



LAWRENCE
LIVERMORE
NATIONAL
LABORATORY

Synergy for a Strong Future FY 2008

L. Devore, P. Chrzanowski

November 10, 2008

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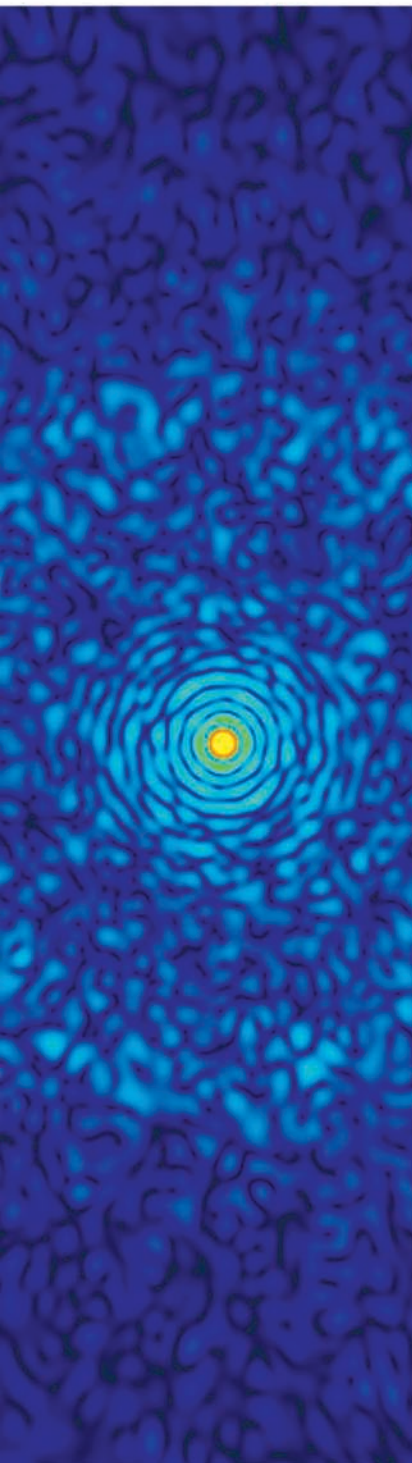
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Lawrence Livermore National Security, LLC
Board of Governors' Annual Report

Synergy for a Strong Future

FY2008



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Synergy

December 10, 2008

To: Department of Energy, National Nuclear Security Administration

Lawrence Livermore National Security, LLC (LLNS) is proud to have been selected to manage the Lawrence Livermore National Laboratory (LLNL). LLNS is capitalizing on the numerous synergies of the LLNS–Laboratory relationship to ensure that the Laboratory continues to achieve outstanding performance and fulfill its critical national security mission.

During the past year, we drew upon the expertise of the LLNS partner organizations to deliver superior science and management and to carry out the Laboratory's mission in a safe, secure, environmentally sound, and fiscally responsible manner. In addition to empowering a new management team to achieve these objectives, we have introduced best practices throughout the Laboratory. Our particular focus on safety and security and support functions led to accomplishments such as a 56-percent reduction in security incidents in FY2008 and a 49-percent reduction in the safety recordable-injury-case rate between June 2006 and October 2008. Furthermore, partner company reachback proved extremely valuable in enabling LLNL to respond promptly and effectively to the findings of a Department of Energy (DOE) Office of Health, Safety, and Security audit.

Additionally, LLNS has contributed to the National Nuclear Security Administration (NNSA) effort to transform, integrate, and consolidate the nuclear weapons complex. Notable accomplishments include:

- Obtaining NNSA approval to proceed with the next generation of high-performance computers with a goal of 14–20 petaflops of processing power.
- Managing the National Ignition Facility construction project, which is 99 percent complete, and entering the “home stretch” toward its scheduled completion date of March 31, 2009. The project is on track to produce ignition in 2010 with temperatures and pressures similar to the core of the Sun.
- Removing and safely shipping more than 25 percent of LLNL's inventory of special nuclear material to other NNSA sites as part of NNSA complex transformation.
- Shutting down more than 500,000 square feet of outdated Laboratory space with a resultant savings of \$5.2 million in annual operating costs and a \$30-million reduction in deferred maintenance costs.

