

LSO Type 1C Qualification Shot Procedure S-AB-P-071 Rev H

Intent: This procedure verifies the characteristics of the pulse(s) to be injected are within specification in preparation for a propagating shot on any/all of Sources 1-4 in short- or long-pulse modes of operation.

Beam paths for all Sources being qualified shall have no obstructions and are terminated at the LS-Calorimeter. LS-Calorimeters shall be in the beam path for all Sources.

Closed access in the Laser Sources Bay is required if the 15-cm and 40-mm glass amplifiers are fired.

Prerequisites: LSO Shot Preparation Checklist, S-AB-P-085

Note:

Laser alignment expires after 60 minutes. If 60 minutes have passed (or will have passed at the time of shot) since alignment, inform the SD and realign (or re-check Pointing and Centering) at his instruction.

Procedure:

Review the Master Template pop-up on the *ep-lse* when the SD sends the PRESHOT signal.

- Review the SRF (and its Configuration page) for the RID.
- 1 • Confirm the Sources to be included in the shot.
- Confirm pulse shape or width and time delay
- Confirm or correct the M W C status of the software processes listed in the Master Template.

Coordinate with the LST to make any necessary configuration changes including:

- Crosshair(s) position is configured for shot
 - HFAPOD position(s) is configured for the shot
 - 2 • Ensure the four SBSS Systems are configured:
 - Failsafe mode for long-pulse shots or
 - Bypass mode for short-pulse shots.
- (continues)
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3 Confirm the position of the Sources crosshair with the LST.

4 Ensure that the energy is consistent with alignment activities

Check and adjust the alignment of each Source in the shot. Record the time of alignment in the LSO logbook.

5		OK	N/A	<input type="checkbox"/>
	LS1	<input type="checkbox"/>	<input type="checkbox"/>	
	LS2	<input type="checkbox"/>	<input type="checkbox"/>	
	LS3	<input type="checkbox"/>	<input type="checkbox"/>	
	LS4	<input type="checkbox"/>	<input type="checkbox"/>	

Record the following information in the LSO logbook:

- Check the LP regen output energy at ED for each Source in LP mode.
- Check the Glass Amp input energy for each Source in SP mode.

6		Energy (mJ)	N/A	<input type="checkbox"/>
	LS1	<input type="checkbox"/>	<input type="checkbox"/>	
	LS2	<input type="checkbox"/>	<input type="checkbox"/>	
	LS3	<input type="checkbox"/>	<input type="checkbox"/>	
	LS4	<input type="checkbox"/>	<input type="checkbox"/>	

Notes:

- Nominal energies are recorded in the LSO logbook.
- If the running average exceeds tolerance, notify the SD and take corrective action.
- Pulse shape changes may impact energy stability.

7 • Acquire regen ROSS pulse shape for LP sources
or
• Acquire Spectrometer pulse spectra for SP sources

8 Obtain SD and/or PI approval for the pulse shape(s) and/or spectra.

9 Acquire Nearfield images to confirm the crosshair and HFAPOD position(s) and to check for clipping.

(continues)

Run the Sources configuration macro(s)

10 Select **Restore** ⇒ **LS(1,2)_LP_QualShot** (for long-pulse) **and/or**
LS(1,2)_SP_QualShot (for short-pulse) **and/or**
LS(3,4)_QualShot □

from the Macros pull-down menu.

- Select **lock** from the commands menu for each macro run

Ensure ROSS filtration consistent with on-shot energy output.

11 • Acquire ROSS image to ensure that the pulse max counts is:
 • Long-pulse: Between 50 and 100 counts in LS1&2
 • Short-pulse: Between 1000 and 5000 counts in LS1&2
 • LS3&4 filtration does not change

Ensure that timing is correct for the acquisition of data on the desired channel for both the ROSS trigger and the OCM trigger.

12 Select **Compare** ⇒ **LS(1,2)_LP_QualShot** (for long-pulse) **and/or**
LS(1,2)_SP_QualShot (for short-pulse) **and/or**
LS(3,4)_QualShot □

from the Macros pull-down menu.

- **Review** the macro reports for errors. Do not proceed until each macro is clean.

Review and OK the Sources Voltage pop-up when it appears and record in the LSO logbook. Discuss and ‘unplanned’ differences with SD.

13

	Nominal Voltage
LS1	13.1 / 10.0 kV
LS2	13.1 / 10.0 kV
LS3	7.4 / 4.5 kV
LS4	7.4 / 4.5 kV

□

(continues)

Ensure that the following LSE clients and their software packages are set up properly to acquire data on shot:

14

	LS1	LS2	LS3	LS4
ED	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ROSS (LS timing)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pre-Pulse Contrast	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
OTDR		<input type="checkbox"/>		
ACSL		<input type="checkbox"/>		
Nearfield Spatial Profile	<input type="checkbox"/>	<input type="checkbox"/>		
Spectrometer	<input type="checkbox"/>	<input type="checkbox"/>		
Pre-amp (Long-pulse only)	<input type="checkbox"/>	<input type="checkbox"/>		

15

Confirm the LST's Propagating Shot Checklist (S-AB-P-120) is complete, LSB sweep is complete and then click the "Checklist" button on the *ep-lse*.

Wait to review the **Qualification Shot** checklist with the SD.

Confirm:

- Most recent version of the SRF and the Sources Configuration page been reviewed and implemented
- Qualification shot checklist complete for LS1, 2, 3 and/or 4
- Correct macros been run and confirmed

For Sources in long-pulse mode

16

- Confirm the SBSS Systems are Enabled.
- Confirm the ISP-Cal's are inserted
- Confirm the injected is _____

If LS1 and/or LS2 are in short-pulse mode; else skip

- Predicted pulse spectra been reviewed
- Confirm SBSS Systems are Bypassed
- Confirm Preamplifiers are Disabled?
- Confirm ISP-Cal's are inserted?
- Confirm the injected energy is _____”

(continues)

Monitor subsystem performance during the charge sequence.

- Confirm regen energies and/or OPCPA energies during charging are within the specified tolerance:
- 17 • If the running average exceeds specification, notify the SD to abort the shot.
- If the running average drops below specification, notify the SD and advise that the shot may continue, but will produce low energy.

On entering POSTSHOT: Follow the LSO POSTSHOT Checklist in S-AB-P-102.

- 18 Report any issues or concerns to the Shot Director and receive direction as to how to proceed.

In the event of an ABORT: Report any issues or concerns to the Shot Director and receive direction as to how to proceed. (Record the information in the LSO logbook)

(done)
