

**Minutes
of the
Fifth Meeting
of the
Los Alamos National Laboratory Oversight Committee
State Capitol ★ November 12, 2004**

The fifth meeting of the Los Alamos national laboratory (LANL) oversight committee was called to order on November 12, 2004 at 10:10 a.m. by Representative Roberto "Bobby" J. Gonzales, co-chairman, in Room 322, State Capitol.

Present were:

Rep. Roberto "Bobby" J. Gonzales, co-chairman
Sen. Phil A. Griego, co-chairman
Rep. Thomas A. Anderson
Rep. Debbie A. Rodella
Rep. Nick L. Salazar
Sen. William E. Sharer

Absent was:

Sen. William H. Payne

Advisory Members:

Rep. Ben Lujan
Sen. Richard C. Martinez
Rep. Jeannette O. Wallace

Staff:

Jonelle Maison
Sarah Salazar

Guests: The guest list is in the meeting file.

Minutes of the fourth meeting were approved.

Copies of all written materials provided to the committee are in the meeting file.

LANL Education Initiatives

Student Education Program Overview — Dave Foster, acting manager, education program office

Mr. Foster presented written testimony on LANL's education programs, which are meant to provide interest in topics such as science and math, which in turn support LANL's strategic goals of workforce development, which include recruiting, retaining and developing the best employees of the future and leveraging the science education outreach. He discussed several programs that have as their goal increasing northern New Mexico science awareness and interest. Programs include science on wheels and a day in Los Alamos at Bradbury science museum, which serves approximately 10,000 students and teachers; New Mexico adventures in supercomputing challenge, in which 350 students and 50 teachers participated last year; go figure mathematical challenge, a two and one-half hour test; robotics workshops, which are one-

or two-day events for students and their teachers; expanding your horizons student and teacher conferences; and Los Alamos space science outreach, which is co-sponsored with NASA and involves 20 K-12 teachers in a month-long program. Several workforce development programs at LANL help the lab develop a "pipeline" for future employees, including student internships, an MBA internship program and a critical skills development program; technician training; and a post-doctoral program. The student internship program provides stipends to high school, undergraduate and graduate students, and 25 percent of the participants come from New Mexico. For 2004, the program served 75 high school co-op students, 1,022 undergraduates and 449 graduate students at a cost of \$9 million. The MBA internship program is unique in the nation and selects interns nationally from major business schools. The critical skills development program, which serves approximately 600 students and 48 teachers, tracks 13 areas of technology; the annual cost is \$1.3 million. The technician training program is a collaborative with UNM-LA, northern New Mexico community college and Santa Fe community college and includes training in electromechanics, material science, computer system administration and machinist apprenticeships. The postdoctoral program served 508 postdoctoral students in 2004 and resulted in 51 LANL hires. In addition, there are other pipeline programs that LANL hopes will help it meet its critical skills needs in the future, covering the gamut from strategic computing to weapons materials science. Other efforts by the education program office to enhance regional K-16 science education include the northern New Mexico council on excellence in education, northern New Mexico math and science academy, New Mexico university partnerships, teacher professional development programs and the DOE college planning guide. LANL has also expanded its tribal education initiatives, including summer internships, in which 31 students from 12 tribes participated in 2004; K-12 education initiatives, including robotics student and teacher workshops, glovebox operations workshop for Santa Clara teachers, Valles Caldera environmental science workshop for Jemez students, science workshops for San Ildefonso students and 32 LANL employees serving as tutors and science fair judges; the environmental monitoring certificate program with NNMCC, which has served 12 students since 2003; and the science education initiative for the accord pueblos, which includes LANL scientists supporting K-12 science curriculum development and pipeline for science, engineering and technology students. LANL and the university of California have made significant investments in regional education, from grants, gifts of equipment and scholarships.

Representative Salazar initiated a discussion of the machinist program with NNMCC. Representative Rodella asked if the program was open to LANL employees. Mr. Foster said the program is primarily focused on students, since LANL does pay for employee training. On questions about critical skills programs, Mr. Foster said programs range from two weeks to full summer programs and some are conducted throughout the year.

