

Testimony of  
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*“NIST’s Proposed Reorganization and  
NIST’s Role in Standards Development”*

## ***Introduction***

Chairman Wu, Ranking Member Smith, and members of the Subcommittee, I want to thank you for this opportunity to discuss NIST's pending reorganization, as well as our broader role in standards development. With the growing importance of NIST's mission to the economy -- and with the Subcommittee's work to reauthorize the America COMPETES Act (PL 110-69) -- this is an opportune time to consider how to make the agency most effective.

The first question I'd like to address today is: what do these two topics have in common with each other? I believe the answer is that they both fundamentally deal with how NIST can most effectively carry out its mission. As you know, NIST has many critical roles assigned to it. NIST's Laboratories ensure U.S. leadership in measurement science, documentary, and artifact standards. NIST supports other federal agencies in meeting U.S. Government needs for voluntary consensus standards, and continually advances measurement science through cutting-edge research.

Notwithstanding our continued success on these fronts, NIST finds itself at a critical time in its history. In the current economic environment, it is more important than ever that NIST be effective and efficient in supporting the industrial competitiveness and economic prosperity of the United States. This is the main reason why I have proposed a reorganization of the Director's Office, and am considering a realignment of our laboratory programs. It is also why we are embarking on an initiative to strengthen and better coordinate federal deployment of documentary standards.

Because these two topics -- realigning NIST and strengthening our standards coordination -- are so important, I also have sought advice on them from our Visiting Committee on Advanced Technology (VCAT). Over this past year, the VCAT has been enormously helpful in providing input on both of these issues, and I am very pleased that they have joined me today in providing testimony to this Subcommittee.

## ***Realignment of NIST Organizational Structure***

### **Motivation**

Why do I believe that the agency needs to be realigned? The answer is simple: The proposed reorganization of NIST's management is designed to allow me to effectively improve accountability by streamlining how the responsibility to carry out our mission is delegated through the organization.

### **Management Reorganization**

Mr. Chairman, as you know, I have been honored to be a NIST employee for over 16 years, and during my tenure the organizational structure of NIST has remained relatively unchanged. In fact, the current organizational structure of the agency originates from the late 1980s, shortly after the enactment of Omnibus Trade and Competitiveness Act of

1988 (PL 100-418), when the National Bureau of Standards became NIST and Congress added several new programs to our mission. Since that time, NIST has been organized into a relatively flat organization with a Presidentially appointed Director, a career Deputy Director, and a collection of line organizations covering all of the various laboratory activities plus the Hollings Manufacturing Extension Partnership, the Baldrige National Quality Program, and the Technology Innovation Program (TIP was created in the America COMPETES Act (PL 110-69) in 2007, and the Advanced Technology Program - its predecessor - was repealed), plus all of the support organizations. At the time I became Director, there were 17 of these major line organizations, all reporting to the Director through the Deputy Director position.

I believe this overall structure is unstable for two reasons. First, the Director's Office (comprised of Director and Deputy Director) is too small to effectively manage and integrate the diverse programs that carry out the mission of the agency. In other words, the agency didn't "come together" until it got up to the Director's office. This structure tends to drive the management of any activity that crosses line organizations up to the Director's office. This is an unwieldy approach. Second, NIST has experienced substantial turnover in both the Director and Deputy Director positions since the early 1990s. These frequent departures result in changes in management focus and direction for the many activities managed at this level. This has negatively impacted those activities requiring an agency-wide management approach, including strategic program planning, program evaluation, and an integrated safety management approach. These weaknesses have been areas of concern for both the VCAT and for this Subcommittee, and I believe that they must be addressed as an urgent priority.

The proposed reorganization of the Director's Office will better distribute the operational responsibilities for NIST. I have proposed to eliminate the current Deputy Director position and establish three Associate Directors (AD): the AD for Laboratory Programs, which will have responsibility for the scientific and technical laboratories and services, as well as have the functions of a Deputy Director for purposes of succession; the AD for Innovation and Industrial Services, which will have responsibility for our external programs, including the Baldrige National Quality Program, the Hollings Manufacturing Extension Partnership, and the Technology Innovation Program; and the AD for Management Resources, which will have responsibility for NIST's administrative and operational support activities.

Since the line organizations currently report to me through the Deputy Director position, this change does not add a new layer of management. It does, however, provide a core management team for the agency with executives directly responsible for the major program elements. I also believe that this structure will make NIST more stable when there are changes in any of these AD positions, or in the Director position. The proposed reorganization of the Director's Office has already been approved by the Department of Commerce and by the Office of Management and Budget (OMB), and is awaiting evaluation by the Appropriations Committees.

