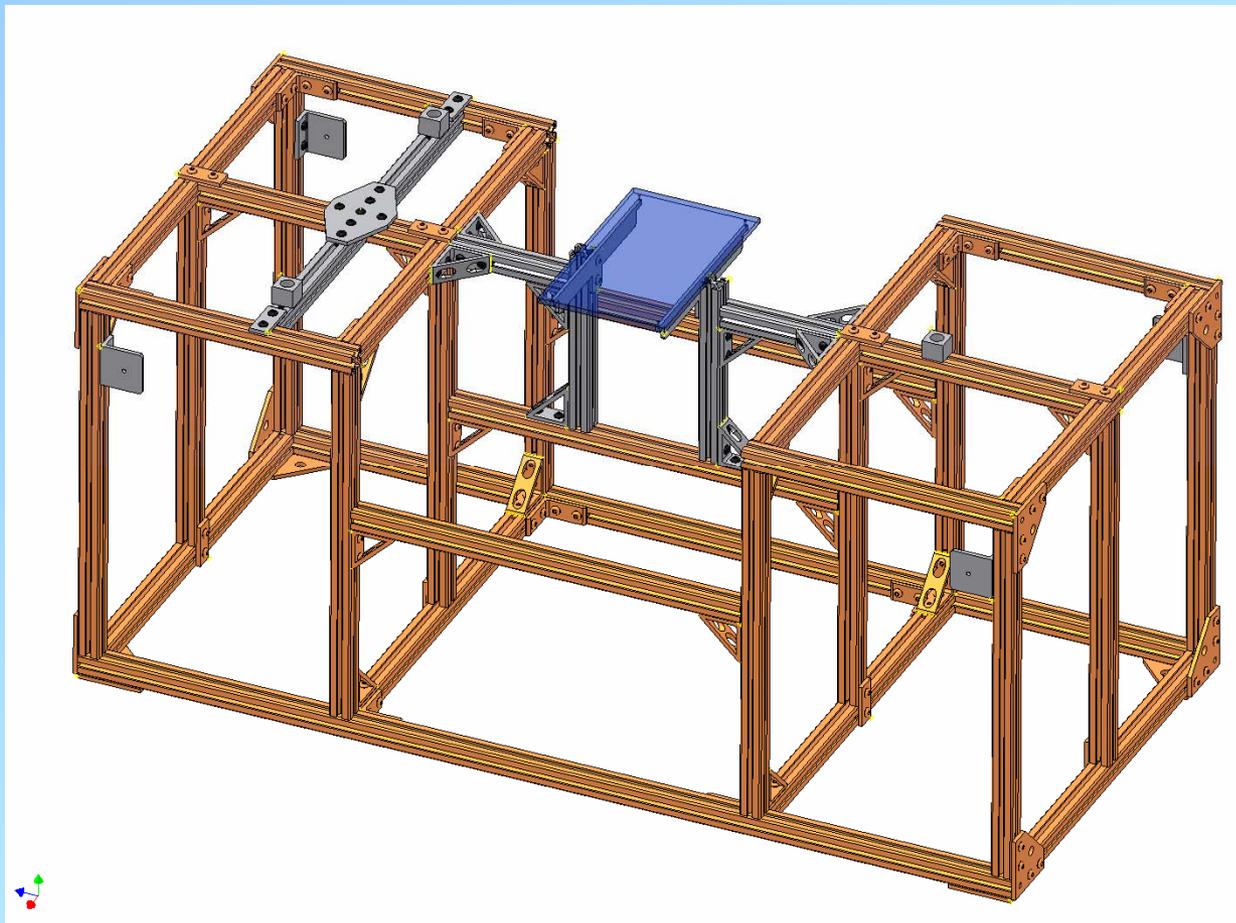


CM central BP supports (2 req'd)



