

FY20 Q1 Laser Facility Report

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During the first quarter of FY20, the Omega Laser Facility conducted 301 target shots on OMEGA and 242 target shots on OMEGA EP for a total of 543 target shots (see Tables I and II). OMEGA averaged 11.0 target shots per operating day, averaging 93.0% Availability and 94.7% Experimental Effectiveness.

OMEGA EP was operated extensively in the first quarter of FY20 for a variety of user experiments. OMEGA EP averaged 9.7 target shots per operating day averaging 95.2% Availability and 96.5% Experimental Effectiveness.

Table I: OMEGA Laser System target shot summary for Q1 FY20.

Program	Laboratory	Planned Number of Target Shots	Actual Number of Target Shots
ICF	LLE	99	98
	LLNL	5.5	6
ICF Subtotal		104.5	104
HED	LLE	22	21
	LANL	22	25
	LLNL	27.5	31
	SNL	11	9
HED Subtotal		82.5	86
LBS	LLE	11	13
	LLNL	16.5	19
	Princeton University	11	11
LBS Subtotal		38.5	43
NLUF		22	24
LLE Calibration	LLE	0	44
Grand Total		247.5	301

Table II: OMEGA EP Laser System target shot summary for Q1 FY20.

Program	Laboratory	Planned Number of Target Shots	Actual Number of Target Shots
ICF	LLE	28	53
	LLNL	21	31
ICF Subtotal		49	84
HED	LLE	14	24
	LLNL	21	28
	SNL	7	15
HED Subtotal		42	67
LBS	LANL	7	1
	LLNL	14	27
LBS Subtotal		21	28
NLUF		28	31
LaserNetUS		14	23
LLE Calibration	LLE	0	9
Grand Total		154	242

Accomplishments During Q1 FY20

A novel cryogenic microscope was deployed in the Cryogenic and Tritium Facility to image a cryogenic DT target for sub-micron features. The key finding was that a filled DT target could be nondestructively imaged at a 0.6- μm resolution. Three $180 \times 280\text{-}\mu\text{m}$ areas were carefully sampled, and new features resulting from the filling operations were counted and analyzed. Based on these three areas, it is estimated that approximately 670 new features appeared from the fill operations. The limb of the target was imaged, and across the entire target, ten new features of 1 to 3 μm in size were discovered on the outside of the shell. The system was unable to determine if the estimated 670 features are predominantly on the outside or inside of the shell. Further work with this new microscope will continue.

The final layer of shielding has been installed between the OMEGA Target Bay and LaCave with measured reduction in the noise level by as much as 50% (depending on location).