

**VISITING COMMITTEE ON ADVANCED TECHNOLOGY (VCAT)
MINUTES OF THE JUNE 11, 2014, MEETING
GAITHERSBURG, MD**

ATTENDANCE:

**Visiting Committee
Members Attending**

Brooks, Rodney
Chowdhry, Uma
Haymet, Tony
Holt, William
Kerr, Karen
Padovani, Roberto
Romig, Alton D.
Solomon, Darlene
Tracy, John*

VCAT Exec. Dir.
Ehrlich, Gail

NIST Leadership Board

Boehm, Jason
Brockett, Del
Celotta, Bob
Dimeo, Robert
Gallagher, Patrick
Harary, Howard
Jenkins, George
Kayser, Rich
Kimball, Kevin
Locascio, Laurie
May, Willie
Olthoff, Jim (Acting)
Porch, Susanne
Rochford, Kent
Romine, Chuck
Royster, Cecelia
Salber, Stephen
Saunders, Mary
Singerman, Phillip

NIST Staff

Acierto, Linda
Arrisueno, Gladys
Averill, Jason
Banovic, Steve
Cauffman, Steve
Cavanagh, Richard

NIST Staff Cont:

Chin, Joannie
Currens, Chris
DesChamps, Jacqueline
Dodson, Donna
Evans, Heather
Fasolka, Michael
Frechette, Simon
Gan, Ron
Gayle, Frank
Hayes, John (Jack) R.
Holbrook, Dave
Hughes, Colleen
Ibberson, Richard
Jillavenkatesa, Ajit
Kilmer, Roger
Kinser, William
Lellock, Karen
Liu, Rosa
Lucas, Jeff
Massey, Sunni
McAllister, Terri
Migler, Kalman
Miner, Laurel
Newhouse, Bill
Parris, Reenie
Phan, Long
Porter, Gail
Regenscheid, Andrew
Reidy, Kari
Satterfield, Mary
Scholl Matthew
Schufreider, Jim
Semerjian, Hratch
Shaw, Stephanie
Simpson, Michael
Snowden, Hope
Thorne, Roger
Troppe, Mark
Wiggins, Thomas
Wixon, Henry
Yakimov, Gary

Others

Tabakman, Rachel –
University of Maryland,
Baltimore
Vashela, Ameet –
Lockheed Martin Corporation
Webber, Naomi –
Lewis-Burke Associates LLC
Wessel, Vickie –
MEP Advisory Board &
Founder & President, Spirit
Electronics, Inc.
Wilcox, Jeffrey –
MEP Advisory Board
Member & Vice President for
Engineering, Lockheed
Martin Corporation
Wolbert, Ed –
MEP Advisory Board
Member & President, Transco
Products, Inc.

*Participated Remotely

Call to Order – Dr. Tony Haymet, VCAT Chair

Dr. Haymet called the meeting to order at 8:15 a.m. and pointed out the emergency exits. For the benefit and welcome of the new VCAT member, Dr. Rodney Brooks, Dr. Haymet asked meeting attendees to introduce themselves. He also thanked Dr. Patrick Gallagher, outgoing NIST Director, for years of productive partnership with the VCAT.

Thoughts on Transition of NIST Leadership – Dr. Patrick Gallagher, Under Secretary of Commerce for Standards and Technology and NIST Director

Presentation Summary: Dr. Gallagher provided his perspective of the importance of NIST's partnership with VCAT, as well as NIST's current position and important pending matters. Dr. Gallagher expressed his appreciation of the VCAT's time and advice, and credited much of the success of NIST over his tenure to the positive, engaged, and trusting relationship of NIST with the VCAT.

Turning to NIST's current position and challenges, Dr. Gallagher described the importance of maintaining focus on NIST's mission. The mission of NIST is both broad – it can touch on anything related to measurement, standards, and technology – and specific – to be the Nation's measurement laboratory and standards coordinator. In planning and execution, NIST examines its mission through three perspectives: how to be relevant to the Nation's current priorities, how to ensure capabilities are in place to meet long-term trends, and how to have the processes in place to execute effectively.

