

**TESTIMONY**

**OF**

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U.S. DEPARTMENT OF COMMERCE**

**BEFORE THE**

**COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION  
UNITED STATES SENATE**

**April 16, 2002**

Chairman Hollings, Ranking Member McCain, and Members of the Committee, I thank you for this opportunity to testify in support of Congressional authorization of the programs of the Technology Administration and the National Institute of Standards and Technology (NIST) within the Department of Commerce. I also understand that the Committee wishes to focus particular attention on the reforms that the Administration has proposed concerning the Advanced Technology Program. I look forward to discussing them with you today.

**Technology Administration (TA) and NIST Programs: their goals and importance.**

TA and NIST are committed to maximizing the contribution of technology to our national economy. They also work with the private sector and other agencies to spur the innovation and entrepreneurship that lead to more high-quality, high-paying jobs, which in turn foster our country's economic security. A strong economy and national defense are not only the bedrock of our quality of life and global leadership, but of our very freedom. More than ever before, technology is vital to maintaining and building these U.S. strengths.

As we have all witnessed in the past few months, technology is our force-multiplier in the war on terrorism and in homeland security. Thanks to technology, we can put the world's finest tools in the hands of our military, law enforcement and public safety personnel. Our advanced technologies are significantly reducing the risk to these American men and women in service to their communities and their country. There is every reason to believe that, in the years ahead, technology will continue to be a significant force in our economy and in the defense of our nation.

I would like to report to the Committee that on March 29th, NIST and FEMA entered into a Memorandum of Understanding (MOU) that we believe will significantly enhance the effectiveness of the two agencies' cooperation. The MOU establishes a framework under which NIST will be a research resource for FEMA in the areas of disaster prevention and homeland security.

It is no accident that the United States leads the world in sophisticated technology, both civilian and defense. Our achievements are the dividends that flow from sustained public and private sector investments in research and development since the late 1940's, coupled with America's entrepreneurial spirit and willingness to take risks. While under our economic system private enterprise takes the lead in ensuring that the United States remains on the cutting edge of technology and stays competitive in the world's high-tech markets, the Federal government plays a critical enabling role. The U.S. Government, in recent decades, has strongly supported scientific and technological research, fostered excellence in standards development, and maintained laws that foster innovation. These activities -- in which the Technology Administration plays a key part -- have not only helped our industries become technology leaders, but have caused our universities to become world-class scientific and technological research institutions. I would like briefly to outline some of the key operational elements and programs of TA and NIST that support this role.

### **The Technology Administration**

**The Office of Technology Policy.** In support of the President's priorities for science, technology, and U.S. competitiveness, the Technology Administration's Office of Technology Policy develops and advocates national policies and initiatives that support the use of technology to build America's economic strength. Its activities include:

- Promoting innovation through leadership and advocacy of policies that encourage research, development, and commercialization of new technologies (such as nanotechnology and biotechnology);
- Representing the interests of U.S. innovators and entrepreneurs in international forums and partnerships;
- Working with states, localities, and Federal labs to institute policies that promote technology-led economic development;
- Fostering national workforce policies that promote and improve the education and training of future scientists and engineers, and by recognizing excellence through the National Medal of Technology program;
- Working with industry to employ technologies, such as telemedicine and other e-commerce applications, in new ways for greater productivity and higher standards of living, and encouraging more students to pursue scientific and technological careers through the GetTech public-private partnership;
- Maintaining close communication and understanding between government, industry and academia on technological and innovation issues. Recently TA has hosted a series of

workshops, several of which I have chaired, that build mutual understanding of important market trends and developments. Topics have included the environment for innovation and R & D in the U.S., the factors affecting domestic demand for broadband technologies, the state of technological development in the EU, and the flow of venture capital in Russia.

**The National Technical Information Service (NTIS).** The overall role of NTIS is to enhance public access to Federal ly generated scientific and technical information. I am pleased to report that NTIS is performing this important work on a self-sustaining basis. Part of its revenue is derived from the sale of technical reports. But, consistent with Congress' 1988 mandate that NTIS develop new ways to disseminate information and its 1992 mandate to focus on electronic media, NTIS is also generating revenue through services to other Federal agencies that help them communicate more effectively with their own constituencies online.

### **The National Institute of Standards and Technology (NIST).**

As this Committee well knows, NIST is a world-class organization that performs cutting edge research driven by its mission of developing and promoting measurements, standards, and technology to enhance productivity, facilitate trade, and improve the quality of life.

