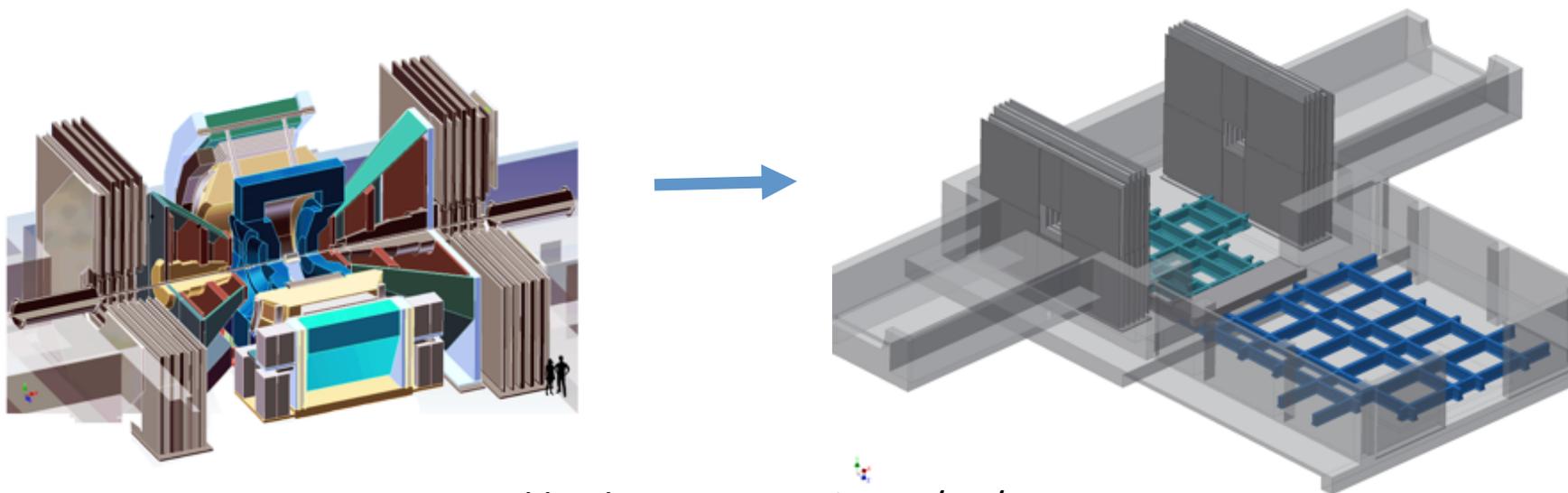


# Removal and Refurbishment (R & R) of the PHENIX Experiment at 1008



Weekly Planning Meeting: 6/30/16

Paul Giannotti

# Decommissioning Schedule

Major Tasks	Start Date	Finish Date
R&R Engineering, Prep and Planning	In Progress	6/30/17
Initial Tasks Following Run 16	6/27/16	7/15/16
Disassemble East Carriage	7/17/16	10/28/16
Remove Beampipe/replace with temp pipes	7/17/16	11/30/16
Disassemble Muon Magnet South	8/1/16	12/30/16
Disassemble Central Magnet		
Part 1 (things that can be done early)	8/1/16	12/30/16
Part 2 (everything else)	6/30/17	11/10/17
Disassemble West Carriage		
Part 1 (things that can be done early)	8/1/16	12/30/16
Part 2 (everything else)	7/28/17	11/17/17
Disassemble Muon Magnet North		
Part 1 (things that can be done early)	8/1/16	12/30/16
Part 2 (everything else)	9/25/17	3/9/17
R&R Support Structures		
Part 1 (things that can be done early)	8/1/16	12/30/16
Part 2 (everything else)	6/30/17	9/30/17

Detailed Schedules for each of these major tasks are detailed on separate slides and in Work Permits as indicated on next slide

