

Work Permit # DRL-2009-004

Work Order # \_\_\_\_\_

Job # \_\_\_\_\_ Activity # \_\_\_\_\_

1. Work requester fills out this section.

Standing Work Permit

Requester: <u>PAUL GIANNITI</u>	Date: <u>2/4/09</u>	Ext.: <u>3815</u>	Dept/Div/Group: <u>PO/PHENIX</u>
Other Contact person (if different from requester): <u>JOHN STAMBEK</u>		Ext.: <u>7821</u>	
Work Control Coordinator: <u>DON LYNN</u>	Start Date: <u>2/4/09</u>	Est. End Date: <u>2/6/09</u>	
Brief Description of Work: <u>TROUBLE SHOOT GROUP PANEL ON PHENIX ELECTRONICS RACKS FIRE ALARM PAUL</u>			
Building: <u>1008</u>	Room: <u>1R ANALOG ROOM</u>	Equipment: <u>RACKS</u>	Service Provider: <u>PHENIX ENIGS &amp; REEVE</u>

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

<b>ESS&amp;H ANALYSIS</b>			
<b>Radiation Concerns</b>	<input checked="" type="checkbox"/> None	<input type="checkbox"/> Activation	<input type="checkbox"/> Airborne
	<input type="checkbox"/> Contamination	<input type="checkbox"/> Radiation	<input type="checkbox"/> Other
<input type="checkbox"/> Special nuclear materials involved, notify Isotope Special Materials Group		<input type="checkbox"/> Fissionable materials involved, notify Laboratory Criticality Officer	
<b>Radiation Generating Devices:</b>	<input type="checkbox"/> Radiography	<input type="checkbox"/> Moisture Density Gauges	<input type="checkbox"/> Soil Density Gauges
	<input type="checkbox"/> X-ray Equipment		
<b>Safety and Security Concerns</b>	<input type="checkbox"/> None	<input type="checkbox"/> Explosives	<input type="checkbox"/> Transport of Haz/Rad Material
<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"/> Asbestos*	<input type="checkbox"/> Cryogenic	<input type="checkbox"/> Heat/Cold Stress	<input type="checkbox"/> Nanomaterials/particles*
<input type="checkbox"/> Beryllium*	<input checked="" type="checkbox"/> Electrical	<input type="checkbox"/> Hydraulic	<input type="checkbox"/> Noise*
<input type="checkbox"/> Biohazard*	<input type="checkbox"/> Elevated Work	<input type="checkbox"/> Lasers*	<input type="checkbox"/> Non-ionizing Radiation*
<input type="checkbox"/> Chemicals/Corrosives*	<input type="checkbox"/> Excavation	<input type="checkbox"/> Lead*	<input checked="" type="checkbox"/> Oxygen Deficiency*
<input type="checkbox"/> Confined Space*	<input type="checkbox"/> Ergonomics*	<input type="checkbox"/> Material Handling	<input type="checkbox"/> Penetrating Fire Walls
			<input type="checkbox"/> Vacuum
* Industrial Hygiene (IH) Review Required			
<b>Environmental Concerns</b>	<input checked="" type="checkbox"/> None	<input type="checkbox"/> Work impacts Environmental Permit No.	
<input type="checkbox"/> Atmospheric Discharges (rad/non-rad)	<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"/> Oil/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"/> Underground Duct/Piping
Waste disposition by:			<input type="checkbox"/> Other
