

See "Instructions for Filling out the Work Permit" contained in the Work Planning and Control for Experiments and Operations Subject Area.

1. Work request WCC fills out this section.

Standing Work Permit

Requester: Don Lynch	Date: 7/15/2014	Ext.: 2253	Dept/Div/Group: PO/PHENIX
Other Contact person (if different from requester): Carter Biggs			Ext.: 7515
Work Control Coordinator: Don Lynch	Start Date: 7/15/2014		Est. End Date: 9/30/2014
Brief Description of Work: MPC North Repairs			
Building: 1008	Room: IR	Equipment: MPC North	Service Provider: MPC Experts & PHENIX Techs

2. WCC, Requester/Designee, Service Provider, and ESSH (as necessary) fill out this section or attach analysis

ESSH ANALYSIS

Radiation Concerns	<input checked="" type="checkbox"/> None	<input type="checkbox"/> Activation	<input type="checkbox"/> Airborne	<input type="checkbox"/> Contamination	<input type="checkbox"/> Radiation	<input type="checkbox"/> NORM	<input type="checkbox"/> Other
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Special nuclear materials involved, notify Isotope Special Materials Group Fissionable/Radiological materials involved, notify Laboratory Nuclear Safety Officer

Radiation Generating Devices:	<input type="checkbox"/> Radiography	<input type="checkbox"/> Moisture Density Gauges	<input type="checkbox"/> Soil Density Gauges	<input type="checkbox"/> X-ray Equipment
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Safety and Security Concerns	<input type="checkbox"/> None	<input type="checkbox"/> Explosives	<input type="checkbox"/> Transport of Haz/Rad Material	<input type="checkbox"/> Pressurized Systems
<input type="checkbox"/> Adding/Removing Walls or Roofs	<input type="checkbox"/> Critical Lift	<input type="checkbox"/> Fumes/Mist/Dust*	<input type="checkbox"/> Magnetic Fields*	<input type="checkbox"/> Railroad Work
<input type="checkbox"/> Asbestos*	<input type="checkbox"/> Cryogenic	<input type="checkbox"/> Heat/Cold Stress	<input type="checkbox"/> Nanomaterials/particles*	<input type="checkbox"/> Rigging
<input type="checkbox"/> Beryllium*	<input type="checkbox"/> Electrical	<input type="checkbox"/> Hydraulic	<input type="checkbox"/> Noise*	<input type="checkbox"/> Silica*
<input type="checkbox"/> Biohazard*	<input checked="" type="checkbox"/> Elevated Work	<input type="checkbox"/> Lasers*	<input type="checkbox"/> Non-ionizing Radiation*	<input type="checkbox"/> Security Concerns
<input type="checkbox"/> Chemicals/Corrosives*	<input type="checkbox"/> Excavation	<input type="checkbox"/> Lead*	<input type="checkbox"/> Oxygen Deficiency*	<input type="checkbox"/> Suspect/Counterfeit Items
<input type="checkbox"/> Confined Space*	<input type="checkbox"/> Ergonomics*	<input type="checkbox"/> Material Handling	<input type="checkbox"/> Penetrating Fire Walls	<input type="checkbox"/> Vacuum

Ladder Access Required: Portable Ladder Fixed Ladder- Status/Restrictions:

* Safety Health Rep. Review Required Haz, Rad, Bio Material Exceed DOE 151.1-C Levels - Contact OEM Other

Environmental Concerns

<input type="checkbox"/> Atmospheric Discharges (rad/non-rad/GHG)	<input type="checkbox"/> Land Use Institutional Controls	<input type="checkbox"/> Soil Activation/contamination	<input type="checkbox"/> Waste-Mixed
<input type="checkbox"/> Chemical or Rad Material Storage or Use	<input type="checkbox"/> Liquid Discharges	<input type="checkbox"/> Waste-Clean	<input type="checkbox"/> Waste-Radioactive
<input type="checkbox"/> Cesspools (UIC)	<input type="checkbox"/> PCB Management	<input type="checkbox"/> Waste-Hazardous	<input type="checkbox"/> Waste-Regulated Medical
<input type="checkbox"/> High water/power consumption	<input type="checkbox"/> Spill potential	<input type="checkbox"/> Waste-Industrial	<input type="checkbox"/> Historical Environmental Hazards