★ Representative Rodella requested information on how many employees take advantage of training, specifically a five-year history and the number of participants that received higher degrees. On further questions, Gilbert Ratliff said that tuition reimbursement costs are part of the overhead budget; if training is job-related, it is up to managers to approve the training.

On questions from Speaker Lujan regarding student internships, Mr. Foster said his office

oversees the program, but that individual departments process the applicants. The lab recruits in high schools in the fall and spring and works with counselors; the schools determine academic qualifications and the lab works with the schools to ensure a fair and equitable selection process that might include relatives of lab employees. There is a similar process for the college internships, whereby students post their resumes on line and are put in touch with someone in their area of education. Students learn about the programs through lab recruitment efforts and other participants. Speaker Lujan said he would like to see a higher percentage of New Mexico students participate in the programs.

New Mexico University Partnerships — Dr. Don Rej, acting director, science and technology base program office, and Professor Billy Sanders, assistant dean, university of California Davis and educational consultant to New Mexico highlands university

Dr. Rej presented written testimony on lab employee education data and LANL-New Mexico university projects. New Mexico-educated personnel make up the largest fraction of current LANL workforce employees. LANL employees hold 3,365 degrees from New Mexico institutions of higher education; 25 percent of total degrees are from New Mexico schools, with the largest percentage of those coming from the university of New Mexico. Joint research projects benefit students, faculty and campuses by training students; providing opportunities for recruitment, development and retention of faculty and staff; providing campus infrastructure and facility investments; and leveraging facilities, personnel and programs. An important measure of collaboration is the number of joint publications between LANL and schools, and New Mexico universities enjoy the highest number of joint publications. In 2003, LANL published 83 joint papers with UNM, in contrast to its next highest partner, Berkeley, at 25 papers. Joint research projects with New Mexico schools cover a wide range of disciplines, including physics, biology/genetics, chemistry, engineering, earth sciences, materials science, environment, medicine, astronomy and mathematics. These efforts are enhanced by the formal memoranda of understanding between LANL and UNM, NMSU, NMIMT and NMHU. The objectives of joint lab-university collaboration include enhancing the synergy and cross-fertilization of ideas; providing solutions to scientific challenges and developing new technologies and research areas; providing new and innovative research opportunities for undergraduate and graduate students, post-doctoral researchers and faculty; encouraging students to pursue careers at LANL; helping LANL attract topnotch students and retain world-class scientists; making unique LANL facilities and resources accessible; giving LANL staff the opportunity to participate in university programs, thus enriching their work at the lab; and providing educational and training opportunities.

Dr. Sanders gave a brief presentation on highlands university's new engineering program, which was approved by the academic senate in January 2004. Highlands had requested a UC engineering assessment team in 2003, which, after review, recommended a computational engineering degree. Computational engineering is cutting edge, inexpensive and in demand at both LANL and Sandia national laboratories. The bachelor of science in computational engineering is the first in New Mexico and one of the few in the United States. In August 2004, 12 freshman were enrolled in the program. Dr. Sanders pointed out several reasons why partnerships like the one between UC and highlands are important in building quality employees;

chiefly, they prepare students to compete successfully for well-paying professional positions in New Mexico and provide opportunities for engineering research programs between faculty and LANL staff.

Senator Griego expressed his concern that rural schools are being left out of a lot of the programs being offered. He urged lab officials to find avenues to provide equal access for rural and urban students.

On questions from Representative Salazar about the difference in salaries in the computational engineering program at highlands compared to other universities, Dr. Sanders replied that he is not too sure what other universities are paying, but that the salary range highlands should pay its professors in order to recruit and retain staff is \$65,000 to \$75,000 a year.

★ After a discussion of the joint research efforts, Representative Salazar asked for a distribution by discipline and a list of papers and joint research projects.

Representative Anderson asked the status of accreditation for the highlands program. Dr. Sanders said there must be one full graduating class and at least four faculty before the university can apply for accreditation, which takes five to six years to be granted.

