NIST Director's Update

Visiting Committee On Advanced Technology February 2, 2010

Dr. Patrick D. Gallagher
Director

NIST
National Institute of Standards and Technology
U.S. Department of Commerce

Overview

- Departing and New VCAT Members
- NIST update
- VCAT report topics
  - Planning and direction
  - 3-year plan
  - Budget
  - Documentary standards
  - Safety
  - Organization
- Next year…

Departing VCAT Members

Elsa Reichmanis

Term: Feb. 1, 2007 – March 31, 2010

Contributions include:

- Member of VCAT Nanotechnology Subcommittee

James Serum

Term: March 5, 2004 – March 4, 2010

Contributions include:

- VCAT Chair and Vice Chair
- Guidance on Strategic Planning – “Dare to be Great”
- Member of VCAT Bioscience/Healthcare Subcommittee
- Helped establish a strategic planning framework for NIST program expansion in biosciences and health
- Congressional Testimony
- Educating and welcoming new VCAT members

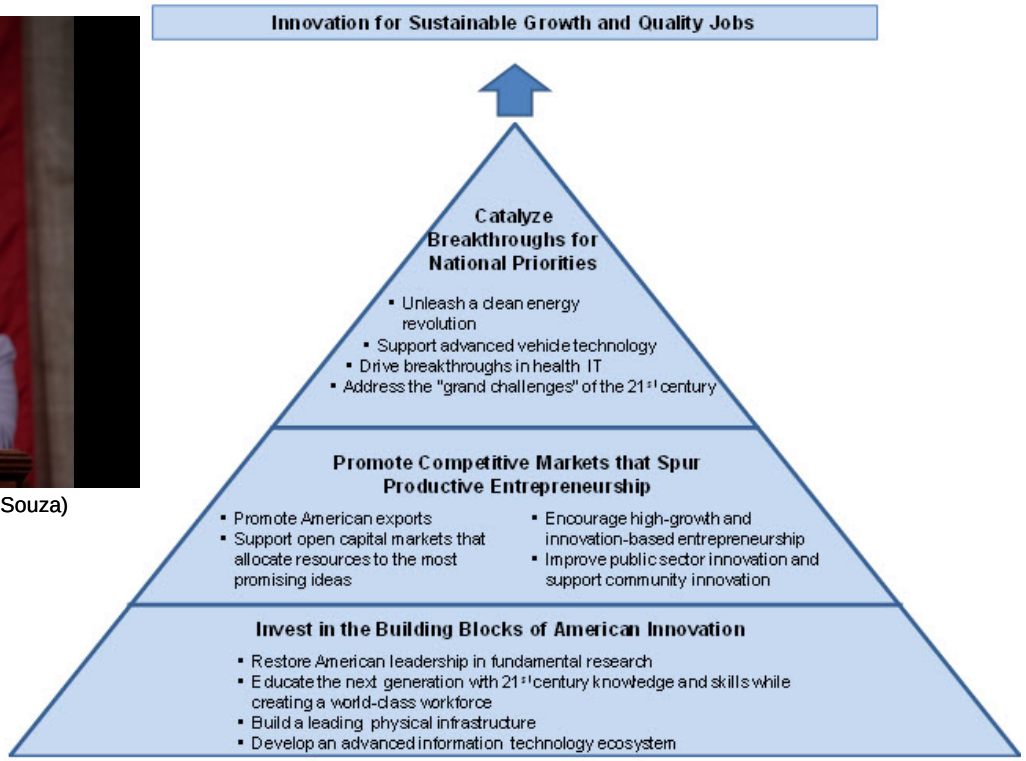
New VCAT Member

Darlene J. S. Solomon
Chief Technology Officer
Agilent Technologies

- Joined Agilent Technologies in 1999 when the company was first formed
- Former R&D manager for the Chemical and Biological Systems Department at HP
- Board member of the National Research Council Review Committee for NIST
- National Academies' Board on Chemical Sciences and Technology
- California's Blue Ribbon Task Force on Nanotechnology
- External advisory board for the National Science Foundation Nanobiotechnology Center
- Inducted into the Women in Technology International's Hall of Fame
- Numerous patents and publications

Direction & Planning: at 100,000 feet

(Official White House Photo by Pete Souza)



Major drivers:

Economic recovery

- Jobs!
- Long-term growth
- Energy/environment
- National security
- Healthcare

Lens:

Government role

Policy approach – Innovation strategy

Resources/leverage

….at 50,000 feet

Major drivers:

- R&D
- Innovation & entrepreneurship
- Job creation
- Tech transfer
- Promoting new technologies
- IP
- Trade promotion
- Manufacturing
- Workforce/education
- Energy
- Environment
- Healthcare
- Cybersecurity
- etc.

