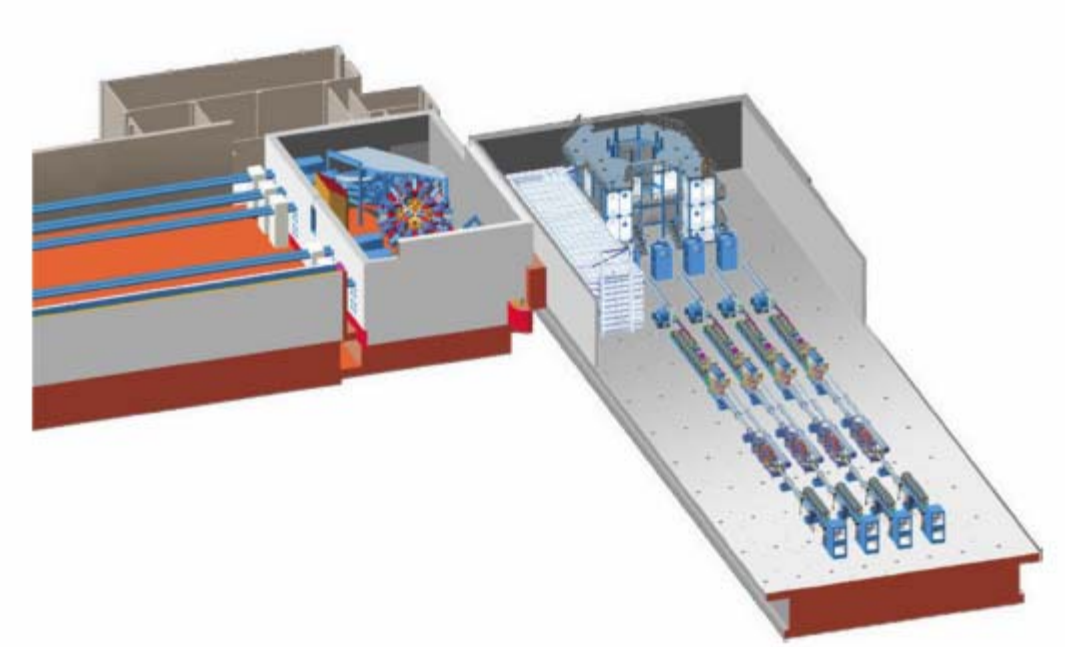
LFORM Refresher Training



Laser Facility Organization and Regulation Manual

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SUMMARY

LFORM governs the operation of Omega to ensure safety, effectiveness, and efficiency

- LFORM training is required of all personnel who work in the OMEGA or OMEGA EP facilities
- Governance and scheduling
- Watch organization and responsibilities
- Training and qualification process
- Standard operating procedures
  - Lockout/tagout
  - Communication
  - Control of maintenance
  - Work Authorization Procedures
  - Closed Access

Safe and effective operations require attention to detail and a disciplined approach

Shot campaigns are scheduled by the Facility Advisory and Scheduling Committee (FASC)

- **Shot campaigns are scheduled before the fiscal year by the FASC with input from the Laser Facility Manager and Experimental groups**
- **Campaigns are reviewed three months in advance by the LFMs and Experimental groups to ensure the plan can be efficiently executed**
- **Campaign plans are reviewed twice in the final two weeks to ensure all operational groups are ready to support**
- **Laser Facility Manager writes day orders to describe unique instructions for the day**
- **Experimental critiques are reviewed by the FASC in the weeks following a campaign**

Shot Operations are conducted by watchstanders using formal hierarchy

Laser Facility Manager (and ALFM)

Shot Director

Operator(s)

Technician(s)

Formal use of the watchstation hierarchy is required to ensure the correct person is coordinating activities

Watchstander qualification is established through completion of a training card

- Individual effort to study written materials
- Lectures on a variety of topics from system design to safety principles
- Feedback on quality of learning through oral examination
- Training under the instruction of a proficient operator
- Completion of practical factors under observation
- Certification by the Laser Facility Manager

Instructors are responsible for the actions of the trainee. Trainee shall never commit actions without the Instructor present and in approval.

Watchstander proficiency must be maintained

- **Regular watchstanding is required to ensure up to date system knowledge.**
- **Proficiency will be revoked if you have not completed 2 shifts in a quarter**
- **Periodic refresher training is required**
  - **Safety**
  - **System design and operation**
  - **Area access**

Safety is a mindset

- **Accidents are caused by people**
  - **Rushing**
  - **Complacency**

Failure to engage the brain increases the probability of an accident

- **Accidents attributed to equipment, material, or procedure are actually caused by**
  - **Inadequately designed equipment**
  - **Improperly selected materials for construction**
  - **Improper assembly or low quality control**
  - **Improper operations**
  - **Improper or inadequate maintenance**

