

Office of the President

TO MEMBERS OF THE NATIONAL LABORATORIES SUBCOMMITTEE:

DISCUSSION ITEM

For Meeting of July 18, 2018

UPDATE ON THE NATIONAL LABORATORIES

The item will provide an update on the three UC-affiliated National Laboratories: Lawrence Berkeley National Laboratory (LBNL), Lawrence Livermore National Laboratory (LLNL), and Los Alamos National Laboratory (LANL).

LANL Contract Competition

On June 8, 2018, the Department of Energy's National Nuclear Security Administration (DOE/NNSA) announced that it had awarded the follow-on LANL management and operating (M&O) contract to the UC team: Triad National Security, LLC.

Triad is a limited liability company consisting of three members: the Regents of the University of California, Battelle Memorial Institute, and the Texas A&M University System. Triad will be supported in the performance of the LANL M&O contract by integrated subcontractors Fluor Federal Services, Stoller Newport News Nuclear, and various small business concerns.

DOE/NNSA conducted formal debriefs with Triad and the other three bidding teams during the week of June 18. After the debriefs, the teams had ten days to protest the award to the Government Accountability Office. The protest period closed on July 2 with no protests filed.

On July 3, DOE/NNSA issued Triad its Notice to Proceed, which formally commenced the period of transition from Los Alamos National Security, LLC (LANS) to Triad. DOE/NNSA indicated that the transition period would start on July 5 and end on October 31, 2018. As such, Triad will officially take over as the M&O contractor at LANL on November 1, 2018. The Triad M&O contract will include a five-year base period with five one-year option periods, for a total of ten years if all options are exercised.

The current LANL M&O contract held by LANS, presently expires on September 30, 2018. DOE/NNSA announced that it would seek a short-term extension of the LANS contract to allow for the four-month period of transition to Triad.

LLNL: National Ignition Facility Achieves New Record

An experimental campaign conducted at LLNL’s National Ignition Facility (NIF) has achieved a total fusion neutron yield of 1.9×10^{16} (1.9×10^{16}) and 54 KJ of fusion energy output – doubling the previous record. Researchers in LLNL’s Inertial Confinement Fusion Program detailed the results in a paper published in June in *Physical Review Letters*.

In addition to increased yield, the experiments produced other critical results. For the first time, the hot spot pressure topped out at approximately 360 Gbar (360 billion atmospheres) – exceeding the pressure at the center of the sun. Moreover, these record yields mean there was a record addition of energy to the hot spot due to fusion alpha particles. By depositing their energy rather than escaping, the alpha particles further heat the fuel, increasing the rate of fusion reactions and thus producing more alpha particles. This leads to yield amplification, which in these experiments was almost a factor of 3. As the implosions are further improved, this yield amplification could eventually lead to fusion ignition.

NIF is the world’s largest and most energetic laser, designed to perform experimental studies of fusion ignition and thermonuclear burn, the phenomenon that powers the sun, stars, and modern nuclear weapons. As a key component of the NNSA’s Stockpile Stewardship Program, experiments fielded on NIF enable researchers to gain fundamental understanding of extreme temperatures, pressures, and densities – knowledge that helps ensure the current and future nuclear stockpile is safe and reliable.

Key to Acronyms

DOE	Department of Energy
FY	Fiscal Year
LANL	Los Alamos National Laboratory
LANS	Los Alamos National Security, LLC
LLC(s)	Limited Liability Company(ies)
LLNL	Lawrence Livermore National Laboratory
LLNS	Lawrence Livermore National Security, LLC
M&O	Management and Operating
NIF	National Ignition Facility
NNSA	National Nuclear Security Administration