On questions from Representative Rodella, Dr. Rej said that LANL has competitive standards for employment and that New Mexico graduates or participants in LANL-sponsored programs must compete for jobs in the same way as anyone else. Representative Rodella said she hopes the lab will keep track of what happens to program participants.

★ Speaker Lujan asked for a better breakdown on the minority graduates who are employed by LANL and where they came from. Mr. Foster provided the following information:

- ▶ in the internship programs, 25 percent of the 1,600 interns were from New Mexico;
- ▶ in the undergraduate program, out of 870 participants, 344, or 40 percent, were New Mexico students; of those, 38 percent were Hispanic and 6 percent were Indian, Asian or other;
- ▶ in the graduate program, out of 349 participants, 99, or 28 percent, were New Mexico students; and
- ▶ in the high school co-op program, 100 percent of participants are New Mexico students.

The speaker amended his request to include information on where minority undergraduates come from.

Math and Science Academy (MSA) — Carol Brown, master teacher

Ms. Brown presented written testimony on the math and science academy, which is a professional development program for teachers that meets all the requirements for teacher

professional development under the federal No Child Left Behind Act. The program is unique because it addresses many of the complex and challenging aspects of teaching and learning and provides intensive follow-up in the classroom during the school year. The goal is to improve student learning and achievement in math, science and technology by improving teacher practice. The MSA staff has experience in teaching pre-K-16 classes in core curricular subjects, technology and Native American programs; teacher preparation and teacher professional development; adult education; and administering projects. In its pilot year, 2000-2001, there were teams of four middle school teachers from three school sites: Chama, Espanola and Mora. In the current school year, 2004-2005, there are 72 participants; 55 elementary teachers and 17 middle school teachers at Chama, Mora, Espanola, Pojoaque and Taos. Seven of the original 12 participants are cognitive coaches and mentors at their sites this year. MSA is not a canned program, and has the flexibility to deliver whatever is needed. Districts, principals and teachers make a three-year commitment to the program, which includes summer institutes to focus on standards-based education as well as math and science content, technology and classroom management; collaboration among teachers during after-school meetings and on-line discussion groups; reflective practice that occurs through coaching and mentioning and growth portfolios; celebrations of learning, which improves communications between parents and teachers; and Saturday meetings to refocus teachers on MSA concepts. MSA follows up in the classroom throughout the school year and works with site administrators to provide training and support. MSA is not only about additive learning, but transformational learning as well. The national center for research on evaluation, standards and student testing at the university of California, Los Angeles is the external evaluator for the project. Its reports are available at: <http://education.lanl.gov/newEPO/k12/MSA/MSAindex.html>. Ms. Brown provided a graph showing significant increases in Chama 7th grade test scores in reading, language arts, math, science and social studies from 2000 through 2003. MSA is hoping to expand the program in the current districts; design and pilot a teacher mentoring program with LANL scientists; increase the number of participating districts; solidify continued funding for the current program and expansion; and evaluate possible replication nationally.

Representative Salazar asked if MSA had been used in probationary schools. Ms. Brown said the Chama elementary school had been on warning but now meets standards. In Espanola, eight or nine schools in the district are on probation and there will be new assessments in March for 3rd, 9th and 11th grades.

Speaker Lujan praised the program.

Student Experience

Espanola Middle School 7th grade math teacher, Veronica Fresquez

As a 25-year veteran of the educational system, Ms. Fresquez told the committee she loves the challenge the MSA program provides. She is encouraged by the support system of everyone involved in the program, as well as the way she looks at education; she gets excited when she learns innovative new ways to teach in her class, and in turn feels that her students are excited to learn.

Mentor, Dr. Tracy Ruscetti

Dr. Ruscetti serves as a mentor to Tony Sena, a PhD candidate at UNM. Dr. Ruscetti said she is piloting a new program, Pipeline for Undergraduate Student Horizon (PUSH) at NNMCC, and the response has been phenomenal. This program is for people who want to stay in the community. There are currently six women participating, all of whom are considered nontraditional students. The women are young, all have children and all would like to eventually work at LANL. Dr. Ruscetti recommends the co-op and intern programs because they provide experience that makes participants competitive.