Waste disposition by: Other

Pollution Prevention (P2)/Waste Minimization Opportunity: No Yes Environmental Preferable Products Available: No Yes

FACILITY CONCERNS

<input checked="" type="checkbox"/> None	<input type="checkbox"/> Intermittent Energy Release
<input type="checkbox"/> Access/Egress Limitations	<input type="checkbox"/> Electrical Noise
<input type="checkbox"/> Credited Controls (Use USI Process)	<input type="checkbox"/> Potential to Cause a False Alarm
<input type="checkbox"/> Configuration Management	<input type="checkbox"/> Vibrations
<input type="checkbox"/> Impacts Facility Use Agreement	<input type="checkbox"/> Temperature Change
<input type="checkbox"/> Maintenance Work on Ventilation Systems	<input type="checkbox"/> Utility Interruptions

WORK CONTROLS

Work Practices

<input type="checkbox"/> None	<input type="checkbox"/> Exhaust Ventilation	<input checked="" type="checkbox"/> Lockout/Tagout	<input type="checkbox"/> Spill Containment	<input type="checkbox"/> Security (see Instruction Sheet)
<input checked="" type="checkbox"/> Back-up Person/Watch	<input type="checkbox"/> HP Coverage	<input type="checkbox"/> Posting/Warning Signs	<input type="checkbox"/> Time Limitation	<input type="checkbox"/> Other
<input type="checkbox"/> Barricades	<input type="checkbox"/> IH Survey	<input checked="" type="checkbox"/> Scaffolding-requires inspection	<input type="checkbox"/> Warning Alarm (i.e. "high level")	<input type="checkbox"/> Electrical Inspection Required

Personal Protective Equipment

<input type="checkbox"/> None	<input type="checkbox"/> Ear Plugs	<input checked="" type="checkbox"/> Gloves, as necessary	<input type="checkbox"/> Lab Coat	<input checked="" type="checkbox"/> Safety Glasses, where req'd
<input type="checkbox"/> Coveralls	<input type="checkbox"/> Ear Muffs	<input type="checkbox"/> Goggles	<input type="checkbox"/> Respirator*	<input type="checkbox"/> Safety Harness
<input type="checkbox"/> Disposable Clothing	<input type="checkbox"/> Face Shield	<input type="checkbox"/> Hard Hat	<input type="checkbox"/> Shoe Covers	<input checked="" type="checkbox"/> Safety Shoes, as req'd
				<input type="checkbox"/> High visibility cloths/vest
				<input type="checkbox"/> Other

Permits Required (Permits must be valid when job is scheduled.)

<input checked="" type="checkbox"/> None	<input type="checkbox"/> Cutting/Welding	<input type="checkbox"/> Impair Fire Protection Systems
<input type="checkbox"/> Concrete/Masonry Penetration	<input type="checkbox"/> Digging/Core Drilling	<input type="checkbox"/> Rad Work Permit-RWP No
<input type="checkbox"/> Confined Space Entry	<input type="checkbox"/> Electrical Working Hot	<input type="checkbox"/> Other

Dosimetry/Monitoring

<input checked="" type="checkbox"/> None	<input type="checkbox"/> Heat Stress Monitor	<input type="checkbox"/> Real Time Monitor	<input type="checkbox"/> TLD
<input type="checkbox"/> Air Effluent	<input type="checkbox"/> Noise Survey/Dosimeter	<input type="checkbox"/> Self-reading Pencil Dosimeter	<input type="checkbox"/> Waste Characterization
<input type="checkbox"/> Ground Water	<input type="checkbox"/> O ₂ /Combustible Gas	<input type="checkbox"/> Self-reading Digital Dosimeter	<input type="checkbox"/> Other
<input type="checkbox"/> Liquid Effluent	<input type="checkbox"/> Passive Vapor Monitor	<input type="checkbox"/> Sorbent Tube/Filter Pump	

Training Requirements (List specific training requirements)

