LLE’s Energized Work Policy
Safety training topic: E_003

University of Rochester
Laboratory for Laser Energetics
Energized Work Permit

Part I: To be completed by the requester as preparation of the job

<table>
<thead>
<tr>
<th>Requester’s Name and Title</th>
<th>Request Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description of Equipment:</td>
<td>Job Site Location:</td>
</tr>
<tr>
<td>Description of Work to Be Done:</td>
<td></td>
</tr>
</tbody>
</table>

Justification of why the equipment cannot be de-energized or the work delayed until the next scheduled outage.

Part II: To be completed by the qualified person(s) completing the work. Attach response on separate page(s) if necessary. Check when Complete

| Hazard present while system remains energized: | |
| Detailed description of procedure to be used in performing the above work: | |
| Description of safe work practices to be employed: | |
| Voltage exposure (check hazard analysis): | |
| Determination of shock protection boundaries: | |
| Results of flash hazard analysis: | |
| Determination of flash protection boundaries: | |
| PPE required to safely perform the task: | |
| Method used to restrict access to the work area: | |

Do you agree that the above work can be done safely? **YES** (proceed to Part III) **NO** (return to requester)

Qualified Person: Name __________ Title __________ Signature __________ Date __________

Part III: To be completed by LLE Safety Officers

<table>
<thead>
<tr>
<th>Approvals:</th>
<th>Name __________ Title __________ Signature __________ Date __________</th>
</tr>
</thead>
</table>

Note: Route Permit to LLE Safety Officers. A minimum of two safety officers must approve energized work. When job is finished, forward to Chief Safety Officer for review and retention.

Douglas Jacobs-Perkins
LLE Chief Safety Officer
LLE’s Energized Work Policy
Safety training topic: E_003

This training
• is to inform supervisors and workers about LLE’s Energized Work policy
• does NOT permit individuals to authorize Energized Work

LLE’s Energized Work Policy is to be applied to ALL forms of energized work, including
• Energized high voltage electrical equipment
• Pressurized systems (gas, steam, hydraulic, …)
• Rotating & reciprocating machinery (motors, fans, pumps, …)

“High voltage” is defined as > 50 Volts
LLE’s Energized Work Policy requires systems to be de-energized before servicing, with limited exceptions:

- Energized Work Permits, or written and approved procedures, are required when this can’t be achieved.
- “Nuisance” and “Inconvenience” are not sufficient justification to work on energized equipment.
- Must demonstrate critical need.
- Requires developing a safe work plan before execution:
  - Hazard analysis
  - Mitigation strategy
  - Review & Approval
  - Training

De-energizing equipment is not sufficient to ensure personnel and equipment safety. **Make sure it can’t be re-energized!** *Lockout / Tag out!*
Everyone has the right and RESPONSIBILITY to “Stop work” if they perceive an Imminent Danger

- An imminent danger is a hazard that presents an unacceptable risk of injury, environmental impairment or property damage.
- Such hazards may result from
  - defective equipment,
  - failure to follow procedures,
  - equipment or techniques unsuitable for a specific task, or
  - unforeseen circumstances.
- Resolve the problem; get the right people involved:
  - co-workers, supervisors, Shot Director, Safety Officers, and/or the Laser Facility Manager.
- Provide feedback to the Chief Safety Officer to
  - reduce future risks and
  - improve planning.
These excerpts from OSHA regulations are the basis for LLE’s policy

1910.333(a)

- Safety-related work practices shall be employed to prevent … injuries … when work is performed near or on equipment … which are or may be energized. The specific safety-related work practices shall be consistent with the nature and extent of the associated … hazards.

- … parts to which an employee may be exposed shall be de-energized before the employee works on or near them, unless the employer can demonstrate that de-energizing introduces additional or increased hazards or is infeasible due to equipment design or operational limitations…

- If the exposed … parts are not de-energized …, other safety-related work practices shall be used to protect …
De-energizing equipment is not sufficient to ensure personnel safety

Make sure it can’t be re-energized!

