

Chapter 10: [Laser Safety](#)

Class 3B and Class 4 Laser Facility Approval Procedure

Product ID: [805](#) | Revision ID: 2918 | Date published: 7 August 2026 | Date effective: 7 August 2026

URL: <https://www-esh.slac.stanford.edu/eshmanual/references/laserProcedClass3Band4FacilityApproval.pdf>

1 Purpose

The purpose of this procedure is to ensure hazards are analyzed and proper controls selected, reviewed, and implemented before granting approval to operate Class 3B and Class 4 laser facilities.

It covers obtaining operational approval for a *laser facility* where Class 3B or Class 4 laser systems are in use.

It applies to *system laser safety officers (SLSOs)*, *laser facility program managers*, *laser safety system (LSS) Engineering* and reviewers, ESH coordinators, the *laser safety officer (LSO)*, and the Laser Safety Committee (LSC).

Operation approval for a laser facility with Class 3B or Class 4 lasers requires

- An SLSO, assigned by the laser facility program manager, who authors the facility's standard operating procedure (SOP) document and who will submit the laser facility operation request
- An SOP document describing laser hazards and controls for the facility
- Laser safety certification checks, including for the engineered LSS
- LSO inspection of the laser facility and completion of action items identified from that which need to be completed prior to operation approval.
- Operation approval from the LSO, laser facility program manager and ESH coordinator

See [Laser Safety: Class 3B and Class 4 Laser Operation Requirements](#) for details.

- **Who does this?** Laser facility program manager and individual(s) assigned by them to be the laser facility SLSO(s)
- **When?** Before Class 3B or Class 4 lasers can begin to be operated in the facility
- **How?** As detailed in the procedure below, complete the requirements for establishing a laser facility and then request approval in the [Laser Safety Tool](#).

Note Accessing this tool requires the laser facility program manager and SLSO(s) to have a SLAC Windows account.

2 Procedure

Note The sequence for some of the steps below may differ from what is presented. There may also be some iteration of steps required, for example if the LSS certification indicates changes are needed to one or more of the SOP, LSS code, or LSS IAT. A flowchart for an example procedure is provided in Figure 1.

Note Establishing a laser facility requires a significant time investment, so please plan accordingly.

Step	Person	Action
1.	SLSO (or interim SLSO) and laser facility program manager	Determine the planned scope and specifics of laser operation and develop a general schematic of the proposed facility Communicate this to the LSO
2.	SLSO (or interim SLSO), laser facility program manager, and LSO	Meet to discuss the planned scope, schematic, and specifics of laser operation The initial discussion may include considerations for - Using lower than Class 3B lasers, thus avoiding the need for Class 3B or 4 lasers - Fully enclosing Class 3B and Class 4 lasers in a Class 1 enclosure The meeting should note requirements in Chapter 10, "Laser Safety" and in the Laser Safety Systems Technical Basis Document .
3.	SLSO (or interim SLSO)	Reviews the Guidance for SLAC System Laser Safety Officers document, which includes information on laser facility design, engineered laser safety system (LSS) controls, SOPs, and PPE considerations
4.	Laser facility program manager, SLSO, and LSO	SLSO is appointed by the program management and approved, using the System Laser Safety Officer Approval Form , after SLSO training is completed Once approved, the form will be posted on the laser facility SharePoint site
5.	LSO	Creates a laser safety SharePoint site for the laser facility for managing the facility's laser safety documents
6.	SLSO	Provides laser manuals, if available, for LSO review. Prepares, posts to the facility SharePoint site, and submits for LSO review (typically provided in a draft SOP): - Laser facility schematics (Figures in Sections 2 and 7 in a SOP; refer to the SOP example template on the Laser Safety Program Site): - Laser configuration - Safety shutter locations - Interlock sensor locations for doors, enclosure covers - EMERGENCY OFF button locations - LSS electronic sign display locations - LSS control panel location(s) - Description of laser hazards (Section 3 Table(s) in a SOP): - Laser wavelength(s) - Power for CW lasers