Lens:

- Department/Agency mission/roles
- Legislative authority/direction
- Aligning major programs
- Interagency coordination
- External partnerships
- Resources

….at 15,000 feet

Drivers

- ARRA
- Manufacturing
- Facilities and equipment
- Staffing
- Promoting new technologies
- Tech transfer
- Partnerships: Clusters, RICs
- Standards
- Cybersecurity
- Energy & energy efficiency
- Smart Grid
- Climate measurements
- Health IT
- Advanced technology
- Resilient structures – disasters
- Forensic science
- Electronic voting
- Education
- Etc…

Effective strategic management is essential. It must be robust and "built in" to NIST programs.

Any effective strategic planning process must support this goal.

Direction

"To promote U.S. innovation and industrial competitiveness by advancing measurement science, standards, and technology in ways that enhance economic security and improve our quality of life."

Unique programmatic span:

- NIST laboratory programs
- Technology Innovation Program
- Hollings Manufacturing Extension Partnership Program
- Baldrige National Quality Program

NIST is the nation's innovation agency.

NIST 3-year Programmatic Plan

With the aim of promoting U.S. innovation and industrial competitiveness, NIST has established four overarching priorities to guide and align investments in its programs:

Strengthen and focus NIST's Laboratories and facilities to ensure U.S. leadership in measurement science and standards.

- Improve NIST measurement and standards services
- Enhance the NIST facilities and equipment that enable cutting-edge research
- Promote leadership at the frontiers of science and technology

Focus new NIST activities to address critical national priorities.

- Energy
- Environment
- Healthcare
- Information Technology
- Manufacturing
- Physical Infrastructure

Promote innovation & competiveness working in partnership with industry and academia through NIST extramural programs.

- Technology Innovation Program
- Hollings Manufacturing Extension Partnership
- Baldrige National Quality Program

Expand collaboration to leverage NIST capabilities and advance innovation at regional and national levels.

NIST Three-Year Plan

NIST Programs by Investment Priority Area
(✪ Primary, ✓ Secondary)

NIST Programs	NIST Investment Priority Areas					
	Buildings and Physical Infrastructure	Energy	Environment	Healthcare	Information Technology	Manufacturing
Advanced Alternative Energies		✪	✓			✓
Net-Zero Energy Buildings		✪	✓			✓
Greenhouse Gas Measurements and Climate Change			✪			✓
Sustainable Manufacturing		✓	✓			✪
Biomedical Measurements to Support Disease Diagnosis and Treatment				✪		
Nanomaterial Environmental Health and Safety			✪	✓		✓
Scalable Cybersecurity for Emerging Technologies and Threats					✪	
Infrastructure Development and Remediation	✪					
Standards for National Priority Critical Infrastructures						
Smart Grid Interoperability		✪	✓		✓	
Health Information Technology				✪	✓	

Changes from last year

Initial efforts (FY09):

- Clear statement of mission focus
- What NIST is: 4 programs
- Priorities (included investment priorities)

This year (FY10):

- Building on FY09 plan
- Changed internal planning to program plans, not initiatives
  - Allows multi-year planning framework
  - Improves information on program focus/goals
- Improving stakeholder input process

The strategic and programmatic planning process at NIST is still in development. I welcome VCAT comments/recommendations on the improvements and progress. I especially welcome comments on our progress towards the goal of effective strategic management.

NIST Budget
FY 2008 – FY2011

	FY 2008 Enacted	FY 2009 Enacted	FY 2010 Enacted	FY 2011 Request	FY 2011 Change
STRS[1]	**$440.5**	**$472.0**	**$515.0**	**$584.5**	**$69.5**
ITS	**$154.8**	**$175.0**	**$194.6**	**$209.6**	**$15.0**
Technology Innovation Program	65.2	65.0	69.9	79.9	10.0
Hollings Manufacturing Extension Partnership [2]	89.6	110.0	124.7	129.7	5.0
CRF	**$160.5**	**$172.0**	**$147.0**	**$124.8**[3]	**$(22.2)**
NIST Construction & Major Renovations	42.6	29.7	22.0	52.3	30.3
Safety, Capacity, Maintenance, and Major Repairs	36.6	68.3	58.0	72.5	14.5
Competitive Construction Grants Program	30.0	30.0	20.0	0.0	(20.0)
Congressionally Designated Projects	51.3	44.0	47.0	0.0	(47.0)
Total NIST	**$755.8**	**$819.0**	**$856.6**	**$918.9**	**$62.3**

[1] FY 2011 Includes $69.4 M in initiatives and redirection of FY 2010 Congressionally Designated Projects toward FY 2011 ATBs.

[2] FY 2011 Includes $0.4 M in ATBs.

[3] FY 2011 includes $66.1 M to fund $52.3 M in construction and major renovations (to include $22 M of construction drop-out from FY 2010) for Building 1 Renovation ($37.9 M), General Purpose Laboratories ($14.4 M), and $13.8 M in Safety, Capacity, Maintenance, and Major Repair (SCMMR). An additional $0.7 M in ATBs increases SCMMR to $14.5 M from the FY 2010 enacted level.

