VISITING COMMITTEE ON ADVANCED TECHNOLOGY (VCAT)
MINUTES OF THE FEBRUARY 3-4, 2016 MEETING
GAITHERSBURG, MD

ATTENDANCE:

Visiting Committee Members Attending
Adler, Allen
Brooks, Rodney
Chand, Sujeet*
Garvey, Michael
Holt, William
Ishak, Waguih
Kerr, Karen
Padovani, Roberto
Prafullchandra, Hemma
Sizer, Theodore

VCAT Exec. Dir.
Lellock, Karen

NIST Leadership Board
Boehm, Jason
Brockett, Del
Celotta, Bob
Chin, Joannie
Dimeo, Rob
Fangmeyer, Robert
Jenkins, George
Kayser, Rich
Locascio, Laurie
May, Willie
Molnar, Michael
Orr, Dereck
Porch, Susanne
Rochford, Kent
Romine, Charles (Chuck)
Salber, Stephen
Saunders, Mary
Singerman, Phillip
Thomas, Carroll
Williams, Carl
Wixon, Henry

NIST Staff
Acierto, Linda
Alderoty, Neil
Bald, Kevin
Banovic, Stephen

Bowman, Samm
Brunner, Zahraha
Crammer, David
Currens, Christopher
Davis, Melissa
DeLongchamp, Dean
Dohne, Kirk
Evans, Heather
Fasolka, Mike
Fitzgerald, Ryan
Frechette, Simon
Gayle, Frank
Hight-Walker, Angela
Hughes, Colleen
Ivy, Nahla
Kauffman, Leah
Lequin, Wiza
Moldover, Michael
Newton, Tom
Orellana, Cindy
Pacelli, Mary Ann
Parris, Reenie
Pillitteri, Vicky
Reidy, Kari
Robinson, Crissy
Satterfield, Mary
Scholl, Matt
Schufreider, Jim
Shaw, Stephanie
Sheppard, Heidi
St. Pierre, Jim
Stoughton, Jason
Thomas, Nico
Thorne, Roger
Wadsworth, Phillip
Wilkinson, Richard
Yashar, David
Ye, Jun

Others
Davidson, Alan – Department of Commerce
Hossain, Kamal – National Physical Laboratory (UK)
Thompson, Peter – National Physical Laboratory (UK)

Webber, Naomi – Lewis Burke

*Participated Remotely

Wednesday, February 3, 2016

<u>**Call to Order –**</u> *<u>Dr. Roberto Padovani, VCAT Chair</u>*

Dr. Padovani called the meeting to order at 8:30 a.m. and he welcomed Dr. Allen Adler and Dr. Waguih Ishak as the two newest members to join the VCAT. Dr. Padovani also introduced our two invited guests from the National Physical Laboratory located in the United Kingdom, Peter Thompson and Kamal Hossian.

OVERVIEW AND SAFETY

<u>**NIST Update and Agenda Review –**</u> *<u>Dr. Willie E. May, Under Secretary of Commerce for Standards and Technology and NIST Director</u>*

Presentation Summary:

Dr. May began by introducing the newest members of the VCAT, as well as welcoming Tod Sizer, a member for whom this was the first meeting attended. He also introduced the visitors from the UK National Physical Laboratory.

Dr. May then presented a brief overview of the NIST safety metrics. He noted that though DART (Days Away, Restricted or Transferred) and Occupational Safety and Health Administration Reportable cases were both increased from this time in 2015, that we're still uncertain about whether that trend would hold for the year. He reemphasized that our goal is zero, and that our safety culture is continuing to mature towards that goal.

Next, Dr. May updated the VCAT on the July 2015 security incident that involved an explosion in Building 236. In response to that incident, NIST requested the assistance of three external security experts to examine our security posture: David Komendat, Boeing Senior VP and Chief Security Officer, William Cullen, NIH Associate Director for Security & Emergency Response, and Nicholas Schnare, Department of Commerce Assistant Director for Security and Emergency Management. Dr. May summarized their feedback as focusing on authorities, culture, resources, and strategic planning. Dr. May then described some of the physical and information technology (IT) security improvements NIST has initiated and planned.

Dr. May then provided the VCAT with an update to the progress against his high-level priorities. He reminded the VCAT that one of his first priorities was to fill a number of NIST's leadership positions. In addition to the Directors of the Engineering Laboratory, Physical Measurement Laboratory, Communications Technology Laboratory, and Hollings Manufacturing Extension Partnership (MEP)that Dr. May had previously heard about, Dr. May introduced the new Associate Director for Laboratory Programs, Dr. Kent Rochford.