North MPC Cavity BP support

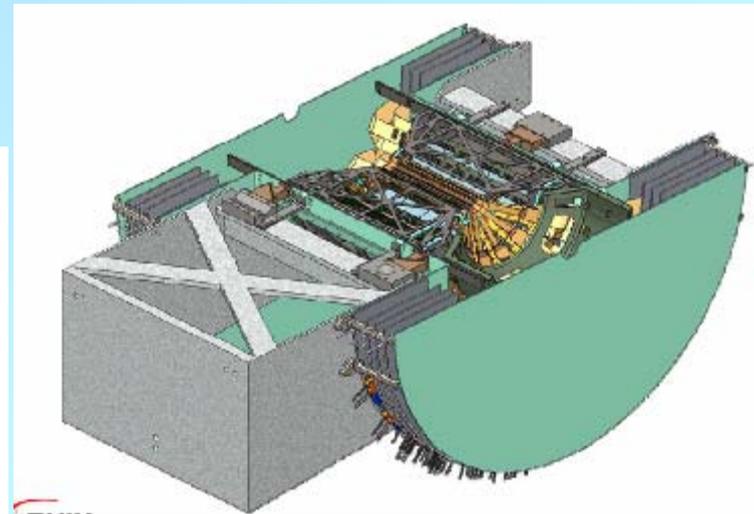
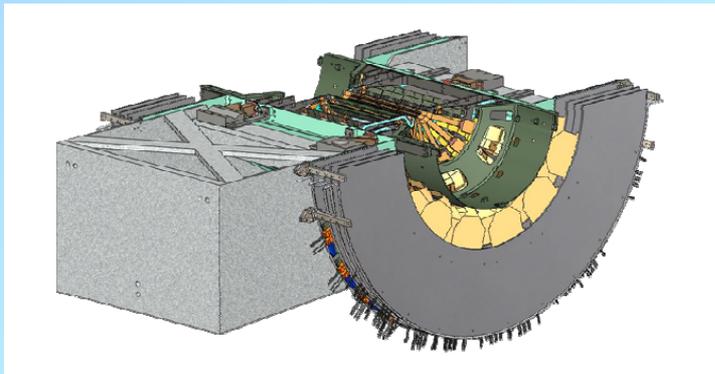
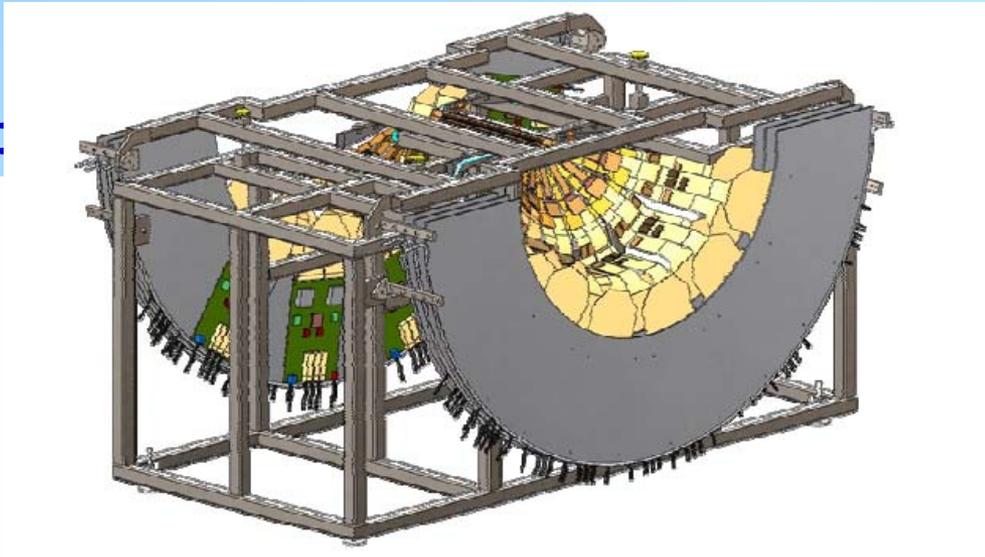
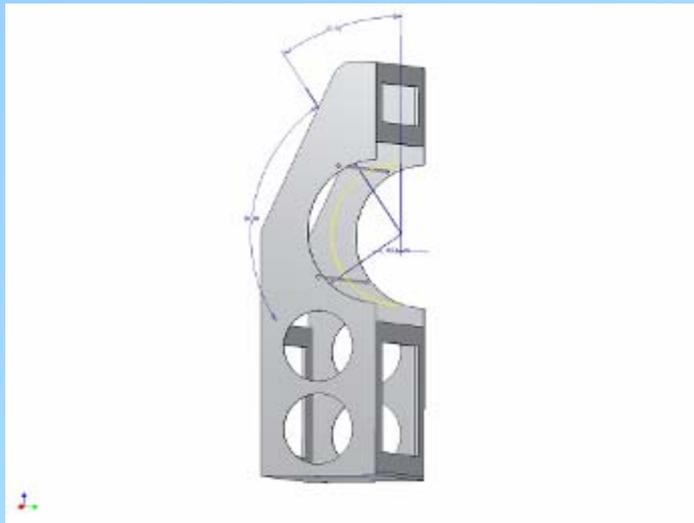
VTX Assembly Fixture (3 others are similar)



TECHNICAL SUPPORT NO-0

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

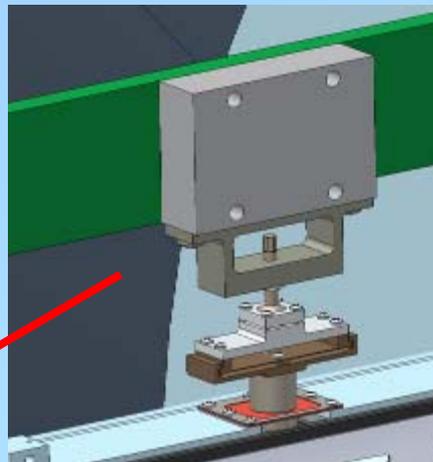
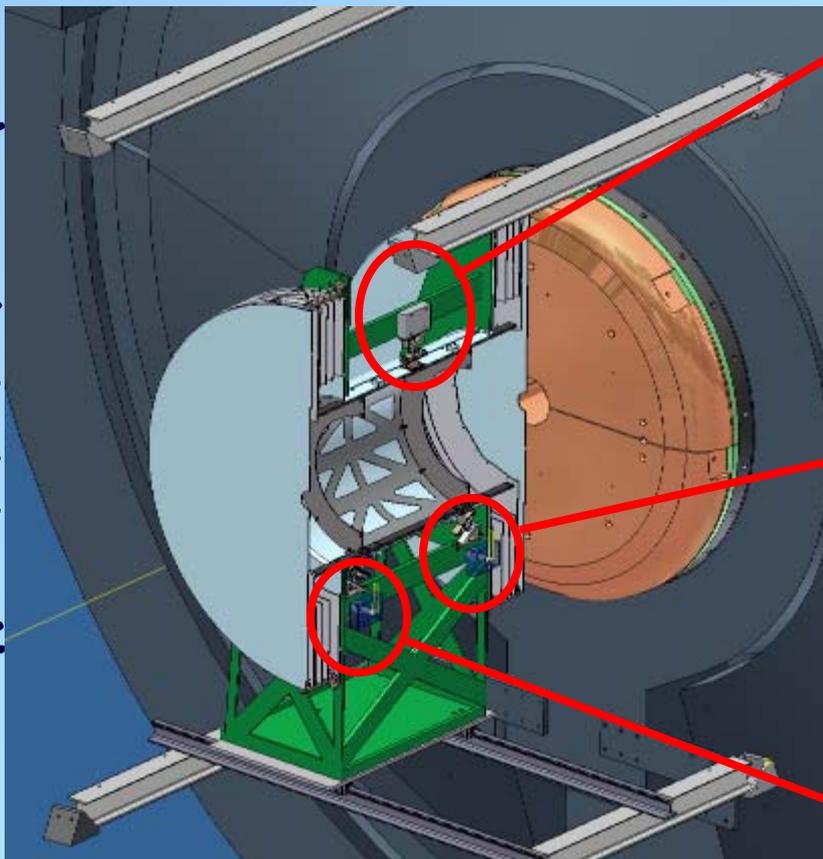
TECHNICAL SUPPORT NO-0