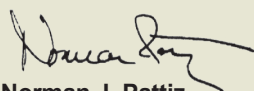
One of our team's key objectives is to help the Laboratory pursue new mission-relevant projects with sponsors other than NNSA, particularly in the areas of nonproliferation and homeland security, biosecurity, intelligence, advanced defense capabilities, energy security, and counterterrorism. In FY2008, the Laboratory's work-for-others funding increased by more than \$50 million to nearly \$350 million. As part of the Laboratory's global security mission, its Autonomous Pathogen Detection System was selected by the Department of Homeland Security for possible deployment across the United States.

We are working closely with Los Alamos National Security, LLC to identify opportunities for integration and collaboration in both research and operations. We have already realized significant cost savings by integrating management functions associated with the administration of retirement benefits and are planning the integration of several central business functions.

Increased efficiency and decreased costs are another important area of success. Our focus on support cost reduction and process improvement has produced FY2008 cost reductions totaling \$75 million. This accomplishment is a significant step toward meeting our proposal commitment of reducing support costs by \$150 million by FY2010 and will make LLNL more competitive as we grow our mission programs.

As we reflect on a year of challenge and change, we are proud of our team's performance and the progress we have made in implementing our contract with NNSA. We look forward to successfully performing the work ahead of us and are confident that LLNS management with LLNL will continue to deliver groundbreaking science and technology as well as quality operations and management to meet current and future national security needs.

Respectfully,



Norman J. Pattiz
Chair, Board of Governors
LLNS, LLC



J. Scott Ogilvie
Vice Chair, Board of Governors
LLNS, LLC

for a Strong Future

Lawrence Livermore National Security, LLC

is committed to delivering the best combination of scientific research, technology development, business management, and safe, secure operations in support of Lawrence Livermore National Laboratory's critical national security mission.

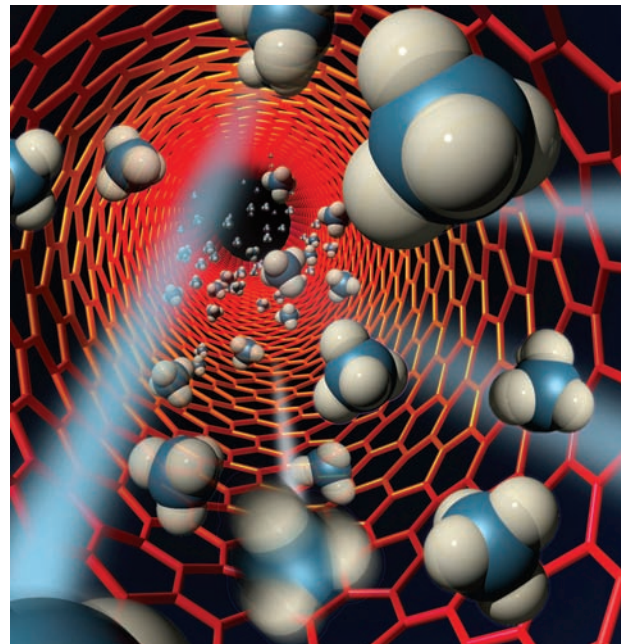
LLNS was formed specifically to manage LLNL for the Department of Energy's National Nuclear Security Administration. LLNS consists of a team of five organizations renowned for their expertise and accomplishments throughout the U.S. nuclear weapons complex and beyond—Bechtel National, University of California, Babcock & Wilcox, Washington Division of URS Corporation, and Battelle.