## Laboratory Realignment

On a separate track, NIST is working with its stakeholders, including the VCAT, on ways our laboratory programs might be realigned by mission to improve *service delivery*. The NIST Laboratory Program is currently organized into ten laboratory or center line organizations (these are the same line positions that would report to the Associate Director for Laboratory Programs). There are two user facilities (the NIST Center for Neutron Research, and the Center for Nanoscale Science and Technology) and eight laboratories, seven of which are organized by discipline area (Physics, Chemical Sciences and Technology, Electronics and Electrical Engineering, Materials Science and Engineering, Manufacturing Engineering, Building and Fire Research, and Information Technology) and one for measurement services (Technology Services).

Increasingly, the technological and scientific challenges tackled by NIST are multidisciplinary. Examples of our multidisciplinary work include initiatives on Smart Grid, advanced photovoltaics, climate change, and bioscience and health. Currently all major multidisciplinary NIST programs involve more than one laboratory, and several programs involve as many as seven. Coordination of these major programmatic responsibilities increases the “friction in the system,” making it more difficult to address these challenges efficiently and effectively.

In addition, by organizing by disciplinary area of research, the current structure emphasizes the role of these organizations in managing their research portfolios, not the dissemination of this research into our mission-based activities. Currently a laboratory that conducts research leading to a new or improved measurement capability or service is often not directly responsible for delivering the resulting product or service to government or industry, which divides a single mission across operational boundaries. This diminishes the responsibility of the laboratory management over these services. This is a major concern for me because it can make us less customer focused, since many of our industry stakeholders interact with NIST through these measurement, standards, and technology activities.

Therefore, in November I asked my senior leadership to undertake an assessment of the NIST organizational structure with a goal of answering three important questions:

1. Is NIST’s current organizational structure aligned to best accomplish the important missions that the Congress and the Administration continue to entrust to us and which distinguish NIST from other scientific research laboratories?
2. Can we improve the integration of operational responsibilities into NIST’s laboratory programs, with clear roles and responsibilities defined?
3. Can we improve the efficiency and effectiveness of the Institute?

As part of their assessment, the NIST leadership considered multiple approaches and principles under which a national scientific laboratory program might best be aligned. In February they provided me with an analysis of these options, outlining the pros and cons of each alternative. At the same time, I asked the NIST Visiting Committee on Advanced

Technology for input on these proposed changes. This was the major focus of the February VCAT meeting. Additionally, I held a Town Hall meeting with NIST staff in December and announced my intention to review the agency's structure and seek input from NIST employees on the organization. I have received, and continue to receive, very thoughtful input from the NIST staff on the potential realignment, with their suggestions of what would be most effective for the agency. I am continuing to work closely with senior Department officials, other organizations and key stakeholders on this process.

After carefully reviewing this input, my initial assessment is that alignment by mission would be the most effective way to structure the laboratories. The benefits of such realignment should outweigh any disruption that it would inevitably entail. A mission-based alignment would enhance our ability to accomplish NIST's missions, improve the integration of operational responsibilities into the laboratory programs, and enhance our efficiency and effectiveness both now and in the future. Aligning the Institute along mission lines would create a vertically integrated structure in which a single laboratory will be responsible for everything from delivery of products and measurement services to customers all the way to the basic and applied research and development upon which these services depend.

In a mission-based organization the realigned measurement laboratories would be responsible not only for fundamental measurements and advancing the state-of-the-art for measurement science, but also for the dissemination of measurements into industry. This means that they include measurement services and programs, such as calibrations, Standard Reference Materials and data, legal metrology, metric program, etc. The technology laboratories would assume responsibility for our sector-specific programs in technology and technology infrastructure, including NIST mission activities in: cybersecurity, health IT, voting technology, building and fire research, and manufacturing process and automation technology, as well as specific responsibilities given NIST by legislation such as the Federal Information Security Act of 2002 (PL 107-347), the Help America Vote Act of 2002 (PL 107-252), the National Construction Safety Team Act of 2002 (PL 107-231), and the National Earthquake Hazard Reduction Program (PL 108-360).

### **Impact & Status**

A realignment of this type would not change the focus of NIST programs. Rather, it would make NIST more effective in delivering its products and services to its customers. Critical functions performed by the current laboratories would continue under a mission-based structure. For example, the President's FY 2011 budget request for NIST includes about \$70 million in increased funding for manufacturing related research and support services. In a mission-based alignment manufacturing would be a central mission focus of all our laboratories.