CA -Collider User, PHENIX Awareness, working at heights

Work screening has identified the following as the reason for permitted work: ESSH Complexity Work Coordination

When work is categorized as worker planned work and a permit is used only the following signatures are required: (Although allowed, there is no need to use back of form)

<input checked="" type="checkbox"/> Permit Not Required (Sections 3 through 7 optional)	WCC: _____ Date: _____
	Service Provider: _____ Date: _____
	Authorization to start: _____ Date: _____
	(Department/Division, or their equivalent, Sup/WCC/Designee)

3. Both work requester and service provider contribute to work plan (use attachments for detailed plans)

Work Plan (procedures, timing, equipment, scheduling, coordination, notifications, and personnel availability need to be addressed in adequate detail): See attached work plan and procedure				
Special Working Conditions Required (e.g., Industrial Hygiene hold points or other monitoring) None				
Notifications to operations and Operational Limits Requirements: None				
Post Work Testing, Notification or Documentation Required: See Attached Plan				
Job Safety Analysis Required: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			Review Done: <input checked="" type="checkbox"/> in series <input type="checkbox"/> team	
Reviewed by: * Primary Reviewer signature (not required for Worker Planned Work) means that the Review Team members were appropriate for the work that was planned, the Team visited the job site, hazards and risks that could impact ESSH have been considered and controls established according to BNL requirements. In addition, this signature indicates that applicable JRAs, FRAs, as well as other planning documents have been reviewed and training requirements have been identified and recorded on this permit.				
Title	Name (print)	Signature	Life #	Date
ES&H Professional				
F&O Facility Project Manager				
Service Provider				
Work Control Coordinator	Don Lynch		20146	
Safety Health Representative				
Research Space Manager				
Other				
Other				
Required Walkdown Completed				
*Primary Reviewer				

4. Job site personnel (Supervisor and workers) fill out this section.

Note: Signature indicates personnel performing work have read and understand the hazards and permit requirements (including any attachments) and all training required for this permit is current/complete. Job Supervisor/Contractor Supervisor signatures also includes verification that worker training required for this permit is current/complete.			
Job Supervisor:		Contractor Supervisor:	
Workers:	Life#:	Workers :	Life#:
Workers are encouraged to provide feedback on ESSH concerns or on ideas for improved job work flow. Use feedback form or space below.			

5. Department/Division, or their equivalent, Line Manager or Designee

Conditions are appropriate to start work: (Permit has been reviewed, work controls are in place and site is ready for job.)			
Name:	Signature:	Life#:	Date:

6. Worker provides feedback.

Worker Feedback (use attached sheets as necessary)
a) WCM/WCC: Are there any changes as a result of worker feedback? <input type="checkbox"/> Yes <input type="checkbox"/> No
Note: See Work Planning and Control for Experiments and Operations Subject Area section 2.6.

7. Post Job Review/Closeout: Work Control Coordinator (authorizing dept.) checks quality of completed permit and ensures the work site is left in an acceptable condition. (WCC can delegate clean up of job site to work supervisor.) The WCC ensures that the change process to update drawings, placards, postings, procedures, etc., is initiated, if necessary.

Name:	Signature:	Life#:	Date:
Comments:			

**MPC South and North Detector Subsystems, Removal and Reinstallation
PHENIX IR, Bldg. 1008**

Discussion

During run 14 the north MPC internal electronics experienced damage to 10 modules similar to damage experienced in run 12, and these modules can not be repaired in situ. Consequently the MPC modules must be removed and repaired in the PHENIX electronics shop.

Caution: During all phases of the work described herein, maintain extreme care at all times to prevent contact with the beam pipe.

Procedures

A. Removal of North MPC

1. LOTO the power to the MMN magnet coil at the power supply in 1008B.
2. Assure that the CM is locked in its southern most position by locking out the hydraulics to each magnet mover.
3. Assure that all power to the detector is locked out.

Note: The station 1 is being shared with the MPC-Ex installation effort. All descriptive, authorizing information, etc. concerned with the scaffolding is described in the separate Work Permit for the MPC-Ex detector, WP# DRL-2014-009.)