# R&R Engineering, Prep and Planning: Work Plan and Work Permits



• <b>R&amp;R of PHENIX Components</b>	Overall workplan	D. Lynch/P. Giannotti (DONE)
• <b>Initial Tasks to prep for R&amp;R after run 16</b>	General:SDD-2016-002	D. Lynch (Done)
• <b>Dismantle EC</b>	Enhanced:SDD-2016-003	P. Giannotti/D. Phillips (needed by 7/15)
• <b>EC &amp; WC- DC East/West</b>	Enhanced:SDD-2016-004	C. Biggs (needed by 8/12)
• <b>EC &amp; WC- Rich East</b>	Enhanced:SDD-2016-005	R. Pisani (needed by 8/26)
• <b>EC &amp; WC- EM Cal PbSc East, PbGI</b>	Enhanced:SDD-2016-006	R. Pisani (needed by 9/1)
• <b>EC &amp; WC- PC-3 &amp; TEC</b>	Enhanced:SDD-2016-007	R. Pisani (needed by 8/19)
• <b>EC - TOF E</b>	Enhanced:SDD-2016-008	R. Pisani (needed by 9/16)
• <b>Remove and Preserve Beampipe</b>	Enhanced:SDD-2016-009	D. Lynch, D. Philips (needed by 7/1)
• <b>Dismantle MMS</b>	Enhanced:SDD-2016-0010	P. Giannotti/D. Phillips (needed by 7/8)
• <b>MMS&amp;MMN - MPC-Ex South/North</b>	Enhanced:SDD-2016-011	D. Lynch (needed by 7/15)
• <b>MMS&amp;MMN - MPC South/North</b>	Enhanced:SDD-2016-012	D. Lynch (needed by 7/22)
• <b>MMS&amp;MMN - MuTr Sta 1South/North</b>	Enhanced:SDD-2016-013	C. Biggs (needed by 9/9)
• <b>MMS&amp;MMN - MuTr Sta 2 &amp; 3 South/North</b>	Enhanced:SDD-2016-014	C. Biggs (needed by 10/7)
• <b>Dismantle WC</b>	Enhanced:SDD-2016-015	P. Giannotti/D. Phillips (not needed until 2017)
• <b>WC - Aerogel</b>	Enhanced:SDD-2016-016	R. Pisani (needed by 12/16)
• <b>WC - TOF W</b>	Enhanced:SDD-2016-017	C. Biggs (not needed until 2017)
• <b>Dismantle CM</b>	Enhanced:SDD-2016-018	P. Giannotti/D. Phillips (not needed until 2017)
• <b>CM - F/VTX</b>	Enhanced:SDD-2016-019	D. Lynch (needed by 7/9)
• <b>CM - BBC N&amp;S</b>	Enhanced:SDD-2016-020	D. Lynch (needed by 7/22)
• <b>CM - RPC1 N&amp;S</b>	Enhanced:SDD-2016-021	D. Lynch (needed by 7/15)
• <b>Dismantle MMN</b>	Enhanced:SDD-2016-022	P. Giannotti/D. Phillips (not needed until 2017)
• <b>R&amp;R IR and Non-IR Support Structures</b>	Enhanced:SDD-2016-023	P. Giannotti/D. Phillips/R. Pisani (needed by 7/15)

# R&R Engineering, Prep and Planning:

## Lifting Fixtures, platforms and other equipment needed for disassembly, etc

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R&R Engineering, Prep and Planning	No lift fixtures, platforms or other equipment needed
Initial Tasks Following Run 16	All lifts performed with standard rigging hardware, no scaffolding required (use manlifts), no special equipment required. Refer to work permit for details
Disassemble East Carriage	Existing EC platforms used to access racks and services for disassembly and removal. RICH lifting fixture to be refurbished and used to remove RICH
Remove Beampipe/replace with temp pipes	All lifts performed with standard rigging hardware, no scaffolding required (use manlifts), no special equipment required. Refer to work permit for details will use station Mu Tr 1 scaffolding in north and south CM to Muon Magnet gaps. Manlifts and MuTr station 1 scaffold to be used to install temporary BP
Disassemble Muon Magnet South	Standard rigging hardware used for MuTr electronics, lampshades and other structural parts; MPC and MPC-Ex have special tools available to remove them, MuTr vacuum lift fixtures need to be refurbished; MMS internal custom scaffolding is available for removing internal MuTr sta 2&3 detectors and electronics
Disassemble Central Magnet Part 1 (things that can be done early) Part 2 (everything else)	Standard rigging equipment needed to remove racks, BBC's, RPC1's, platforms and TBD
Disassemble West Carriage Part 1 (things that can be done early) Part 2 (everything else)	TBD TBD
Disassemble Muon Magnet North Part 1 (things that can be done early) Part 2 (everything else)	TBD TBD
R&R Support Structures Part 1 (things that can be done early) Part 2 (everything else)	TBD TBD