NIST is also in the fortunate position of being able to realign at a time of growth for the agency. This means we are able to avoid any adverse impacts on existing staff – in particular, there would be no Reductions in Force (RIFs).

Where are we now? Compared to the Director's Office reorganization, a change in laboratory structure is more complex and requires careful planning. NIST is now working with all its stakeholders to develop a proposal for Departmental and Administration review. I hope to continue working closely with this Subcommittee to ensure that any changes to NIST result in a more effective agency that can meet its mission responsibilities. In terms of process, we are following procedure which would be to provide a proposal to the Congress after the Department and the Administration have received and approved it.

### *NIST's Historical Role in Standards*

Mr. Chairman, I would like to turn to the larger picture.

NIST scientists and engineers have played an important government role in standards development and use for most of its 109 year history. NIST staff support the development of documentary standards through their technical participation in standards development organizations -- ensuring standards that are based on sound science and supported by effective measurements and testing that promotes conformity to and acceptance of the standards. Last year over 400 technical experts from NIST participated in almost 1100 standards related activities, in more than 100 standards development organizations. NIST brings to the table a breadth and depth of technical expertise, a reputation as an unbiased and neutral party, and a long history of working collaboratively with the private sector. NIST values that collaborative relationship and looks to its continued success. This is one of our primary roles under the National Technology Transfer and Advancement Act or NTTAA (PL 104-113).

The NTTAA, and its implementation under OMB Circular A-119, guide Federal agencies on the use of standards and conformity assessment practices. This seminal piece of legislation aimed to reduce the development of government-centric standards and promote the adoption and use of consensus based private sector standards to meet government needs, and was principally focused on the use of standards by federal agencies in procurement and regulation. The Act also charged NIST with the role of coordinating Federal, state and local technical standards and conformity assessment activities and coordinating these activities with the private sector.

In terms of reducing the use of government specific standards in procurement, the NTTAA has been remarkably successful. Since 1997, over 3000 government-specific standards have been replaced with private sector standards. In addition, NIST has identified over 9,000 citations of standards incorporated by reference in regulatory documents and a similar number used in procurement actions. These citations are available in an interactive database which illustrates the extensive use of private sector standards by the U.S. Government.

## *New Models for Engagement*

Nevertheless, today there is increased urgency in discussions about how we can strengthen the coordination and engagement of federal agencies on the use of private sector standards as called for by the NTTAA.

Why is this the case? I believe it is because the technical standards needed today cover more complex technologies and are playing an increasingly important role beyond procurement by individual agencies. Whether as a basis for federal regulations, or as a requirement for recipients of federal assistance, agencies increasingly want to look towards effective private sector standards to meet policy goals. In addition, the needed standards often deal with complex system-level performance, such as interoperability or security, rather than component level performance or specification. This can greatly increase the complexity of the needed standards. For example, our Smart Grid efforts have focused on the development of a model framework of private sector standards to support a secure and interoperable electrical infrastructure, one of the most complex systems in use today. Larger efforts like the Smart Grid often involve multiple federal agencies and can involve hundreds of different private sector standards.

These changes are driving two urgent goals:

- (1) How do we work more effectively with industry and private sector standards developers on the development of timely and effective standards, and;
- (2) How do we work more effectively across agencies to make sure that federal efforts to work with the private sector are effectively planned and coordinated?

I'd like to follow up and discuss how we are working on these two issues.

NIST's Smart Grid related work could be looked at as a model for future standards development activities in areas of significant government interest and national need. The Smart Grid effort was characterized by a stronger federal leadership role in convening the appropriate government stakeholders, and private-sector players to coordinate their activities, define objectives and reference architectures, and establish priorities for work towards mutually acceptable goals on an accelerated timescale.

The Smart Grid program has broken new ground, marshalling a massive public/private sector effort to create standards for the transformation of one of the largest and most complex infrastructures ever built – the electric grid. In less than a year's time, building upon the foundational work of the Department of Energy and its National Lab partners, this effort has created a "Release 1.0" standards framework for the Smart Grid that is providing a roadmap to align the efforts of over 3100 electric utilities and thousands of suppliers. Our experience in leading the development of interoperability standards for the Smart Grid over the last year has demonstrated a number of principles and best practices that can be applied in leading the development of standards for other major national initiatives where the government has a well defined interest. Key elements for success include:

- Committed leadership from the top. Standards activities are usually driven bottom up – rarely from the top down. In the case of a national infrastructure, top down leadership is essential. The President led this effort with a meeting at the White House, chaired by two Cabinet Secretaries and involving nearly 70 industry CEOs and senior executives. This high-level engagement and leadership is continuing, and is essential to keep the efforts of the hundreds of companies and organizations involved aligned and the momentum going.
- A broad partnership that involves all the critical players – For example the Smart Grid Interoperability Panel, now numbers more than 550 companies and organizations and 1700 individual participants, which represents a novel organizational model for public/private collaboration on standards.
- Strong coordination among federal agencies – well defined roles and responsibilities has been critical to the success of the ongoing Smart Grid efforts. Strengthening NIST’s role as a convener and coordinator of Federal standards activities will be critical for future success.
- Strong technical capability.