With regard to the priority of delivering on National priorities, Dr. May gave a brief update on a number of efforts in his programmatic updates later in the session. On enhancing current and developing new capabilities, Dr. May pointed to a number of programs that NIST employs to develop competence in new areas, including the Innovations in Measurement Science program, Centers of Excellence program, and the great number of post-doctoral researchers and associates.

To address the long-term sustainability of the Baldrige program, Dr. May described new efforts to develop a new Baldrige award in cybersecurity, which would also enhance use of NIST's cybersecurity framework and share best practices around cybersecurity risk management and improve our national cybersecurity

posture. Dr. May also reminded the VCAT that the MEP program is undergoing a recompetition of its centers to right-size the funding to be congruent with the manufacturing enterprise that is serves, as well as strengthen the partnerships with the MEP centers.

On the priority of increasing the efficiency and effectiveness of our internal operations, Dr. May provided an update to the VCAT on the task groups he established on improving human resources support programs, reimbursable agreements, legal services, and acquisitions. Associate Director for Management Resources, Mary Saunders, described progress towards improving process tracking and communication.

Dr. May next described the NIST budget status. He described that unlike previous years where Congress gave NIST significant autonomy to prioritize increases to the NIST Science and Technology Research and Services (STRS) budget, in the FY2016 budget Congress directed NIST to fully-fund a number of initiatives without providing the increases in budget associated with those initiatives. To meet these requests, NIST will have to redirect funding by a total of $27.3M to fund these new initiatives as well as to account for inflationary increases.

For the NIST Industrial Technology Services (ITS) budget, the Advanced Manufacturing Technology Consortia (AMTech) program was defunded, MEP remained at $130M, and the National Network for Manufacturing Innovation (NNMI) program was funded for the first time at $25M. These funds will be split between supporting shared services and networking capabilities for all NNMI institutes ($5M) and for a DOC-funded NNMI institute ($20M).

For NIST's Construction of Research Facilities (CRF) budget, NIST received both an increase in its Safety, Capacity, Maintenance, and Major Repair budget (to $59M), as well as $60M to begin work to modernize Building 245 on its Gaithersburg campus.

Next, Dr. May highlighted a number of recent achievements and recognitions of NIST staff. Dr. May also provided updates on a few laboratory programmatic efforts. Regarding the modernization of the NIST Internet Time Services, NIST has decided not to privatize its Network Time Protocol servers due to security concerns, but will centralize, upgrade, and harden its servers. NIST has also developed a new small angle x-ray scattering measurements that could aid the manufacture of next-generation computer chips.

Dr. May concluded his presentation with updates on a number of NIST programmatic initiatives. Regarding advanced communications, NIST making progress in public safety communications interoperability, which will be accelerated by funds received from the spectrum auction. NIST, working with National Telecommunications and Internet Administration, the Department of Defense, and others, launched the National Advanced Spectrum and Communication Test Network to enhance spectrum sharing. Dr. May also updated the VCAT on the realignment of NIST's cybersecurity portfolio, which will allow NIST to more effectively manage the growth in cybersecurity at NIST. On NIST's work in forensic science, Dr. May described new advances in the science behind dating fingerprints. Finally, Dr. May provided a brief synopsis of many of NIST's challenges and entrepreneurship activities.

Discussion:

The group discussed the following topics:

- Recording near-misses to find additional information about the safety culture.
- The status and purpose of the NIST Special Projects Building.

For more information, see Dr. May's presentation.

Safety Update – *Richard Kayser, Chief Safety Officer*

Presentation Summary:

Dr. Kayser provided an update on NIST's safety culture and approach, focusing on two primary areas: the next steps of the 2014 safety climate survey, and NIST's approach to safety communications.

As a result of the 2014 NIST safety climate survey, NIST planned actions in six areas: employee rights and responsibilities; unsafe conditions and practices; incident reporting and lessons learned; safety training; management observations; and performance appraisals. Dr. Kayser provided an in-depth update about NIST's plans for incident reporting and lessons learned. In this area, NIST plans to improve what's reported, improve incident investigations, and improve sharing lessons learned.

Dr. Kayser then spoke in more depth about NIST's approach to safety communications. NIST uses a wide variety of mechanisms to communicate to the NIST staff about safety issues, including colloquia, email newsletters, videos, flyers, and an internal website. Dr. Kayser emphasized the importance to awareness and sustainability of the current leadership's value of safety.

For more information, see Dr. Kayser's presentation.