Undergraduate Student, Robert Aragon

Mr. Aragon, a student at NNMCC, participates in the LANL applied science internship program. He is most pleased with the hands-on experience the program provides, which he would have not had otherwise. He spoke highly of the mentors in the program who made work easier. Mr. Aragon will graduate with associate degrees in electronics and computer electronics.

Electro/Mechanical Training Program Student, Sarah Sweeney

Ms. Sweeney testified that the program has opened doors for her as a single mother of two children; she is one of the few women in an electromechanical technician position at LANL. The program paid her tuition and books and she was only required to work 20 hours a week while being paid for 40. She received a certificate from the university of New Mexico-Los Alamos.

Representative Salazar said one of the most important components of the internship programs is that students work at the lab and learn lab culture, thus making it easier to succeed when they are real employees of the lab.

Education Roundtable Discussion — What do the national laboratories need from the New Mexico workforce? What do secondary and post-secondary schools need to do to ensure qualified applicants for high-paying lab careers? What do schools need from the state to produce an adequately trained workforce?

Roundtable participants were:

LANL — Gilbert Ratliff, Dr. Don Rej, Carol Brown
University of California — Dr. Rae Lee Siporin
Sandia — Tom Daly, West Mesa high school teacher
UNM — Dr. John McIver
PED — Dr. Lena Trujillo-Chavez
CHE — Guy Jacobus
NNMCC — Dr. Sigfredo Maestas
Highlands University — Dr. Clarence Sanchez
Española School District — Victoria Garcia
Santa Fe School District — Carolann Gutierrez
Los Alamos School District — Dr. Mary McLeod

Pojoaque School — Gloria Shuttler
UNM Los Alamos — Dr. Carlos Ramirez
UNM Taos — Erlinda Gonzales
Office of Work Force Training and Development — Reese Fullerton
Association of Community Colleges — Jack Jekowski

Mr. Daly began the discussion by explaining Sandia's advanced technology academy and photonics academy for the West Mesa high school cluster of APS. Through Sandia's participation, West Mesa has the only high school photonics laboratory west of the Mississippi. Applicants to the programs must have a 3.5 grade point average and must maintain a 3.0 to remain in the program. Sandia began its educational programs because, like LANL, it faces a workforce crisis as long-time employees in critical skills areas retire.

★ Dr. Maestas said that retirement trends make training critical and that schools must have data from the national laboratories on what kinds of training are needed. Mr. Ratliff said LANL has information regarding attrition in each of the lab's staffing series and what degrees are needed. Dr. Maestas asked that participants be provided with that information.

Dr. Maestas said the amount of remedial education needed in the post-secondary educational system continues to escalate. New Mexico is not alone in its predicament; other states face the same problem. He thinks the state is doing a good job supporting public schools and higher education, but there are systemic problems that must be addressed more radically. He gave as an example the Espanola schools, which face huge problems in transportation of students, dropout rates and overcrowded schools. He noted that what Sandia, UNM and APS were doing was extending the school day for students. He advised that the state cannot advance until schools do better.

Representative Salazar pointed out that educational systems place a lot of importance on degrees, but in job interviews the question is: "What is your experience?". He asked how that chasm, between school and career, can be bridged.

Dr. Rej said it is crucial that the state begin to invest in math and science in the 4th and 5th grades if it wants to produce qualified applicants for many jobs at the national laboratories.

Dr. Trujillo-Chavez said there are a number of gubernatorial initiatives to improve education in New Mexico. Currently, the department is focusing on standards for language arts and math, aligning graduation requirements with higher education and teaching to the future in K-12.

Senator Sharer observed that one big problem is the lack of focus on mission in education. He noted that most people do what is expected of them; therefore, schools need to know and articulate their mission. He said the focus in public schools seems to be lost; students are not told why they are there or what their purpose is.

Dr. Maestas pointed to the joint LANL-NNMCC electromechanical program as a model program. The program hires students full-time and gives them time for school; over 90 percent of participants are hired by the lab. He said he would like to see the labs, community colleges and high schools building on existing or former programs. The summer bridge program, in which the lab no longer participates, is the kind of educational investment he would like to see the labs support.