# R&R Engineering, Prep and Planning: Contracts, Storage areas, Disposition of detector equipment plans

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R&R Engineering, Prep and Planning	No needed storage areas, contracts or material disposition needed for these tasks
Initial Tasks Following Run 16	No needed storage areas, contracts or material disposition needed for these tasks
Disassemble East Carriage	Contracts, storage areas, and equipment disposition needs for these tasks are TBD
Remove Beampipe/replace with temp pipes	Contracts, storage areas, and equipment disposition needs for these tasks are TBD
Disassemble Muon Magnet South	Contracts, storage areas, and equipment disposition needs for these tasks are TBD
Disassemble Central Magnet	Contracts, storage areas, and equipment disposition needs for these tasks are TBD
Part 1 (things that can be done early)	Contracts, storage areas, and equipment disposition needs for these tasks are TBD
Part 2 (everything else)	Contracts, storage areas, and equipment disposition needs for these tasks are TBD
Disassemble West Carriage	Contracts, storage areas, and equipment disposition needs for these tasks are TBD
Part 1 (things that can be done early)	Contracts, storage areas, and equipment disposition needs for these tasks are TBD
Part 2 (everything else)	Contracts, storage areas, and equipment disposition needs for these tasks are TBD
Disassemble Muon Magnet North	Contracts, storage areas, and equipment disposition needs for these tasks are TBD
Part 1 (things that can be done early)	Contracts, storage areas, and equipment disposition needs for these tasks are TBD
Part 2 (everything else)	Contracts, storage areas, and equipment disposition needs for these tasks are TBD
R&R Support Structures	Contracts, storage areas, and equipment disposition needs for these tasks are TBD
Part 1 (things that can be done early)	Contracts, storage areas, and equipment disposition needs for these tasks are TBD
Part 2 (everything else)	Contracts, storage areas, and equipment disposition needs for these tasks are TBD

# R&R Engineering, Prep and Planning

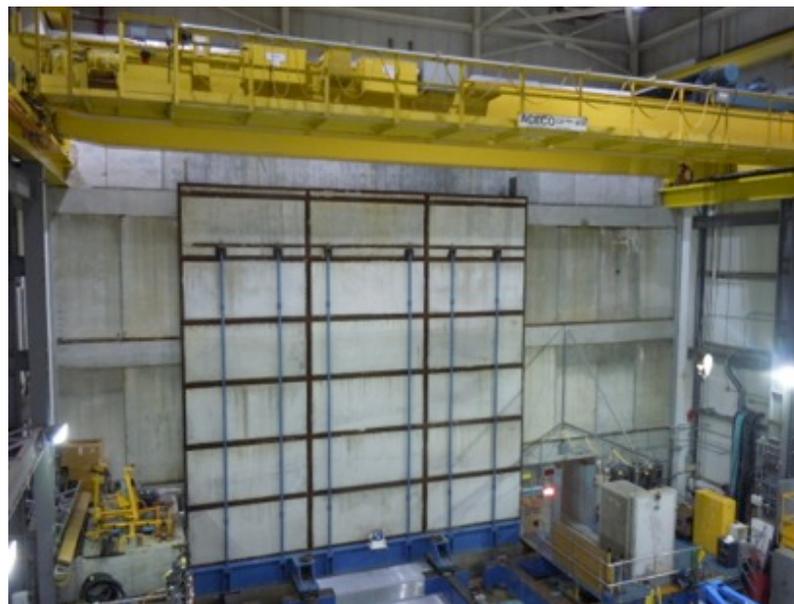
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- Liaison Engineer and Physicist - Dave Phillips/Mike Sivertz
- Lifting Fixtures, Scaffolding, Equipment Required to Disassemble – Efforts to identify and prep in progress
- Work Plans for Disassembly – 23 WP's identified 1 done, 22 in progress
- Contracts for Disassembly and Disposal – Identifying needs in progress
- Specify and Prepare Storage Areas - 912 RPC tent area and adjacent area requested
- Determine Disposition of Non-PHENIX/DOE Equipment – M. Chiu has list