VTX Installation Plan

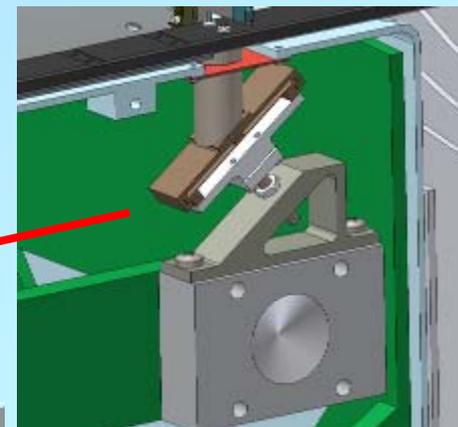
TECHNICAL SUPPORT NO-0

Kinematic mounts for mating east and west detector halves

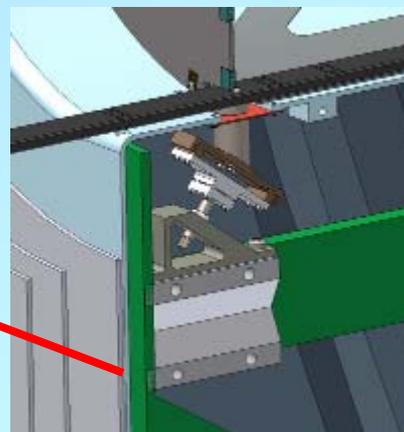


2 DOF (Y & Z)

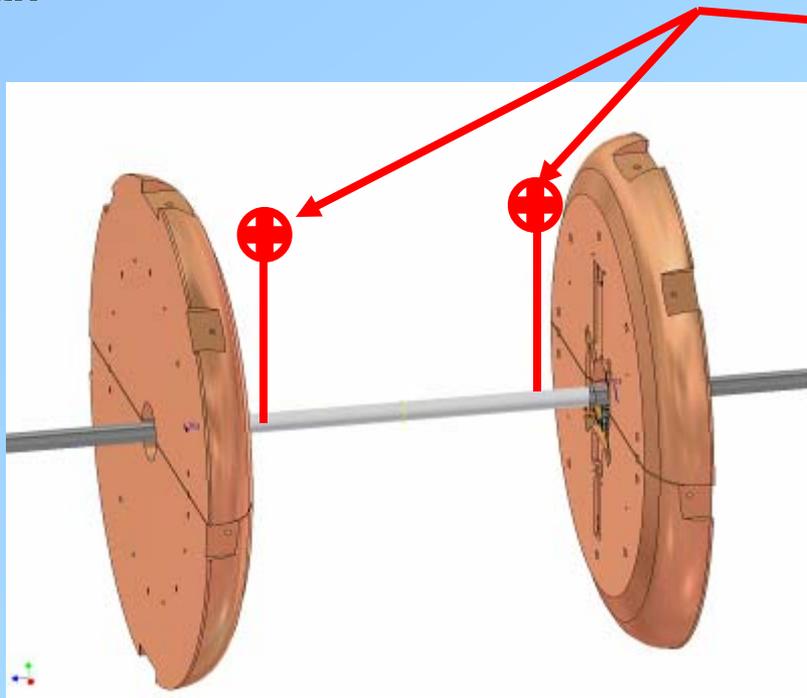
0 DOF



6 interface points w/ HYTEC

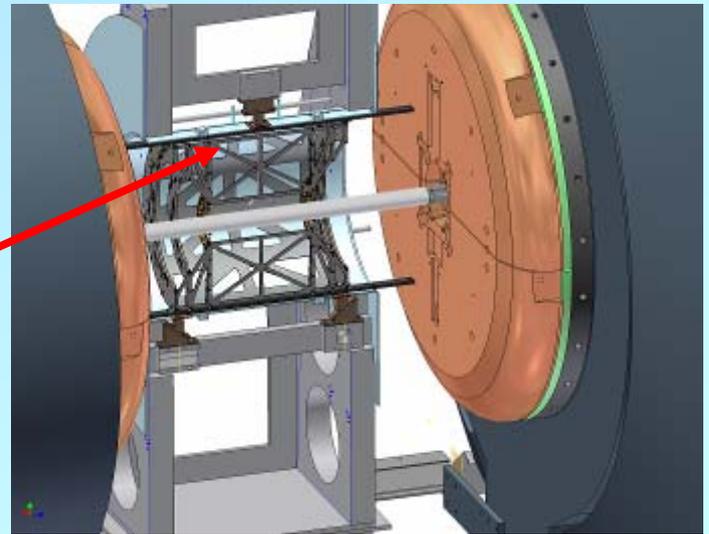


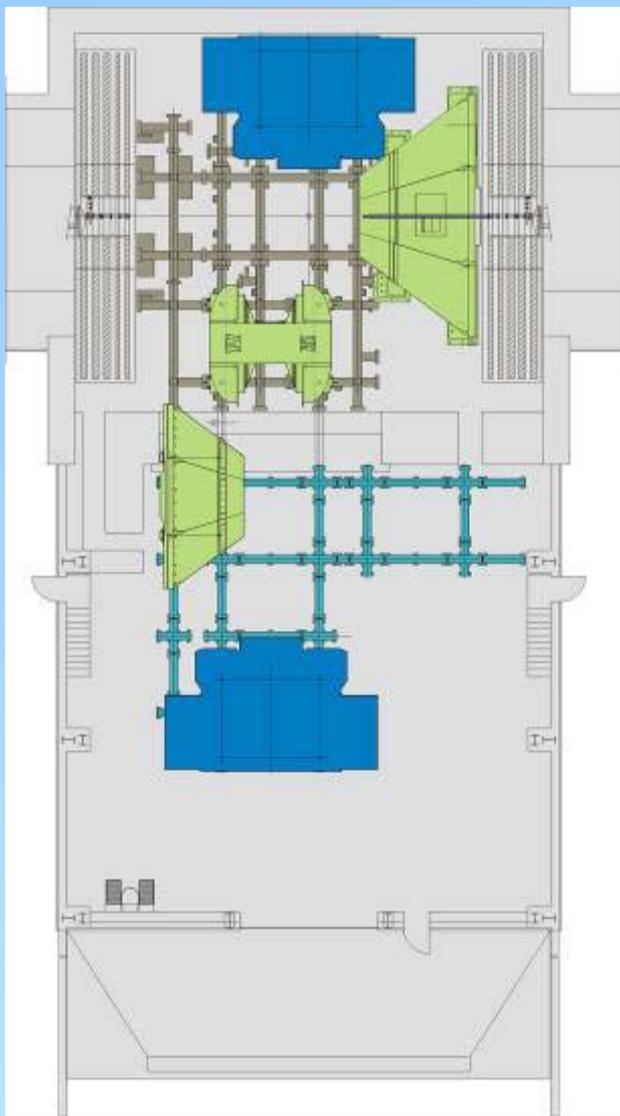
1 DOF (Z)



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

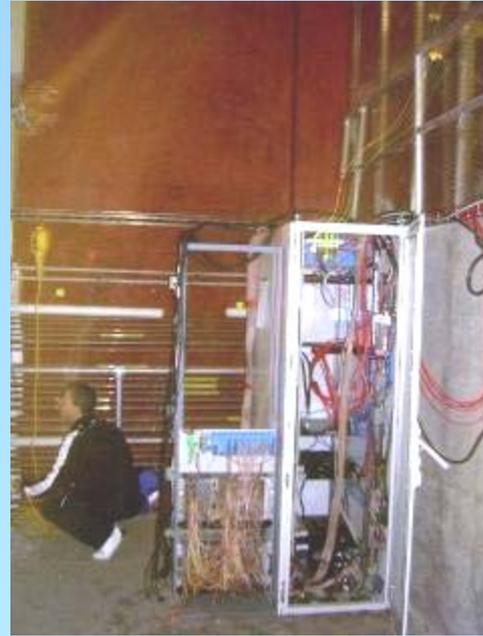




Major PHENIX Components during shutdown when Old beampipe is out and new beampipe is ready to go in. Approximately last week in July.

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. The merits of these proposals will be weighed and decisions made in the next week or so. The schedule will be adjusted accordingly.

TECHNICAL SUPPORT NO-0





Future Project:

Recapacitation of MuTr Station 1

Question: what would it take to revive the vacuum lift fixture(s)?

Shutdown Constraints:

- 5 months from start of shutdown to start of Run 11
- (all schedules herein assume shutdown starts 6/23, Run 11 starts 12/1. Any further extension of run 10 will result in an equal delay in the start of Run 11)
- All normal start of shutdown tasks and end of shutdown run prep tasks must be contained within these 5 months.
- RPC3S tasks are done in parallel with new BP and VTX tasks
- BP must be completely installed before bakeout.
- Bakeout must be completed before any detectors close to BP are installed or re-installed (MPC, BBC, VTX)