Dr. Gallagher gave a brief summary of NIST's priorities in each of those perspectives. In terms of national priorities, NIST is currently focused on forensics, cybersecurity, and advanced manufacturing. NIST is also working to execute the priorities described in the Department of Commerce FY 2014-2018 Strategic Plan: trade, innovation, data, and environment. For building capacity, Dr. Gallagher described how NIST both is using budget increases to both increase internal research capacity and capabilities and is leveraging collaborations in new ways with industry-driven frameworks, joint research centers, and a new Federally Funded Research and Development Center. For internal processes, Dr. Gallagher cited the importance of safety to NIST, as well as the challenge of finding the right process improvements to accommodate the heterogeneity across the NIST labs.

Last, Dr. Gallagher described the positive view of NIST in the business community, congress, and other agencies.

For more information, see Dr. Gallagher's [presentation](#).

Discussion: The group discussed the following topics:

- How NIST shuts down programs and research areas to address new priorities;
- How NIST avoids mandates and commitments outside of the scope of the NIST mission;
- What is NIST's role in skills development and job creation;
- How to describe NIST's economic and technological impact;

- How NIST's role in standards will evolve in the face of globalization of the international economy.

NIST Safety Update – Dr. Richard Kayser, NIST Chief Safety Officer

Presentation Summary: With regard to safety metrics, Dr. Kayser reviewed NIST's actual number of Occupational Safety and Health Administration (OSHA) recordable and Days Away, Restricted, or Transferred (DART) cases from FY 2006 – FY 2014, emphasizing that both metrics were on track to decrease for the fourth year in a row. Most of NIST's OSHA recordable and DART cases continued to be due to slips, trips, and falls.

Turning to VCAT's recommendation that NIST perform a safety climate survey to see what progress has been made since the 2011 survey, Dr. Kayser described the 2014 Safety Climate Assessment. NIST is designing the survey to both be comparable to the 2011 survey and to have actionable information, and will have preliminary results to share with the VCAT at the October meeting.

Finally, Dr. Kayser described NIST's leadership safety training. NIST is developing safety training for all staff in supervisory positions. Dr. Kayser asked the VCAT for their expertise and perspectives about what safety training is provided in their organizations.

For more information, see Dr. Kayser's [presentation](#).

Discussion: The group discussed the following topics:

- How to incorporate staff safety at home into the safety culture in general;
- Tips, models, and success stories of safety training in different organizations;
- How to deal with safety incidents when the victim was violating a safety policy practice

NIST Update – Dr. Willie E. May, Associate Director for Laboratory Programs and Principal Deputy

Presentation Summary: Dr. May began with a brief summary of a recent safety incident at the Hollings Marine Laboratory. He emphasized that while this incident wasn't serious, it revealed some potential holes in our safety processes with regard to partner institutions that have their own processes. Dr. Laurie Locascio, Director of the NIST Material Measurement Laboratory, then provided a few more details about the incident and NIST's response.

Turning to membership, Dr. May welcomed the new VCAT member, Dr. Rodney Brooks, Founder, Chairman, and Chief Technology Officer of Rethink Robotics, Inc.

With regard to the NIST budget, Dr. May provided a brief status update about NIST's FY 2015 and FY 2016 budgets. The FY 2015 President's request provided \$900M for NIST, a \$50M increase over FY 2014 levels. This included increases in forensics, cyber-physical systems, advanced materials, synthetic biotechnology, lab to market transformations, the Manufacturing Extension Partnership Program, and National Network of Manufacturing Innovation (NNMI) network coordination. The Commerce, Justice, Science Appropriations bill passed the full house

with NIST at \$856M, and it cleared the Senate Appropriations Committee with NIST at \$900M. Internal planning has started for the FY 2016 President's request.

Turning to NIST organization and leadership, Dr. May pointed out a few recent changes. Dr. Kent Rochford has been appointed the Director of the new Communications Technology Laboratory, and Cecelia Royster has been appointed the Director of the new Office of Acquisition and Agreements Management. Mr. George Arnold, Director of the Standards Coordination Office, and Dr. Joseph Dehmer, Director of the Physical Measurement Laboratory, were both retiring and NIST is moving aggressively to fill those positions. Dr. May also recognized Gail Ehrlich, VCAT Executive Director, who was also retiring.