FY 2010 STRS Summary

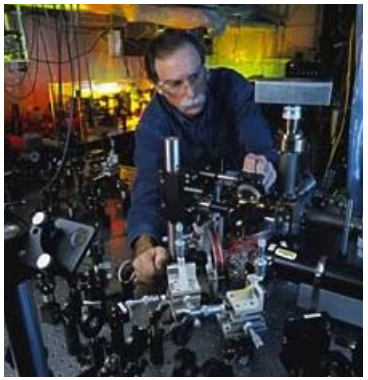
Scientific and Technical Research Services: Focused Investments on National Priorities (+$34.2 M)

- Towards a Nationwide Healthcare Information Infrastructure: Assuring Quality, Accessibility, and Cost Containment of Healthcare (+$3.7 M)
- Powering Up America: Accelerating an Interoperable Smart Grid (+$5.0 M)
- Measurement Standards and Measurement Technology to Support Innovation in Healthcare, Clinical Diagnostics and Medical Imaging (+5.0 M)
- Greenhouse Gas Emission Measurements (+$7.0 M)
- Measurement Science for Net Zero Energy, High Performance Green Buildings (+$4.0 M)
- Comprehensive National Cybersecurity (+$5.5 M)
- Quantum-Based Measurements (+$3.0 M)
- NIST Center for Neutron Research (NCNR) Reactor Operations (+$1.0 M)

NIST FY 2011 Budget Request

STRS: Investments on National Priorities **(+$69.4 M)**

- Measurement science research and standards to address critical national priorities in energy, environment, manufacturing, cybersecurity, and healthcare



ITS: Revitalizing extramural programs **(+14.6 M)**

- Hollings Manufacturing Extension Partnership ($4.6 M)
- Technology Innovation Program ($10 M)

CRF: Strengthen facilities to assure U.S. leadership in measurement science **(+66.1 M)**

- Boulder Building 1 Renovation ($37.9 M)
- Gaithersburg General Purpose Laboratories (GPL) Renovation Planning and Design ($14.4 M)
- Safety, Capacity, Maintenance, and Major Repair ($13.8 M)

FY 2011 STRS Initiative Requests

Focused Investments on National Priorities (+$69.4 M)

Competitive Manufacturing and Construction In a Clean Energy Economy ($20 M)

- Green Manufacturing and Construction
- Innovations for 21st Century U.S. Manufacturing

Standards and Conformity Assessment for Interoperability in Emerging Technologies ($10 M)

Scalable Cybersecurity for Emerging Technologies and Threats ($10 M)

Innovations in Healthcare – Measurement Science and Standards to Support Manufacturing and Regulatory Approval of Biologic Drugs ($10 M)

Sustainable Energy Sources and Nanomaterials ($9 M)

- Advanced Solar Technologies – 3rd Generation Photovoltaics
- Nanomaterial Environmental, Health, and Safety

Disaster Resilient Buildings and Infrastructure ($5 M)

Enhancing Science, Technology, Engineering and Math Education ($3.4 M)

- NIST NRC Postdoctoral Research Associateships

Strategic and Emerging Research Initiatives ($2 M)

NIST ARRA Update

Approp	Project	Total Allocation	2009-2010 Obligations to Date	Remaining Unobligated Balance	Status
STRS					
	Equipment	108,000	22,531	85,469	On target
	Research Grants	34,125	27,870	6,255	On target
	PostDoc Fellowships	21,775	12,128	9,647	On target
	Fellowships Program	19,500	0	19,500	On target
	Research Contracts	16,600	9,886	6,714	On target
	IT Infrastructure	9,000	6,453	2,547	On target
CRF					
	Internal Construction	172,000	11,627	160,373	On target
	Construction Grants	177,900	170,952	6,948	On target
STRS/CRF	Administrative Support	21,100	8,423	12,677	On target
	Total, Direct NIST Approp	580,000	269,870	310,130	
DOE	Smart Grid	10,000	2,290	7,710	On target
NTIA	BTOP	2,230	940	1,290	On target
HHS	Health IT	20,000	528	19,472	On target
	Total, All NIST Spending	**612,230**	**273,628**	**338,602**	

Standards

Documentary standards have emerged as a major area of activity, closely tied to major programs:

- Cybersecurity
- Smart Grid
- Health IT

Coordination of federal development and use of documentary standards is also a unique and significant role for NIST. These programs play a key role in shaping the related laboratory technical programs.

→ Will cover later…

Safety Management

Goal: Manage NIST to achieve **zero** accidents for **everyone** that works at NIST, but also prepare for, and learn from incidents and accidents that do occur.

- Use, assess, and improve the OU hazard management and management observation programs begun last year.
- Continue to improve the safety office to provide high quality safety support to our programs.
- Develop key metrics and improve safety information sharing across NIST.
- Improve our emergency preparedness.

