

NSLS ELECTRICAL WORK PERMIT

Testing, Troubleshooting, and Voltage Measuring
(Including LOTO Zero Energy Verifications) on
Systems/Equipment Operating at Hazard/Risk Category 2 or less AND 240 volts or less

Department Code	LS		
Permit #	0001	Revision	A
Limitations	<u>Hazard/Risk Category 2 or less AND 240 volts or less</u>		
Start Date	3/31/2009		
Expiration Date	4/1/2010		
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PART I: JOB DESCRIPTION:

1. **Description of circuit/equipment/job location:** Completing this permit is the final step in obtaining approval to perform basic energized troubleshooting voltage measurements and LOTO zero energy verifications. Personnel are only authorized to work on systems that are listed in their worker qualification matrix.
 - a. **NSLS employees, users, and guests are only permitted to:**
 - i. Troubleshoot systems operating at Hazard/Risk Category 2 or less AND 240 volts or less.
 - ii. Complete LOTO zero energy verifications on systems operating at Hazard/Risk Category 2 or less AND 240 volts or less
 - iii. Complete LOTO on systems that exceed Hazard/Risk Category 2 AND 240 volts that are equipped with a engineered voltage monitoring solutions.
 - b. **BNL Electricians are permitted to:**
 - i. Troubleshoot systems that exceed Hazard/Risk Category 2 AND 240 volts.
 - ii. Complete LOTO zero energy verifications on systems that exceed Hazard/Risk Category 2 AND 240 volts.

Warning: For work that exceeds the description above, the hazards associated with energized troubleshooting shall be analyzed and proper controls shall be documented on a task specific energized work permit.

2. **Description of work to be done:** LOTO zero energy verifications and basic energized troubleshooting voltage measurements on systems operating at **Hazard/Risk Category 2 or less AND 240 volts or less** within the NSLS complex. Prior to performing any energized work, the worker must verify the hazard/risk category and system voltage rating by checking the label on the upstream power source (disconnects or circuit breaker panel).
3. **Justification of why the circuit/equipment cannot be de-energized or the work deferred until the next scheduled outage:**
 - a. **For LOTO Zero Energy Verifications:** These systems are in the process of being verified as de-energized for maintenance purposes.
 - b. **For Basic Troubleshooting:** These systems must be energized for testing and repairs.

PART II: HAZARD ANALYSIS:

1. **Detailed job description procedure and safe work practices to be used in performing the above detailed work:**
 - a. **LOTO:** For systems that do not meet the SBMS LOTO subject area definition of a “simple system”, task specific LOTO procedures must be developed and implemented. For systems that meet the SBMS LOTO subject area definition for “simple system”, the LOTO subject area is the required procedure.
 - b. **Troubleshooting:** This permit is for basic troubleshooting and testing of a wide range of electrical equipment at the NSLS. No task specific procedures are required for this basic electrical work. Arc flash hazard category and system voltage must be determined prior to starting work. Proper PPE must be selected based on the arc flash hazard category (see PPE matrix below). PPE must be donned and the area barricaded to the arc flash boundary before exposing any live parts.

PPE Matrix	Hazard/Risk Categories (<= 240 volts)		
	Category 0	Category 1	Category 2
Personal Protective Equipment	<ul style="list-style-type: none"> • Cotton Clothing (Long Sleeve Shirt and Pants) • Leather Gloves (over voltage rated gloves) • Voltage Rated Gloves Class 00 • Non-conductive Safety Glasses • NRTL Approved Category 3 or 4 Multimeter • Voltage rated Tools 	<ul style="list-style-type: none"> • Non-melting Undergarments • Fire Rated Clothing: Long Sleeve Shirt and Pants (> or = 4 cal/cm²) • Leather Gloves (over voltage rated gloves) • Voltage Rated Gloves Class 00 • Hard Hat • Non-conductive Safety Glasses • Leather Shoes • NRTL Approved Category 3 or 4 Multimeter • Voltage rated Tools 	<ul style="list-style-type: none"> • Non-melting Undergarments • Fire Rated Clothing: Long Sleeve Shirt and Pants (> or = 8 cal/cm²) • Face Shield (> or = 8 cal/cm²) • Earplugs • Leather Gloves (over voltage rated gloves) • Voltage Rated Gloves Class 00 • Hard Hat • Leather Shoes • Non-conductive Safety Glasses • NRTL Approved Category 3 or 4 Multimeter • Voltage rated Tools
Arc Flash Boundary	4 Feet	5 Feet	6 Feet
Shock Hazard	YES	YES	YES
Limited Approach Boundary	3 Feet 6 Inches	3 Feet 6 Inches	3 Feet 6 Inches
Restricted Approach Boundary	0 Feet 1 Inch	0 Feet 1 Inch	0 Feet 1 Inch
Prohibited Approach Boundary	Avoid Contact	Avoid Contact	Avoid Contact
Working Distance	18 Inches	18 Inches	18 Inches
Means employed to restrict access of unqualified persons from the work area.	A second person as a safety watch “OR” barricade tape and stanchions with warning signs.	A second person as a safety watch “OR” barricade tape and stanchions with warning signs.	A second person as a safety watch “OR” barricade tape and stanchions with warning signs.

PART III: APPROVAL(S) TO PERFORM THE WORK WHILE ELECTRICALLY ENERGIZED:

Section Head

Date

NSLS Safety Officer or Power Distribution Engineer

Date

PART IV: PERFORM WORK and FEEDBACK:

- **Perform a daily pre-work briefing:**
 - **Read this permit, and any applicable procedures.**
 - **Check your qualification matrix**
 - **Confirm your training status**

- **Provide post work feedback:**
 - **Provide verbal or written feedback to your supervisor on how to perform this work more safely or more efficiently.**

