The Regents of the University of California

COMMITTEE ON OVERSIGHT OF THE DEPARTMENT OF ENERGY LABORATORIES
March 14, 2013

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

Members present: Regents Blum, De La Peña, Gould, Pattiz, Reiss, Rubenstein, and Ruiz; Ex officio members Lansing and Yudof; Advisory members Powell and Schultz

In attendance: Regents Island, Kieffer, Mendelson, Stein, and Zettel, Regents-designate Feingold and Flores, Faculty Representative Jacob, Secretary and Chief of Staff Kelman, Associate Secretary Shaw, General Counsel Robinson, Chief Investment Officer Berggren, Chief Compliance and Audit Officer Vacca, Provost Dorr, Executive Vice President Brostrom, Chief Financial Officer Taylor, Senior Vice Presidents Dooley and Stobo, Vice Presidents Duckett, Mara, and Sakaki, Chancellors Block, Desmond-Hellmann, Drake, and Yang, Acting Chancellor Conoley, and Recording Secretary McCarthy

The meeting convened at 9:30 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 January 16, 2013 were approved.

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

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

Committee Chair Pattiz noted that Secretary of Energy Steven Chu would be stepping down. He introduced Lawrence Livermore National Laboratory (LLNL) scientist David Richards, LLNL Deputy Director for Science and Technology William Goldstein, and LLNL computational physicist Erik Draeger to highlight current research being conducted at LLNL.

Mr. Goldstein said that the Sequoia supercomputer, delivered to LLNL a little more than one year prior, had been officially recognized in June 2012 as the fastest computer in the world. The Sequoia, the latest product of a long-standing collaboration between LLNL and IBM, provides computing power equal to 1.5 million coordinated computers, the applications of which are only beginning to be realized.

Mr. Richards said that the power of the Sequoia supercomputer had been used to develop detailed simulations of the electrical activity of the human heart. About two years prior, computational biologists at IBM approached LLNL scientists to ask if Sequoia could be used to make breakthroughs in the field of cardiac simulation. Mr. Richards stated that such simulations could be used, for example, to test drugs for unintended cardiac effects, since it had recently been shown that some drugs can cause heart arrhythmias in certain genetic subpopulations. Sequoia can create simulated electrocardiogram curves and detect markers that could predict heart attacks. Such simulations require data on the human heart to create a three-dimensional computer model. The technology is becoming available that will enable patient-specific modeling in the future. Also, the simulation requires a mathematical model of the functioning of key ions as they pass through the heart's cell walls, a system of 20 differential equations that describe six different ion concentrations and 14 different cell wall gates. Mr. Richards said that the addition of the Vulcan and Sequoia computers have increased LLNL's computing power almost tenfold. Scientists at LLNL have the expertise necessary to create programs for the supercomputers to run at these very large and complex parallel scales. This expertise, in combination with that of computational biologists at IBM, was necessary to divide the work appropriately among the supercomputer's processors.

Mr. Richards showed some early results of the cardiac simulations, such as a whole-heart simulation of the initiation of an arrhythmia event. Simulations can also compare a normal heart rhythm with one affected by a drug. At this point, LLNL has done simulations of only the electrical functioning of the heart; the next step will be to simulate both the electrical and mechanical heart functions. The ability to use supercomputing power will lead to nearly real-time heart simulations and other major advances.

Regent Kieffer asked how managing the National Laboratories benefits the University. Mr. Goldstein said that the relationship between UC and the National Laboratories goes back to the Laboratories' founding, and continues to be very strong. UC faculty interact with Laboratory scientists and UC far outweighs any other university as a source for the Laboratories' scientists. Vice President Mara said he could provide data about the benefits to UC from its relationship with the Laboratories.

Regent Island expressed his appreciation for the presentation about the critical nature of the public service work done at the Laboratories. Committee Chair Pattiz stated that UC's international reputation is linked to its management of the National Laboratories.

Committee Chair Pattiz displayed a short video regarding the national security work of Los Alamos National Laboratory. Regent Ruiz expressed his view that the University's use of the Laboratories as a resource, enabling UC professors to have more access to the Laboratories to develop new products, would be beneficial.

Regent Blum said that the Blum Center for Developing Economies at UC Berkeley recently received a major award from the United States Agency for International

Development, largely as a result of ongoing collaboration with Lawrence Berkeley National Laboratory and the UC Berkeley College of Engineering.

Committee Chair Pattiz stated that UC is part of the limited liability companies that manage LLNL and LANL with private sector partners. The University provides the chairmen of the Boards of Governors of the LLCs and a tiebreaking vote in case of a deadlock. The private sector government contractors have interests different from UC's. The University has the very important responsibility for the Laboratories' science and technology.

The meeting adjourned at 10:10 a.m.

Attest:

Secretary and Chief of Staff