- Electronics, electrical, cooling and gas support equipment installations are done in parallel with mechanical installations
- Design, engineering, logistics and procurement must be complete prior to shutdown.

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	3/29/2010	CAD
Beampipe Installation Review (Preliminary)	Done	Done
Bp and sections acceptance tests and inspection	In Progress	
Send beampipe to CERN for NEG Coating	3/15/2010	
Fabricate beampipe supports	5/31/2010	In Progress
Receive bp back at BNL	5/31/2010	
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	3/31/2010	(PHENIX) In progress →
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	→
Receive & inspect components (installation, support & alignment)	7/15/2010	→
Assemble Hemispheres	7/15/2010	→
Mock installations/alignments, bench tests	7/31/2010	↓

RPC3 Pre Shutdown Prep

TUESDAY 3/22/10
 WEDNESDAY 3/23/10
 THURSDAY 3/24/10
 FRIDAY 3/25/10
 SATURDAY 3/26/10
 SUNDAY 3/27/10

<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	(Some parts to be added)
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	3/15/2010	In Progress
Order purchased parts for RPC3 South	3/15/2010	In Progress
Prepare Installation Plan	4/15/2010	In Progress
pre-survey 1/2 octant shells	3/29/2010	In Progress
Fabricate PHENIX parts	5/14/2010	In Progress
Receive and inspect CS fabricated parts	5/28/2010	
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	
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

