BROOKHAVEN NATIONAL LABORATORY

Work Permit # __SDD-2016-025 _
Work Order # ___
Job# ___ Activity# ___

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: Robert Pisani	Date: 10/2//2016	Ext.: 5301	Dept/Div/Group: PO
Other Contact person (if different from requester): Carter Biggs			Ext.:
Work Control Coordinator:		Start Date:	Est. End Date: 11/1/2016
Brief Description of Work: Removal and packing of phototubes from Phenix RICH detectors (East and West)			
Building: 912	Room: 912 near door 15	Equipment: PHENIX RICH Detectors (east and west)	Service Provider: PHENIX Techs, Engineers, Subsystem experts, C-A Carpenters and Riggers if needed

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

ESSH ANALYSIS

Radiation Concerns	☐ None	☒ Activation	☐ Airborne	☐ Contamination	☐ Radiation	☐ NORM	☐ Other
☐ Special nuclear materials involved, notify Isotope Special Materials Group				☐ Fissionable/Radiological materials involved, notify Laboratory Nuclear Safety Officer			
Radiation Generating Devices:	☐ Radiography		☐ Moisture Density Gauges		☐ Soil Density Gauges	☐ X-ray Equipment	

Safety and Security Concerns	☐ None	☐ Explosives	☐ Transport of Haz/Rad Material	☐ Pressurized Systems
☐ Adding/Removing Walls or Roofs	☐ Critical Lift	☐ Fumes/Mist/Dust*	☐ Magnetic Fields*	☐ Railroad Work
☐ Asbestos*	☐ Cryogenic	☐ Heat/Cold Stress	☐ Nanomaterials/particles*	☒ Rigging
☐ Beryllium*	☐ Electrical	☐ Hydraulic	☐ Noise*	☐ Silica*
☐ Biohazard*	☒ Elevated Work	☐ Lasers*	☐ Non-ionizing Radiation*	☐ Security Concerns
☐ Chemicals/Corrosives*	☐ Excavation	☐ Lead*	☐ Oxygen Deficiency*	☐ Suspect/Counterfeit Items
☐ Confined Space*	☐ Ergonomics*	☐ Material Handling	☐ Penetrating Fire Walls	☐ 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	☒ None	☐ Work impacts Environmental Permit No.	
☐ Atmospheric Discharges (rad/non-rad/GHG)	☐ Land Use Institutional Controls	☐ Soil Activation/contamination	☐ Waste-Mixed
☐ Chemical or Rad Material Storage or Use	☐ Liquid Discharges	☐ Waste-Clean	☐ Waste-Radioactive
☐ Cesspools (UIC)	☐ PCB Management	☐ Waste-Hazardous	☐ Waste-Regulated Medical
☐ High water/power consumption	☐ Spill potential	☐ Waste-Industrial	☐ Historical Enviornmental Hazards
Waste disposition by:			☐ Other
Pollution Prevention (P2)/Waste Minimization Opportunity: ☒ No ☐ Yes		Environmental Preferable Products Available: ☒ No ☐ Yes	

FACILITY CONCERNS	☒ None	☐ Intermittent Energy Release		
☐ Access/Egress Limitations ☐ Credited Controls (Use USI Process) ☐ Configuration Management	☐ Electrical Noise	☐ Potential to Cause a False Alarm		☐ Vibrations
	☐ Impacts Facility Use Agreement		☐ Temperature Change	☐ Other
	☐ Maintenance Work on Ventilation Systems		☐ Utility Interruptions	

WORK CONTROLS

Work Practices

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

Personal Protective Equipment

☐ None	☐ Ear Plugs	☒ Gloves, as necessary	☐ Lab Coat	☒ Safety Glasses, where req'd		
☐ Coveralls	☐ Ear Muffs	☐ Goggles	☐ Respirator*	☐ Safety Harness, when required		
☐ Disposable Clothing	☐ Face Shield	☒ Hard Hat, As required	☐ Shoe Covers	☒ Safety Shoes, as req'd	☐ High visibility cloths/vest	☐ Other

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

☒ None	☐ Cutting/Welding	☐ Impair Fire Protection Systems
☐ Concrete/Masonry Penetration	☐ Digging/Core Drilling	☐ Rad Work Permit-RWP No
☐ Confined Space Entry	☐ Electrical Working Hot	☐ Other

