BROOKHAVEN NATIONAL LABORATORY

Work Permit # DRL-2013-16
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: Don Lynch	Date: 12/19/13	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: 12/20/2013	Est. End Date: 2/11//2014
Brief Description of Work: Repair/ remove detector chamber wire(s) in Drift Chamber on PHENIX West Carriage			
Building: 1008	Room: IR	Equipment: DC West detector	Service Provider: DC Experts & PHENIX Technicians

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

ESS&H 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
* Safety Health Rep. Review Required	☐ Haz, Rad, Bio Material Exceed DOE 151.1-C Levels - Contact OEM			☒ Other Purge Flammable Gas Prior to repair procedure

Environmental Concerns	☒ None	☐ Work impacts Environmental Permit No.	
☐ Atmospheric Discharges (rad/non-rad)	☐ Land Use Institutional Controls	☐ Soil Activation/contamination	☐ Waste-Mixed
☐ Chemical or Rad Material Storage or Use	☐ Liquid Discharges	☐ Waste-Clean	☐ Waste-Radioactive
☐ Cesspools (UIC)	☐ Oil/PCB Management	☐ Waste-Hazardous	☐ Waste-Regulated Medical
☐ High water/power consumption	☐ Spill potential	☐ Waste-Industrial	☐ Underground Duct/Piping
Waste disposition by:			☐ Other
Pollution Prevention (P2)/Waste Minimization Opportunity:	☒ No ☐ Yes		

FACILITY CONCERNS	☒ None	☐ Intermittent Energy Release	
☐ Access/Egress Limitations	☐ Electrical Noise	☐ Potential to Cause a False Alarm	☐ Vibrations
	☐ Impacts Facility Use Agreement	☐ Temperature Change	☐ Other
☐ Configuration Management	☐ 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 appropriate	☐ Lab Coat	☒ Safety Glasses as appropriate
☐ Coveralls	☐ Ear Muffs	☐ Goggles	☐ Respirator*	☐ Safety Harness

☐ Disposable Clothing	☐ Face Shield	☐ Hard Hat	☐ Shoe Covers	☒ Safety Shoes	☐ 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)

C-A User or equiv. , PHENIX Awareness, LockOut/TagOut affected

Based on analysis above, the Review Team determines the risk, complexity, and coordination ratings below:				**If using the permit when all hazard ratings are low, only the following need to sign: (Although allowed, there is no need to use back of form)**	
ESS&H Risk Level:	☒ Low	☐ Moderate	☐ High	WCC: Don Lynch	Date:
Complexity Level:	☒ Low	☐ Moderate	☐ High	Service Provider:	Date:
Work Coordination:	☒ Low	☐ Moderate	☐ High	Authorization to start Don Lynch	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
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:
Job Safety Analysis Required: ☐ Yes ☒ No — Review Done: ☒ in series ☐ team

Reviewed by: * Primary Reviewer signature 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 ESS&H 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 ESS&H 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:

Attachment to W.P. #_DRL-2013-16_ December 2013

Drift Chamber repair in the PHENIX Experimental Hall (bldg. 1008).

Problem

Broken detector wires have been discovered which require repair by removal of the broken wires. The repair effort will require access from the extended CM lift table.

Access to the elevated locations is difficult, as they are located 10 to 20 feet above track level, tucked inside the arc formed by the RICH detector, with the Central Magnet in front of the west carriage. The procedures described below were used successfully in the past to trouble shoot and repair failed chamber wires.

Work Plan

This work is to be done by fully trained and experienced personnel prior to commencement of run 14.

DC Chamber wire troubleshooting and repair

Access will be from the CM lift table with extension wings and elevation step attachment.

Prior to commencing the repair effort:

1. Flammable gas shall be purged from the DC West detector subsystem using gaseous Nitrogen continuously until the flammable gas content is reduced to less than 10%. (Note: flammable gas has not been introduced into the DC West chamber for run 14 yet, but this step is retained for its general application.)

2. The PHENIX magnets are to be turned off and locked out. (Note: again, magnets have not yet been turned on for run 14, but this step is retained so the procedure is applicable for general use).

