

FY21 Q3 Laser Facility Report

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During the third quarter of FY21, the Omega Facility conducted 296 target shots on OMEGA and 225 target shots on OMEGA EP for a total of 521 target shots (see Tables I and II). OMEGA averaged 10.0 target shots per operating day, averaging 87.2% Availability and 94.3% Experimental Effectiveness. OMEGA EP averaged 8.4 target shots per operating day, averaging 94.1% Availability and 92.6% Experimental Effectiveness.

Table I: OMEGA Laser System target shot summary for Q3 FY21.

| Program | Laboratory | Planned Number of Target Shots | Actual Number of Target Shots |
|--------------------|------------|--------------------------------|-------------------------------|
| ICF | LLE | 99 | 83 |
| | LLNL | 11 | 7 |
| ICF Subtotal | | 110 | 90 |
| HED | LLE | 44 | 42 |
| | LANL | 11 | 13 |
| | LLNL | 38.5 | 46 |
| | SNL | 22 | 21 |
| HED Subtotal | | 115.5 | 122 |
| LBS | LLE | 5.5 | 6 |
| | LLNL | 5.5 | 5 |
| LBS Subtotal | | 11 | 11 |
| AIBS | | 22 | 24 |
| APL | | 11 | 10 |
| CMAF | | 11 | 12 |
| NLUF | | 22 | 21 |
| Calibration | LLE | 0 | 6 |
| Grand Total | | 302.5 | 296 |

AIBS: Academic and Industrial Basic Science

APL: Applied Physics Labs (Johns Hopkins University)

CMAF: Center for Matter at Atomic Pressures

LBS: Laboratory Basic Science

NLUF: National Laser Users Facility

Table II: OMEGA EP Laser System target shot summary for Q3 FY21.

| Program | Laboratory | Planned Number of Target Shots | Actual Number of Target Shots |
|----------------|-------------------|---------------------------------------|--------------------------------------|
| ICF | LLE | 28 | 24 |
| | LLNL | 21 | 21 |
| ICF Subtotal | | 49 | 45 |
| HED | LLE | 35 | 50 |
| | LANL | 7 | 8 |
| | LLNL | 21 | 23 |
| HED Subtotal | | 63 | 81 |
| LBS | LLNL | 14 | 14 |
| LBS Subtotal | | 14 | 14 |
| AIBS | | 7 | 9 |
| CMAP | | 14 | 25 |
| LaserNetUS | | 14 | 17 |
| NLUF | | 7 | 10 |
| Calibration | LLE | 0 | 24 |
| Grand Total | | 168 | 225 |

The OMEGA stage-F alignment sensor package upgrade project was completed on all 60 beams. This project provides higher resolution of alignment and spatial profile information for the alignment beam. With this system now in place, automated alignment algorithms are being developed for improved consistency. Additionally, the stage-C alignment sensor packages were augmented with appropriate filtration to take on shot measurements, improving system characterization.

The OMEGA de-ionized water-cooling system for the amplifiers has been augmented with a degassing system to reduce the oxidization of components and reduce the resulting contamination in the coolant flow. This is anticipated to reduce the amount of maintenance required on the amplifiers and may increase the transmission of flash-lamp light to the amplifier disks.