Dosimetry/Monitoring

☒ None	☐ Heat Stress Monitor	☐ Real Time Monitor	☐ TLD
☐ Air Effluent	☐ Noise Survey/Dosimeter	☐ Self-reading Pencil Dosimeter	☐ Waste Characterization
☐ Ground Water	☐ O_2/Combustible Gas	☐ Self-reading Digital Dosimeter	☐ Other
☐ Liquid Effluent	☐ Passive Vapor Monitor	☐ Sorbent Tube/Filter Pump	

Training Requirements (List specific training requirements)

PHENIX Awareness, C-A Access, Working at Heights (where needed), Electrical Safety 1, LOTO where needed

Work screening has identified the following as the reason for permitted work:	**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)**
☐ **ESSH**	WCC: Date:
☐ **Complexity**	Service Provider: Date:
☐ **Work Coordination**	Authorization to start: Date:
☒ **Permit Not Required** (Sections 3 through 7 optional)	(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): During the 2016 PHENIX R&R Shutdown, PHENIX will be performing R&R work to prepare for a new sPHENIX detector. This work will be worker planned work by skilled PHENIX technicians and appropriately trained BNL bargaining unit personnel if needed. This procedure covers the removal of the RICH phototubes from the RICH detector vessel and the packing of the tubes for transport.
Special Working Conditions Required (e.g., Industrial Hygiene hold points or other monitoring)
Notifications to operations and Operational Limits Requirements:
Post Work Testing, Notification or Documentation Required:

Job Safety Analysis Required: ☐ Yes ☒ No	Review Done: ☒ in series ☐ 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	Carter Biggs			
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: Carter Biggs		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? ☐ Yes ☐ 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:

Work Plan Attachment, W.P.# SDD-2016-025
Removal and packing of phototubes from PHENIX RICH. This procedure covers both the East and West RICH detectors.

Introduction

This procedure will provide guidance for safe removal of the Phototubes from the RICH detector and their packing for shipping.

1.0 Purpose & Scope

The purpose of this procedure is to provide guidance for handling and removing phototubes from the PHENIX RICH detectors. It applies to BNL personnel, outside contractors, contract labor, sub-system experts and to personnel designated to work under this work plan. Safety standards provided by BNL for Material Handling (1.6.0) and required training and certification (1.6.1) will apply. There are three parts to the procedur: prepping of the RICH detector prior to removing the phototubes , the removal of the phototubes from the detector itself and finally the prepping of the phototubes for shipping.

2.0 Responsibilities

2.1 All operations shall be performed under the direction of the PHENIX "Person-in-Charge" or his designee. At no time is any individual to perform work alone.

2.2 Due to the component value, as well as the inherent personnel risk involved in handling such objects, this procedure and all relevant BNL safety guidelines must be strictly adhered to. In accordance with BNL policy, any individual may cease operations if they in any way feel unsafe or if they believe unsafe procedures are being followed. Such a complaint shall be reviewed by the cognizant engineer, and if necessary, BNL ES & H Services.

3.0 Prerequisites

3.1 All personnel involved in this procedure shall wear hard hats when required.

3.2 Personnel involved in this procedure shall wear safety shoes when required.

3.3 Personnel involved in this procedure shall wear safety glasses when required

3.4 Personnel involved in this procedure shall wear work gloves when required

4.0 Precautions

4.1 Visitors shall not be permitted in the area during these procedures.

5.0 Equipment/Parts List

5.1 Various Hand and power tools
5.2 Various packing materials (bubble wrap/foam/tape)
5.3 Wooden shipping crates

6.0 Preparations

Note: All lifting hardware shall be checked for current inspection stickers and shall be visually inspected for defects prior to each lift. Any items found to have expired inspection tags or any evidence of physical degradation shall be immediately removed from service and replaced with conforming hardware of the same capacity.

Procedures:

7.0 Prepping detector before phototubes are removed:

Note: To be done by PHENIX or C-A technical staff that is trained and has permission to work on vessel.

a) Lower light shield shall be removed
b) Lower window gussets shall be removed as necessary to simplify access
c) Lower gas window shall be removed
d) 3 side hatches shall be removed from both sides.
e) Portable lighting shall be installed to help properly illuminate work
f) At this point, the job will be assessed and it will be determined if the detector mirrors need to be removed. If not, go to 7.1
g) Remove upper light shield
h) Remove several upper window gussets as needed.
i) Remove upper gas window.
j) Remove mirrors from detector.