Dr. May then updated the VCAT about a few recent measurement technology breakthroughs based on NIST research. These included the development of a new atomic clock, NIST-F2, which was launched in April, and NIST's contribution to the first direct evidence of cosmic inflation, observed by cosmologists using the BICEP2 telescope at the South Pole in March.

Dr. May presented an update on selected NIST programs. In the FY2014 budget, NIST got the authority to establish Centers of Excellence (CoE) to allow us to very quickly grow new or enhanced technical capabilities that we don't have in cases where we really don't have the time to do this organically. This year NIST stood up the first CoE, the Center for Hierarchical Materials Discovery in Chicago. It's a joint institute among NIST, the University of Chicago, Northwestern and Argonne National Laboratory, focusing on providing the tools that will allow us to realize the Materials Genome Initiative. This activity will involve at least two of our laboratories, but primarily our Material Measurement Laboratory. With new FY 2015 funds, NIST will establish additional CoEs in Forensics and Disaster Resilience.

In the area of cybersecurity, the National Cybersecurity Center of Excellence (NCCoE) continues to be on track to become the Department of Commerce's first Federally Funded Research and Development Center. The NCCoE is partnering with large and small companies to bring equipment, with brainpower, and with software to work with the NIST scientists and with academicians and with other federal agencies and sector representatives to identify and begin to put together integrated solutions of various kinds of IT products that can tackle particular cybersecurity challenges. Turning to the Framework for Improving Critical Infrastructure Cybersecurity, Dr. May mentioned the positive feedback and support the Framework has received from industry, and reinforced NIST's commitment to ensuring widespread industry implementation of the Framework.

On extramural partnerships for advanced manufacturing, Dr. May first provided brief updates on the Advanced Manufacturing Partnership (AMP) 2.0 efforts, the Advanced Manufacturing Technology Consortia (AMTech) program, and the National Network for Manufacturing Innovation (NNMI). AMP 2.0, an advisory committee working under the President's Council of Advisors on Science and Technology, is working to put together white papers on various emerging technology areas of advanced manufacturing. AMTech funded its first round of consortia, awarding 19 proposals out of the 80 received, and is preparing to establish their second round of grants this year. The Departments of Defense and Energy are continuing to

establish Manufacturing Institutes for the NNMI program, and NIST is working to establish the network aspects of those institutes.

Turning to research assessment, Dr. May gave a brief summary of the current plans for the National Research Council (NRC) assessments, as well as a description of a new peer assessment of NIST's measurement services. In 2012 the NRC looked at a crosscut on advanced manufacturing. In 2013 the NRC returned to traditional single-lab assessments with the NIST Center for Neutron Research. This year, the NRC is assessing the Material Measurement Laboratory and the Engineering Laboratory, and will assess the Physical Measurement Laboratory and the Information Technology Laboratory in 2015. For the peer assessment of NIST's measurement services, NIST has asked leading international metrologists to assess the technical capabilities that we have to underpin the services that we provide to customers, primarily NIST's standard reference material, standard reference data, and calibration services, as well as the policy system that underpins these programs.

For more information, see Dr. May's [presentation](#).

Discussion: The group discussed the following topics:

- The role of the NIST atomic clock in precision navigation timing in the absence of global positioning system navigation.
- NIST's role and activities in the Brain Research through Advancing Innovative Neurotechnologies (BRAIN) initiative.

Hollings Manufacturing Extension Partnership (MEP) Program Update – Phil Singerman, NIST Associate Director for Innovation and Industry Services

Presentation Summary: Dr. Singerman provided a brief review of the MEP program's structure, an introduction of key MEP staff, and a highlight of the significant and growing role of the MEP Advisory Board. He pointed out a few distinguishing characteristics of MEP, including the rigorous analysis process, which is underpinned by independent quarterly surveys of MEP clients. These surveys also gives the MEP programs and its network of centers valuable insight into how to provide better, more relevant services to MEP clients. Dr. Singerman pointed out two areas where MEP has recently expanded services: supply chain optimization and workforce development. He then introduced the first of three members of the MEP advisory board to speak, Mr. Ed Wolbert.

For more information, see Dr. Singerman's [presentation](#).