4. Using the station 1 scaffolding (currently erected for installation of the new MPC-Ex detector) to access the MMS piston cavity, carefully detach the signal and power cables, move the detached cables away from the piston hole and secure them so that they will not interfere with MPC removal MPC re-installation..
5. Remove the electronics cards and front panels from each of the sextants,
6. Remove the individual modules from each sextant and carefully stow them for reassembly.
7. Disassemble the individual sextants in reverse order indicated in the attached MPC North Installation Plan.

8. As sextants are removed, transport them to the MPC temporary staging area in the PHENIX electronics assembly room and reassemble the individual modules into the sextants to store until ready for reinstallation in the piston hole.

B. Reinstallation of North MPC

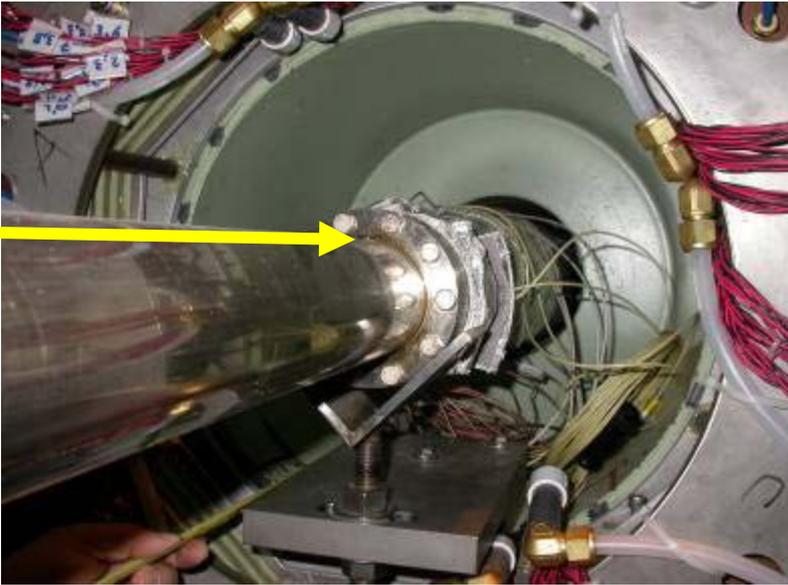
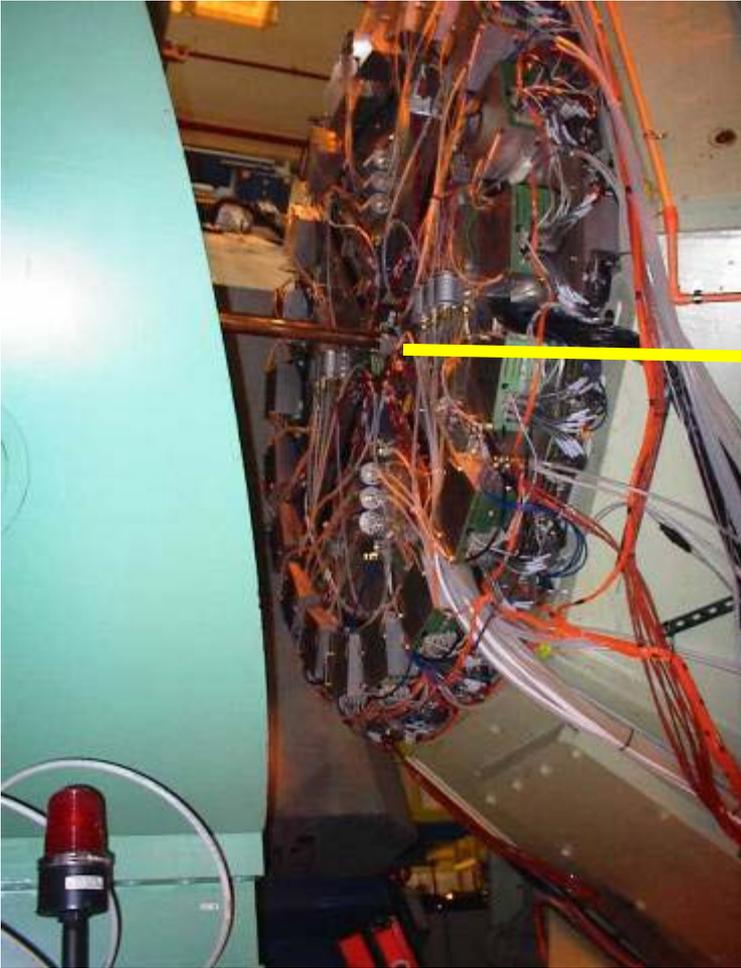
1. After repairs/upgrades have been completed and the MPC North re-assembled, LOTO the power to the MMN magnet coil (if not already locked out) at the power supply in 1008B.
2. Assure that the CM is locked in its southern most position by locking out the hydraulics to each magnet mover.
3. Assure that all power to the detector is locked out