NIST, has just begun its second century of service to the Nation, and in this period it has already produced some notable achievements. In 2001, for the second time in five years, a NIST scientist won the Nobel Prize in Physics, the ultimate recognition in science. This time, NIST's Eric Cornell, along with a colleague from the University of Colorado and another from MIT, won the prize for creating an entirely new state of matter, called a Bose-Einstein condensate. This super-cold creation, first accomplished in 1995, has launched a new branch of atomic physics and unlocked a potential treasure trove of discoveries and new technologies. The work of Cornell and his colleagues builds on the contributions of NIST's 1997 Nobel Prize winner, Bill Phillips, who perfected methods for trapping and cooling atoms with lasers. This capability is now exploited in NIST's newest atomic clock, which neither gains nor loses as much as one-billionth of a second in 20 years.

NIST's standards and measurements activities actively support efforts to strengthen homeland security. Currently, NIST is conducting more than 75 projects that support law enforcement, military operations, emergency services, airport and building security, cyber security, and efforts to develop new types of security technologies. NIST is truly the "crown jewel" of the Federal laboratory system.

Three particular ongoing or planned initiatives address homeland security. The first of these deals with current building design standards and practices. Current building design practices do not consider fire as a design condition or the consequences of injected fuels or other highly flammable materials. Architects, not engineers, specify fire protection in buildings, and the current testing standards are based on work carried out by NIST in the 1920s. In addition, progressive collapse – the spread of failure by

a chain reaction disproportionate to the triggering event – is an important issue that will be investigated in connection with the World Trade Center collapse and was responsible for the high number of deaths in the 1995 bombing of the Federal building in Oklahoma City. Yet there are no U.S. standards, codes, and practices to assess and reduce this vulnerability. Beyond designing buildings that are better able physically to withstand major disasters, the development of "intelligent" buildings could significantly affect the outcome in terms of lives saved.

For this and other reasons, NIST is proposing to increase the resources devoted to its Program for Accelerating Critical Information Technologies. This increase in emphasis will support the development of networked systems of embedded devices ("EmNets") to detect, prevent, and respond to natural and human-caused disasters. As computing device costs decline and capabilities increase, devices and sensors will be embedded in buildings, office spaces, manufacturing floors, transportation medians, and appliances and will be interconnected using wired or wireless networks. EmNets could offer enormous benefits to personnel responding to a disaster, providing substantial amounts of information in real time that could help to save lives and resources.

NIST's third new initiative in support of homeland security involves the Computer Security Expert Assist Team. This team, based at NIST, assists other Federal agencies on a cost-reimbursable basis. Federal agencies are taking action to improve security, but most do not understand what actions to take or in what order. NIST staff includes world leaders in all aspects of information security.

**The Advanced Technology Program.** The Advanced Technology Program (ATP) has been the subject of perennial debate that has hindered its stability and effectiveness. Last summer, Secretary Evans initiated a review of the Program with a view toward resolving this debate. The results of that review are outlined in a report, *The Advanced Technology Program: Reform with a Purpose*, which was issued earlier this year.

Based on the Department's careful review and analysis of ATP, the report highlights important reforms for the Program and more clearly defines its role in the R&D enterprise. Technologies developed through ATP have significant potential to bring economic growth and benefits to the entire Nation. Nevertheless, our review concluded that some reforms are needed to provide ATP with the proper tools and direction it needs in order to be effective in the 21<sup>st</sup> century. For example, much has changed since the Program's inception over a decade ago, such as the increasingly important role of universities in innovative activity. Despite this expansion in their R&D role, universities may not, under current law, lead ATP joint ventures or hold rights in the intellectual property that results from ATP-funded research. The Program needs to respond to this and other changes in the research and business environment. Specifically, the proposed reforms include:

- Recognizing the significant value of the resources that institutions of higher education offer by allowing universities to lead ATP joint ventures;

- Offering universities increased incentive to participate in developing commercially relevant technologies by allowing them to negotiate with joint venture partners over the rights to hold the intellectual property that results from research;
- Limiting very large companies' participation in ATP to joint ventures. ATP support for companies of Fortune 500 size as single applicants is inappropriate. However, in recognition of the economic value of the diffusion of knowledge -- as well as other national benefits that arise from large firm participation in joint ventures -- very large companies should be permitted to receive ATP awards, although only as part of a joint venture;
- Allowing recoupment from companies, and reinvestment into the Program, of a percentage of revenues derived from successfully commercialized awards. To accomplish this, ATP-funded companies that achieve commercialization would pay an annual royalty to the government of 5% of any gross product revenues, up to 500% of the amount of the original award;
- Modifying ATP project management activities and selection criteria to ensure that the Program funds technological innovation and development, as contrasted with marketing or other commercialization activities; and
- Ensuring that ATP's project evaluation boards, where appropriate, have additional private-sector, non-proprietary input as to whether a specific technology is truly innovative and not already being adequately supported by the private sector.

