

FY21 Q4 Laser Facility Report

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During the fourth quarter of FY21, the Omega Facility conducted 304 target shots on OMEGA and 257 target shots on OMEGA EP for a total of 561 target shots (see Tables I and II). OMEGA averaged 10.1 target shots per operating day, averaging 88.1% Availability and 93.9% Experimental Effectiveness. OMEGA EP averaged 8.7 target shots per operating day, averaging 91.0% Availability and 97.1% Experimental Effectiveness.

Table I: OMEGA Laser System target shot summary for Q4 FY21.

Program	Laboratory	Planned Number of Target Shots	Actual Number of Target Shots
ICF	LLE	66	67
	LANL	11	11
	LLNL	22	22
	SNL	11	9
ICF Subtotal		110	109
HED	LLE	16.5	16
	LANL	11	7
	LLNL	55	44
	SNL	11	11
HED Subtotal		93.5	78
LBS	LLE	11	12
	LLNL	11	10
LBS Subtotal		22	22
AIBS		11	9
APL		11	14
OFES		11	14
CMAP		11	11
NLUF		60.5	47
Grand Total		330	304

AIBS: Academic and Industrial Basic Science

APL: Applied Physics Labs (Johns Hopkins University)

CMAP: Center for Matter at Atomic Pressures

LBS: Laboratory Basic Science

NLUF: National Laser Users Facility

OFES: Office of Fusion Energy Sciences

Table II: OMEGA EP Laser System target shot summary for Q4 FY21.

Program	Laboratory	Planned Number of Target Shots	Actual Number of Target Shots
ICF	LLE	31.5	49
	LLNL	21	21
ICF Subtotal		52.5	70
HED	LLE	14	20
	LANL	14	13
	LLNL	38.5	42
	SNL	7	8
HED Subtotal		73.5	83
LBS	LLNL	14	18
LBS Subtotal		14	18
AIBS		14	19
CMAF		14	18
LaserNetUS		21	23
NLUF		17.5	18
Calibration	LLE	7	8
Grand Total		213.5	257

During this quarter, the port H2 neutron time-of-flight diagnostic was installed and activated on OMEGA to add additional views to the neutronics suite of diagnostics. This additional view has allowed scientists to measure variations in ion temperature along a previously uncharacterized axis.

The Gas-Jet Target System, a ten-in. manipulator (TIM)-based payload that injects a plume of gas into the vacuum of the target chamber immediately prior to laser shot arrival and allows for the formation of a low-density plasma, has been upgraded to provide up to 1500 psia of pressure. The design of the nozzle controls the speed and pattern of the gas plume and configurations allowing Mach numbers in the range of 3 to 8 have been characterized at this point. With adequate design time, users may request additional nozzle designs.