Safety Management: VCAT comments

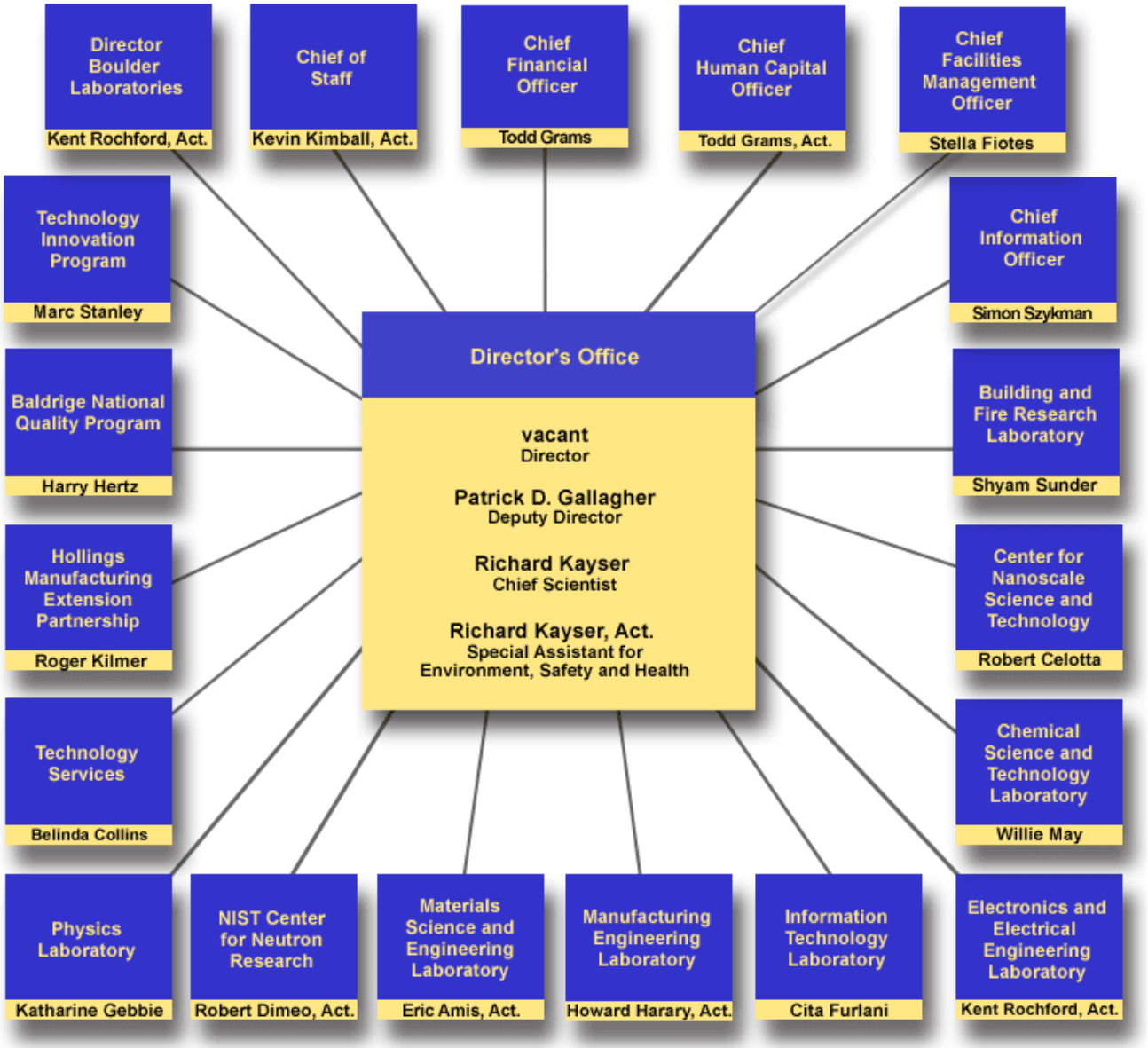
Blue Ribbon Commission findings (November 2008):