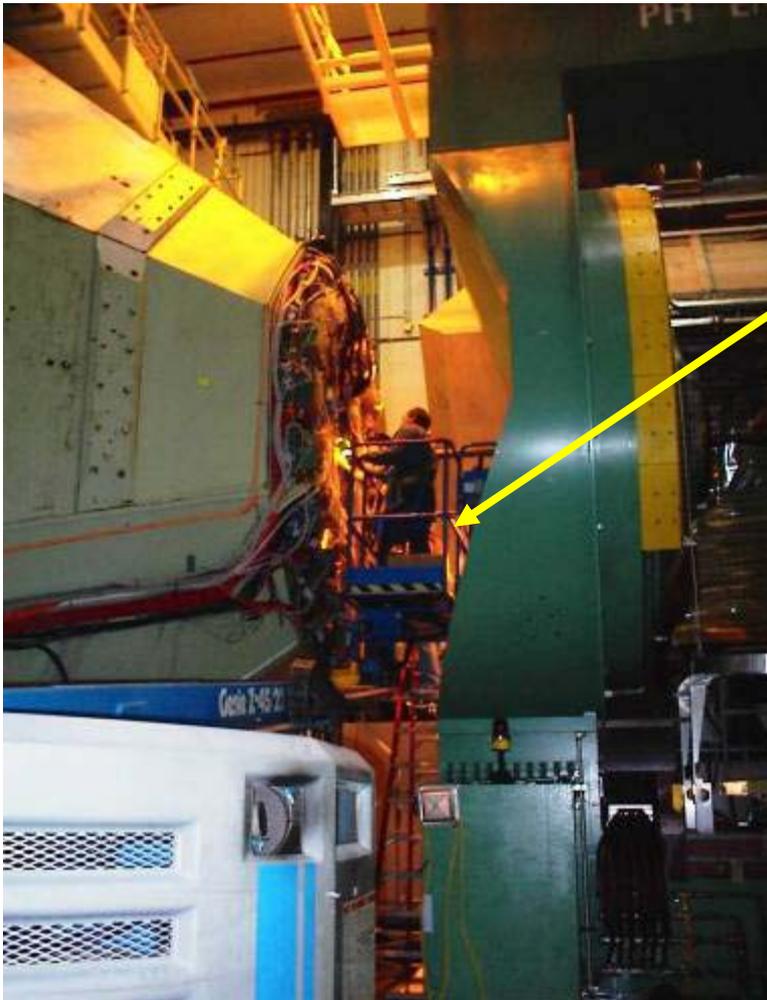
Note: Only PHENIX technicians fully trained and approved for this operation by the cognizant engineers and technical supervisor may operate the articulated arm man lift. A maximum of 2 people may perform the following work in the manlift bucket and a third person shall be in the PHENIX IR, aware of the work being performed, and within communication distance at all times. The passenger in the manlift shall be fully trained as indicated above and shall be approved for this work by the cognizant engineers and technical supervisor.

4. Retrieve the 6 sextant sections of the MPC North from the temporary staging area in the PHENIX electronics assembly room.
5. Using the station 1 scaffold, being extremely carefully to avoid any possibility of contact with adjacent detector components or the beampipe, to access the MMS piston cavity, carefully install the 6 sextants. The north sextants are installed and aligned empty, after which the individual modules are assembled and cabled. Front covers are then attached.
6. Connect front end electronics, power and signal cables, etc.
7. Align and position the MPC as desired.
8. Test, commission and verify operation of all MPC North components.