***Note: no equipment or components of any kind to leave PHENIX domain without signed permission from the sPHENIX Project Manager (E. O'Brien).***

*PHENIX Domain is 1008 area and any storage areas at CAD designated for storage/disassembly and prep for disposition by the sPHENIX Project Manager (E. O'Brien).*

***In Progress: All items to be completed in time to meet schedule requirements***



# Initial Tasks Following Run 16

Details are documented in PHENIX R&R Initial Tasks work permit: SDD-2016-002

- |   |           |
|---|-----------|
| •Purge Flammable Gas & Disconnect Gas Lines | Done      |
| •Open & Remove Shield Wall                  | 6/27-6/30 |
| •Remove MuID Collars                        | 6/30-7/1  |
| •MMS move south                             | 7/11-7/12 |
| •Remove dumbwaiter & ladder, fold Platforms | 6/29-6/30 |
| •Disconnect EC                              | 6/30-7/1  |
| •Move East Carriage to AH                   | 7/5-7/7   |
| •Un-fold EC Platforms                       | 7/7-7/12  |
| •Move Muld Collars to AH                    | 7/13-7/15 |



6/30/2016

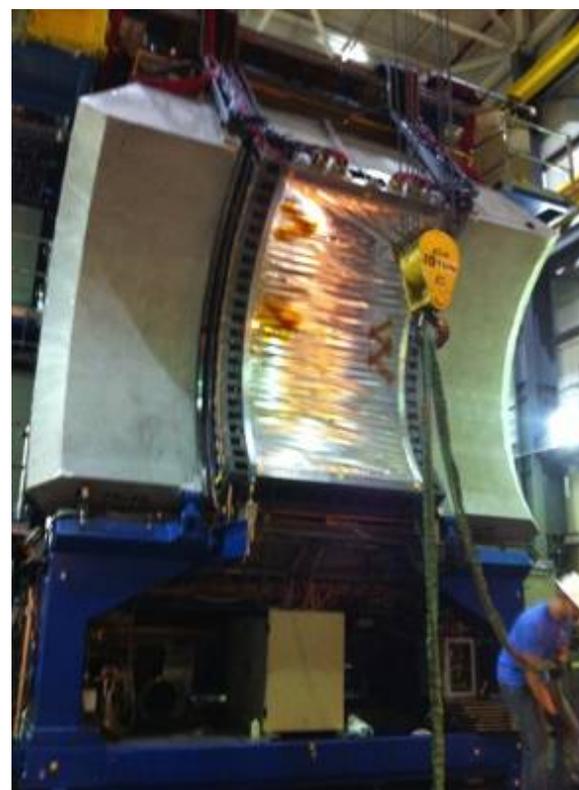


# Disassemble East Carriage

**Details to be documented in EC disassembly work permit:** SDD-2016-003 (and referenced WP's as indicated below)

Remove EC Experimental Cables	7/18-7/29
Strip unwanted Electronics from EC Racks	(to be done at storage area, as time/resources permit)
Move EC Electronics Racks to Storage	8/1-8/12
Remove EC Platforms	8/1-8/12
Remove and dispose DC East & PC1 East (see Work Permit SDD-2016-004 for details on these tasks)	8/15-8/19
Remove and dispose PC3 East & TEC (see Work Permit SDD-2016-007 for details on these tasks)	8/22-8/26
Remove and dispose RICH East (save PMT's) (see Work Permit SDD-2016-005 for details on these tasks)	8/29-9/2
Remove and dispose EM Cal: PbSC East, PbGI (see Work Permit SDD-2016-006 for details on these tasks)	9/6-9/16
Remove and dispose TOF-E (see Work Permit SDD-2016-008 for details on these tasks)	9/19-9/23
Remove EC Tray, Power Cables & Lights	9/26-9/30
Strip EC Copper Gas & Water Lines	10/3-10/7
Remove EC Steel Frame	10/10-10/14
Disposal/Storage of EC Materials	10/17-10/28