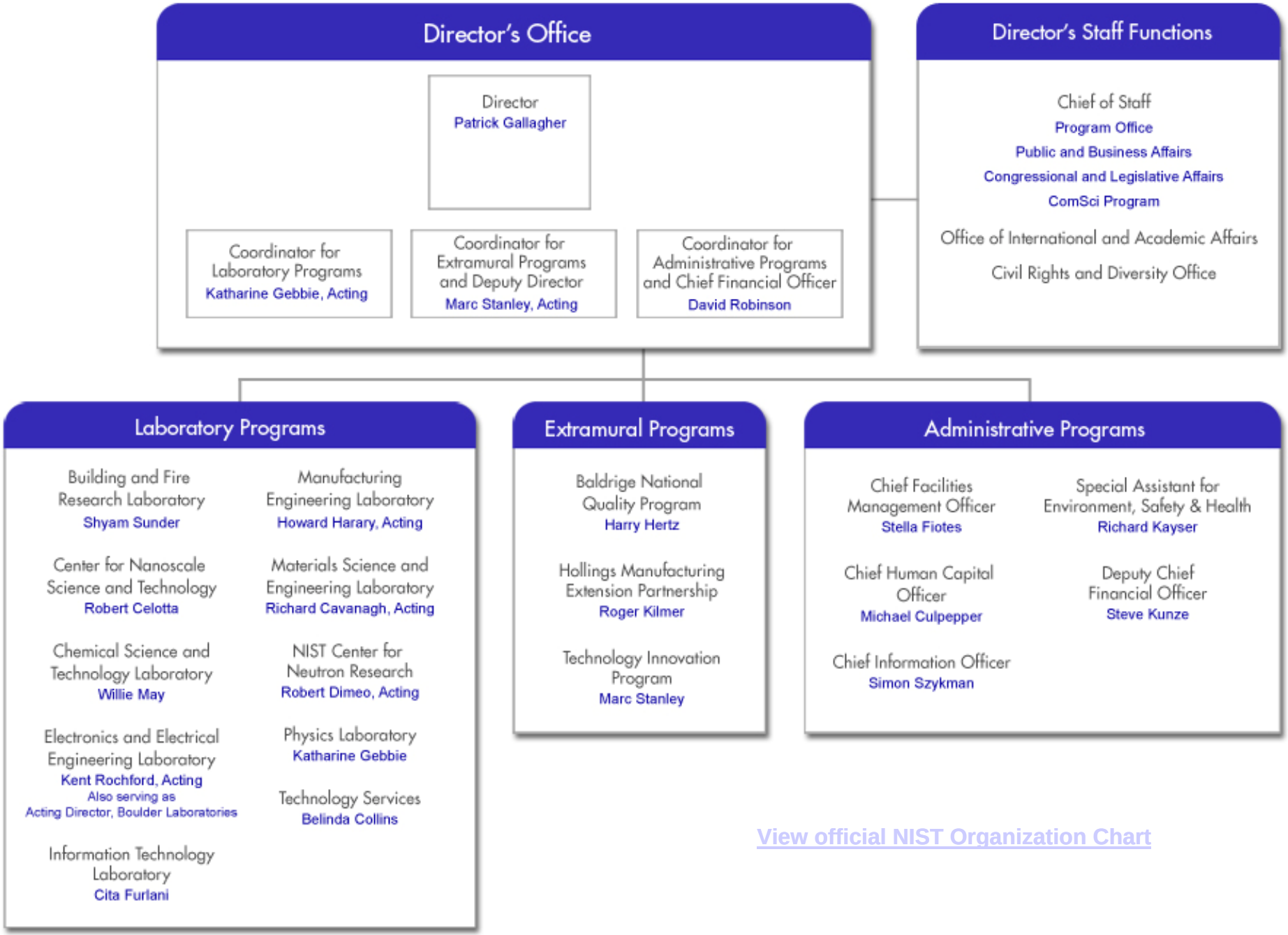
1. Safety is not a core value at NIST.
2. Safety is not integrated with the conduct of operations in a meaningful way across organizational units.
3. NIST has not benchmarked safety protocols and performance against similar organizations with strong safety cultures.
4. NIST is plagued by lack of resources for safety.
5. The staff is eager, willing, and ready to embrace a safety culture.

Improving safety management at NIST is, and must remain, a top management priority. VCAT recommendations in support of this objective are most welcome.

For example, a request for a follow up review by external experts of NIST progress in safety management is appropriate. This review could be made available to VCAT.

Organization: one year ago…





View official NIST Organization Chart

VCAT focus for FY2010

Suggested possibilities:

Measurement services: calibrations, laboratory accreditation, SRMs, data, legal metrology, technical reports/guidance, etc – are a unique mission activity for the agency. These programs impact major technical areas:

- Energy
- Healthcare
- Safety
- Defense and homeland security

Innovation and industrial programs: MEP, TIP, and Baldrige are receiving renewed attention for their role in the innovation strategy. The NIST organization is being refocused to better coordinate these activities, and to address related functions previously provided by the DOC TA.

Discussion

NIST-related roles in documentary standards

National Technology Transfer and Advancement Act (1995)

- Compare standards used in scientific investigations, engineering, manufacturing, commerce, industry, and educational institutions with the standards adopted or recognized by the Federal government.
- Coordinate the use of private sector standards used by Federal agencies, emphasizing, where possible, the use of standards developed by private consensus organizations.
- Coordinate Federal, State, and local standards activities and conformity assessment activities with private sector standards activities and conformity assessment activities

Office of Management and Budget (OMB) Circular A-119:

Through the Secretary of Commerce (Section 13):

- Coordinate and foster executive branch implementation of Circular A-119 and, as appropriate, provide administrative guidance to assist agencies in implementing Circular A-119, including guidance on identifying voluntary consensus standards bodies and voluntary consensus standards.
- Sponsor and support the Interagency Committee on Standards Policy, chaired by NIST, to consider agency views and to advise the Secretary and agency heads on Circular A-119
- Report to the Director of OMB about implementation of the policy provisions of Circular A-119.
- Establish procedures for agencies to use when developing directories identifying agency employees participating in voluntary consensus standards bodies and identifying the voluntary consensus standards bodies where they participate.
- Issue guidance to agencies to improve coordination on conformity assessment.