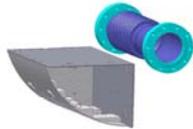
MPC North Installation Plan

MPC North will be installed in the Muon Magnet North piston cavity

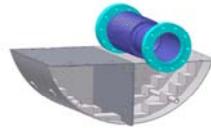




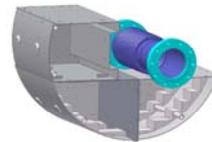
MPC North to be installed from man lift, as South version was.



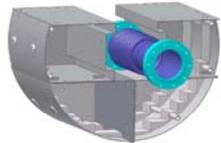
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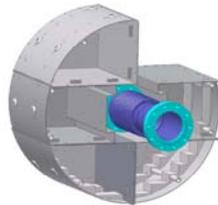
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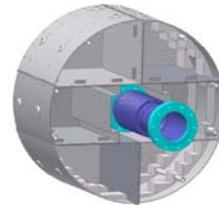
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4



5



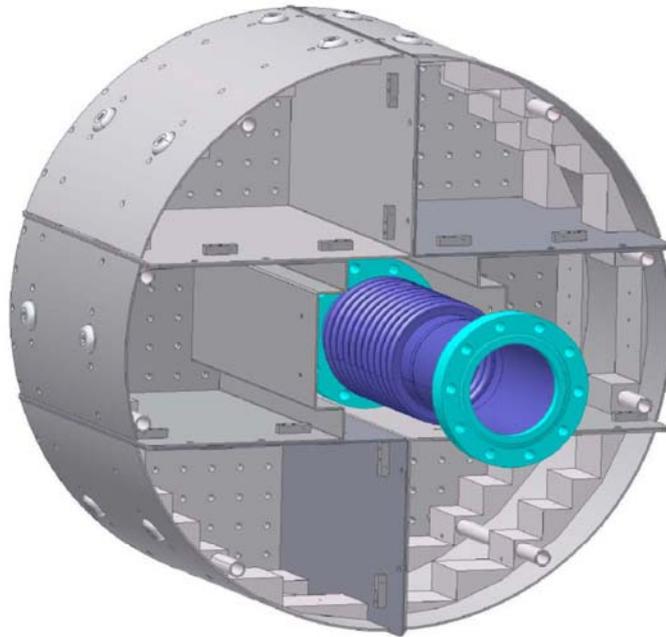
6

Empty sextants are installed first. LED's and LED board are already attached.

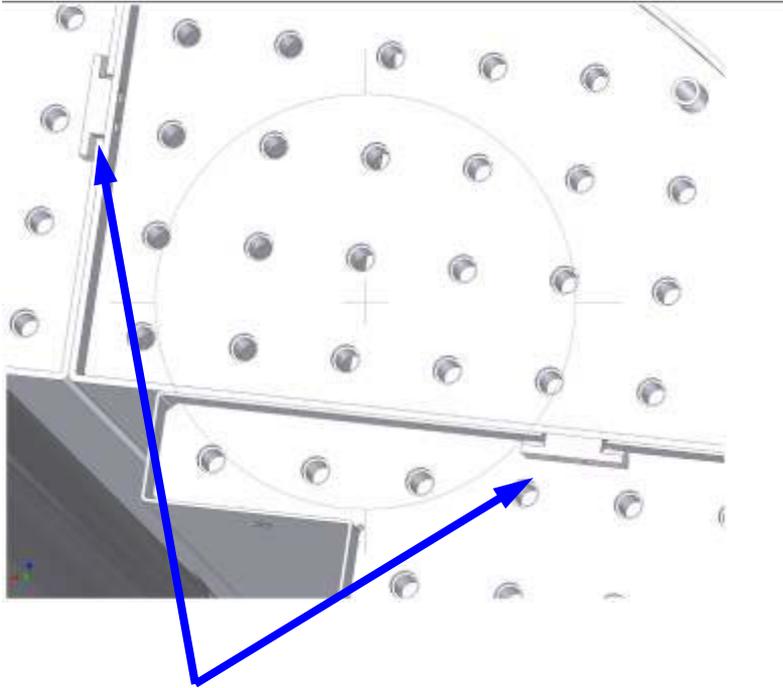
Then modules are individually inserted.