Beampipe De-installation

TECHNICAL SUPPORT NO-0

<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	

New Beampipe installation



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	

3/18/2010

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	→
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 NO-0

<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 →
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	

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 roof leaks in laser room and IR (southeast corner)



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

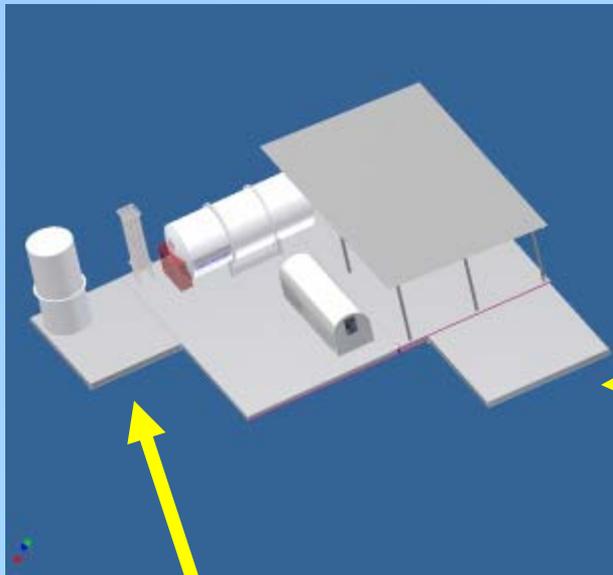
11 Proposed/Draft Procedures (never previously formalized)

Web retrieval of latest procedures now available from PHENIX Internal:

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

TECHNICAL SUPPORT NO-0

New Argon Dewar and Empty Gas Bottle Storage Area



Pad for Empty Gas Bottles

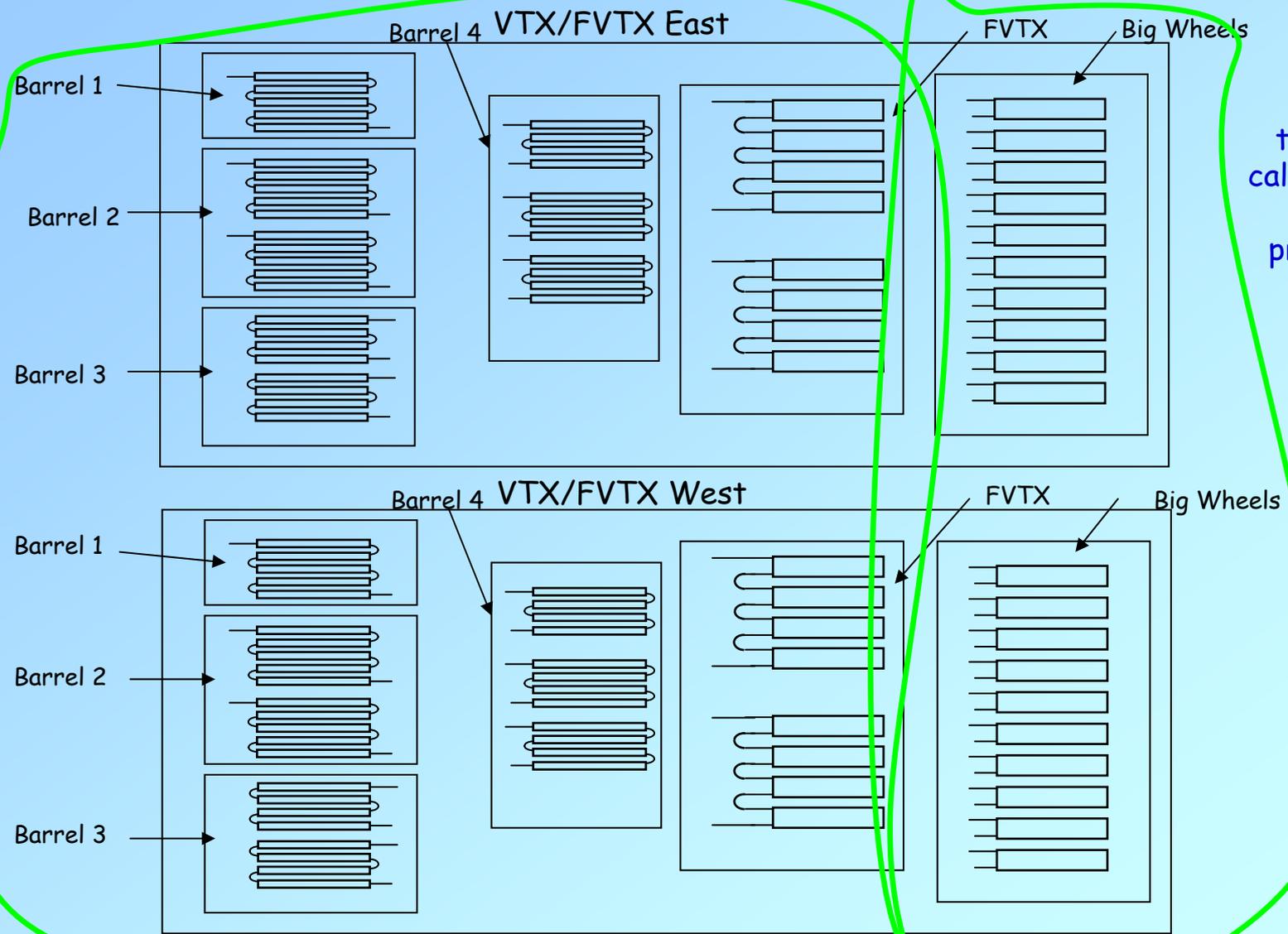
Pad for argon Dewar



Sensor electronics to be cooled in the NOVEC 7200 Loop

Big Wheel electronics to be cooled in a separate water/glycol Loop

TECHNICAL REPORT NO-0



New thermal calculations are in progress

FVTX/VTX Cooling Specifications Revised:

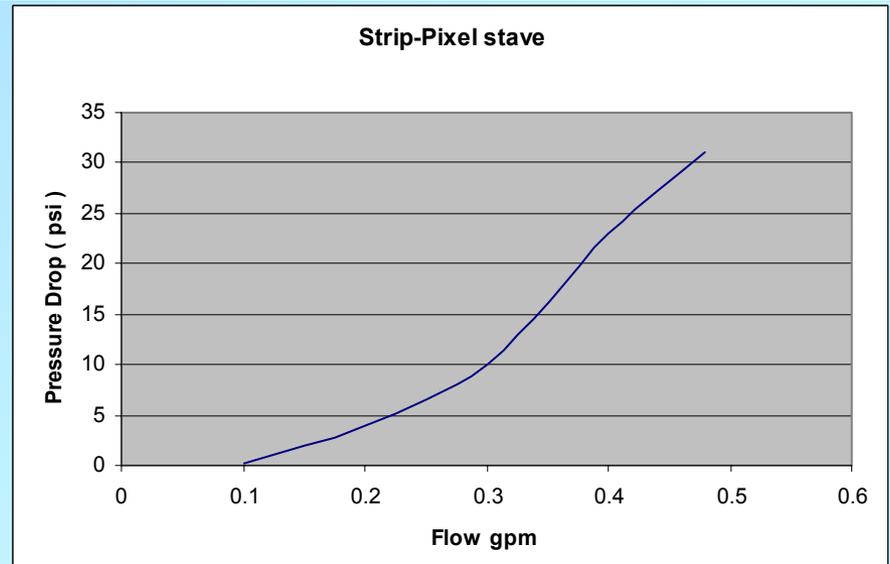
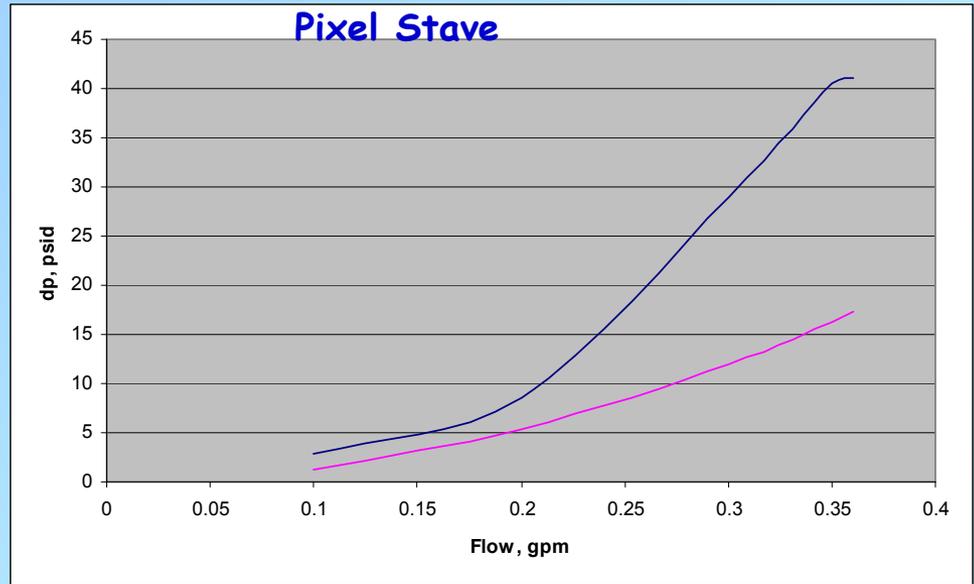
1. Separate chillers for electronics within and exterior to the N2 envelope
2. Internal parallel/series configuration TBD with calculations. Internal/external manifolding TBD
3. Stuck with existing fittings
4. Tygon tubing clamps/alternate tubing TBD
5. Design to restrict maximum cooling fluid pressure to 20 psig
6. Ambient heat load TBD for effects on sensor temp.
7. External surfaces to be maintained above dew point
8. Pre-chilling N2 to be evaluated.