NIST WORKFORCE

Panel Discussion on Improving Employee Engagement at the Local Level - *Joannie Chin, Acting Deputy Director, Engineering Laboratory (EL), Carroll Thomas, Director, Manufacturing Extension Partnership (MEP), Laurie Locascio, Director, Material Measurement Laboratory (MML)*

Presentation Summary:

Each member of the panel began with a description of what their organization is doing to improve employee engagement.

First, Dr. Chin summarized the response of the leadership of Engineering Laboratory (EL) took to the results of the Federal Employee Viewpoint Survey. Since that survey included low scores on the many facets that underlie employee engagement, EL sought to strengthen the four main areas that underpin employee engagement: listen and communicate, empower staff, show gratitude, and streamline administrative requirements. Not only did EL begin unique initiatives to improve communication, they adopted best practices from other NIST laboratories.

In particular, EL leadership began deep-dive examinations of divisions that had scored particularly poorly in employee engagement. The deep dives included listening sessions with 100% of staff, asking open ended questions, and enacting key findings and recommendations. Some of these examinations resulted in management changes. EL also rolled-back a number of policies to enable authority at the lowest level possible, and to have policies consistent with, but generally not in addition to, NIST policy.

Next, Ms. Thomas described her efforts to improve employee engagement in the Hollings Manufacturing Extension Partnership (MEP) program, as motivated by low scores in the Federal Employee Viewpoint Survey. To gather more information about the source of the low employee engagement, Ms. Thomas formed a peer-based employee relations team as well as an employee suggestion box to collect feedback

and recommendations. The MEP program also worked with an outside organization, The Clearing, to get more feedback and identify top-level organizational priorities.

MEP has since taken a period of 90 days to focus on three high-impact priorities: organizational discipline, branding, and performance measurement. Next, MEP will begin working on longer-term, complex issues that require extended resolution, such as leadership training and organizational restructuring.

Finally, Dr. Locascio discussed a staff survey that the Material Measurement Laboratory (MML) took in 2013. This online survey included professional analysis and reporting, including benchmarks to high performing organizations. This analysis defined staff as most effective, least effective, detached, or frustrated, based on their engagement and enablement scores in the survey. The proportion of "least effective" employees was clearly dependent on tenure, with employees with 5-10 years at NIST having the largest "least effective" population.

As a result of this survey, MML initiated a number of efforts to increase transparency, accountability, and communication. This included an MML-focused strategic plan, developed with the engagement of almost half of the MML staff. MML has also expanded use of professional development and training opportunities. Dr. Locascio concluded by highlighting her focus on increasing the number of female engineers at NIST through a number of outreach and volunteer activities.

Discussion: The group discussed the following topics:

- Leveraging NIST associates and other young staff to gather innovative ideas to increase employee engagement.
- What factors underlie the disengagement of staff at 5-10 years in tenure.
- Best approaches to recruit and retain women in the workforce.

For more information, see the presentations of Dr. Chin, Dr. Locascio, and Ms. Thomas.

HR Recruitment and Engagement Activities – *Susanne Porch, Director, Office of Human Resource Management*

Ms. Porch provided a summary of a number of new recruitment and engagement activities that the NIST is undertaking at the institute level. First, NIST is making greater efforts to use social media to improve recruiting, since developing a visible online presence is key for our future. In particular, NIST is increasing efforts to elevate awareness of its mission to enhance recruiting and retention of both technical and administrative staff.

Next, Ms. Porch highlighted a new pilot to improve the staff recruitment and onboarding process. In partnership with NIST's Communications Technology Laboratory, NIST's Office of Human Resource Management is piloting a new service to increase transparency for managers, develop immediate and actionable metrics, and lead to faster hiring.

Third, Ms. Porch described new leadership development programs, supported by significantly increased program investment in 2015. Finally, Ms. Porch provided the VCAT with NIST's examination of its personnel management system, which will focus on staffing and recruitment, compensation, and performance management.

Discussion: The group discussed the following topics:

- Recruiting challenges specific to younger generations.
- Appropriate transparency of personnel actions resulting from outstanding or inadequate performance.
- Efforts to decrease hiring time, and the potential lower bound of that timeline.

