The University of California and Los Alamos National Laboratory

Historic beginning

Los Alamos was founded as part of the Manhattan Project during World War II. University of California physicist Robert Oppenheimer led a team of extraordinary scientific talent to design and produce the atomic weapons used to bring the war to an end. The University was asked to operate the remote laboratory and, as part of its public service, did so despite knowing little about its purpose until the end of wartime secrecy brought full managerial involvement.

Los Alamos' scientific staff included many of the luminaries of 20th century physics. Since World War II, Los Alamos has evolved into one of the world's largest multidisciplinary research and development institutions. It continues to play a critical role in the nation's defense, principally by certifying the safety and reliability of the nation's nuclear weapons stockpile.

Its technological developments and scientific discoveries also are helping the nation respond to terrorism and the broad range of other threats the nation faces today.

Key to the nation's security

Los Alamos and Lawrence Livermore together have designed all of the U.S. nuclear weapons. Each year, the laboratories must report formally on whether the weapons remain safe and reliable. This primary responsibility of nuclear weapons stewardship requires staff with complex sets of skills and experience, one-of-a-kind technical resources and the laboratory's continued ability to attract the best and the brightest minds.

Through the urgency of the Cold War, Los Alamos was driven by military requirements to constantly improve the U.S. nuclear stockpile.

Today, the two UC-operated design laboratories are taking a common approach to maintenance of the nation's nuclear weapon deterrent without nuclear testing.

The University of California advantage

The University of California is widely recognized as contributing significantly to the scientific quality of the laboratory's work and technical staff.

Laboratory Director G. Peter Nanos (center) makes a point to UC Regent John J. Moores, (left) and UC President Robert Dynes at a recent Los Alamos meeting.

The most important contribution of the University in the management of the labs has been to create and nurture the environment required for effective stewardship. The UC tradition of world-class science has always been key to creativity and innovation.

Intellectual freedom, intellectual integrity, and the University's inspiring tradition of public service enable the laboratory to carry out its responsibilities, placing the nation's interests first. UC's enormous prestige improves Los Alamos' governance, attracts new talent, and brings in advisers from academia, industry and government.

The University has increased its presence and influence on operations significantly in the past decade. Performance-based management has been the hallmark of successful business practices for many years.

The UC President's Council of advisers worked with the Department of Energy in 1992 to develop one of the first performance-based contracts that includes measures for world-class operations as well as science. This arrangement uses clearly defined performance objectives, criteria and agreed-upon measures on a fiscal year basis.

Addressing business needs

Some weaknesses in the business system controls were recently discovered and are being corrected by aggressive actions consistent with UC's response to previous issues. The University and Los Alamos have worked together on data-driven improvement aimed at meeting performance objectives and measures negotiated with DOE and the National Nuclear Security Administration, and performance scores have improved dramatically.

These measurable successes, together with improvements in self-assessment of operations and administrative functions and increased focus on mission perfor-

effect in the correction of business system controls.

UC and Los Alamos also have addressed project management issues aggressively through UC's Project Management Panel of nationally renowned experts in project management. UC worked directly with DOE and NNSA executives to establish key project management initiatives and added a Director of Project Management and Project Management Working Group to provide an ongoing forum for sharing lessons learned and best practices among its three laboratories: Los Alamos, Livermore, and Lawrence Berkeley national laboratories. All Los Alamos' major construction projects are on schedule and within cost baselines.

Los Alamos and UC now have an opportunity to build on these successes by showing how business processes and other administrative efforts can achieve the same excellence as the laboratory's scientific work.

Professorships, Collaborations, and Publications

Currently, at least nine Laboratory staff members hold adjunct professorships or other appointments at UC campuses in materials science, engineering and several other fields. Since September 1998, nine Los Alamos staff members have taken sabbaticals at UC campuses. More than 200 UC faculty and non-faculty researchers hold affiliate status at Los Alamos, sometimes bringing their students on visits to discuss ongoing collaborations. Affiliates come from every UC campus, with the majority from UC Berkeley, UCLA, UC San Diego, UC Santa Barbara and UC Santa Cruz. In addition, Los Alamos and UC researchers have collaborated on nearly 700 peer-reviewed publications in the past 5 1/2 years. And 125 UC Ph.D.s have been hired for prestigious Los Alamos postdoctoral fellowships over the same period, along with several special fellowships.

UC-LANL Science Institutes, Centers and User Facilities

In 2001, Los Alamos Neutron Science Center established a five-year professorship at UC San Diego held currently by Physics Professor Sunil (Sunny) Sinha. Sinha, his students, and postdocs conduct research at LANSCE. The Laboratory and UCSD split his salary and the Laboratory funded an additional $1 million to build an X-ray diffraction and reflectivity capability for nanoscience at UCSD.

The Institute for Complex Adaptive Matter is a multi-campus research program funded by the University of California, NSF, and member dues and is centered at LANL. ICAM funds innovative workshops and prestigious postdoc fellowships involving 14 campuses in the US and Europe.

UCSD's Jacobs School of Engineering and the Laboratory are jointly training engineers in disciplines that support Los Alamos' mission of enhancing global security.The educational initiative focuses on technologies to detect damage and predict the remaining useful life of engineered systems. This research will support critical infrastructure management in the civil and defense sectors, including stewardship of the U.S. nuclear weapons stockpile, and maintenance of bridges, roads and aircraft. Los Alamos plans to hire approximately 300 engineers over the next five years, many of them early in their careers, and the initiative with the UCSD Jacobs School of Engineering will help fill the Laboratory's need for a well-trained workforce. A graduate-level, research-based engineering degree program co-located at UCSD and Los Alamos will allow students to participate in ongoing research at Los Alamos or at UCSD, and qualified students may opt to continue on for a Ph.D. Eventually as many as 30 students a year may enroll in the program.

The strength of Los Alamos' scientific and engineering base is due in large part to the high caliber of the committees that annually examine technical performance at the Laboratory's 30 divisions, and provide frequent advice on critical research issues. Of the current 188 **Division Review Committee** members, 21 distinguished researchers, 11.2 percent of the total, are from UC campuses.

One of the most popular Los Alamos research programs for UC postdoctoral fellows has been the **National High Magnetic Field Laboratory.** The condensed matter research project, a National Science Foundation collaboration of Los Alamos, the University of Florida, and Florida State University, attracted 11 UC postdocs in 1999, 12 in 2000, 14 in 2001, 13 in 2002, and 14 in 2003.

Los Alamos hosts a branch of UC's **Institute of Geophysics and Planetary Physics,** founded in 1980, whose 30 scientists work closely with IGPP branches at UCLA, San Diego, Riverside, Santa Cruz and Lawrence Livermore National Laboratory. Close to 40 IGPP postdoctoral researchers have done research at Los Alamos over the past five years.

In addition to the above postdoctoral collaborations, three UC postdoctoral research positions have been funded since 1999 at the Center for Nonlinear Studies and three others at the Manuel Lujan Neutron Science Center.

Los Alamos National Laboratory and four University of California campuses — Riverside, Santa Barbara, Davis, and San Diego — have signed **Cooperative Agreements on Research and Education.** The Laboratory and the campuses share the strategic goal of strengthening University interactions to provide opportunities for research in three to four specified areas, along with education, recruiting, and retention.

Support for the collaborations are provided to the campuses from the Laboratory's UC Directed Research and Development funds.

Los Alamos National Laboratory is operated by the University of California for the U.S. Department of Energy's National Nuclear Security Administration