

The Regents of the University of California

**COMMITTEE ON OVERSIGHT OF THE  
DEPARTMENT OF ENERGY LABORATORIES**

May 20, 2010

The Committee on Oversight of the Department of Energy Laboratories met on the above date at UCSF–Mission Bay Community Center, San Francisco.

Members present: Regents Kieffer, Marcus, Pattiz, Reiss, Stovitz, and Varner; Ex officio members Gould and Yudof; Advisory member Simmons

In attendance: Regents Bernal, De La Peña, Island, Lansing, Makarechian, Maldonado, Nunn Gorman, Schilling, and Zettel, Regents-designate Cheng, DeFreece, and Hime, Faculty Representative Powell, Secretary and Chief of Staff Griffiths, Associate Secretary Shaw, General Counsel Robinson, Chief Investment Officer Berggren, Chief Compliance and Audit Officer Vacca, Provost Pitts, Executive Vice Presidents Brostrom, Darling, and Taylor, Senior Vice Presidents Dooley and Stobo, Vice Presidents Beckwith and Duckett, Chancellors Block, Blumenthal, Desmond-Hellmann, Drake, Kang, Katehi, White, and Yang, Laboratory Director Miller, and Recording Secretary Johns

The meeting convened at 9:35 a.m. with Committee Chair Pattiz presiding.

**1. APPROVAL OF MINUTES OF PREVIOUS MEETING**

Upon motion duly made and seconded, the minutes of the meeting of March 25, 2010 were approved.

**2. UPDATE ON THE DEPARTMENT OF ENERGY LABORATORIES**

Committee Chair Pattiz encouraged Regents who had not yet done so to visit Lawrence Livermore National Laboratory (LLNL). He recalled that Los Alamos National Laboratory (LANL) and LLNL are managed by two limited liability corporations (LLCs). The primary entities running the LLCs are UC and Bechtel. Committee Chair Pattiz observed that the board members of the LLCs are businesspeople who are concerned with profits, but emphasized that the University has benefited greatly from the LLC arrangement and that this arrangement has had no negative effect on science research at the National Laboratories. LLNL and LANL are scientific and technological powerhouses in the service of the nation. The University's historical and continuing role at the Laboratories has instilled in them a culture of scientific excellence and objectivity. The Laboratories maintain close ties to UC faculty and offer unique learning opportunities for students.

At no time since the Manhattan Project have the National Laboratories played such a pivotal role in world policy, particularly regarding nuclear nonproliferation. The Laboratories provide critical technical advice to U.S. leaders. Committee Chair Pattiz stated that it was gratifying to see that the Obama administration and Congress acknowledge the importance of the Laboratories, not only in ensuring a safe nuclear stockpile, but also in working to reduce global threats posed by vulnerable nuclear materials and nuclear terrorism.

Committee Chair Pattiz then introduced LLNL Director Miller, who has served as director since 2006, but has had multiple roles in the national security mission at the Laboratory since 1972. He has led every aspect of the nuclear weapons program. Director Miller signs an annual independent technical assessment to the Secretaries of Energy and Defense attesting to the safety and security of the U.S. nuclear stockpile. He advises the commander of the U.S. Strategic Command and has worked with counterparts in Britain and France on laser technologies and their applications.

Director Miller described LLNL as a national security laboratory in the broadest sense. Its mission responsibilities in nuclear security include taking care of the nuclear stockpile, but also studying the threats of nuclear proliferation and nuclear terrorism. LLNL has substantial programs in international and domestic security, as well as in energy and environmental security. Science and technology form a link between these different areas. An excellent operations and business culture is essential for LLNL's work. LLNL carries out work in basic science and it has an enviable publication record. This basic science research furthers LLNL's mission. LLNL, like LANL and Sandia National Laboratories, is distinguished by its engineering capability. LLNL has more engineers than scientists or technologists.

LLNL's UC heritage continues to be a part of its basic values. The new LLC managing the Laboratory, Lawrence Livermore National Security (LLNS), is based on an agreement principally between UC and Bechtel, but also includes the partners Babcock & Wilcox (BWXT), URS Corporation, and Battelle. The LLNS Board of Governors, chaired by Committee Chair Pattiz, includes representation by UC and other partners. Mr. Miller noted that he is both Laboratory Director and president of the company.