For more information, see the [presentation.](#)

Ensuring a world-class scientific and technical NIST workforce: Thoughts from two NIST fellows – *Dr. Michael Moldover, NIST Fellow and Dr. Jun Ye, NIST Fellow*

Presentation Summary:

Dr. Moldover and Dr. Ye both provided their perspectives on why they came to NIST, why they stay, and what to do to maintain a world-class workforce. Dr. Moldover highlighted the importance of NIST postdoctoral researcher programs to the vibrancy of the NIST workforce. The National Research Council (NRC) Postdoctoral program, which brings about sixty-five researchers to the NIST Laboratories each year, particularly supports the recruiting efforts of the Physical Measurement Laboratory and Material Measurement Laboratory. About half of all NRC postdocs stay at NIST after their postdoc program is over. Dr. Moldover also raised the challenges that NIST has recruiting talent to the Engineering Laboratory and the Information Technology Laboratory through postdoctoral programs. He described the challenges posed to hiring the best scientific talent in many fields due to recent restrictions in NIST's direct hire authority.

Dr. Ye emphasized the importance of the NIST work environment, especially including world-renowned staff, to recruiting and retaining new talent. The opportunity to work with the best scientists in the world is a significant draw for many scientists, so NIST has little problem recruiting in areas where it has an outstanding reputation and existing workforce.

Discussion: The group discussed the following topics:

- Unique challenges faced in recruiting in the information technology field.
- Innovative approaches to hiring post-docs.
- Efforts to retain high-performing talent.

For more information, see the presentations of [Dr. Moldover](#) and [Dr. Ye](#).

Deliberations and Presentation on Observations, Findings, and Recommendations of 2015 Annual Report, Part 1

Dr. Padovani reviewed the draft 2015 VCAT Annual Report and solicited comments from the members as well as NIST leadership on the initial observations, findings, and recommendations for deliberation by the Committee in the following areas:

- NIST Safety Systems and Culture
- Bioscience
- Information Technology/Cybersecurity
- Retaining a World-Class Workforce
- NIST Partnerships

The [Annual Report](#) also provides the VCAT's thoughts on the NIST budget and planning efforts.

Thursday, February 4, 2016

Commerce Digital Economy Agenda – _Alan Davidson, Director of Digital economy, US Department of Commerce_

Presentation Summary:

Mr. Davidson provided an overview of the Department of Commerce's new, coordinated approach and priorities in the Digital Economy. He began by motivating the involvement of the Department in the Digital Economy. The digital economy already accounts for over five percent of gross domestic product in the U.S., but that number does not capture its true potential. Experts estimate that digitization has the potential to boost annual U.S. GDP up to $2.2 trillion by 2025. The United States is the largest global exporter of services, exporting $662 billion in 2013.

Dr. Davidson highlighted the number of bureaus in the Department of Commerce that have significant responsibilities in the Digital Economy, from the National Telecommunications and Information Administration's work in expanding broadband and managing spectrum, to the International Trade Administration's role in enabling export of Digital Economy technologies, to the significant data resources that come from the National Weather Service and Census, to NIST's enabling measurement science and expertise.

Dr. Davidson described the four grand policy challenges that comprise the Department's Digital Economy agenda. These include:
- Global free exchange of information through a free and open internet,
- Trust and security online,
- Access and skills, and
- Innovation and emerging technologies.

Finally, Dr. Davidson outlined the structures that Commerce is building to support its Digital Economy capacity over the long term. These include:
- A Digital Economy Board of Advisors
- 21st Century Export Assistance
- Commerce "Policy Labs"

Discussion: The group discussed the following topics:

- Interagency coordination around Digital Economy issues.
- The opportunities and challenges of ubiquitous and universal connectivity.
- Potential role for NIST at the intersection of technology and policy in the Digital Economy.

For more information, see Mr. Davidson's presentation.

Deliberations and Presentation on Observations, Findings, and Recommendations of 2015 Annual Report, Part II

Presentation Summary:

Dr. Padovani requested final comments on the draft 2015 VCAT Annual Report and solicited comments from the members as well as NIST leadership on the initial observations, findings, and recommendations for deliberation by the Committee in the following areas:

- NIST Safety Systems and Culture
- Bioscience

- Information Technology/Cybersecurity
- Retaining a World-Class Workforce
- NIST Partnerships

The [Annual Report](#) also provides the VCAT's thoughts on the NIST budget and planning efforts.

Administrative Business

Roberto Padovani stepped down from the chairmanship of the VCAT, and Darlene Solomon's term ended January 2, 2016. The VCAT voted unanimously for Rita Colwell for Chair and Bill Holt for Vice Chair.

There were no public comments offered.

The VCAT offered final comments and observations and discussed potential topics for future meetings.

<u>**Adjournment**</u>

The meeting was adjourned at 10:15 AM.

I hereby certify that to the best of my knowledge, the forgoing minutes are accurate and complete.

Karen Lellock, Executive Director, NIST Visiting Committee on Advanced Technology

Dr. Roberto Padovani, Chair, NIST Visiting Committee on Advanced Technology