MEP Program Perspective – Vickie Wessel, Vice Chair, MEP Advisory Board and Founder and President, Spirit Electronics, Inc.; Jeffrey Wilcox, Member, MEP Advisory Board and Vice President for Engineering, Lockheed Martin Corporation; and Ed Wolbert, Member, MEP Advisory Board and President, Transco Products, Inc.

Mr. Wolbert's Presentation Summary: Mr. Wolbert's presentation included a short history of his relationship with the Illinois-based MEP center, IMEC, and with the MEP advisory board more generally. He emphasized the importance of the services that MEP centers offer to small and medium-sized enterprises. Mr. Wolbert described how information and priorities flows both

down from MEP to the network of centers to their clients - when MEP develops priorities, those flow down to the local centers, the local centers then take it and develop work plans around it and are able to deliver these to the manufacturers. He then reiterated the importance of the client surveys to gather information to inform MEP how to prioritize efforts to bring the most benefit to manufacturers. For more information, see Mr. Wolbert's [presentation](#).

Ms. Wessel's Presentation Summary: Ms. Wessel first reiterated the significance and value that the MEP program brings to the small manufacturing firm that she owns. Since she finds this value, Ms. Wessel has taken roles on the advisory boards of both the Arizona center and the MEP program more generally. Ms. Wessel then described some of the topics that the MEP Advisory Board has been involved in recently, including the cost-share structure of the MEP centers and strategic planning for the MEP program.

Mr. Wilcox's Presentation Summary: Mr. Wilcox described his perspective of the role of the MEP National Advisory Board, which is to enable small- and medium-sized businesses to learn from each other, as well as to look ahead at how new practices and technologies will impact these businesses in the future. He emphasized the value that MEP has in giving a voice to small- and medium-sized businesses, and that the flexibility of the MEP program allows different business models to be tailored to local communities. Mr. Wilcox also provided his thoughts on how the MEP National Advisory Board was most helpful, which is by being given specific charges, and also to serve as ambassadors for the program.

Discussion: The group discussed the following topics:

- What segments of the workforce are MEP's programs aimed towards.
- Specific actions the NIST could take to make MEP a stronger program.
- How to increase MEP's reach beyond 10% of the nation's small- and medium-enterprises.

Disaster Resilience Capabilities and Authorities: Context Setting – Willie E. May, NIST Associate Director for Laboratory Programs and Deputy Director

Presentation Summary: Dr. May introduced Dr. Averill and provided some context for the session. This session builds on the presentation to the VCAT at the February 2014 meeting on the Disaster Resilience Framework and serves as a basis for a more in-depth discussion at the October 2014 meeting.

For more information, see Dr. May's [presentation](#).

Disaster Resilience Capabilities and Authorities – Jason Averill, Acting Chief, Materials and Structural Systems Division, NIST Engineering Laboratory

Presentation Summary: Dr. Averill presented an overview of NIST's disaster resilience capabilities and authorities, starting with context for NIST's programs in this area, then described four specific authorities; first, the National Construction Safety Team (NCST) Act; second, the National Earthquake Hazard Reduction Program (NEHRP), where NIST has lead agency authority; the National Wind Storm Impact Reduction Program (NWIRP), and NIST's

Fire Research authorities, ending with a discussion of how community resilience is a wrapper that all of these hazard-based programs feed into.

Beginning with NIST's role and authorities in disaster resilience, Dr. Averill first pointed out that many parts of NIST outside of the Engineering Laboratory (Materials Measurement Laboratory, Physical Measurement Laboratory, Office of Law Enforcement Standards, and Hollings Manufacturing Extension Partnership) have various technical and development roles in supporting the Department of Commerce recovery coordinator. In addition, NIST has been developing disaster studies on earthquakes, hurricanes, tornadoes, fires, and building failures for more than fifty years.