LLNL has a broad set of scientific and technical capabilities. These include nuclear weapons science and technology; diagnostics and sensors, applied in a wide variety of programs in domestic and international security, but also in environmental programs; systems engineering; high-performance computing; networks and systems, including cyber security; earth and atmospheric sciences; and laser technology.

LLNL provides a series of around-the-clock operational capabilities for the U.S. The National Atmospheric Release Advisory Center (NARAC) monitors emissions that occur in accidents. It was actively engaged in monitoring the cloud and plumes from the eruption of Eyjafjallajökull, a volcano in Iceland which disrupted European air traffic. Should there be terrorist activity involving the release of atmospheric pollutants, NARAC could provide information on such dispersal in a complex urban environment. Other

operational capabilities at LLNL include the Biodefense Knowledge Center, which advises the U.S. government on biological terrorism, the FBI-certified Forensic Science Center, and one of only two laboratories in the nation that can process samples to monitor compliance with the Chemical Weapons Convention.

LLNL has major research and development facilities, such as the High Performance Computing and Simulation Facility and the National Ignition Facility (NIF). The Center for Accelerator Mass Spectrometry was developed jointly with UC. This Center is perhaps best in the world in its capability to measure minute quantities of almost any material. It facilitates research in a wide variety of fields, including archaeology, atmospheric chemistry, and forensic dating. The Center receives support from external organizations such as the National Institutes of Health (NIH).

In its investment strategy, LLNL tries to anticipate the nation's future needs. Mr. Miller outlined some research areas in which LLNL invests internal discretionary resources: the possibility of large-scale production of carbon-free energy; the interplay of climate, energy, and the environment; and response to asymmetric threats to the U.S. in cyber and space security. LLNL addresses a wide variety of serious threats.

The importance of the National Laboratories has been a topic of discussion at the highest levels of government. Mr. Miller noted that he, LANL Director Anastasio, and Michael Hunter, director of the Sandia National Laboratories, had a two-hour meeting with Vice President Biden. The meeting partly concerned preparation for the U.S. nuclear posture review, but half the meeting was devoted to the question of how the federal government can make use of the talent at the National Laboratories within a broad set of national imperatives – energy, environment, asymmetric threats, counterterrorism, and nonproliferation. The key objectives of the Obama administration in the nuclear security arena have been established with the release of quadrennial defense review and nuclear posture review reports, and with submission of the Strategic Arms Reduction Treaty. The administration's priorities are the prevention of nuclear proliferation and nuclear terrorism, reducing the role of U.S. nuclear weapons in the national security strategy, maintaining the U.S. nuclear deterrent at reduced levels, strengthening regional deterents with allies, and sustaining the U.S. arsenal. The administration's agenda is broad and ambitious, and the National Laboratories are engaged in every element of it.

Mr. Miller then discussed the challenges facing LLNL. Foremost among them is the Laboratory's ability to recruit and retain world-class talent. The retention of a world-class scientific and technical workforce is a major concern in the U.S., as indicated in a number of national and international studies. LLNL operates in a very competitive environment. Mr. Miller observed that the Laboratory's association with UC has been an important part of its ability to recruit employees. There are challenges in the effective management of LLNL, which is like a small city with 10,000 employees; the corporate partners in the LLC are helpful in this regard. In the current economic environment, securing resources to carry out LLNL's mission will be a continuing challenge.

Mr. Miller presented some LLNL accomplishments from the previous four months. LLNL has produced sophisticated equipment to monitor the state of the nuclear stockpile without nuclear testing and developed nuclear terrorism protection measures. The NIF has made important progress toward producing fusion in the laboratory. The Department of Energy, in collaboration with truck manufacturing firms, is examining the fuel efficiency of truck fleets. With its advanced computational capabilities, LLNL has shown how to reduce drag on vehicles, with potential 20 percent to 50 percent savings on fuel for trucking companies.

In one month there were three outstanding events at LLNL. The discovery of a new element was announced. LLNL participated in the dating of a newly discovered species of hominid. A remarkable technology that can test simultaneously for 390,000 different viruses and bacteria was used in confirming the presence of a contaminant in a commercial vaccine.

