



**3130-T3**

# Appendix 3130-T3 FEL Experiment Safety Approval Form

FEL Experiment ID#: \_\_\_\_\_ (To be completed by the FEL Facility Manager)

**This form documents your experiment. You must complete ALL the numbered questions; write “not applicable” or “none” where appropriate. Once approved, this form is valid for one year. If your experiment changes before the form expires, you must notify the FEL Facility Manager (G. Neil, 757-269-7443, neil@jlab.org). Most changes are easily accommodated and should not result in significant delay.**

1. Lab Number: \_\_\_\_\_ Expected Start Date: \_\_\_\_\_

2. Experiment Title: \_\_\_\_\_

3. List all the experimenters who will be working at the FEL.

**All personnel with potential exposure to high power laser light are required to obtain an eye exam, Laser Safety Orientation, and laser specific safety training.**

First Name and Last Name

Affiliation

Phone Number

e-mail

_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Continued on attachments.

Name of person who completed this Safety Approval Form: \_\_\_\_\_

e-mail: \_\_\_\_\_ Phone #: \_\_\_\_\_





- 4.b. Describe target material and any airborne contaminants produced and method of exhaust, composition/decomposition expected, fixture description, and expected interaction with FEL beam.
- 4.c. Describe the beam stop construction and ability to handle power.
- 4.d. Describe any chemical/gas handling procedures (i.e., gas mixing, electropolishing, etc.) to be performed at Jefferson Lab.
5. Describe any additional lasers used in the experiment. Use of additional Class 3b and above lasers requires a separate additional Laser Standard Operating Procedure (LSOP).



**JEFFERSON LAB FEL EXPERIMENT SAFETY APPROVAL FORM (cont.)**

6. a. Task Hazard Analysis

**Instructions: Answer the following questions. Questions with answers that indicate a hazard may exist, flag and document resolutions and hazard mitigations.**

General Conditions	Keywords	Y/N	Resolutions
1. Have you read the MSDS requirements for the materials being used and the required Personal Protective Equipment (PPE)?	acids, flammable gases and solvents, heavy metals (lead, etc.), respirator, gloves, aprons, face shield, safety glasses, working with flammables		
2. Will you create dust, welding arcs, heat, excessive noise, RF or x-rays?	welding, grinding, painting, x-rays, respirator, gloves, RF, lasers, chemicals, epoxies		
3. Are there any fire or explosive hazards associated with the work?	painting, welding, grinding, brazing, mixing chemicals, battery charging		
4. Could the work create headaches, breathing problems, or dizziness from odors, etc.?	Motor exhaust, painting, ozone, solvents, acids, bases, chemicals, portable heaters		
5. Will Compressed or liquefied gasses be used?	cryogenics, nitrogen, helium, argon, carbon monoxide		
6. Does the task require work in areas or with materials subject to temperature extremes?	welding, soldering, brazing, cryogenics, resistive heating		
7. Does the work involve the use of hoists or robotics?	manlifts, subcontractors, rentals, slings, rigging		
8. Will powered hand tools be used?	drills, saws, PPE, GFCI, power activated tools		
9. Does the work involve the risk of electrical shock or other forms of hazardous energy?	LOTO, compressed gases, power supplies, pressure, cryogenics		
10. Does the task involve lifting, pulling, pushing, or carrying heavy objects, or repetitive motion?	posture, back injury, twisting		
11. Does the task involve work with pressurized or vacuum vessels?	resistive heaters, GFCI, pressure relief, tanks, containers		
12. Does the task require any permits?	welding, grinding, open flame soldering		
13. Does the task require specialized training?	respirator		
14. Will waste products require special handling or disposal requirements?	chemicals, by products, discharges to sanitary sewer or air		
15. Any other hazards we may have overlooked with this list?			



**JEFFERSON LAB FEL EXPERIMENT SAFETY APPROVAL FORM (cont.)**

Outline the procedures involved in your experiment. Include task locations, quantities of materials to be used, and equipment requirements. Provide sufficient information to illustrate what will be done, who will do it, and where procedures will occur. You may refer to the LSOP for the particular lab, its hardware, and procedures. If this work involves modifications of the basic optical beam delivery system, provide a description of these modifications. Include work involving, chemicals, compressed gasses, biological materials, and physical hazards (cryogenics, radioactive materials, motorized or robotic equipment, electrical concerns, and stored energy concerns). Describe how the materials and equipment will be used.

Include any precautions you plan such as requirements for: personal protective equipment, posting, process restrictions, laser beam containment, and material containment, transport and quantity limitations. Refer to the Jefferson Lab EH&S Manual for hazard mitigation measures. Incorporation of personnel safety interlocks is normally by a 24V continuity test in the Laser Safety System loop.

If there are no new risks presented by your experiment, provide a simple description of your planned activities. Please be concise. Attach additional pages and figures as required for complete explanation. The specific Test Plan for your experiment will be filed on a separate form after technical and safety approval and scheduling.