Dr. Siporin, referring to a funnel diagram presented earlier, noted the very small opening to jobs at LANL and Sandia. Sixty to 70 percent of those going into the higher educational system need remedial education, and if the state concentrates only on those who qualify for jobs at LANL and Sandia, others will be cheated. Preparation must begin in elementary school; if the mission is to be accomplished, the state must work at the wide end of the funnel.

Dr. McLeod said that what she has seen in education in the last five years gives her hope. She supports the Baldrige initiative.

Mr. Jacobus said policymakers must look at the totality of governance of higher education. New Mexico ranks first, second or third in per capita support of higher education in national ranking systems.

Ms. Shuttler pointed out that schools are workforces too, and they are unable to staff classrooms with math and science teachers.

Mr. Daly, referring back to Dr. Siporin's comments, said that most of West Mesa is Hispanic but that he had never met a parent who did not want the best for his child. He noted that a lot of children in education are passed over; they are not born dumb, they are made dumb by the system. What he likes about the program he works with is that it is trying to push the effort down to elementary schools.

Dr. Maestas, getting back to original questions, said that schools must know job markets and train students to those markets. Professional jobs in northern New Mexico are scarce except at LANL and in government. The northern New Mexico economy needs to diversify, but that effort is going poorly, e.g., the area does not have people with the business acumen to develop jobs; to start small manufacturing concerns; or with the business skills necessary to start technology transfer businesses. He suggested the need for a graduate institute in business and technology in northern New Mexico, in cooperation with LANL, NNMCC, UNM, highlands and others. He noted that he cannot expect LANL to hire all NNMCC graduates; there simply needs to be more jobs for them.

Mr. Jekowski concurred with Dr. Maestas's points. Dr. Maestas went on to say that northern New Mexico's problems are not unique, but that New Mexico suffers more because of the rurality of the state and the economy. He does think the state has a unique opportunity to make significant changes. As PED develops its standards and benchmarks, it should ask for employers' input. What are the skill sets needed to match job vacancies? He complimented the office of work force development's strategic plan as a good first step to bring education, business and funding together.

Representative Gonzales stressed that there are exciting opportunities for the state if its workforce is adequately trained. He noted that New Mexico is number two in the nation for solar energy; the hospitality industry is booming; and the state's dairy industry is growing to be one of the most significant in the nation, which means that there will be a need for veterinarians, technicians and skilled personnel. However, if the workforce is not prepared for new industries, the state will have to continue importing trained people. There are many opportunities for the state to take advantage of.

Dr. Rej concurred that there are niche markets for people who are also trained to qualify for lab jobs. For example, the skill sets needed in the solar energy field are similar to those needed for some lab positions.

Dr. McIver said that most successful people point to an inspired teacher who inspired them to achieve. In order to develop the skill sets needed for the kinds of jobs the lab and others need, in order to get more students in the pipelines, schools will have to start earlier with pertinent curricula; but most importantly, those classes have to be taught well by inspired teachers. Why the photonics academy works, he said, is because the teachers believe, they have passion for it. New Mexico needs more programs to teach teachers passion and to get families excited about education. He said that education needs to be more creative, not necessarily more expensive.

Ms. Garcia said that public schools, particularly in rural areas, need more resources, such as materials and field trip transportation. Senator Griego agreed.

Representative Gonzales said that with the federal mandates of No Child Left Behind, this is the most critical time to support public schools. In closing, he thanked the participants for their contributions and proposed that the discussion be ongoing, meeting once or twice a year. He asked roundtable participants or others to submit any additional comments to staff, who would pass them on to the committee.

The committee met in executive session to discuss Mr. Montano's request to call for congressional hearings on whistle blower retaliation at LANL. After the session, the committee voted 6-0 in open session to write a letter to Mr. Montano expressing the committee's position that it did not have enough evidence of wrongdoing on the part of LANL to make such a request of congress. The committee members thought the New Mexico congressional delegation was the appropriate vehicle for such requests.

There being no further business, the committee adjourned at 5:05 p.m.

Committee note: the December 13 meeting has been canceled.