NIST, with its broad technical capabilities and infrastructure for conformity assessment, close ties to the standards development community and industry, and reputation as a neutral and honest third party positioned it well to catalyze and improve the efficiency of the US government’s engagement on Smart Grid. I believe that this is a model approach for other similar standards efforts. The government has a wide spectrum of standards needs, so it should have a wide variety of approaches to working with the private sector. Traditionally, this has meant either limited government involvement in private sector led efforts, or government written standards. I think the approach taken with Smart Grid offers a middle approach of strategic and focused engagement of the private sector community to put in place an effective standards framework to address public need.

### ***Improved Interagency Coordination***

More effective federal engagement in standards development, use, and standards promotion will require more effective interagency coordination as well. This is a role specifically called out for NIST under the NTTAA. Interagency coordination on standards related issues is also a primary function of the Executive Office of the President, especially the Office of Science and Technology Policy (OSTP), the Office of Management and Budget (OMB) and The United States Trade Representative (USTR.) OMB Circular A-119 specifically addresses interagency coordination on the development and use of standards by federal agencies, and OMB and NIST have a long track record of working closely on this topic. A more strategically focused interagency process to tackle specific standards related issues or to address emerging standards related policy topics would require a more robust interagency coordination process. I am currently working closely with OSTP and OMB to explore specific mechanisms that would allow the coordination to be strengthened in specific ways: to provide leadership level coordination and decision making regarding policy or agency or Department participation; to provide a working-level coordination process that is tasked by the leadership group on specific topics and which can monitor and report on standards related

activities, including implementation of the NTTAA; and a collection of issue-specific working groups to develop and implement plans for engaging on specific standards needs, or for developing possible policy positions for consideration by the leadership group. I am very aware of the strong interest in standards related topics by this Subcommittee and the full Committee. I would like to continue to work closely with you on this topic so that we can ensure that government-needed standards are in place when needed, and are effective in carrying out their intended purpose.

Chairman Wu, Ranking member Smith and members of the Subcommittee, I have approached the reorganization of NIST with extreme care, and I believe there is a unique opportunity to strengthen and improve NIST. I also believe that our efforts in standards related to Smart Grid and Health IT can serve as a model for future standards challenges to address critical national needs. I look forward to working with you closely and I am happy to answer any questions that you might have.

## Dr. Patrick D. Gallagher, Director



Dr. Patrick Gallagher was confirmed as the 14th Director of the U.S. Department of Commerce's National Institute of Standards and Technology (NIST) on Nov. 5, 2009. Gallagher provides high-level oversight and direction for NIST. The agency promotes U.S. innovation and industrial competitiveness by advancing measurement science, standards, and technology. NIST's FY 2009 resources total \$1.6 billion and the agency employs about 2,900 scientists, engineers, technicians, support staff and administrative personnel at two main locations in Gaithersburg, Md., and Boulder, Colo. In addition to \$819 million in FY09 appropriations and \$125 million from other agencies, the American Recovery and Reinvestment Act of 2009 provides a total of \$610 million to NIST for building critically needed research facilities, expanding fellowships and research grants, and addressing important national priorities critical to the nation's future.

Gallagher had served as Deputy Director since 2008. Prior to that, he served for four years as Director of the NIST Center for Neutron Research (NCNR), a national user facility for neutron scattering on the NIST Gaithersburg campus. The NCNR provides a broad range of neutron diffraction and spectroscopy capability with thermal and cold neutron beams and is presently the nation's most used facility of this type. Gallagher received his Ph.D. in Physics at the University of Pittsburgh in 1991. His research interests include neutron and X-ray instrumentation and studies of soft condensed matter systems such as liquids, polymers and gels. In 2000, Gallagher was a NIST agency representative at the National Science and Technology Council (NSTC). He has been active in the area of U.S. policy for scientific user facilities and was chair of the Interagency Working Group on neutron and light source facilities under the Office of Science and Technology Policy.