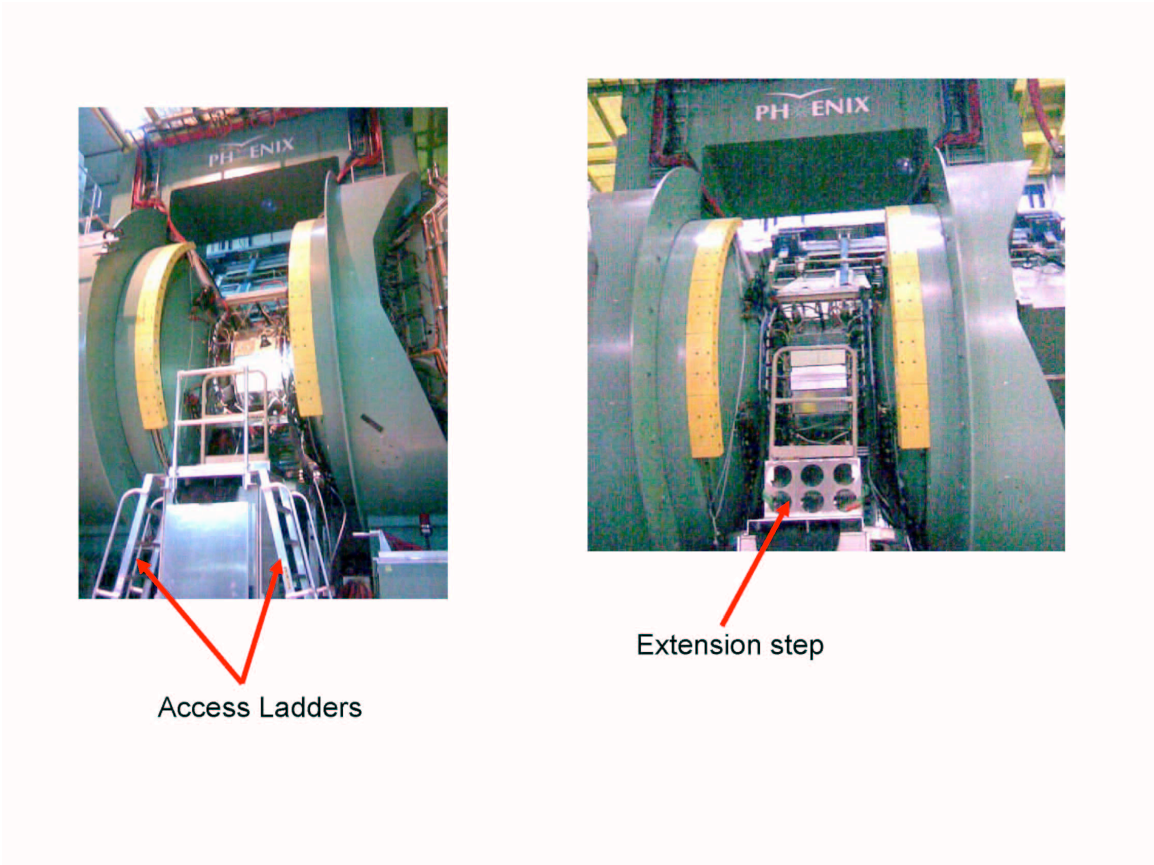
3. The PHENIX flammable detection system shall be put into bypass mode (until repairs have been completed.)

4. Safety rail on elevation step must be attached as shown in the photo below.

Experienced DC group technicians will troubleshoot the shorted Chamber wire(s) by carefully slicing into the DC chamber at a known short location, isolate and remove the failed wire eliminating the short, then resealing the chamber, testing and verifying the repair.

The west carriage shall be in its run position for this repair. Access to the CM region shall be from the east side.

After completion of the repairs, restore the flammable gas detection system to normal operating mode, remove all tools and equipment from the CM region and remove the CM extension step and return it to storage for future use.



CM Lift Table Extension Step and safety rail