Safety underpins all work at LLE

- **Eliminate unnecessary hazards**
- **Engineering controls minimize exposure**
  - **Barrier(s)**
  - **Interlock(s)**
- **Procedural controls**
  - **Standard operating procedure**
  - **Process procedures**
- **Wear personal protective equipment**

General safety procedures must be enforced

- **Equipment, systems, or tools with safety defects shall not be operated**
- **Only trained personnel will perform equipment or system maintenance**
- **No safety interlock, alarm, detector, or device shall be overridden or disabled without the explicit permission of the Laboratory Safety Officer**
- **All safety incidents and potentially unsafe practices or conditions shall be reported immediately**
- **No person shall intentionally expose themselves to hazards**
- **Read and obey signs**
- **Strictly adhere to personal protective equipment directives**

Incidents are investigated thoroughly and corrective actions taken to prevent recurrence

- An incident is any event that
  - Causes or could have caused personnel to receive hospital emergency room treatment
  - Causes or could have caused significant lost shot time
  - Causes or could have caused significant equipment damage
  - Results in exceeding environmental release limits
- Operations are halted until the Omega Facility Division Director determines it is safe to continue
- The incident shall be investigated to determine root causes and corrective actions

By understanding the principal issues causing past incidents, we can avoid recurrence

The tagout system is critical to safety at LLE

- **Use a tag if there is a *risk* of someone inadvertently operating a system**
  - ***Risk of personal injury* (electrical shock)**
  - ***Risk of equipment Damage* (starting a pump without oil)**
- **The Out of Commission (OOC) List tracks all tags and is maintained at the Shot Director station.**
- **The Shot Director authorizes the tagout**
- **The tag must be cleared before performing post test**
- **The Shot Director restores the device to commission**
- **Operation of a tagged out device is strictly forbidden**

Control room formality is required for effective operations

- **Formal atmosphere at all times**
  - **Conduct yourself professionally**
  - **Communicate respectfully**
- **Meetings and gatherings should be moved outside of the control room**
- **No eating**
- **Do not enter during charge sequence**

Remember that communication is interactive and follows a standard format

- **To address: the watchstander/person to whom the message is intended**
- **From address: the watchstander/person sending the message**
- **Message: the information to be communicated**
- **Acknowledgement: affirmation of the receiver that the message is understood. When action is requested or information is being transferred, repeat the message**
- **Confirmation: the sender listens to acknowledgement. If the repeat back is incorrect, operator shall say “Wrong” and start the communication again**

Headset protocol is required for effective communication

- Be precise, concise, and formal
- Do not interrupt other communications unless your message is urgent and important
- Do not unnecessarily tie up a channel with idle chatter or rambling
- Use watchstation titles for clarity.
  - Use full name for individuals not on the watchbill
- Letters shall be spoken phonetically, eg., alpha (for A), bravo (for B)
- Numbers shall be spoken individually, eg., one-one instead of eleven

Example communications

- **SD: "Drivers (Shot Director) ready for checklist"**
  LDO: "Drivers aye"
- **LSO: "Beamlines Operator (LSO) Beam 1 is ready for injection"**
  BLO: "Beam 2 is ready for injection, aye"
  LSO: "Wrong, Beamlines Operator (LSO) Beam 1 is ready for injection"
  BLO: "Beam 1 is ready for injection, aye"
- **AT: "PCT, AT, safe A-two amplifier"**
  PCT: "AT, repeat with phonetic alphabet"
  AT: "PCT, (AT) safe Alpha-two amplifier
  PCT: "Safe Alpha-two amplifier, aye"
  PCT completes action
  PCT: "Alpha two amplifier is safe"
  AT: "Alpha two amplifier is safe, aye"
  AT begins work

Approved procedures and procedural compliance are required to ensure personnel and equipment safety

- **Written and approved procedures for operations and maintenance are required**
- **Procedural compliance means**
  - **Use of only formally approved written procedures**
    - **When deviation is required, stop work and obtain approval from the Laser Facility Manager**
  - **Continuous “open reference” to operational procedural checklists**
  - **Reference to and use of other startup, operational, shutdown, and maintenance procedures**
  - **Mental alertness**

Maintenance must be conducted deliberately

- Maintenance is scheduled by the operations group in concert with the Laser Facility Manager
- Communicate with the Shot Director before placing equipment out of commission and when restoring equipment
- Procedural compliance is critical to achieving the desired results
  - Complete work as prescribed or stop work and get the procedure updated
- Carefully maintained logs are important to efficiency
  - Material Deficiency List (MDL)
  - E-logs
  - Preventive Maintenance Data Base (PMDB)

SUMMARY

Safe and effective operations require attention to detail and a disciplined approach

- **Quality people, written procedures, procedural compliance, and supervision/audits are the key to safe and effective operations**
- **Responsibility for safety, operations, and maintenance must be internalized**
- **Thorough incident investigation and follow-up are required to prevent their recurrence**