*Note: The responsible manager with authority and responsibility for safe operation of the experiment is the FEL Facility Manager, George R. Neil. The standard emergency response in all cases is for the FEL Duty Officer to disable the laser, cease beam operations, and to notify the Crew Chief (879-3367) who will follow the appropriate emergency response procedures as approved by operations.*

**Key References:**

FEL Operations Directives  
Jefferson Lab EH&S Manual  
especially Chapter **3130** *The FEL Experiment Review Process* (and relevant appendices)  
ANSI Z136.1  
EMP-04

**Proposed Outline:**

- I. Brief Description of Experiment (include layout and approximate duration of testing program)
- II. Maximum Laser Parameters Considered (Power, Wavelength Ranges, Special Focal Conditions)
- III. Laser Safety Considerations (Personnel Safety, Equipment Limits, Beam Containment, Interlocks)
- IV. Other Safety Considerations (Heavy Equipment, Industrial Hazards, Effluent, Electrical Safety, etc.)
- V. Residual Hazards (Contaminants, Disposal, Safe Disassembly, etc.)



**JEFFERSON LAB FEL EXPERIMENT SAFETY APPROVAL FORM (cont.)**

**6.b. Regulatory Requirements**

yes  no. Does the proposed experiment utilize viruses, viable bacteria, or material presenting a biological hazard at the FEL? Certain biological hazards require notification to agencies outside TJNAF. If you plan to work with these materials, contact the Jefferson Lab Industrial Hygienist at (757) 269-7039.

yes  no. Does the proposed experiment require any radioactive materials or radiation producing equipment? Transport of radioactive materials to Jefferson Lab or within Jefferson Lab requires notification of the Radiation Control Group: (757) 269-7551. They will determine the proper procedures for the transfer of these materials.

yes  no. Does the proposed experiment require any industrial chemicals to be brought to Jefferson Lab? Chemical shipments arriving at or leaving Jefferson Lab must be handled through the Jefferson Lab Shipping and Receiving Office at (757) 269-7338 with notification to the Safety Lab at (757) 269-7039. All such shipments must include a MSDS for each material shipped.

yes  no. Does the proposed experiment create any chemical hazards.

7. Wastes: List all wastes that will be generated. Include anticipated quantities of each disposal approach.

**Environmental Management Information (EMP-04)**

**Air, Water, and Waste Information** (*complete as applicable*)

Anticipated Air Emissions \_\_\_\_\_

Water-Based Project?            Yes or No

Source of Water for the Project \_\_\_\_\_

How is water to be discharged or disposed (provide estimated quantity): \_\_\_\_\_

Sanitary Sewer \_\_\_\_\_

Surface Water \_\_\_\_\_

Other types of Waste Generated \_\_\_\_\_

Waste Disposal Plan (attach additional information as necessary)

Special Sanitary Sewer Discharge \_\_\_\_\_

Other Waste Water \_\_\_\_\_

Hazardous Waste \_\_\_\_\_

Solid Waste (landfill or recycling) \_\_\_\_\_

Power/Natural Resource Consumption Expected \_\_\_\_\_

Name/Description of Waste Generated/Anticipated Quantity

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



**JEFFERSON LAB FEL EXPERIMENT SAFETY APPROVAL FORM (cont.)**

8. All personnel performing an experiment at the FEL facility are required to take the standard Jefferson Lab EH&S training.

Unescorted access to many areas in the FEL facility requires ODH training.

Access to the FEL vault on a regular basis requires radiation worker training and badging.

All those utilizing lasers above Class 3a are required to pass the Laser Safety Course or equivalent and obtain an approved eye examination.

Other training (such as Lock and Tag, etc.) may be required depending on the nature of the experiment.

Prior to use of the FEL or User Labs, each User shall receive an FEL facility orientation and checkout and be approved by the FEL Laser System Supervisor

The personnel below are happy to answer your questions and offer suggestions as to the most effective way of dealing with common hazards.

**9. SUBMITTING A COMPLETED SAFETY APPROVAL FORM**

Submit completed form to FEL Office at address or fax below, or give it to the FEL Facility Manager at least two weeks before experiment starts. If the experiment involves hazards requiring special procedures or new equipment, discussions with the FEL Facility Manager should start significantly earlier.

Responsible for Laser Safety at Jefferson Lab  
Jefferson Lab Laser Safety Officer and Industrial Hygienist  
Patty Hunt, 757-269-7039, hunt@jlab.org

Responsible for FEL Laser Safety  
FEL Laser System Supervisor  
Steve Benson, 757-269-5026, felman@jlab.org

Responsible for Overall Facility Activities  
FEL Facility Manager  
George Neil, 757-269-7443, neil@jlab.org  
FAX 757-269-5519

This form will be returned, once reviewed, with any necessary changes to required hardware configuration, training, or outstanding issues that must be resolved before the experiment can be performed. Minor modifications to the equipment and procedures not affecting safety issues require only verbal approval from the Facility Manager. Significant changes necessitate a revised ESAF submission and approval.