7.1 Removal of Phototubes:

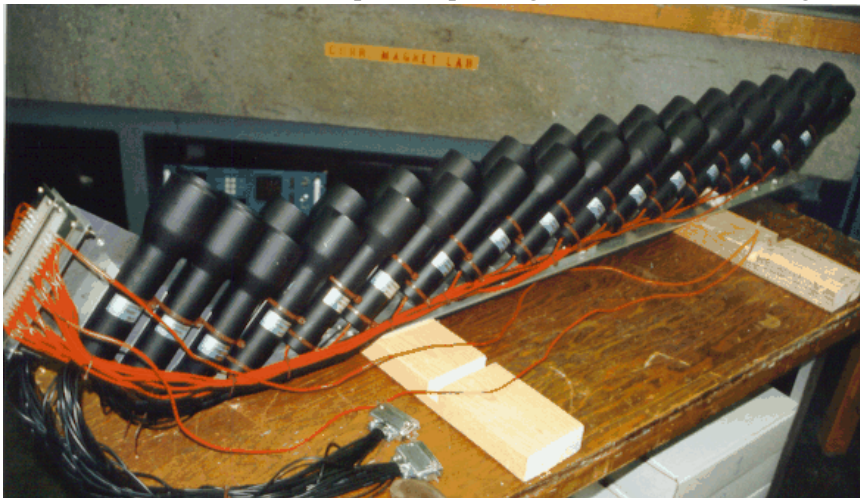
Note: To be performed by PHENIX or C-A technical staff that is trained and has permission to work on vessel.

a) Start at the upper row and remove the 6 long mounting bolts from the phototube assembly.
b) Cut or disconnect the HV and signal cables close to the connector to maximize cable length
c) Carefully lift the phototube assembly using 2 people and remove from the detector.
d) Repeat the procedure until all tubes are removed from both the north and south side.

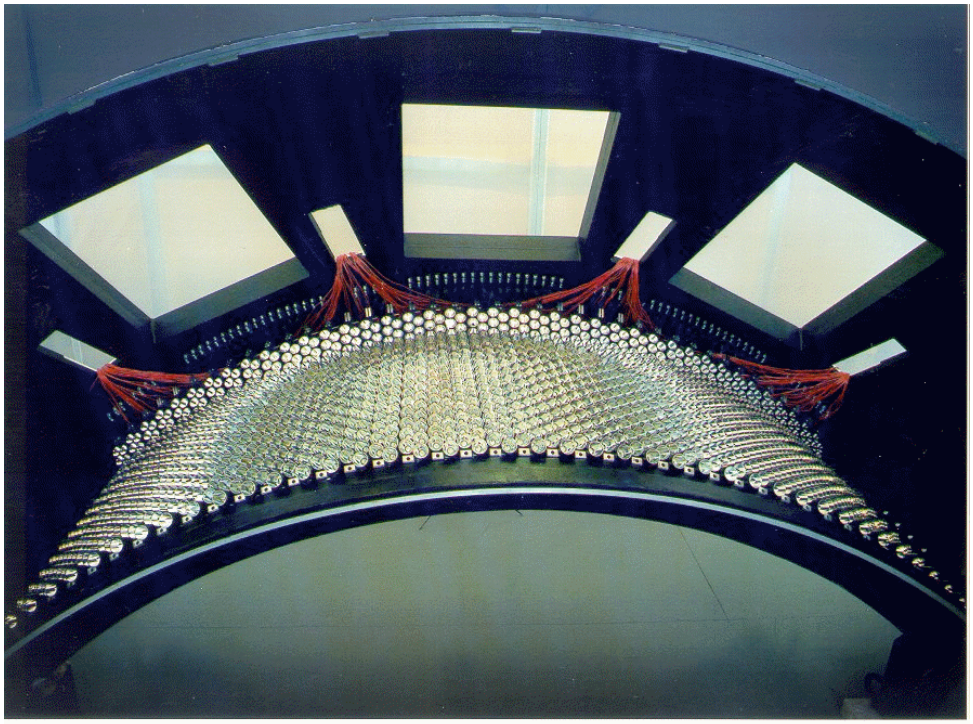
7.2 Packing phototubes / supermodules for shipping