<b>Pollution Prevention (P2)/Waste Minimization Opportunity:</b>	<input type="checkbox"/> No	<input type="checkbox"/> Yes	
<b>FACILITY CONCERNS</b>	<input type="checkbox"/> None		
<input type="checkbox"/> Access/Egress	<input type="checkbox"/> Limitations	<input type="checkbox"/> Electrical Noise	<input checked="" type="checkbox"/> Potential to Cause a False Alarm
	<input type="checkbox"/> Impacts Facility Use Agreement	<input type="checkbox"/> Temperature Change	<input type="checkbox"/> Vibrations
<input type="checkbox"/> Configuration Control	<input type="checkbox"/> Maintenance Work on Ventilation Systems	<input type="checkbox"/> Utility Interruptions	<input type="checkbox"/> Other
<b>WORK CONTROLS</b>			
<b>Work Practices</b>			
<input type="checkbox"/> None	<input type="checkbox"/> Exhaust Ventilation	<input checked="" type="checkbox"/> Lockout/Tagout	<input type="checkbox"/> Spill Containment
<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"/> Barricades	<input type="checkbox"/> IH Survey	<input type="checkbox"/> Scaffolding-requires inspection	<input type="checkbox"/> Warning Alarm (i.e. "high level")
<b>Personal Protective Equipment</b>			
<input type="checkbox"/> None	<input type="checkbox"/> Ear Plugs	<input checked="" type="checkbox"/> Gloves	<input type="checkbox"/> Lab Coat
<input type="checkbox"/> Coveralls	<input type="checkbox"/> Ear Muffs	<input type="checkbox"/> Goggles	<input type="checkbox"/> Respirator*
<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 Glasses
			<input type="checkbox"/> Safety Harness
			<input type="checkbox"/> Safety Shoes
			<input type="checkbox"/> Other
<b>Permits Required</b> (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	
<b>Dosimetry/Monitoring</b>			
<input type="checkbox"/> None	<input type="checkbox"/> Heat Stress Monitor	<input type="checkbox"/> Real Time Monitor	<input checked="" type="checkbox"/> TLD (PO Turner)
<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 <sub>2</sub> /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	
<b>Training Requirements</b> (List specific training requirements) <u>Rad worker / PO Turner</u>			
<u>ODH, PO Turner, PHENIX AWARENESS &amp; CIA ACCESS</u>			
Based on analysis above, the Walkdown 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)	
<b>ESS&amp;H Risk Level:</b>	<input checked="" type="checkbox"/> Low	<input type="checkbox"/> Moderate	<input type="checkbox"/> High
<b>Complexity Level:</b>	<input checked="" type="checkbox"/> Low	<input type="checkbox"/> Moderate	<input type="checkbox"/> High
<b>Work Coordination:</b>	<input checked="" type="checkbox"/> Low	<input type="checkbox"/> Moderate	<input type="checkbox"/> High
		WCC: <u>[Signature]</u>	Date: <u>2/4/09</u>
		Service Provider: <u>[Signature]</u>	Date: _____
		Authorization to start: <u>[Signature]</u>	Date: <u>2/4/09</u>
		(Departmental Sup/WCC/Designee)	