Standards: VCAT focus

Focused on three high-profile standards related activities:

- Smart Grid
- Health IT
- Cybersecurity

Objectives:

- Demonstrate high profile nature of role
- Illustrate the wide variety in approaches
- Pull out “common mode” issues in NIST role

Standards for Smart Grid Interoperability - *Update*

- Launched the Smart Grip Interoperability Panel on November 19, 2009 at the Grid-Interop Conference and convened first meeting of the Governing Board on December 8-9, 2009.
- Solicited nominations for a new Smart Grid Advisory Committee through a Federal Register Notice on January 12, 2010.
- Announced the officers for the Smart Grid Interoperability Panel's Governing Board on January 15, 2010 with John D. McDonald (*General Electric*) serving as Chair.
- Issued the *NIST Framework and Roadmap for Smart Grid Interoperability Standards, Release 1.0* that provides an initial list of standards, a preliminary cyber security strategy, and elements of the Smart Grid Framework on January 19, 2010

Nationwide Healthcare Information Infrastructure - *Update*

- The first generation NIST Health IT Testing Infrastructure debuted to over 70 vendors at the Integrating the Healthcare Enterprise (IHE) Connectathon, Chicago, January 2010, and will be used for the IHE Connectathons in Europe and Asia
- Provided expertise on authentication to the Policy Committee's Nationwide Health Information Network (NHIN) Workgroup
- Health IT usability road map presented and discussed at Informatics for Consumer Health Summit, November, 2009
- Working closely with ONC to develop effective conformity assessment (testing/certification) procedures for Health IT
- Participating in review and selection processes for the HHS Strategic Health IT Advanced Research Projects (SHARP) Program

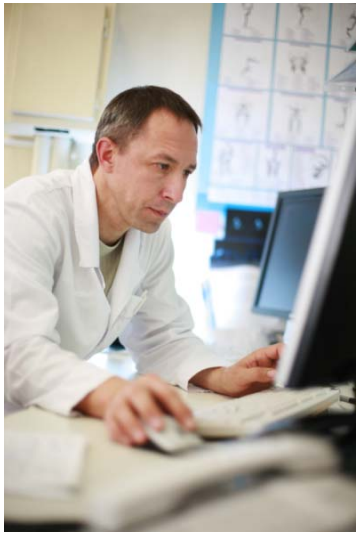


Image: Shutterstock, ©Konstantin Sutyagin

Cybersecurity - *Update*

- **60-Day Cybersecurity Review**
  - Howard Schmidt named as White House Cybersecurity Coordinator
    - Interagency coordination to respond to the report's recommendations
    - Member of ISPAB until his appointment
  - NIST involvement in addressing report recommendations include
    - Conducting cybersecurity R&D
    - Developing an international cybersecurity policy framework
    - Creating an identity management strategy for the Federal government
    - Promoting workforce cybersecurity awareness and education
- **CyberMaryland Summit**
  - CyberMaryland Report—comprehensive inventory of the cybersecurity sector in Maryland
  - Cybersecurity economic development plan for Maryland
  - Showcase for NIST cybersecurity research projects
- **Pending cybersecurity legislation**
  - 13 cybersecurity bills introduced during 2009 and many more in draft

Common issues

Strengthening federal coordination:

- Define need (policy), framework (e.g. architecture) and approach to developing standards and a conformity assessment system before it is needed.
- Provide a federal forum to develop policy recommendations for standards related issues.
- Improve USG coordination between standards development efforts and standards promotion efforts.
  - US standards approach
  - Specific standards
  - Effectively addressing standards related barriers

Documentary Standards

How can NIST strengthen its role and authority in coordinating the development of national and international documentary standards in high-priority areas (e.g. Smart Grid, Cybersecurity, Healthcare IT)?

VCAT recommendations/findings are needed in the following areas:

Should NIST play a central role in coordinating – in close coordination with the EOP – the development, use, and promotion of documentary standards needed by the federal government? Why is NIST the right agency?

Does the NIST role in documentary standards play an important role in the direction and focus of the technical programs in the NIST laboratories? Should this connection be strengthened?

What should NIST do to enhance its effectiveness in coordinating standards development with other federal agencies?