Flow vs Pressure drop test of pixel stave

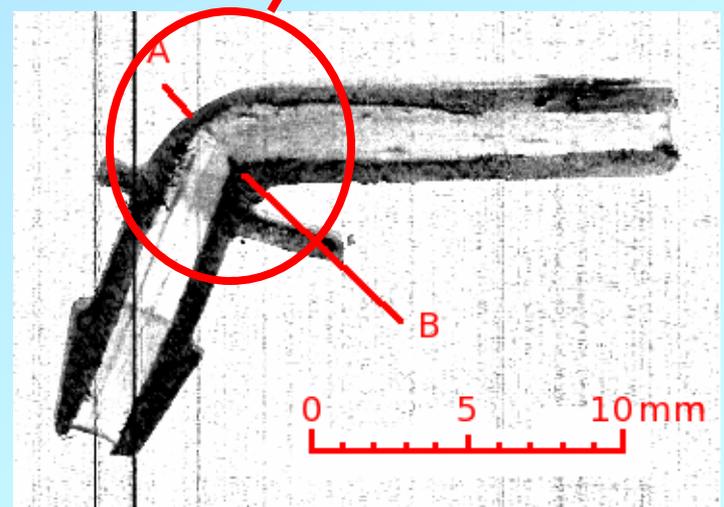
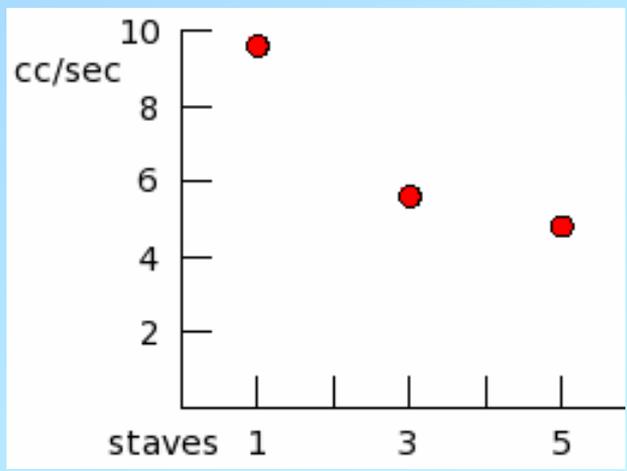
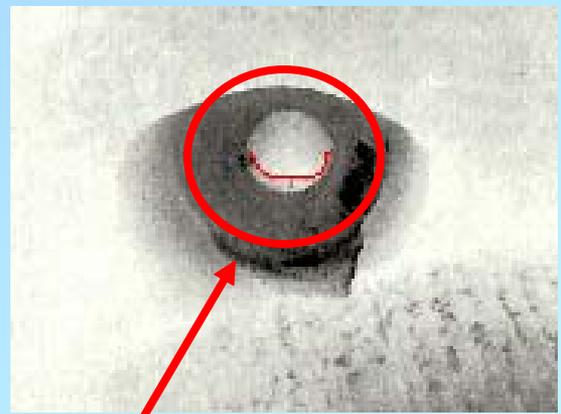
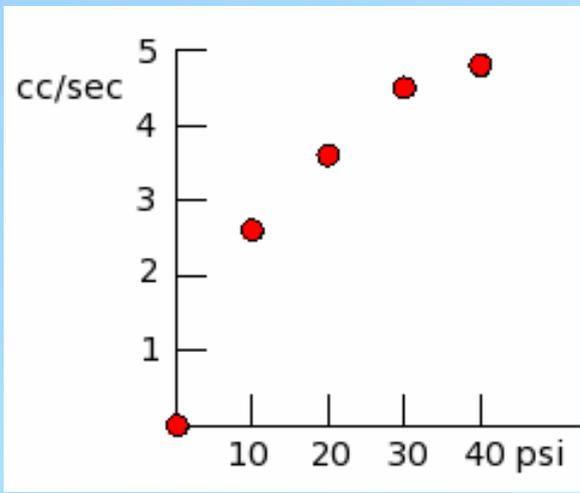
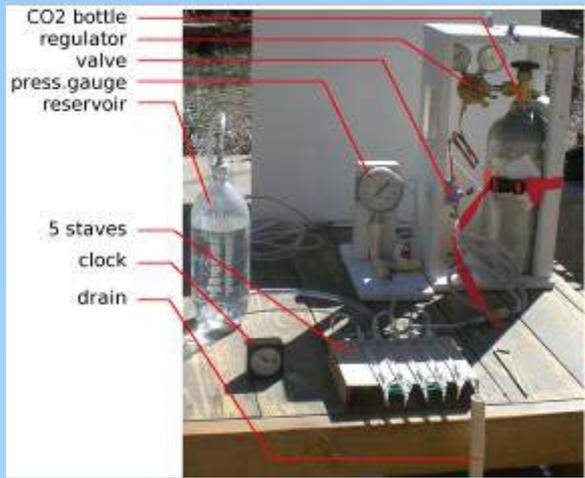


Flow vs Pressure drop test of fittings



Additional flow vs pressure drop tests to be run by Mike Lenz to establish empirical data for calculation support

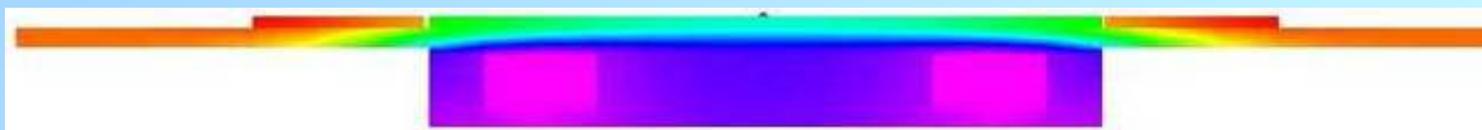
TECHNICAL REPORT NO-0



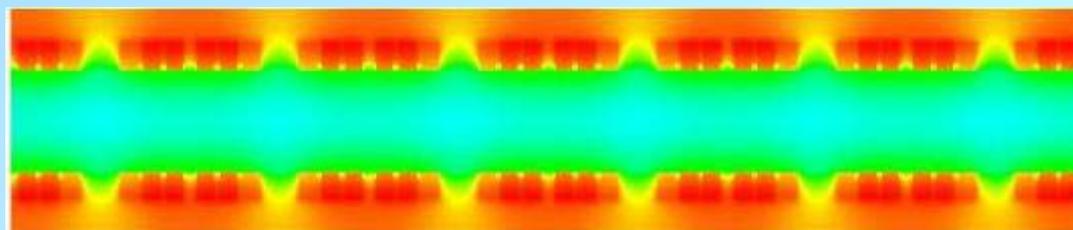
Tests at LANL confirm BNL tests

FEA Results – Expected Temperature Distribution

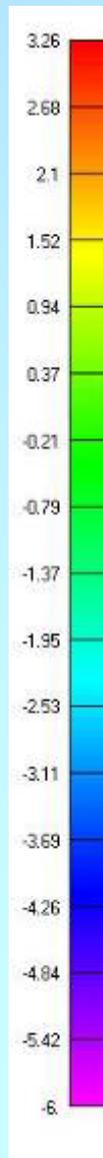
- Coolant wall temperature of -6°C
- Peak temperature 3.2°C
- Sensor temperature $\approx -0.5^{\circ}\text{C}$
- Temperature rise between coolant and stave surface 2.46°C
- Temperature rise between stave and sensor 3.09°C