**14 weeks**



## Remove Beampipe (“BP”)/Replace With Temp BP

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**Details to be documented in BP remove & preserve work permit: SDD-2016-009**

Close PHENIX Isolation valves	7/5-7/8/2016
Fill PHENIX BP with N <sub>2</sub> at atmospheric pressure	7/5-7/8/2016
Disconnect, remove and store south 5” Spool BP	7/5-7/8/2016
Disconnect south bellows from PHENIX south 3” to 40 mm reducer BP	7/18-7/19/2016
Remove and store south 5” to 3” reducer BP and south bellows	8/17-8/19/2016
Remove and store south 3” to 40 mm reducer BP	8/9-8/10/2016
Remove and store central Al/Be BP	8/22-8/23/2016
Remove and store north 3” to 40 mm reducer BP	8/24-8/25//2016
Remove and store north 5” to 3” reducer BP and north bellows	11/14-11/15/2016
Design temporary 5” replacement BP’s and BP stands	6/13-8/5/2016
Fabricate temporary 5” replacement BP’s and BP stands (central shops)	8/8-10/28/2016
Install temporary 5” replacement BP’s and BP stands	11/14-11/18/2016
Bakeout 5” replacement BP’s	11/21-12/12/2016

# Disassemble Muon Magnet South

**Details to be documented in MMS disassembly work permit:** SDD-2016-010 (and referenced WP's as indicated below)

Install scaffolding in station 1 gap	7/13-7/15/2016
Remove and store MPC-Ex South (see Work Permit SDD-2016-011 for details on these tasks)	7/18-7/22/2016
Remove and store MPC South (see Work Permit SDD-2016-012 for details on these tasks)	7/25-7/29/2016
Remove east vertical lamp shade	7/25-7/29/2016
Strip unwanted Electronics from MMS Racks & Dispose	8/1-8/5/2016
Move MMS Racks to Storage	8/8-8/12/2016
Move MMS to AH	8/8-8/9/2016
Remove Experimental Cables	8/10-8/19/2016
Remove all MMS Tray, Power Cables & Lights	8/22-8/26/2016
Remove MuTrigger Platform & Dispose	8/29-9/2/2016
Remove Eyebrow Platform & Dispose	9/6-9/9/2016
Remove and dispose MuTr station 1 South (see Work Permit SDD-2016-013 for details on these tasks)	9/12-9/16/2016
Remove MMS Upper 4 Lamp Shades	9/19-9/23/2016
Build MMS Internal Access Scaffold	9/26-9/30/2016
Remove MMS Exp Cables	10/3-10/7/2016
Remove & Dispose MuTr Stations 2 & 3 South & Support Structure (see Work Permit SDD-2016-014 for details on these tasks)	10/10-10/28/2016
Remove MMS Internal Work Platforms	10/31-11/4/2016
Remove MMS Cooling Water Piping & Hosing	11/7-11/11/2016
Remove MMS Teacup	11/14-11/18/2016
Remove MMS Coils	11/21-12/2/2016
Disassemble MMS Steel & Lead (all pieces under 40T)	12/5-12/9/2016
Disposal/Storage of MMS Materials	12/12-12/16/2016