Bechtel is the nation's largest engineering and construction firm and a leader in project management. The University of California is the world's largest public research institution. Babcock & Wilcox and the Washington Division of URS Corporation are top nuclear facilities contractors and between them manage four of DOE's five safest sites. Battelle is a global leader in science and technology development and commercialization.

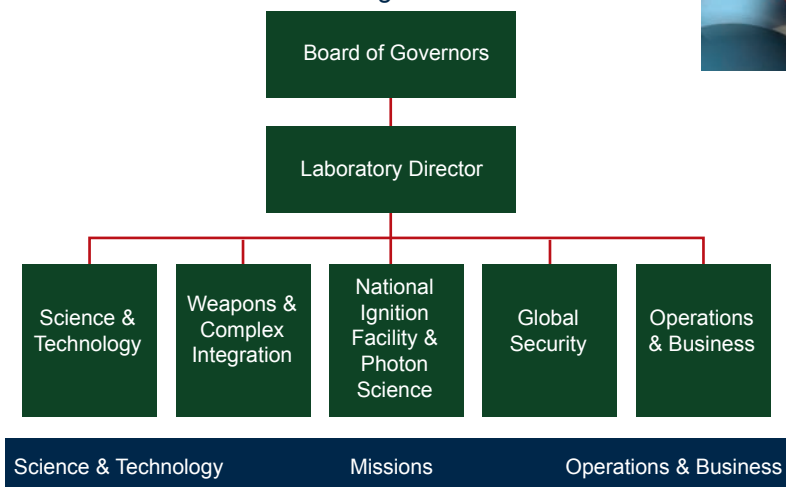
The LLNS Board of Governors provides oversight for the management of the Laboratory and holds the Director and LLNS President responsible for the Laboratory's performance. The Board has seven standing committees that assist in assessing

Laboratory performance and monitoring risks and internal controls. Through the Board of Governors, the Laboratory can reach back to LLNS partner organizations to help ensure that it fulfills its national security mission with excellence in scientific research, technology development, business management, and safe, secure operations.

LLNS assumed management of LLNL on October 1, 2007. This report highlights LLNS accomplishments in FY2008, its first year as the Laboratory's managing contractor. It is clear that LLNS and the Laboratory have exploited numerous synergies inherent in their relationship—for example, science and engineering, mission and operations, LLNS partners and LLNL directorates—to notable success.



LLNS Organization



Effective Oversight

National Security

LLNS management helped facilitate important accomplishments in the Laboratory's national security mission:

- Achieved scientific breakthroughs that explain some of the key "unknowns" in nuclear weapons performance that are critical to developing the predictive science of stockpile stewardship
- Reached 99 percent completion on the National Ignition Facility project, with all 192 beamlines tested and operational qualification shots demonstrating a combined infrared energy of more than 4 megajoules
- Solicited and received bids for Sequoia, the next Advanced Simulation and Computing (ASC) supercomputer, slated to run at 14–20 petaflops
- Developed advanced detection instruments that provide increased speed, accuracy, specificity and resolution for identifying biological, chemical, nuclear, and high explosive threats



Science & Engineering

Laboratory excellence in science and engineering was bolstered by LLNS initiatives to strengthen external review and identify areas for growth:

- Made significant scientific contributions to Nobel Prize-winning work on climate change
- Garnered three R&D 100 Awards, six Nanotech 50 Awards, and two awards for excellence in technology transfer, and earned \$9.4 million in licensing income (an increase of nearly 50 percent over the previous year)
- Applied earned-value management principles to a high-energy-density physics experiment important to stockpile stewardship
- Revamped processes to improve the Laboratory's ability to attract new mission-relevant business and increased work-for-others funding by more than \$50 million to nearly \$350 million



Safety & Security

LLNS assumed management of the Laboratory with a commitment to enhancing safety and security:

- Improved LLNL's overall safety performance, achieving a 63 percent decrease in serious injuries compared with FY2007
- Completed the review of LLNL's current Integrated Safety Management System (ISMS), preparing for implementation of revamped work control processes and Phase 1 of ISMS reverification in FY2009
- Was the first laboratory to implement a quality assurance process addressing all requirements of the new DOE standard "Hazards Analysis for Nuclear Operations"
- Took immediate and effective steps to address the findings of a DOE Office of Health, Safety, and Security audit, with more than one-third of the corrective action plan milestones completed as of October 1, 2008



Contract Management

LLNS established effective mechanisms to support the Laboratory in accomplishing its mission work in compliance with the terms and conditions of the prime contract:

- Established seven standing Board of Governors committees to assist in assessing and monitoring Laboratory performance, risks, and internal controls
- Provided teams of subject matter experts from LLNS partner organizations to conduct Functional Management Assessments and Assess, Improve, and Modernize evaluations of critical Laboratory operations
- Implemented processes and tools to monitor progress in executing the FY2008 Performance Evaluation Plan, track contract deliverables, and manage review of draft directives and standards, resulting in a cost avoidance to the Laboratory of at least \$1.7 million



Enhanced Systems, Tools, and Processes

Improved Governance

Improved systems were put in place to enable efficient, accountable, and transparent governance of Laboratory programs and operations:

- Initiated a Contractor Assurance System that provides LLNL managers, the Board of Governors, and NNSA with assurance, based on performance data, that performance objectives are being met
- Realigned the Facility Governance Board to closely mirror the LLNS management structure for the Laboratory and enable a coordinated institutional approach to facilities and infrastructure management
- Developed a comprehensive Biogovernance Improvement Plan, incorporating recommendations from a Laboratory task force for strengthening risk management associated with biological research



Project Management

The Laboratory drew on LLNS partner organization expertise and industry best practices to improve project management:

- Completed the Project Costing Implementation initiative, transitioning LLNL's financial systems to project- and task-based accounting and enabling the retirement of several legacy financial systems, saving millions of dollars annually
- Used Six Sigma methodology to streamline the process for payment of certified invoices, increasing the on-time payment rate to well over 90 percent for a time savings of 75–100 hours per month and a cost savings of more than \$500,000 annually
- Developed the procurement process for the next-generation Sequoia petaflop/s computer to not only select a vendor but also define potential R&D contracts for other interested vendors, thereby promoting long-term healthy relationships with multiple bidders

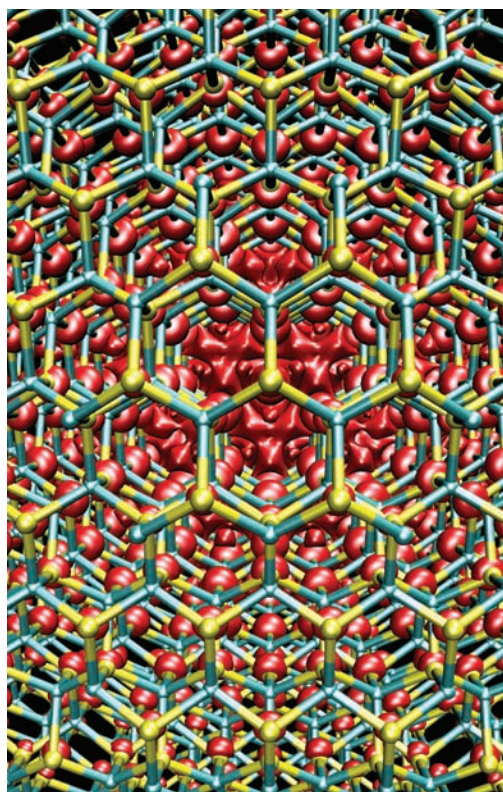




LLNS/LANS Integration

LLNS worked with Los Alamos National Security, LLC (LANS) to integrate S&T strategies and business systems to increase overall effectiveness and reduce the cost of doing business at the Livermore and Los Alamos laboratories:

- Developed multi-laboratory S&T strategies with Los Alamos and other national laboratories for stockpile certification science issues, proliferation signatures and data exploitation, alternative energy technologies, and other topics
- Arranged for LANS to perform LLNS's benefits accounting instead of establishing a separate benefits accounting organization at Livermore
- Established a group trust with LANS to jointly invest the assets of the LLNS and LANS defined benefit pension plans, for a cost avoidance of almost \$2 million per year at no additional risk to the plans
- Developed integration plans for a number of central business functions, including payroll, benefits, travel, and information technology



Cost Management

LLNS launched an aggressive campaign to achieve cost efficiencies in Laboratory activities and operations:

- Saved \$75 million in support costs through organizational changes, service consolidations, work process improvements, technology upgrades, and shared systems with Los Alamos; some \$23 million in nonlabor cost savings came from the use of online services, a major energy conservation campaign, and reductions in office computers, furniture, and travel
- Simplified the Laboratory's indirect rate structure, reducing the number of rates from 67 in FY2007 to 19 beginning in FY2009 and streamlining charging practices for better cost management
- Achieved end-to-end management of the Laboratory's supply chain functions and synergy with LLNL's financial functions by creating an integrated Supply Chain Management Department and consolidating financial services within the Business Directorate

Reachback to Partner Expertise

Functional & Operational Assessments

LLNS partners provided subject matter experts to evaluate and make recommendations for improving critical Laboratory functions and operations:

- Restructured the external review process, recruiting technical experts to serve on review committees and provide critical, candid assessment of LLNL's programs and science and technology base
- Conducted 26 Functional Management Assessments covering all functional and programmatic areas (eight for mission-related work and 18 for operations and business)
- Fielded eight Assess, Improve, and Modernize teams to evaluate Laboratory operations
- Established a less formal, more timely reachback mechanism for providing assistance to LLNL in implementing best practices
- Brought in more than 80 partner company experts who provided more than 8,000 hours of assistance on a range of topics



Security Enhancement

The Laboratory tapped the LLNS partners for expertise in enhancing its security posture:

- Provided subject matter experts from Pantex Plant and Idaho National Laboratory (managed by LLNS partner companies) and Bechtel for assistance in upgrading LLNL's protective force response capabilities
- Assisted in defining and validating upgrades to Livermore's classified material protection and information control systems

Safety & Emergency Management

LLNS partner company expertise was also tapped to strengthen safety and emergency management at the Laboratory:

- Reviewed Livermore's reverification plans for ISMS
- Established the Nuclear Operations Directorate to improve nuclear facility operations, with managers and staff brought in from LLNS partner organizations
- Centralized emergency management functions into a single department and brought in an emergency management specialist from Westinghouse Savannah River Company (managed by a LLNS partner entity) to lead the organization





Community Engagement

LLNS supported significant efforts in community outreach, math and science education, and charitable giving:

- Established a Director's Roundtable to provide a regular forum for LLNL's senior managers to meet with community leaders and key stakeholder groups for dialogue on issues of mutual concern
- Increased LLNL exposure through proactive news media outreach, with favorable coverage by *National Geographic*, *The New York Times*, *The Wall Street Journal*, *Forbes*, *Popular Science*, *Popular Mechanics*, Discovery Channel, PBS, and ABC TV.
- Donated \$1 million in matching funds to LLNL's annual HOME campaign; together with employee contributions, the total donation was more than \$2.4 million, a record for the Laboratory
- Awarded \$100,000 through a new Community Gift Program as well as \$90,000 in one-time gifts; most of the awards focused on science and math education and cultural arts in the Tri-Valley and San Joaquin County

Leadership Best Practices

A number of leadership programs and practices proven successful at the LLNS partner companies were implemented at Livermore:

- Initiated Safety Leadership Workshops through which more than 1,000 Laboratory managers and supervisors were trained in Human Performance Improvement principles
- Initiated a Six Sigma program at Livermore; trained and certified three "black belt" experts, who are implementing institution-wide process improvement activities and training additional Laboratory employees in Six Sigma techniques
- Trained 23 Laboratory managers through the Museum of Tolerance leadership development program



Positioning for the Future

Workforce Restructuring

The Laboratory drew upon LLNS partners' experience to manage a major workforce restructuring and reduction:

- Applied best-practices metrics to define functional business units and identify positions to be eliminated
- Managed the release of 550 supplemental labor and flexible-term employees, the voluntary separation of 215 career employees, and the involuntary separation of 440 career employees in a safe, professional, and efficient manner and in full compliance with all requirements, while respecting the dignity of the released employees
- Provided outplacement services for released employees, including workshops on resume writing and interviewing, online job search resources, and a job fair featuring 65 companies with 2,825 industry job openings, including 350 job opportunities with DOE and LLNS partner organizations

Complex Transformation

LLNS supported NNSA's efforts to transform the Cold War-era nuclear weapons complex into a smaller, safer, more secure, and more cost-effective complex that meets 21st-century needs:

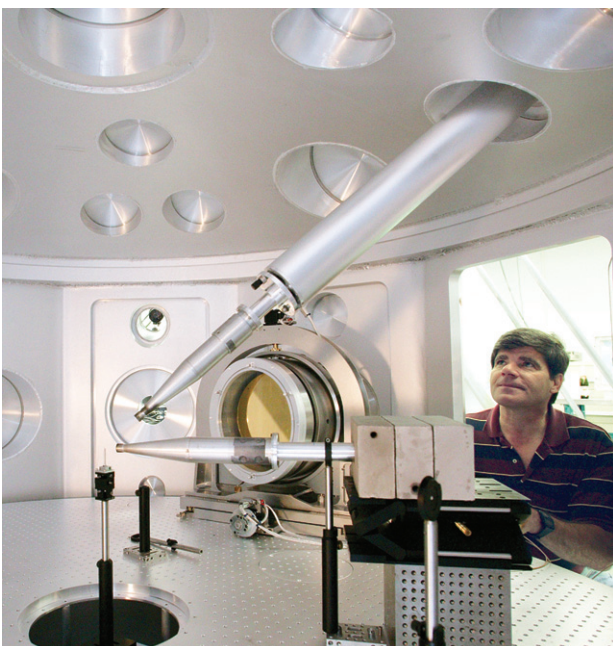
- Completed three shipments of special nuclear material to other NNSA sites, reducing LLNL's nuclear material inventory by about 25 percent, as part of the complex transformation goal of removing essentially all nuclear material from the Laboratory by 2012
- Shut down more than 500,000 square feet of space, including 150,000 square feet transitioned to "cold and dark" status, as part of the Laboratory's effort to reduce the site footprint by 2 million square feet by FY2011; these closures eliminated approximately \$9.1 million in annual operating and maintenance costs as well as \$29 million in one-time deferred maintenance and seismic upgrade costs



Strategic Planning

LLNS identified areas for institutional investment at the nexus of national needs and Laboratory capabilities:

- Prepared a Multi-Year Performance Improvement Strategy for FY2009–2013 that outlines planned efforts and target accomplishments for LLNL mission activities, science and technology, workforce, operations, and management
- Assisted NNSA efforts to develop plans for transforming the nuclear weapons complex and stockpile, including identification of options for using more environmentally friendly materials and manufacturing techniques, reuse of weapon components, and development of reliable replacement warheads
- Conducted initial studies on the Laser Inertial Confinement Fusion–Fission Energy (LIFE) concept, which combines principles of laser fusion energy with elements of conventional fission power in a way that minimizes long-lived nuclear waste and nuclear proliferation concerns and has potential to provide a bountiful supply of clean energy
- Developed an energy and environmental security strategy that applies Laboratory expertise to understand the causes and ramifications of climate change, devise advanced technologies that promote energy security, and develop systems to monitor the impact of those technologies on climate change



2007–2008 LLNS Board of Governors



The LLNS Board of Governors is composed of executive and advisory members from LLNS partner organizations together with key scientific, academic, national security, and business leaders serving as independent governors. The Board provides oversight for the management of the Laboratory and facilitates reachback to the LLNS partner entities for assistance in implementing best business and management practices. It also provides a conduit for coordination and communication with DOE, NNSA, and the national laboratory system.