Cross Section Temperature

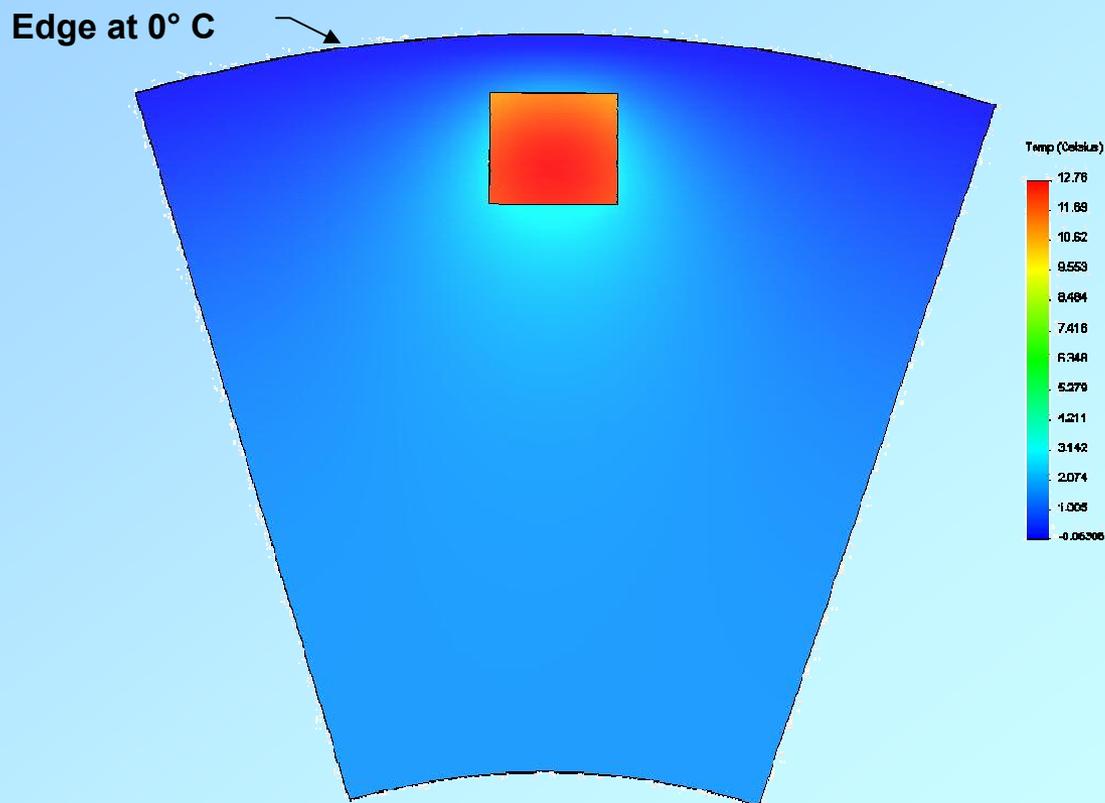


Surface Temperature



VTX Pixel Layer Cooling

- **Model 1**
 - 3 mm thermally conducting foam pad
 - Bergquist Gap Pad 5000S35
 - Thermal conductivity 5 W/m-k
 - Board interface temperature 13° C increase from cooling tube wall



1. See the following note form the BNL Fire Protection Engineer regarding Attic and Concealed Space Storage of Combustible Materials:

http://www.c-ad.bnl.gov/ESSHQ/Attic_and_Concealed_Space_Storage_of_Combustibles.pdf

2. See the following BNL Fact Sheet on Extension Cords, Power Strips and OSHA:

<http://www.bnl.gov/esh/shsd/PDF/fact%20sheet%20text%201.pdf>

3. For staff that have not yet attended a Human Performance class by John Benante and Kerry Mirabella, You might read the book by James Reason at the following site to get a step-up before the class at:

[Managing the Risks of Organizational Accidents](#)

(if a password is needed to gain access to this information use oper8)

Where To Find PHENIX Engineering Info

TECHNICAL SUPPORT 2010

St. Paddy's Day Fun Facts

- 1st parade: Boston 1737, New York 1762, Dublin 1996, Seoul 2001, Moscow 1992, Tokyo 1992, Istanbul 2010
- Longest running: Montreal since 1824
- Isle of Montserrat is one of only 3 places where it is a public holiday (with New Foundland & Labrador in Canada, and Ireland)
- Savannah Georgia claims the largest (Ha!)
- Hot Springs, AR is the shortest
- At least 48 states have parades (Hawaii, Alaska?)
- U.S., Canada, Australia, New Zealand, Ireland, England, Scotland, Wales, Croatia, Denmark, Germany, Cyprus, Greece, Norway, Italy, Netherlands, Russia, Turkey, China, Japan, Korea, Singapore, Taiwan, Dubai, Montserrat



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

