



## FY 2022 Performance Evaluation Summary

**Contractor:** Lawrence Livermore National Security, LLC

**Contract:** DE-AC52-07NA27344

**Evaluation Period:** October 1, 2021 – September 30, 2022

**Basis of Evaluation:** Fiscal Year (FY) 2022 Performance Evaluation and Measurement Plan (PEMP)

The FY 2022 PEMP for this contract is available at: <https://www.energy.gov/nnsa/fy22-llns-pemp-final>

The Contract is available at: <https://www.energy.gov/nnsa/lawrence-livermore-national-laboratory-contract>

### Award Fee Scorecard

Goal	Rating		At Risk Available	Final
	Adjectival	Percent		
Goal-1: Mission Execution: Nuclear Weapons	Excellent	91%	\$15,937,440	\$14,503,071
Goal-2: Mission Execution: Global Nuclear Security	Excellent	95%	\$2,276,777	\$2,162,938
Goal-3: DOE & Strategic Partnership Projects Mission Objectives	Excellent	100%	\$0	\$0
Goal-4: Science, Technology & Engineering (ST&E)	Excellent	100%	\$4,553,554	\$4,553,554
Goal-5: Mission Enablement	Very Good	88%	\$13,660,663	\$12,021,384
Goal-6: Mission Leadership	Excellent	91%	\$9,107,109	\$8,287,469
<b>Total Award Fee</b>		<b>91.2%</b>	<b>\$45,535,544</b>	<b>\$41,528,416</b>

In addition, the fixed fee and total fee summaries are provided below:

	Available	Final
Fixed Fee	\$19,515,233	\$19,515,233
SPP (Fixed Fee)	\$8,800,000	\$8,800,000
<b>Total Fixed Fee</b>	<b>\$28,315,233</b>	<b>\$28,315,233</b>
<b>Total Fee (Award Fee and Fixed Fee)</b>	<b>\$73,850,777</b>	<b>\$69,843,649</b>

Overall, LLNS earned an Excellent (91 percent) rating for FY 2022, exceeding almost all of the objectives and key outcomes under the PEMP goals, generally meeting overall cost, schedule, and technical performance requirements with accomplishments that significantly outweigh issues.

LLNS earned Excellent ratings on Goal 1-4, exceeding almost all of the Objectives and Key Outcomes. LLNS successfully executed NNSA program priorities, continuing to successfully deliver on the nation's challenging stockpile requirements and lead the Weapons Laboratories in strengthening the underpinning and future stockpile stewardship. LLNS continued to successfully deliver at a very high level across the balance of the NNSA mission portfolio including Non-Proliferation, Emergency Management, Incident Response, and Nuclear Counterterrorism while effectively supporting DOE and Strategic Partnership Project (SPP) programs. NNSA's national security missions were successfully executed by leveraging and advancing the frontiers of Science, Technology, and Engineering (ST&E). LLNS earned a Very Good rating on Goal 5, exceeding many of the Objectives and Key Outcomes with relatively few issues.

On Goal 6, LLNS earned an Excellent rating as it exceeded almost all of the Objectives and Key Outcomes through its strong partnership with NNSA and effective leadership in overcoming labor and supply chain challenges.

**Accomplishments:****Goal 1**

- Made significant contributions to enable production and qualification of MC4597 pit, including Qualification Engineering Releases, facility startup activities, sample testing
- Made outstanding progress for Phase 6.4 entry for W80-4, PRTs completed Baseline Design Review, updated Baseline Cost Report, improved schedule logic and recovery, Milestone Alignment Tool scores, decreased program variance
- Met all W87-1 deliverables on time, on schedule to close phase 6.2a., completed Weapons Design Cost Report deliverables, supported system cost gate, resolved internal budget shortfall, projected to support system first production unit
- Successfully deployed ATS-4/El-Capitan EAS-3 nodes in open, restricted, and classified environments, achieved significant technical milestones on El Capitan project with Hewlett Packard Enterprise (HPE) and Advanced Micro Devices, Inc. (AMD)
- Achieved new breakthroughs in National Ignition Facility with a record 2.08 megajoules (MJ) delivered to target, initial results on the record shot suggested a 1.15MJ neutron yield with no observed optical filament damage, allowing for higher energy shot
- Enabled Design Agency production through strategic partnerships (e.g. Polymer Enclave, Cold Hearth Melter)