Discussion

Management Challenges

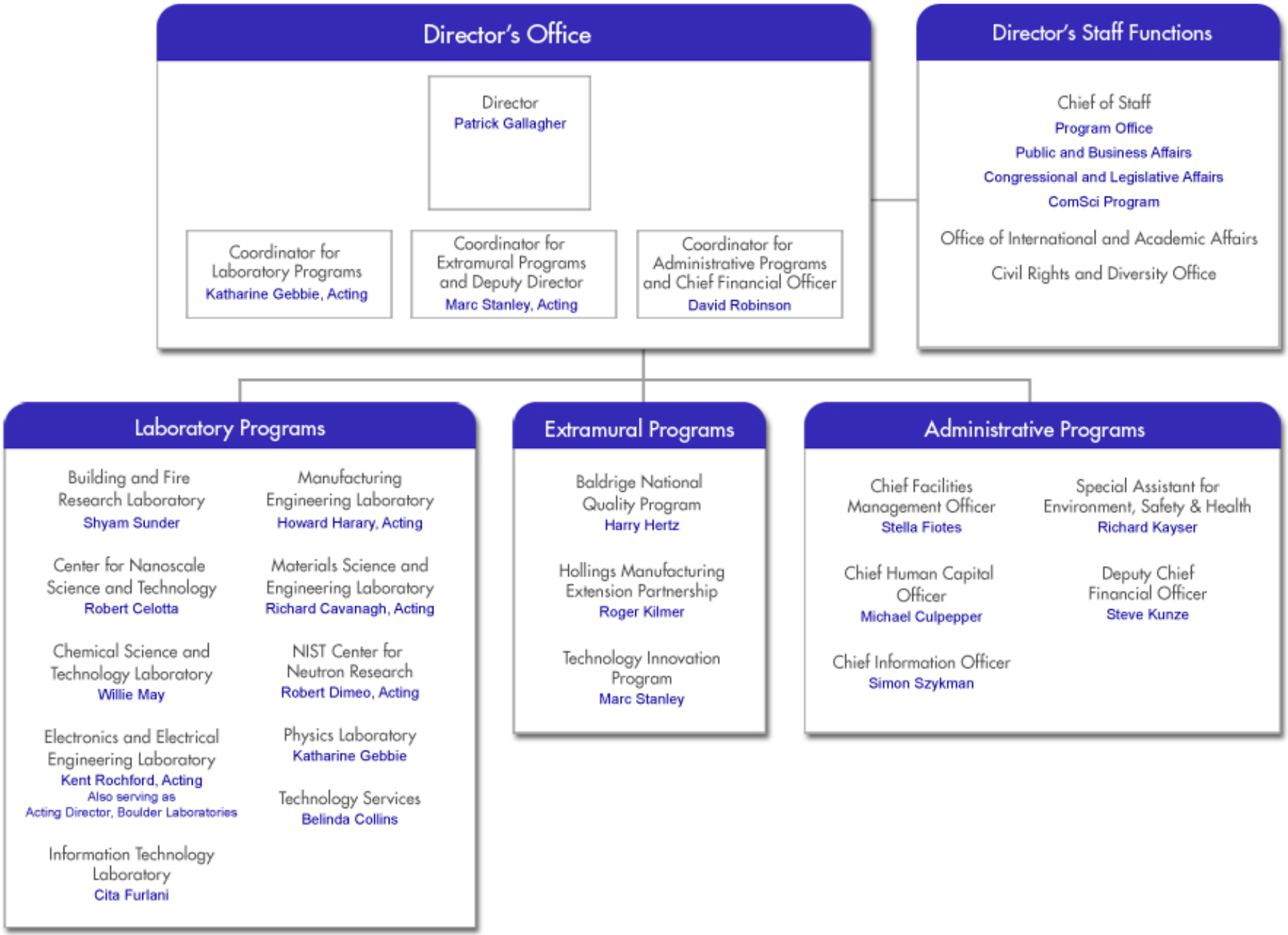
- Our unique mission activities are not clearly understood or applied across NIST;
- Decision making and execution is hampered by ambiguous roles and responsibilities
  - Across OUs
  - Between program/policy and execution
- Program planning is weak, follow up assessment is weaker.
- Leadership engagement is weak (NIST with industry, Congress, senior officials, trade/science organizations, etc)
- Significant gaps and overlaps in operational responsibilities

Management agenda

Why seek a change now?

Motivated by opportunity and management agenda:

- Clarify our mission: What NIST is and what it does will be clear to us and our key stakeholders
- Improve program planning and external engagement
- Integrate services and operations into our programs
- Foster a strong client-service model for our internal support services
- Improve decision-making and execution