~22 weeks:  
Finish before run 17

# Things that can be done early:

## CM, WC, MMN, Other Infrastructure

CM	Remove and Store FVTX/VTX south ( <i>see Work Permit SDD-2016-019 for details on these tasks</i> )	7/11-7/15/2016
	Remove and dispose RPC1 south ( <i>see Work Permit SDD-2016-021 for details on these tasks</i> )	7/18-7/22/2016
	Remove and Store BBC south ( <i>see Work Permit SDD-2016-020 for details on these tasks</i> )	7/25-7/29/2016
	Remove Station 1 south scaffolding	8/1-8/5/2016
	Move CM south	8/10-8/12/2016
	Install Station 1 north scaffolding	8/15-8/19/2016
	Remove and dispose RPC1 north ( <i>see Work Permit SDD-2016-019 for details on these tasks</i> )	8/22-8/26/2016
	Remove and Store BBC north ( <i>see Work Permit SDD-2016-019 for details on these tasks</i> )	8/29-9/2/2016
	Remove Station 1 north scaffolding	9/6-9/9/2016
	Disconnect all CM Racks (bridge and lower racks)	9/12-9/16/2016
	Remove all CM racks and store at old RPC factory (912)	9/19-9/23/2016
	Remove Bridge platform and dispose	10/24-10/28/2016
	Remove and dispose of misc. CM cables, electronics, piping, etc.	10/31-11/4/2016
	Move CM out of IR to AH (or just off beamline)	11/7-11/11/2016
	Remove RPC1 St/St shielding	11/14-11/23/2016
MMN	Remove and store MPC-Ex north ( <i>see Work Permit SDD-2016-011 for details on these tasks</i> )	8/22-8/24/2016
	Remove and store MPC north ( <i>see Work Permit SDD-2016-012 for details on these tasks</i> )	8/25-8/26/2016
	Disconnect all MMN Racks (MuTr, MuTrigger racks, etc.)	9/26-9/30/2016
	Remove all MMN racks and store at old RPC factory (912)	10/3-10/7/2016
	Remove MMN Eyebrow platforms and dispose	11/28-12/2/2016
	Remove and dispose of misc. MMN cables, electronics, piping, etc.	12/5-12/9/2016
WC	Disconnect all WC Racks (as accessible)	10/10-10/14/2016
	Remove all WC racks and store at old RPC factory (912)	10/17-10/21/2016
	Remove Outer platforms and dispose	12/12-12/16/2016
	Remove and dispose of Aerogel detectors ( <i>see Work Permit SDD-2016-016 for details on these tasks</i> )	12/19-12/23/2016
	Remove and dispose of misc. WC cables, electronics, piping, etc.	12/27-12/30/2016
Other Infrastructure	Remove and dispose of misc. MMN cables, electronics, piping, etc.	8/1-12/30/2016
	Cap all piping from GMH to retain for possible future repurposing	8/1-12/30/2016
	Place all GMH and Gas Pad equipment in safe long term non-operational condition for possible future repurposing	8/1-12/30/2016

## R&R Info on PHENIX Engineering Website

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- Procedures:
  - 12 existing procedures used on R&R, 9 need 3 year update
  - All active and active PHENIX procedures linkable (pdf's)
- Work Permits
  - R&R Plan (draft) pdf
  - 12 work plans for R&R identified (1 approved/ released: start of R&R) pdf ;linked
  - Prior work permits form previous years of PHENIX linked
- Pictures and videos
  - Many links

Links start from:

[http://www.phenix.bnl.gov/WWW/INTEGRATION/ME&Integration/DRL\\_SSint- page.htm](http://www.phenix.bnl.gov/WWW/INTEGRATION/ME&Integration/DRL_SSint- page.htm)

# R&R Issues and Concerns

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- **R&R**
  - Schedule recovery
  - Manpower distribution
  - Waste management of **activated steel**
  - Disassembly of the **MMN** in the IR
  - Disassembly of the CM in the AH: Central magnet components exceed 1008 **crane capacity**
  - Final disposition of scrapped materials
  - In-house vs. **outside contractors** for disassembly of large structures

# Safety and Security

# BACK UP SLIDES

# Disassemble Central Magnet

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- Move CM to Assembly Hall
- Remove Experimental Cables
- Remove all CM Tray, Power Cables & Lights
- Remove and dispose Bridge platform
- Remove and dispose RPC stainless shields
- Remove CM Cooling Water Piping & Hosing
- Remove CM Platform
- Disassembly of CM Steel (Gantry Crane)
- Disposal/Storage of CM Materials