Executive Committee



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Chair**

Regent, University
of California
Founder and Chairman,
Westwood One, Inc.



Bruce B. Darling

Executive Vice
President, University
of California



William R. Frazer

Senior Vice President
Emeritus, University
of California



**J. Scott Ogilvie,
Vice Chair**

President, Bechtel
Systems and
Infrastructure, Inc.



E. Preston Rahe

President (retired),
Energy and
Environment Business
Unit, Washington
Division of URS



Craig D. Weaver

Executive Vice
President, Bechtel
Systems and
Infrastructure, Inc.

Independent Governors



Sidney D. Drell

Senior Fellow, Hoover Institution, Stanford University



John A. Gordon

General (retired), U.S. Air Force



Richard W. Mies

Admiral (retired), U.S. Navy
Former Commander, U.S. Strategic Command



Nicholas G. Moore

Global Chair (retired), PricewaterhouseCoopers



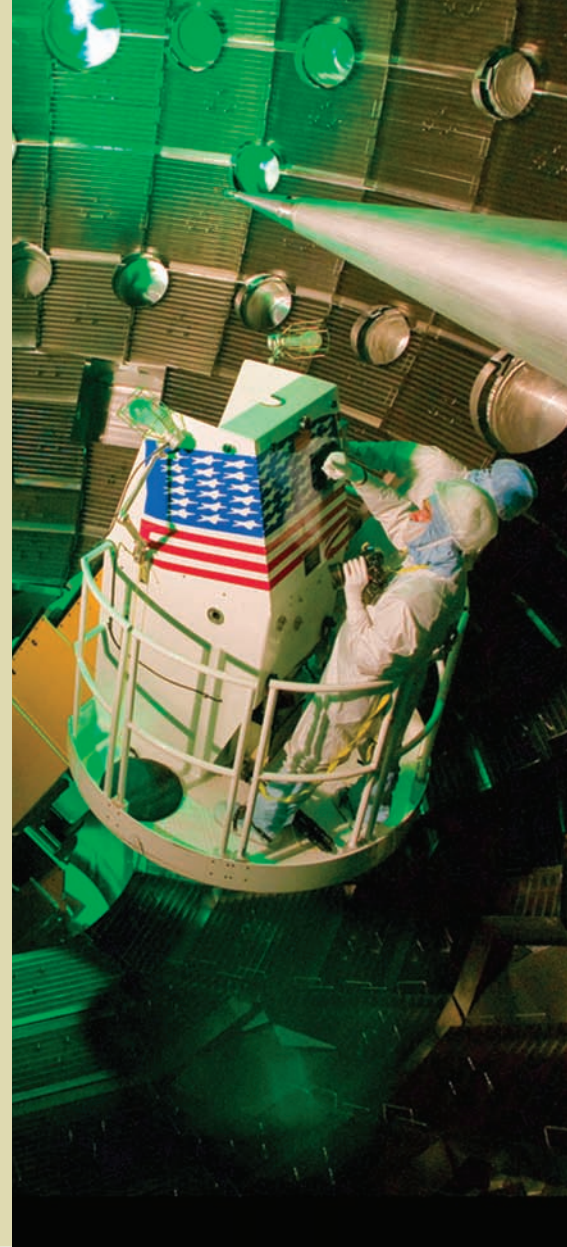
William J. Perry

Senior Fellow, Hoover Institution, Stanford University



Jeffrey Wadsworth

Executive Vice President, Global Laboratory Operations, Battelle



Advisory Governors



Steven V. W. Beckwith

Vice President for Research and Graduate Studies, University of California



Bruce D. Varner

Regent, University of California
Partner, Varner and Brandt, LLP

LLNS President



George H. Miller

Director, Lawrence Livermore National Laboratory



David Walker

President, Bechtel National, Inc.