Next APD cable is attached then snaked through cover which is attached.

Finally, standoffs and signal pcbs are attached, wired and routed to MPC N rack.

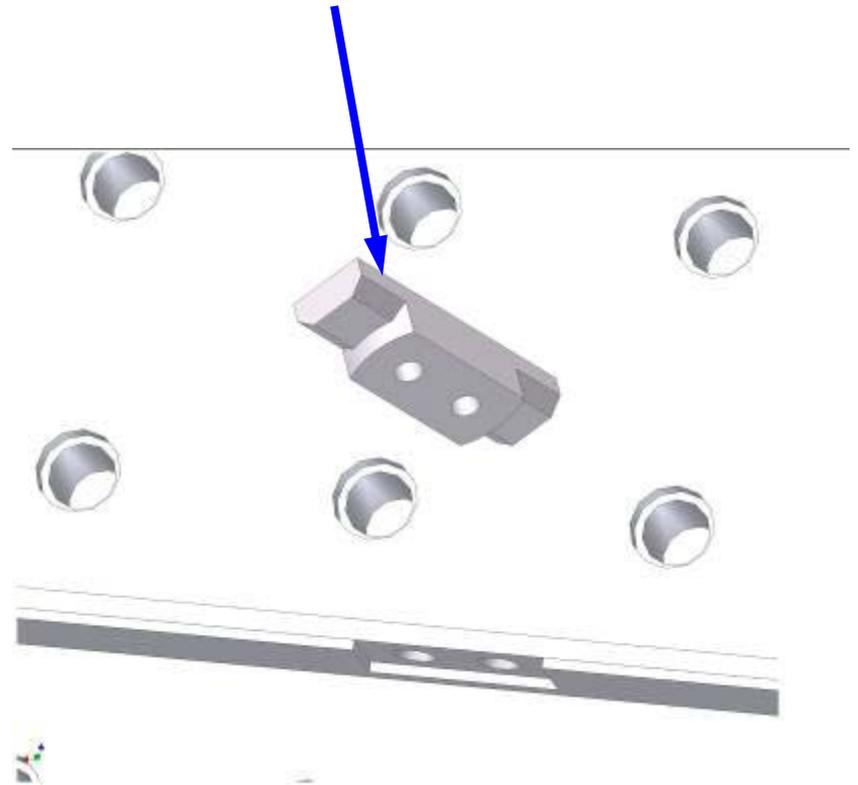


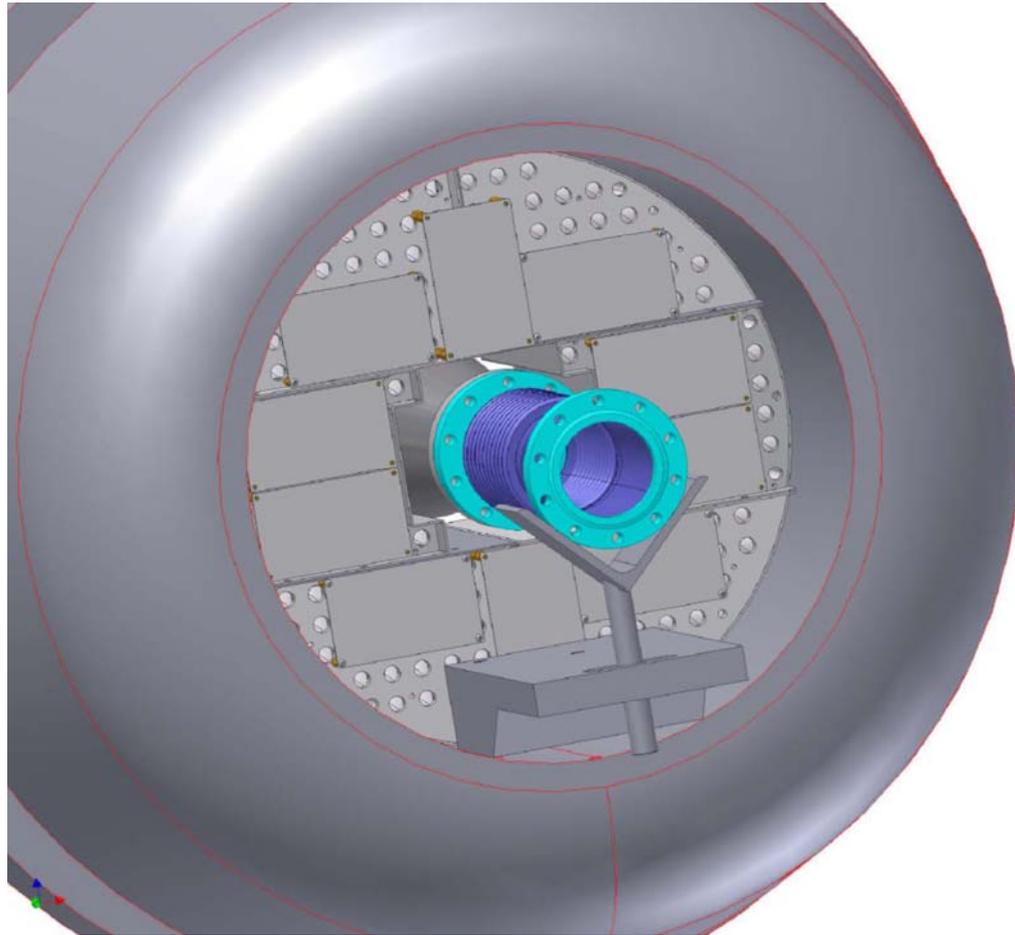
All of the empty sectors are installed before the crystals are inserted



Modules interconnect at rear using tabs as in MPC S

Tabs for MPC N modified for increase clearance and rounded for easy locating and self centering