Step	Person	Action
		– pulse energy, repetition rate, and pulse duration for pulsed lasers ▪ LSS operation modes and associated permissions for safety shutters and laser power supplies (Section 4 Table(s) in a lab-specific SOP), such as – Laser Off – Class 1 – Laser Enclosed – Class 4 Normal – Class 4 Maintenance ▪ LSS interlock logic (Section 8 table(s) in a lab-specific SOP)
7.	SLSO and LSO	Complete a draft LSS specification and submit to LSS Engineering for review Note This should include facility schematics, LSS operation mode summary, and LSS interlock logic.
8.	LSC and SLSO	When required by the LSO's evaluation of the facility's laser hazards, the LSC conducts a review to provide expertise and to advise on hazards and controls for the laser facility and its operation. This helps ensure the laser hazards are adequately analyzed and controlled, in conformance with ESH policy and requirements. When an LSC review is held ▪ The SLSO will make a presentation that includes facility schematics, the LSS specification, and an overview of relevant laser operation procedures. ▪ The LSC chair should include review participation from the project manager, LSS engineering, and the relevant ESH coordinator. The chair may also invite other relevant individuals to contribute to the review. Note If there are many action items from the LSC review or if the facility design and laser safety specifications change significantly, a second LSC review may be required.
9.	SLSO, LSO, and LSS Engineering	Hold meeting to address input from the LSC review (if required), review the draft LSS specification and make updates to it, if needed
10.	SLSO	Updates the draft SOP to address input from the LSC review and input from the meeting with LSS Engineering
11.	LSS Engineering	Develops the LSS, following guidance in the LSS Technical Basis Document Acquires LSS components and installs them Develops the LSS logic (usually utilizing a PLC, but simpler systems may utilize relays) and submits it for an independent review (independent review may not be needed for simpler systems; see LSS Technical Basis Document) Creates initial acceptance test (IAT) certification procedure document and submits for LSO review
12.	LSS Engineering and LSS logic reviewer	Complete independent review of LSS logic (if needed) and make any updates needed
13.	LSS Engineering, LSO, and SLSO	Complete IAT review and make any updates needed

Step	Person	Action
14.	LSS Engineering, LSS logic reviewer, LSO, and SLSO	LSS Engineering performs LSS logic validation checks using the IAT Address any issues found with appropriate updates to the LSS logic, IAT and LSS specification in the SOP
15.	LSS Engineering, SLSO, and LSO	Approve the IAT certification document
16.	SLSO, LSS Engineering, and LSO	LSS certification SLSO performs LSS certification, assisted by LSS Engineering, using the approved IAT. SLSO summarizes any hardware and procedural issues, addresses these if needed, and performs any required additional certification checks. LSO reviews and approves LSS certification documentation.
17.	SLSO, LSO, laser facility program manager, and ESH coordinator	SOP approval SLSO makes any needed updates to the SOP draft, which is then reviewed by the LSO. SLSO addresses LSO review comments. SOP is approved by the SLSO, LSO, laser facility program manager and ESH coordinator. The SOP is published or linked (often to a CDMS document) on the laser facility SharePoint site.
18.	SLSO and LSO	LSO inspection LSO inspects the laser facility with the SLSO LSO writes inspection report, which includes a summary of action items and associated due dates. LSO posts inspection report on the laser facility's SharePoint site for review by SLSO, ESH coordinator, and program manager SLSO, or others as appropriate, addresses the action items in the inspection report. Some action items may be identified as needing to be completed before issuing the laser facility operation approval. SLSO addresses action items and completes those needed for operation approval. A follow-up LSO inspection may be needed.
19.	LSO	Creates LST website for the new laser facility and enters relevant information, including ▪ SLSO ▪ Program manager ▪ ESH coordinator ▪ SOP approval date ▪ Link to the facility SharePoint site
20.	SLSO, LSO, laser facility program manager, and ESH coordinator	Operation approval SLSO submits operation request for the laser facility on its LST site. This initiates e-mail to the LSO, ESH coordinator, and program manager, requesting their approval.

