

“Superb” Year for Science and Management at the Labs

The University of California-operated national laboratories have had an outstanding year, producing “superb science and technology” while, for the first time, the quality of management rose to comparably high levels, according to Dr. John McTague, UC’s Vice President for Laboratory Management.

McTague spoke to a San Francisco meeting of the UC Board of Regents. It was his first report to the Regents since joining the university last June.

The UC-operated laboratories are Los Alamos and Lawrence Livermore National Laboratories, operated for the Department of Energy’s National Nuclear Security Administration, and Lawrence Berkeley National Laboratory, operated for DOE. In the past year, they transcended “a small number of very high profile” problems in security and project management that bedeviled them in 1999 and 2000 to experience “one of the best years ever,” he said

McTague said that one of the most notable and instructive highlights of the laboratories’ performance has been their ability to respond to the Sept. 11 attacks by providing useful science, technology and analysis to authorities almost instantly.

“You can’t respond effectively to a crisis if you only start preparing when the crisis occurs,” he said. “For years, these laboratories were getting ready for things that the rest of us haven’t been thinking about. Their contributions are a dramatic illustration of the importance of doing research before applications become urgent.”

He was referring in part to the well publicized efforts by Los Alamos and Livermore to help health and law enforcement authorities identify anthrax contamination. As an example of one of the powerful new technologies now in use, he held up for the Regents a prototype of one of Livermore’s portable bio-detectors, called HANAA (for Handheld Advanced Nucleic Acid Analyzer.) HANAA, now licensed for commercial development and not much bigger than a large man’s shoe, can identify a microorganism in 20 minutes.

But he also pointed out a range of other post-Sept. 11 activities – all of which originated long before the World Trade Center Attacks. These include airborne biodetection systems, models for identifying and protecting vulnerabilities in gas lines, electrical grids and other parts of the infrastructure, and R&D into airport security and cyber security.

Impressive as they are, the labs’ responses to the Sept. 11 attacks are only a part of the year’s activities. McTague pointed out the following highlights:

- ❑ Los Alamos and Livermore were able to certify, for the first time since the end of nuclear testing a decade ago, the reliability and safety of significantly modified warheads. In the past, significant modifications required testing, and the achievement reflects greatly increased confidence in the power of computer simulations supported by sophisticated non-nuclear tests.
- ❑ Livermore dedicated the world’s most powerful computer facility, ASCI-White, which runs at better than 12 trillion operations per second. As part of now-routine collaboration between the national security labs, Los Alamos researchers have used the Livermore facility for the first full-physics, primary and secondary

nuclear weapon simulation. This has illustrated the value of the UC labs operating cooperatively as a system.

- Berkeley Lab dedicated what was for a time the world's most powerful (and is now the second most powerful) unclassified computer facility – NERSC, for National Energy Research Scientific Computing Center, serving more than 2,400 users around the country with reliable, high quality computations at 5 trillion operations per second.
- Berkeley Lab obtained atomic images of columns of silicon atoms at unprecedented resolution using an electron microscope. Resolution was 0.078 billionths of a meter (0.78 Angstroms) – less than the diameter of many atoms.
- Working together, at DOE's Joint Genome Institute in Walnut Creek, the three labs have developed the world's fastest approach to sequencing genomes. They are paying particular attention to microbial genomes, turning out in some cases a draft sequence in a single day.

McTague's presentation came 10 months after the contracts for the two national security labs were extended by the Regents and by NNSA. (The Berkeley Lab contract remains in force through next fall). He noted that management improvements have been especially gratifying. There have been no major security incidents or safety stand-downs. Environment, safety and health performance, as measured by lost or restricted workdays, has improved steadily for all three labs until they are now better than DOE averages and targets. Employee surveys at the two national security labs show that the vast majority of Livermore and Los Alamos employees believe their workplaces are safe, their management values diversity and they are proud to be associated with their lab.

The one negative, he said, was a significant concern by Los Alamos employees, who detect a decline in productivity due to the imposition of regulations that restrict but do not add value to an operation. "It is time to return to performance based management," he told the Regents. "Our sponsors should specify what needs to be done, and we should be the experts in how to do it."

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