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

Work Plan (procedures, timing, equipment, and personnel availability need to be addressed):  
*SEE ATTACHED*

Special Working Conditions Required (e.g., Industrial Hygiene hold points or other monitoring)  
*ANY RUNNER WORK REQUIRES OPHI TRAINING - O<sub>2</sub> MONITORS & ESCAPE PACKS FOR ALL*

Notifications to operations and Operational Limits Requirements: *NOTIFY OPS WATCH WHEN IN BYPASSES*

Post Work Testing, Notification or Documentation Required: *N/A*

Job Safety Analysis Required:  Yes  No      Walkdown Completed (Required):  Yes

Reviewed by: Primary Reviewer signature means that the hazards and risks that could impact ESS&H have been identified, a Walkdown was completed and the hazards will be controlled according to BNL requirements.

Title	Name (print)	Signature	Life #	Date
Primary Reviewer				
ES&H Professional				
Building Manager				
Service Provider				
Work Control Coordinator				
Safety and Health Services (i.e. IH Rep)				
Other				

Review Done:  in series       team

4. Job site personnel fill out this section.

Note: Signature indicates personnel performing work have read and understand the hazards and permit requirements (including any attachments).

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 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:
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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 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 work area to work supervisor.) The WCC ensures that the change process to update drawings, placards, postings, procedures, etc. are initiated, if necessary.

Name: <i>PAUL GIANNOTTI</i>	Signature: <i>P. Giannotti</i>	Life #: <i>19759</i>	Date: <i>2-4-09</i>
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Comments:  
*PROBLEM RESOLVED. SYSTEMS RETURNED TO NORMAL - SEE ATTACHED EMAIL. P. GIANNOTTI TO DAVE PHILLIPS.*

## **PHENIX Electronics Racks Fire Detection System (Notifier Panel)**

### **Troubleshooting Procedure**

Objective: A ground fault exists on the wiring network for the smoke detectors in the PHENIX Electronics Racks. This procedure will allow a technician to isolate portions of the network in order to find the source of the ground fault.

PHENIX detector systems status during troubleshooting efforts: All electronics racks will remain energized and the Notifier system will be temporarily de-activated. The VESDA HSSD smoke detection system (fire zone 29), BNL building fire alarm zones 2 (IR ceiling detectors), and zone 3 (IR ceiling HSSD) systems are active. Flammable Gas through the detectors will be flowing.

Additional personnel will be stationed in the IR, during this test, to monitor any abnormal conditions related to rack operation.

The Time of Flight (TOF) detector High Voltage will be de-energized and the detector INERGEN fire suppression system will be disabled (via disconnecting the wiring to the release valve).

Specific trip signals will be manually bypassed, from the PHENIX Bypass Switch Panel, during this test. All other PHENIX Safety System alarms and protective actions will be in service.

### **Procedure**

Perform the following steps in order:

1. Turn OFF the HV source to the TOF detector.
2. Turn OFF the TOF air blowers.
3. Disable the TOF Inergen valve via pulling the TB7 plug in the Notifier panel.
4. Place the following trip signals into BYPASS:
  - a) East Carriage Power Breaker
  - b) TOF Sector 0 2/2 Smoke
  - c) TOF Sector 1 2/2 Smoke
5. Turn OFF 120VAC power to the Notifier Fire Alarm Panel via OPEN circuit breaker #26 in Panel DPA-2 (Rack Room).
6. Lift the Notifier panel battery leads (removes backup 24VDC power from the panel).

Proceed with troubleshooting efforts to locate the ground fault.

Return all systems to normal following completion of this testing.

**Giannotti, Paul**

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**From:** Giannotti, Paul  
**Sent:** Wednesday, February 04, 2009 12:02 PM  
**To:** Phillips, David B  
**Cc:** Pendzick, Alexander F; Lynch, Don  
**Subject:** Ground Fault Repaired

Dave,

The source of the Notifier system ground fault has been repaired. The system is now normal and is scanning for smoke in all PHENIX racks & both TOF sectors. All trip bypasses are returned to normal and CAS (Henry) was informed to lock the bypass switch box.

Each rack contains two Notifier system components. One is the photoelectric smoke detector. The other is a relay device known as the CMX Module. Each device has a unique digital address. When smoke is detected within a rack, the Notifier identifies that rack and sends a trip signal to the rack's CMX module. The CMX (normally closed) contacts keep the rack's electrical contactor energized. A CMX trip signal will cause the contacts to open, and the contactor will drop out – de-energizing the rack.

A ground fault will be caused if one of the two Notifier loop wires partially or directly contacts earth ground. Past history shows that (for unknown reasons) a CMX module can sometimes work normally except can also produce a system ground fault. During a ground fault alarm, the system otherwise functions normally while monitoring its smoke detectors. This time, the fault occurred in rack SRPC-1 (south tunnel RPC rack) CMX module. We replaced it and the problem cleared.

Again, this exact failure only occurred once in the past. We don't feel that this is a problem warranting a vendor investigation. The Notifier system has been in service for 10 years and has proven to be very reliable for PHENIX.

Thanks for your support,

Paul