President Yudof asked about LLNL's role in the development of an artificial retina. Mr. Miller informed the Regents that LLNL played a major role in a consortium that developed an artificial retina, which can be implanted to improve visual acuity. President Yudof observed that this innovation could address macular degeneration and other diseases and asked if such a development is still years away. Mr. Miller responded in the affirmative, that this is a matter of years, but not decades.

Mr. Miller then presented examples of one day of media coverage at LLNL, May 14, 2010, to convey the breadth of LLNL activities. There were articles on the possibility of laser fusion energy, which is carbon-free and uses sea water as a source; on the chemical properties of biofuels in a combustion engine; on a collaborative agreement with a small California company to develop cargo scanning technology; on a virus identification system; on LLNL's work, with LANL and Sandia National Laboratories, to assist in addressing the oil spill in the Gulf of Mexico; and on the use of nanotubes, bringing together electronics and biology.

LLNL is very much concerned with providing a safe working environment. It has opted for external registration and validation of its health and safety systems, using International Organization for Standardization (ISO) standards. For the benefit of its employees, LLNL has instituted a wellness program, a program in collaboration with the UC Berkeley Haas School of Business for leadership development, and a classification review for scientists and engineers.

An important initiative under Mr. Miller's leadership has been to make a portion of LLNL into an "open campus." This is an area of the Laboratory that is meant to look and feel like a university campus or an industrial park and that provides a place for enhanced partnerships with academia, with the Laboratory's unclassified sponsors, and with potential industrial partners. The open campus includes the Combustion Research Facility, a collaborative effort with Sandia and major engine manufacturers. Deputy Associate Vice President Koonce, of the Laboratory Management Office at the Office of the President, will lead the open campus activities.

Mr. Miller outlined aspects of the partnership between LLNL and UC. UC is the largest single source of advanced degrees of LLNL employees. UC graduate students and postdoctoral scholars carry out research at the Laboratory, and there are joint UC faculty appointments. An impressive number of jointly authored publications appear in peer-reviewed scientific journals. There are joint institutes funded by federal agencies which have resulted from collaboration between LLNL and UC: the National Science Foundation (NSF) Center for Biophotonics at UC Davis, the NSF Center for Adaptive Optics at UC Santa Cruz, the National Cancer Institute joint Cancer Center at UCD, and the NIH National Resource for Biomedical Accelerator Mass Spectrometry at LLNL with multiple UC collaborators. LLNL physicist Paul Chrzanowski, a collector of rare books, donated his personal collection of Shakespeare rare editions, valued at \$2 million, to UCLA, out of a sense of connection to the University. UC is by far the largest recipient of LLNL subcontracts.

LLNL is concerned about its relationship to the surrounding community. With a matching gift from the parent company, Laboratory employees donated \$3 million to charities this year. The LLC itself has donated \$100,000, mostly in the form of educational scholarships. LLNL is one of the sponsors of the Tri-Valley Science and Engineering Fair. Another very popular program, "Science on Saturday," brings together Laboratory scientists and high school teachers and students. LLNL is also sponsor of the "Expanding Your Horizons" program, which seeks to inspire interest in science, math, and engineering among young women.

LLNL sees itself as a set of scientific and technical capabilities that exists to address some of the nation's most vexing problems. LLNL attempts to anticipate major issues in advance, provide innovative solutions, and deliver real products. In its long-term enterprise, LLNL's strength lies in its employees. Mr. Miller concluded that LLNL owes its values, culture, and approach to UC. The Laboratory's connection to the University is an essential part of its identity and success.

Committee Chair Pattiz recognized the role of Executive Vice President Darling in the LLNS Board of Governors' engagement with the National Nuclear Security Administration, the Department of Energy, and the Department of Defense.

Mr. Darling noted that a recent "Science on Saturday" program drew as many as 3,000 attendees. LLNL has engaged the interest of the community.

Regent Island stated that the Board recognizes and supports the valuable work of LLNL and UC's role in that work. He thanked Mr. Miller for his service and stewardship of LLNL, and for his dedication to excellence.