**MPC North mechanical
assembly complete
ready for cabling**

MPC North Cable Routing



Location for MPC N rack
(side of MuID rack)

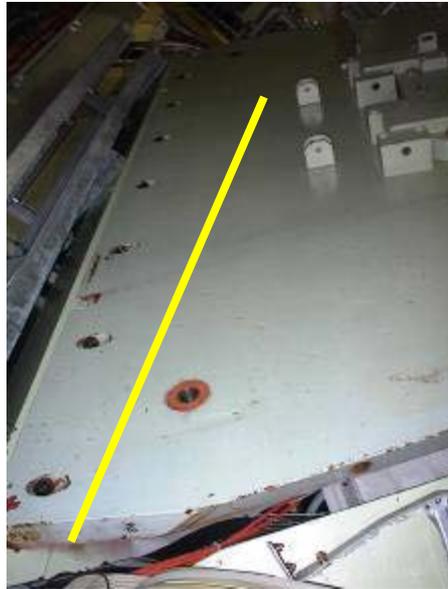
Need to relocate this cable tray

MPC North Cable Routing

1



2



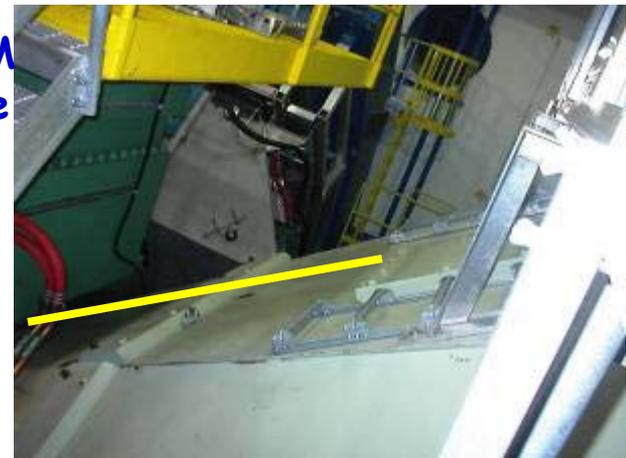
3



4

1. From MuID rack to NMM
2. Up NMM vertical I/shade
3. Over top of NMM to center, then down
4. Under scaffold platform
5. down top lampshade (like MPC S)

July 24, 2006



5

MPC North Assembly