**Goal 2**

- Provided subject matter expert (SME) support in implementing nuclear and radiological security engagements with partners worldwide, and led technical and policy advances in the nuclear forensics community
- Maintained certification as a U.S. Designated Laboratory for Chemical Weapons Convention, and provided essential technical assessments to several Office of Nuclear Warhead Verification Program led and sponsored activities
- Successfully executed the Firebird high-explosive hydrodynamic test campaign
- Provided SME support to major Nuclear Threat Reduction collaborations with foreign partners, furthering the U.S. Government's understanding of nuclear threats and nuclear device defeat capabilities
- Successfully participated in the first NNSA-sponsored Bulk Special Nuclear Material Analysis Program exercise, which evaluated completion of material analysis against International Atomic Energy Agency timeline standards
- Successfully maintained the National Atmospheric Release Advisory Center International Exchange Program and other international reach-back mechanisms

**Goal 3**

- LLNS scientists played an important role in supporting NASA's successful Double Asteroid Redirection Test mission to crash a spacecraft into asteroid Dimorphos conducting over 300 3-D that sampled over seven different potential Dimorphos' material parameters
- Developed a bio-based, environmentally friendly method to extract and separate rare-earth elements
- Developing lightweight solid materials for high-energy-density hydrogen storage media and a new type of nanoconfined composite materials for real-world hydrogen storage vessels
- Led a multi-institutional team of scientists that developed a Multiscale Machine-Learned Modeling Infrastructure, which simulates the behavior of RAS proteins on a realistic cell membrane, which can affect cellular growth signals (precursors to cancer)

- LLNS-led team developed a powerful, high-resolution new global atmosphere model, the Simple Cloud-Resolving E3SM Atmosphere Model. This high-resolution model is 30 times finer than the typical resolution for global climate models

#### Goal 4

- Made significant advancements in the area of advanced manufacturing as it made the Polymer Production Enclave fully operational
- Made several notable advances in 3D printing: a new multiscale simulation framework that guides metal additive manufacturing processes, a real-time diagnostic tool that uses a millimeter-wave detection method of monitoring liquid metal jetting 3D printing, a powerful non-invasive diagnostic technology that is useful in a production environment, and an all-optical ultrasound technique enabling on-demand characterization of formation of defects during the 3D printing process
- Developed a unique technique to investigate the properties of superheavy elements—those with atomic numbers higher than 103 on the periodic table
- Scientists earned the Mark Mills award, and the Edward Teller Award from the American Nuclear Society. Three physicists were selected as 2021 fellows of the American Physical Society and a thin film engineer was elected as an International Society for Optics and Photonics fellow. Researchers collected three R&D 100 awards, and LLNL received five technology commercialization grants through the Department of Energy's Technology Commercialization Fund

#### Goal 5

- ES&H programs remained effective, efficient, and responsive with implementation of the Integrated Health of the Program (IHOP) process best practice across NNSA
- Successfully completed all assigned transuranic waste shipments and met six of eight waste management programmatic goals
- Continued safe operations on project execution (minor and line-item construction) while exceeding performance expectations
- Successfully completed Exascale Computing Facility Modernization and the Emergency Operations Center projects ahead of schedule and under budget
- LLNS achieved a 4.40 percent Strategic Savings Goal, exceeding the target goal of 4 percent with savings of \$32.9 million
- Received three complex-wide best practices and very positive results from a NNSA Procurement Evaluation & Re-Engineering Team (PERT) review that resulted in approval of the purchasing system
- Led the enterprise in meeting NNSA's goal to expand Safety, Analytics, Forecasting, Evaluation, and Reporting

#### Goal 6

- Fully supported number of key enterprise initiatives including NNSA Laboratory, Plant, Site, Strategic Planning Summit; Strategic Outlook Initiative; and Enhanced Mission Delivery Initiative
- Demonstrated strong collaboration with Enhanced Capabilities for Subcritical Experiments (ECSE)/Advanced Sources and Detectors (ASD) project partners (NTESS, Triad, LLNS, and MSTs)
- Continued to effectively respond to national emphasis on accelerating production and certification/qualification timelines and established strategic partnerships
- Made significant contributions to the new Nuclear Posture Review, arms control discussions, and provided critical analysis for NNSA leadership with particular attention on the crisis in Ukraine
- Senior LLNS leadership supported NNSA in defining a bio-assurance program and reviving an international memorandum of understanding between NNSA and the Israel Atomic Energy Commission
- Displayed innovation through successful delivery of critical construction projects (e.g. Exascale Computing Facility Modernization project, Emergency Operations Center)
- Maintained overall positive working environment, as shown by a recent Glassdoor Employees' Choice Award (fourth year in a row), recognizing the laboratory as one of best places to work in 2022

**Issues:**

Goal 1

- Prioritization at superblock remains a challenge resulting in a missed SCE milestone

Goal 5

- ASD-ECSE cost growth of over 50 percent, forced reaffirmation prior to CD-2
- Created a blended value-add vision for long-term strategic disposition plan but did not completely deliver on Key Outcome 5.5