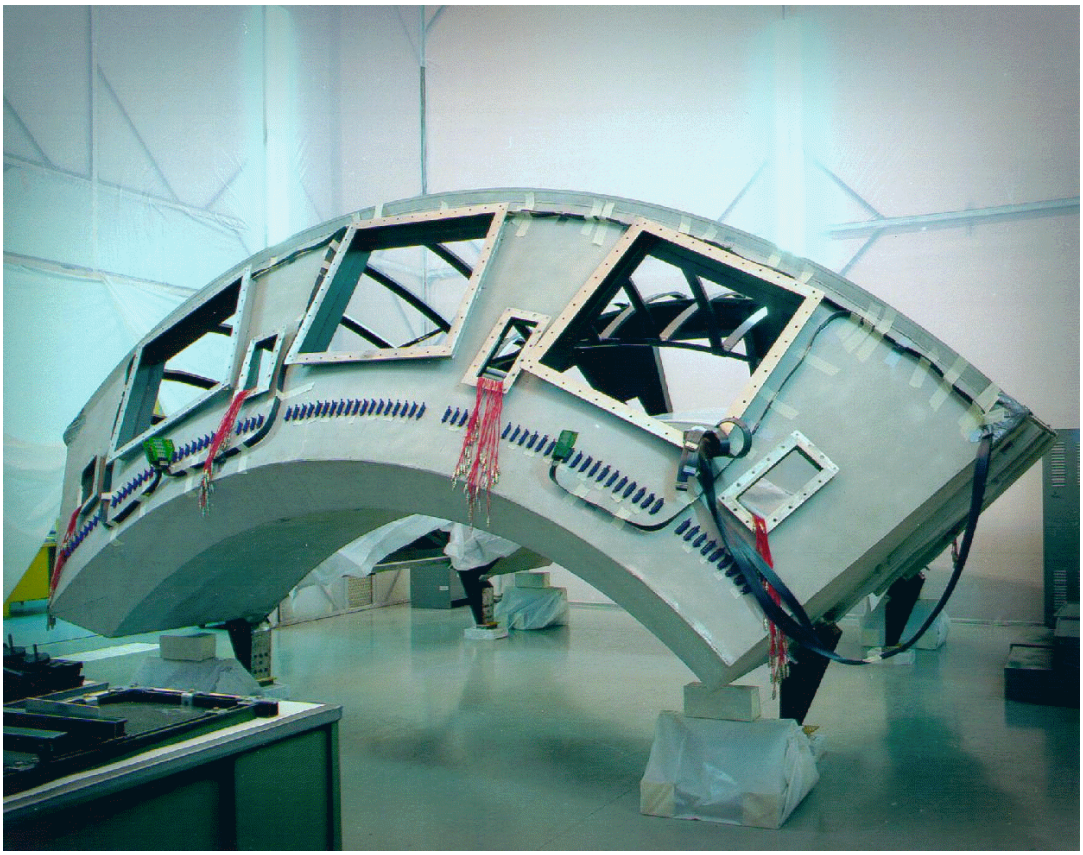
Note: May be done by outside support staff as long as all individuals are properly trained, have permission and are under the supervision of a PHENIX work coordinator. At no time is an individual to work alone at 912.

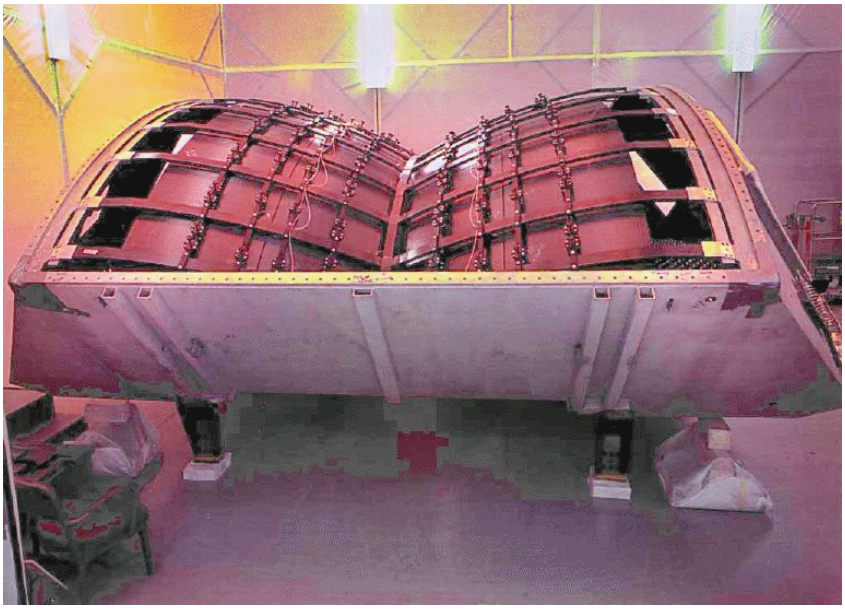
a) Each super module should be packed in a manner that protectors them during shipping.
b) Bubble wrap or packing foam will be used.
c) Once modules are all packaged and protected, they will be safely loaded into shipping crates and sealed.
d) All items must be activation checked prior to packing into crates and leaving the 912 area.



Supermodule







View of mirrors during detector assembly