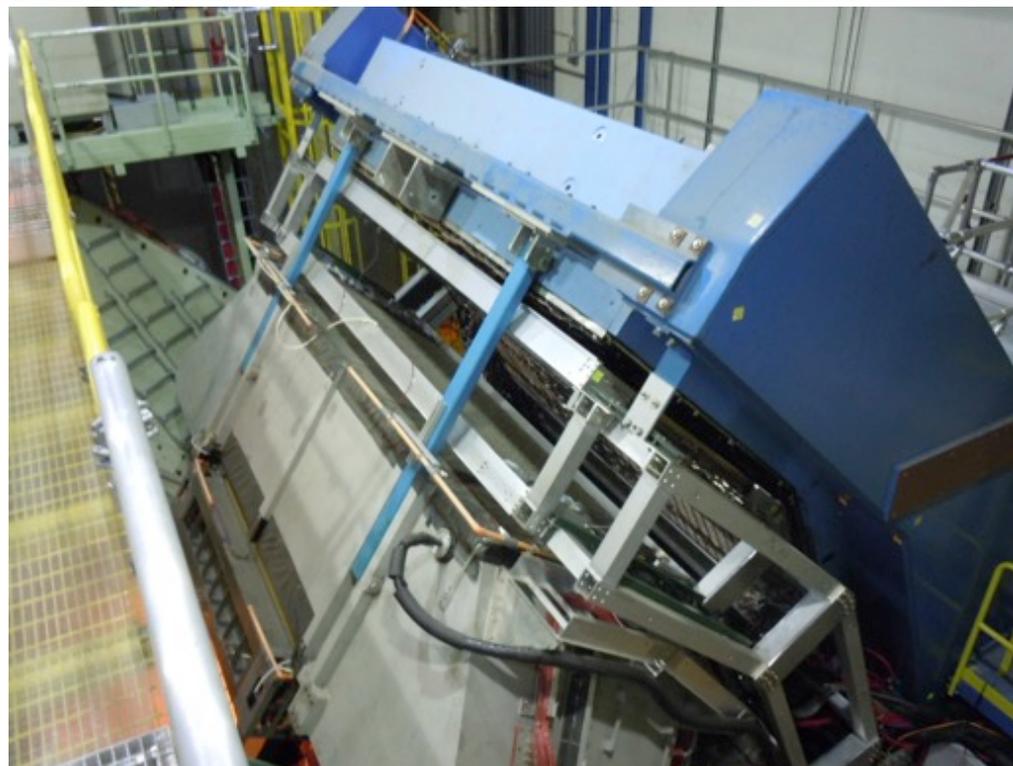
~19 weeks: Schedule TBD



# Disassemble West Carriage

- Disconnect WC Services
- Roll WC to Assembly Hall
- Strip unwanted Electronics from WC Racks
- Move WC Electronics Racks to Storage
- Remove and dispose DC West & PC1
- Remove and dispose RICH West
- Remove and dispose EM Cal: PbSC West
- Remove Experimental Cables
- Remove WC Tray, Power Cables & Lights
- Strip WC Copper Gas & Water Lines
- Remove WC Platforms
- Remove WC Steel Frame
- Disposal/Storage of WC Materials

~16 weeks: Schedule TBD



# Disassemble Muon Magnet North

- Strip unwanted Electronics from MMN Racks
- Move MMN Electronics Racks to Storage
- Remove Experimental Cables
- Remove all MMN Tray, Power Cables & Lights
- Remove MuTrigger platform and dispose/recycle
- Remove Eyebrow platform and dispose recycle
- Remove and dispose MPC-Ex North
- Remove and dispose MPC North
- BP disassembly: Remove North 3" to 5" transition BP spool
- Remove and dispose MuTr station 1 North
- Remove MMN Lamp Shades
- Build MMN Access Platform
- Remove and dispose MuTr stations 2 and 3 North
- Remove MMN Access Platform
- Remove MMN Cooling Water Piping & Hosing
- Remove MMN Detectors
- Remove MMN Teacup
- Remove MMN Coils
- Remove MMN Piston (Gantry Crane)
- Disassembly of MMN Steel
- Disposal/Storage of MMN Materials

~28 weeks: Schedule TBD

6/30/2016



# R&R Support Structures

- Remove all MuID detectors not entrapped in MuID steel and dispose
- Remove and dispose all obsolete piping, wiring and fibers
- Cut Hole in MuID Steel for eRHIC Bypass ?
- Disconnect Power Supply Cables & Water
- Remove Power Supplies
- DAQ room Decommissioning
- Gas Mixing House Decommissioning
- Gas Pad Decommissioning



Schedule: TBD Most equipment to be de-activated in place “mothballed” for possible future repurposing