Regent Stovitz recalled the NIF goal of focusing 192 lasers on a pencil-size target to achieve fusion. He asked if the NIF has a timetable with a projected accomplishment date. Mr. Miller responded that the NIF would begin its first attempts at fusion in the laboratory in the coming fall. There was a successful campaign the previous winter to understand how laser energy is deposited on a small target. The NIF is now developing

the systems for the first experiments. Most of the external review committees have suggested that ignition is likely to occur at some time in the next two years. Given that scientists have been pursuing this goal for nearly 60 years, predicting success in the next two years is a bold step.

Committee Chair Pattiz observed that some Laboratory employees are more optimistic about the project, while others had been pessimistic and thought the project would never achieve its current level. If it succeeds, the NIF project will be extraordinary. Mr. Miller added that the NIF and other LLNL projects are beyond the state of the art. When the NIF was recommended to the National Academy of Sciences, there were goals called “six miracles of NIF.” Many in the technical community thought these goals would never be achieved, but the Laboratory accomplished and surpassed all of them.

Regent Zettel asked which communities are served by the Edward Teller Education Center for K-12 science education, listed on one of the presentation slides. Mr. Miller responded that the Center offers teacher training programs, summer programs, and mentor programs and reflects Edward Teller’s passion for education. It serves primarily local communities, although it has also developed educational materials which are more broadly distributed.

Regent Zettel asked if the summer program for teachers is available to teachers statewide, or only locally. Mr. Miller responded that this program is available to teachers statewide. However, LLNL has a limited ability to subsidize teachers, and those who participate are mostly teachers who can commute to the Laboratory. LLNL would like to secure federal funding sources to support a broader engagement in this area, which is critically important to the future economic well-being of the nation.

Regent-designate DeFreece asked about LLNL activities and about what expertise it is providing to address the oil spill in the Gulf of Mexico. Mr. Miller responded that each of the three NNSA Laboratories was asked to send representatives to Houston. These representatives are in communication with the entire Department of Energy laboratory system, including LLNL, and have access to its expertise. LLNL has been assisting in the consideration of all possible options to stop the current oil leak and in reviewing structural calculations. For the most part, LLNL is providing advice at this point. The site, 5,000 feet under water, is a difficult working environment. The Department of Energy Laboratories offer special capabilities. For example, LANL is preparing to carry out an x-ray of the interior of the blowout protector.

Committee Chair Pattiz emphasized that LLNL is a valuable resource, like LANL and Lawrence Berkeley National Laboratory.

**3. AUTHORIZATION TO APPROVE AND EXECUTE MODIFICATION TO THE DEPARTMENT OF ENERGY CONTRACT FOR THE LAWRENCE BERKELEY NATIONAL LABORATORY AS A RESULT OF CHANGES TO THE FEDERAL ACQUISITION REGULATION AND THE DEPARTMENT OF ENERGY ACQUISITION REGULATION**

The President recommended that he be authorized to execute a modification to the provisions of Lawrence Berkeley National Laboratory contract DE-AC02-05CH11231 in order to incorporate two clause updates and one clause addition.

**New clause**

Clause H.30 – Contractor Assurance System

This new clause requires the establishment of a Contractor Assurance System for Lawrence Berkeley National Laboratory, which is a system of management controls designed to ensure that contract performance is compliant with contract requirements, and which includes a process for documenting and correcting performance deficiencies.

**Clauses updated as a result of technical and administrative changes:**

Clause I.50 - FAR 52.244-6 Subcontracts for Commercial Items (APR 2010)

Clause I.120 - FAR 52.203-13 Contractor Code of Business Ethics and Conduct (APR 2010)

[Background material was mailed to Regents in advance of the meeting, and copies are on file in the Office of the Secretary and Chief of Staff.]

Executive Vice President Darling explained that this item requested approval of changes to the Lawrence Berkeley National Laboratory (LBNL) contract. This was a routine matter. LBNL has had in place a contractor assurance system. Because a new contract was awarded in 2006, this item updates the new contract to include a clause acknowledging that there is a contractor assurance system and that it is operating effectively.

Upon motion duly made and seconded, the Committee approved the President's recommendation and voted to present it to the Board.

The meeting adjourned at 10:20 a.m.

Attest:

Secretary and Chief of Staff