**Lockout / Tag out!**

- Be certain that **ALL** energy sources are disabled before starting work
- Locking-out and/or Tagging-out (LOTO) **ALL** energy sources is critical to keeping personnel safe until conclusion of a task
- LOTO is required whenever there is a **possibility** that someone or something could restore energy to the system, for example by:
  - Operation of a switch, valve, circuit breaker, etc.
  - Remote control (software, automated controls, …)
- LOTO is not required if the worker has **exclusive** control of **ALL** energy sources, e.g.:
  - Line cord to chassis
  - Local compressed gas source (bottle)
LLE’s policy is more restrictive than OSHA and UR

• LLE’s Energized Work Policy is to be applied to ALL forms of energized work, not just energized electrical work, including
  — Energized electrical equipment
  — Pressurized systems (gas, steam, hydraulic, …)
  — Rotating & reciprocating machinery (motors, fans, pumps, …)

• LLE does not use UR’s “Limited Long Term Energized Work Permits”

• Written, approved procedures are required when a recurring need exists to work on energized equipment. Requirements:
  — There is a demonstrated need that can only be satisfied with equipment energized (e.g. testing, trouble-shooting)
  — Safety risks and mitigation steps are defined in the procedure
  — Personnel are trained and follow the procedure
When energized work is required at LLE …

• An Energized Work Permit must be properly completed in advance of performing the job

• Work must be conducted using the LLE Buddy System, where the Buddy is:
  — physically present during activity
  — knowledgeable of trades being practiced (electrician, mechanic, etc)
  — aware of safety risks associated with task
  — ensuring that risk mitigation steps are being followed
  — able to respond appropriately in the event of an emergency (i.e. safely disable energy source)

• At least one qualified first-aid responder must be on site, available, and aware that energized work is being conducted.
Responsibilities

• Safety Officers will help to assess specific situations
• Supervisors must first consider alternatives to performing energized work (i.e. schedule work when down-time is acceptable)
• If there is no viable alternative to performing energized work,
  — Supervisor(s) and Safety Officer(s) perform safety risk assessment.
  — Supervisor and Chief Safety Officer must authorize Energized Work Permit before work may begin
  — Potentially recurrent situations should have procedures that become part of operations protocol
• Procedures are to be reviewed and approved in PDM (Project Data Management) system. Include relevant Safety Officers in procedure approval
An Energized Work Permit…

• Applies to a specific task or event
• Requires explicit authorization from Supervisor and Safety Officer(s) prior to execution
• Names specific individual(s) and time(s) to execute the task
• Is NOT to be re-used (convert to procedure if re-use becomes necessary)

Whereas Operating Procedures are:
• Formal
• Written so that any member of a group may execute a task after receiving instruction
• Approved in PDM system
• Used each time the task is performed, and
  — Do not require explicit approval from Safety Officers each time task is performed
Process for initiating an Energized Work Permit at LLE

• If situation involves a faulty piece of equipment,
  — Notify work area supervisor
  — Contact Chief Safety Officer and Safety Officer(s) from relevant discipline(s)
  — Develop plan to make the work area and equipment safe before proceeding

• Obtain a blank Energized Work Permit form from the LLE Safety Zone
  — http://safety.lle.rochester.edu/520_training/presentations.php

• The Chief Safety Officer will assist with preparation and review of all Energized work permits

• If building maintenance personnel are required (e.g. electrician, mechanic, plumber), contact the Building Facility Manager
Results at LLE to-date

- Since implementing this policy at LLE in 2008, few (<10) energized work permits have been required.
- When challenged, most area supervisors found that work could be postponed and executed while equipment was de-energized, with little impact on productivity.
- Permits have generally been handled in a few hours.
- Some tasks take less time to execute when systems are de-energized.
Sources of related information

- **OSHA Regulations 29 CFR Section 1910.333**

- **University of Rochester Policy No. IH001 “Electrical Safety Program”**
  - [http://www.safety.rochester.edu/policies.html](http://www.safety.rochester.edu/policies.html)

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Plan ahead!

Schedule work to take advantage of down time.
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