NIST's specific responsibilities and authorities are spelled out in a number of pieces of legislation, including the NCST Act, inspired by the events of 9/11 and modeled after the National Transportation Safety Board. Dr. Averill outlined NIST's implementation of this authority in some detail. He pointed out that NIST has done three investigations that have invoked this authority – World Trade Center (including a report on the Towers and on eon WTC7), a 2003 fire in West Warwick, Rhode Island, and the Joplin Tornado. NIST also has a legislated role in NEHRP, where it has lead agency authority to coordinate an interagency group. Dr. Averill also discussed the motivation behind and impacts of the NWIRP, along with the proposed legislative reauthorization of NEHRP and NWIRP. Last, Dr. Averill outlined NIST's authorities and capabilities in Fire Research, with a focus on Wildland Urban Interface (WUI) fires, and their growing impact and hazard in the United States.

Turning to the larger area of community resilience, Dr. Averill reminded the VCAT of the Disaster Resilience Framework NIST is developing through stakeholder outreach and a series of workshops. He also pointed out expansion of NIST's capabilities through partnerships such as a new Center of Excellence in Community Resilience.

For more information, see Dr. Averill's [presentation](#).

Discussion: The group discussed the following topics:

- The potential mismatch of the size of the programs and the scope of NIST's authorities and capabilities;
- NIST's approach to multi-hazard phenomena;
- The role and interest of the insurance industry in community resilience.

Subcommittee on Cybersecurity Progress Report – Roberto Padovani, Chair, VCAT
Subcommittee on Cybersecurity

Presentation: Dr. Padovani described the progress of the Subcommittee on Cybersecurity and the Committee of Visitors (CoV) that it had recruited to assist it in assessing NIST's cryptographic standards and guidelines development process. That CoV included seven leading experts in the field from academia, national and international, and private sector, and standardization development organization. The members were Vint Cerf of Google; Edward Felten of Princeton University; Steve Lipner of Microsoft Corporation; Bart Preneel of Katholieke Universiteit Leuven; Ellen Richey of Visa Inc.; Ron Rivest of the Massachusetts

Institute of Technology (MIT); and Fran Schrotter of the American National Standards Institute (ANSI). Dr. Padovani briefly outlined the series of events that the CoV had to conduct its assessment. Since the CoV and Cybersecurity Subcommittee would soon be done with its assessment, a special VCAT meeting would be held in mid-July to discuss the Subcommittee's findings.

Priorities and Challenges for NIST and Focus of the VCAT in the Next Year – Willie May, Associate Director for Laboratory Programs and Deputy Director

Presentation: Dr. May began by highlighting major advances NIST has undergone under Dr. Gallagher's leadership, including increased budgets, facility expansion, development of a strategic planning framework, and a reorganization. Dr. May said that his time as Acting Director will be focused on maintaining that momentum, and addressing some priorities to enhance the health of NIST.

Dr. May then summarized what those priorities will be for him. They include:

- Strengthening the NIST senior leadership team by filling key vacancies and enhancing leadership training and succession planning
- Continuing progress in improving NIST's safety culture.
- Successfully implementing programs addressing national priorities.
- Enhancing current and developing new technical, collaborative, and partnership capabilities.
- Improve the efficiency and effectiveness of internal operations.
- Establishing and strengthening strategic external partnerships.
- Addressing the long-term sustainability of the Baldrige program.
- Supporting the execution of the Department of Commerce strategic plan.

Turning to priorities for the VCAT over the next year, Dr. May outlined the strategic areas that where he will request advice from the VCAT. These will focus on determining and establishing sustainable strategies for a healthy NIST, including:

- How NIST determines what areas to focus on in ensuring success in national priority areas, including disaster resilience, advanced communications, cybersecurity, advanced manufacturing, and forensics, among others.
- Examining the business case and operations of NIST's Standard Reference Materials Program.
- Reevaluating the effectiveness and completeness of NIST's international engagements.

Discussion: Dr. May then led the VCAT in a discussion of where members most thought their attention and advice would be most helpful. This included:

- How NIST can recruit and retain a workforce that's in the NIST tradition as the workforce ages and retires.
- How globalization and expanded international contributions to standards affect cybersecurity.
- What capabilities NIST can reduce or transition to the private sector to ensure resources are available for addressing pressing and emerging priorities.
- Identifying upcoming national priorities that will require NIST's attention.

Adjournment:

The meeting was adjourned at 3:30 p.m. on June 11, 2014.

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. Tony Haymet, Chair, NIST Visiting Committee on Advanced Technology