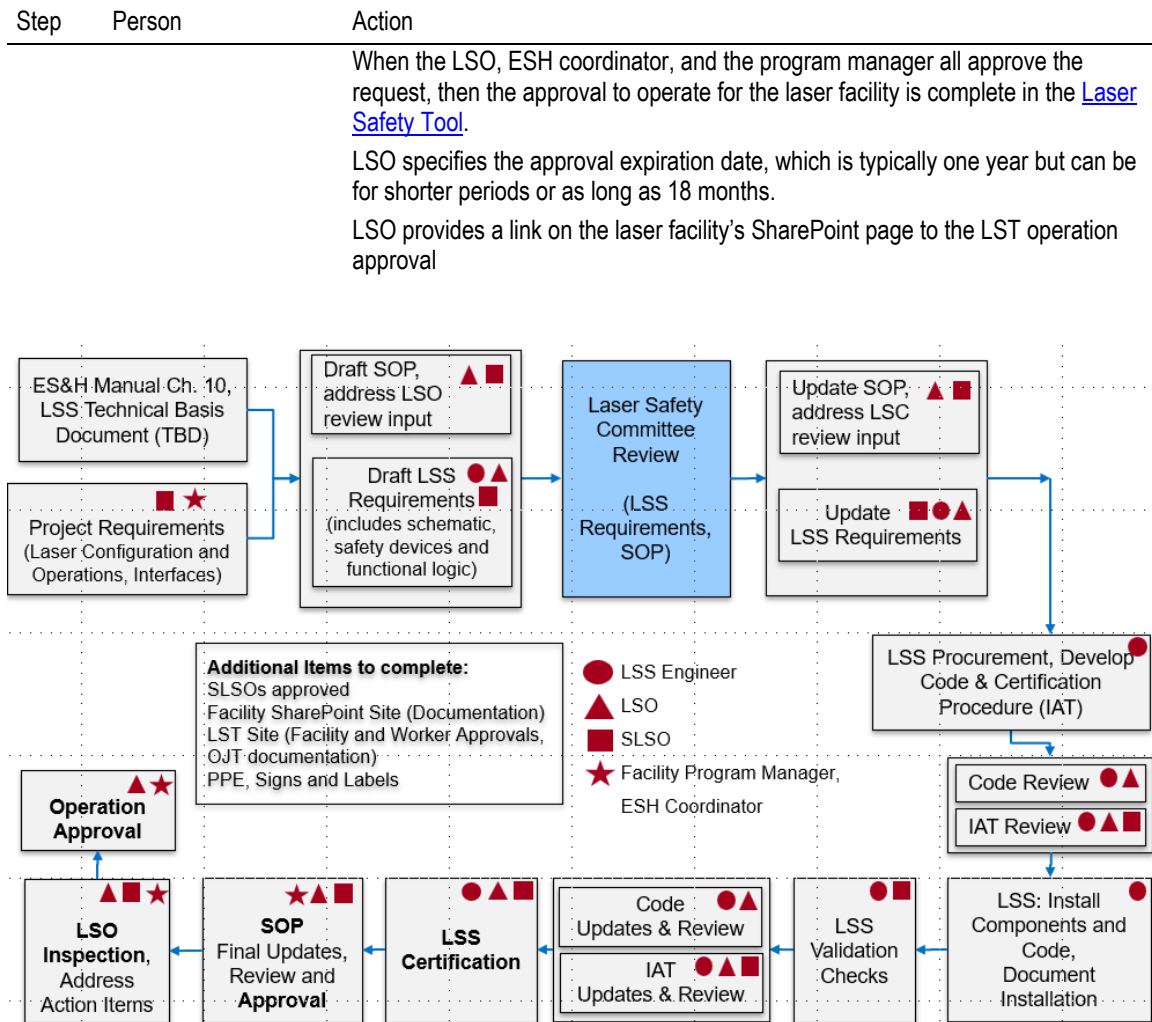


Figure 1 Laser Facility Approval Procedure Flowchart (Example)

3 Forms

The following forms and systems are required by this procedure:

- [Laser Safety: System Laser Safety Officer Approval Form](#) (SLAC-I-730-0A05J-001). Documents approvals for SLSOs
- [Laser Safety Tool](#). System used for maintaining information on laser personnel and facilities, including approvals of facilities and qualified laser operators and laser controlled area workers
- Lab-specific SOP, JSA, and CCF documents: templates and examples for these are available on the [Laser Safety Program Site](#) (SharePoint).

4 Recordkeeping

The following recordkeeping requirements apply for this procedure:

- Laser facility approval records are maintained in the [Laser Safety Tool](#).
- SOP, LSO inspection report, and LSS documents are posted to or linked from the laser facility's SharePoint site; see [Laser Safety Program Site](#).

5 References

[SLAC Environment, Safety, and Health Manual](#) (SLAC-I-720-0A29Z-001)

- [Chapter 10, "Laser Safety"](#)
 - [Laser Safety: Class 3B and Class 4 Laser Operation Requirements](#) (SLAC-I-730-0A05S-004)
 - [Laser Safety Systems Technical Basis Document](#) (SLAC-I-730-0A05Z-001)
 - [Guidance for SLAC System Laser Safety Officers](#) (SLAC-I-704-701-004-00)