Director's Office
Director
Patrick Gallagher
Coordinator for Laboratory Programs
Katharine Gebbie, Acting
Coordinator for Extramural Programs and Deputy Director
Marc Stanley, Acting
Coordinator for Administrative Programs and Chief Financial Officer
David Robinson
Director's Staff Functions
Chief of Staff
Program Office
Public and Business Affairs
Congressional and Legislative Affairs
ComSci Program
Office of International and Academic Affairs
Civil Rights and Diversity Office
Laboratory Programs
Building and Fire Research Laboratory
Shyam Sunder
Center for Nanoscale Science and Technology
Robert Celotta
Chemical Science and Technology Laboratory
Willie May
Electronics and Electrical Engineering Laboratory
Kent Rochford, Acting
Also serving as
Acting Director, Boulder Laboratories
Information Technology Laboratory
Cita Furlani
Manufacturing Engineering Laboratory
Howard Harary, Acting
Materials Science and Engineering Laboratory
Richard Cavanagh, Acting
NIST Center for Neutron Research
Robert Dimeo, Acting
Physics Laboratory
Katharine Gebbie
Technology Services
Belinda Collins
Extramural Programs
Baldrige National Quality Program
Harry Hertz
Hollings Manufacturing Extension Partnership
Roger Kilmer
Technology Innovation Program
Marc Stanley
Administrative Programs
Chief Facilities Management Officer
Stella Fiotes
Chief Human Capital Officer
Michael Culpepper
Chief Information Officer
Simon Szykman
Special Assistant for Environment, Safety & Health
Richard Kayser
Deputy Chief Financial Officer
Steve Kunze

Organization changes and assessment

- Approve top-line organizational change
- Compete to fill the AD positions
- Initiate an assessment of OU/Chief structure below the DO.
  - Is our organization optimized with the major activities/program areas?
  - Can we improve integration of measurement & standards services and functions with our programs?
  - Can we increase the operational responsibility of our program organizations?
  - How do we most effectively provide services to support NIST programs?

Organization: Phasing

Vertical definition:

- AD level: agency level policy and program planning and direction, evaluation and oversight
- OU level: program execution, operations, and services over major program or service element of the agency.

Horizontal definition (assessment):

- Role delineation between laboratory activities
- Definition of functions managed within OU
- Definition of functions managed across OUs
  - Between labs
  - Between labs and service OUs

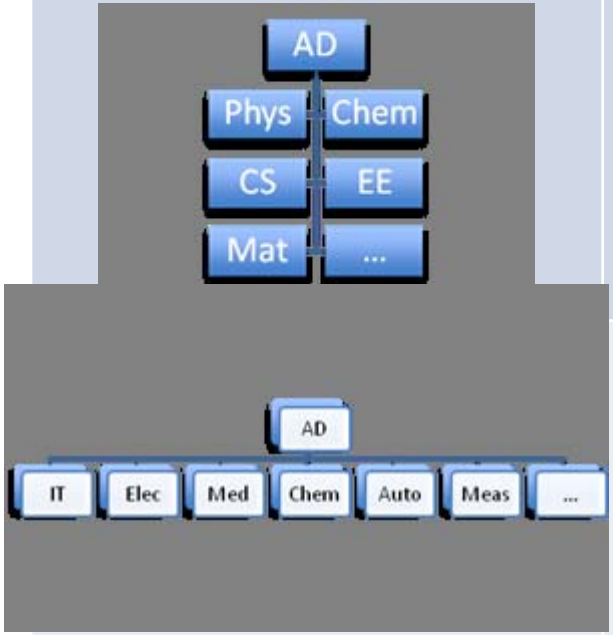
Comments to NLB

- No secret plan in a drawer
- Re-alignment, not reduction
- A (rare) opportunity to assess our organizational effectiveness and make adjustments
- Want decision to be based on broad input and good analysis

Process

- Solicited input from NLB and from general staff
- Four major areas for assessment:
  - Laboratory alignment
  - Innovation & industrial programs;
  - Relationship between program and support units
  - Director's office functions
- Lab realignment
  - Compare several possible scenarios, then ask:
  - What are:
    - Right number of labs?
    - What is managed within lab?
    - What is managed across lab? How?

Alignment considerations

Alignment orientation	Pros/Cons
Disciplinary 	Pros: • Strong shared identity and professional development • Simplifies recruitment and reward of research staff Cons: • Multidisciplinary R&D a challenge to coordinate • Redundant capabilities can develop • Roles and responsibilities overlap
	Pros: • Strong external constituencies • Roles and responsibilities clearer Cons: • NIST breadth implies numerous sectors (“supersectors”) • Technical capabilities are widely distributed
Mission 	Pros: • Emphasizes primary NIST functions • Aligns NIST structure with major activities / priorities • Preserves some disciplinary identity Cons: • Still requires strong program management for multidisciplinary programs

Next steps

- AD (top-level) reorganization plan is under formal review;
- If approved, we will compete to fill all three AD positions;
- I believe that it is time to realign the laboratory structure:
  - Favor segregation into OUs by area of mission activity
    - Industry ties through services and program office;
    - Cross cutting programs managed through AD for Labs
    - Disciplinary management through sub-OU level organizations.
  - Must include empowered program office in AD for laboratory programs
  - To be meaningful, the measurement and research services (all activities that support the mission area) must be fully integrated into the research activities of the OUs, and provide those services for the entire agency.
- Details need to be worked out and a formal plan prepared and reviewed.

VCAT input

I would appreciate input from the VCAT, and individual VCAT members, on any aspect of the proposed laboratory realignment approach (this meeting) or details (going forward).

I need a strong statement of support from the VCAT in order to move forward.

Discussion