LLNL Facts and Figures

About the Laboratory

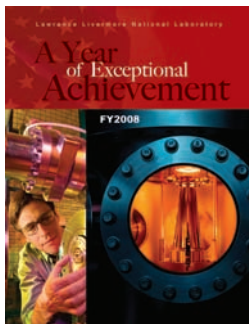
LLNL is preeminent in its ability to harness the power of science and technology to solve critical national security challenges. Since its inception, Livermore has embraced its role as a “new ideas” laboratory, focusing on novel concepts and innovative approaches to national security science and engineering.

LLNL’s defining responsibility is ensuring the safety, security and reliability of the nation’s nuclear deterrent. Laboratory scientists and engineers are tackling the grand challenge of understanding the scientific details of nuclear weapons performance through nonnuclear tests and experimentally validated computer simulations.

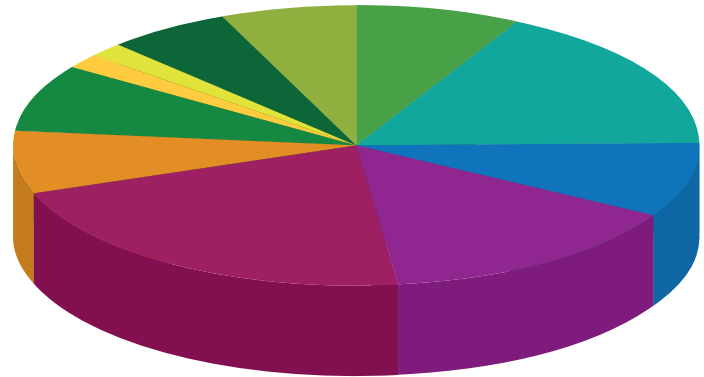
Laboratory researchers also are applying LLNL’s science and engineering capabilities to devise new technologies and approaches for addressing nuclear proliferation and terrorism, energy security and climate change, and other threats to national security and global stability.

With an outstanding workforce, the Laboratory executes its mission through safe, secure, cost-effective operations and scientific and technical excellence.

For information about recent Laboratory accomplishments and distinguishing LLNL capabilities, see the companion documents *A Year of Exceptional Achievement* and *Science in the National Interest*.



LLNL FY2008 Funding: \$1.587 billion



- ▲ Nuclear Deterrent **\$267.5 million**
- ▲ Facility Operations **\$136.9 million**
- ▲ Advanced Simulation and Computing **\$235.1 million**
- ▲ National Ignition Facility **\$338.5 million**
- ▲ Safeguards and Security **\$112.6 million**
- ▲ Nonproliferation **\$123.9 million**
- ▲ Energy **\$27.6 million**
- ▲ Environmental Restoration **\$26.7 million**
- ▲ Basic and Applied Science **\$93.9 million**
- ▲ Homeland Security **\$98 million**
- ▲ Defense and Intelligence **\$126.1 million**

Location:

Livermore, California

Type:

Multi-program national security science and technology laboratory

Contract Operator:

Lawrence Livermore National Security, LLC

Website:

www.llnl.gov

Physical Assets:

- Main site: 459 facilities on 820 acres
- Site 300: 189 facilities on 7,000 acres
- 7.0 million gross square feet in active operational buildings
- Replacement plant value: \$4.3 billion

Human Capital:

- 6,900 employees (including term employees and postdoctoral fellows)
- 300 facility users, visiting scientists, teachers, and students

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