We want to work with the Congress on the implementation of appropriate reforms, including recoupment of the government's investment in profitable ventures, which can be re-invested into the Program. In this way the stability and effectiveness of the Program, we believe, can be greatly improved. The Secretary and I have been personally involved in this issue and feel strongly about the proposed reforms. The Administration's proposed budget of \$107.9 million demonstrates our commitment to an enhanced ATP.

**NIST Laboratory Initiatives.** For the upcoming fiscal year, the Administration has requested a budget of \$396.4 million, an increase of slightly more than \$75 million over last year's appropriation. Of this amount, \$50 million will be used to complete and equip NIST's state-of-the-art Advanced Measurement Laboratory, now under construction. A facility like no other in the world, the Advanced Measurement Laboratory is due to be completed in late 2003.

The Advanced Measurement Laboratory (AML) is extremely important to the Nation's technology future. Its unique, highly controlled environment is essential to NIST's ability to develop necessary capabilities and tools. High-technology industries need advanced measurement methods and standards to efficiently develop and produce new products and services. The semiconductor, telecommunications, data storage, biotechnology, and other key technology industries already require extremely precise

measurements and standards that are approaching atomic scale. Growing demand for these and other exceedingly accurate measurement capabilities can only be met with special equipment in the unique AML environment.

NIST is also planning construction and renovation activities that will include long-overdue improvements at NIST's Boulder, Colorado, laboratories, where most of the buildings are nearly 50 years old. Facility-related problems at the Boulder campus include severe temperature fluctuations and power interruptions that often threaten the quality of NIST data; power outages, spikes, and brownouts that damage sensitive equipment; and poor heating and air conditioning controls that have prevented the on-time delivery of specialized superconducting chips to defense contractors, instrument makers, and other NIST customers.

Key initiatives of the NIST laboratories will help to achieve the President's aim to leverage the Nation's technology resources to speed progress on several security fronts. For example, NIST plans to expand operations and strengthen research capabilities at the NIST Center for Neutron Research. This Center is the best and most productive facility of its kind in the United States and among the best in the world. As growing numbers of researchers are discovering, neutrons are incredibly useful probes. Requests for "beam time" (experimental measuring time) at this facility greatly exceed the Center's existing capacity. We plan to take steps to meet this demand for what is a truly unique resource for U.S. science. NIST will build staff expertise for the development of new instruments and capabilities that will allow the agency to increase the number of users by a minimum of 25 percent, from approximately 1,750 to 2,300 per year, and strengthen key program areas ranging from materials science to biology to fuel-cell research.

NIST also plans to expand its program in nanotechnology, an exceptionally promising area in which NIST is already a leader. Miniature technologies are important in many fields, including health care, semiconductors, information technology, biotechnology and data storage -- many of which applications are important to homeland and national security. Nearly all industrial sectors plan to exploit nanotechnology, and most of their plans call for appropriately scaled measurements and standards -- NIST's specialty.

**The Manufacturing Extension Partnership Program (MEP).** The original blueprint for MEP called for NIST to provide cost-share support to new centers in the network during their crucial start-up years, after which the Federal funding would be slowly phased out and the centers would become self-sufficient. The \$12.9 million FY 2003 budget request would return MEP to this original plan, which called for the phase out of Federal monies to centers after six years of funding. The Administration's proposed budget will continue NIST cost-share funding for two centers that are less than six years old, while allowing MEP to continue to provide full technical and product support and coordination for the network of centers.

**Malcolm Baldrige National Quality Program.** This past year was an especially notable one for the Baldrige Program. It awarded its first Malcolm Baldrige National Quality Awards in the education category. Two school districts -- Chugach, Alaska, and Pearl River, New York -- and one university

-- Stout University in Wisconsin -- accounted for three of the five awards given this year. These award winners will be excellent role models for 21st century education organizations. We are optimistic that, in the years to come, adoption of the Baldrige criteria for performance excellence will spread across the education sector. As it does, we anticipate that the Program will motivate the same kind of revolution in the quality of American education that it helped to launch in U.S. industry.

Mr. Chairman, I thank you for the opportunity to address the Committee on these important issues. I will be happy to answer questions you may have.