

NSF Advisory Committee for Business and Operations
Fall 2018 Meeting
December 12 – 13, 2018

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National Science Foundation
Advisory Committee for Business and Operations
Fall 2018 Meeting

December 12-13, 2018
Room E 3410

Wednesday, December 12, 2018

1:00 pm **Welcome/Introductions/Recap**
Co-Chairs: Chuck Grimes and Susan Sedwick

1:15 pm **BFA/OIRM/OLPA/Budget Updates**
Presenters: Teresa Grancorvitz, BFA; Wonzie Gardner, OIRM; Amanda Greenwell, OLPA

1:45 pm **Results from the 2018 Federal Employee Viewpoint Survey (FEVS)**
Review NSF's FEVS results.
Presenter: Wonzie Gardner, OIRM; Bill Malyszka, OIRM
Discussant: John Palguta

The Federal Employee Viewpoint Survey (FEVS) is an annual measure of NSF staff's engagement across several dimensions. Each year, all staff are invited to share their perspectives on their work unit, supervisor and leadership, and NSF culture. FEVS results are a major input into employee engagement action planning by each directorate and office. Senior leaders see the connection between engagement and productivity, willingness to change and innovate, and retention of our talent.

NSF staff are invested in the employee engagement process, as evidenced by the 76% response rate on the FEVS, compared to the government average of 41%. We have achieved four years of sustained improvement across all the engagement areas of focus – career development; performance and recognition; workload; and inclusion.

OIRM continues to build out resources that support the directorates and offices as they work to improve engagement. Along with providing full transparency on all NSF FEVS results, we also have incorporated a module on effective employee engagement strategies in our Federal Supervisor training course, published a curated engagement website with resources touching many topics, and are providing consulting support to the directorates and offices.

Committee Action/Feedback:

1. What promising practices have you seen organizations like NSF use to sustain improvements in engagement?
2. NSF has a workforce with a diverse set of people and life experiences. How have you seen organizations successfully integrate STEM and non-STEM staff working side-by-side on the same mission?
3. NSF has made good progress on improving the FEVS Workload Index, which is a measure of staff perceptions of workload. NSF still sees room for working more efficiently through better tools, streamlined processes, and increasing staff capabilities. In today's climate of "do more with less", how have you seen organizations successfully balance additional effort to gain efficiency when staff already see their workload as being difficult to complete?

2:30 pm **Break**

2:45 pm **Facilities Subcommittees Updates**
The Cost Surveillance Subcommittee will share the findings of its report, which documents the Subcommittee's evaluation and findings regarding the sufficiency of NSF's end-to-end cost surveillance oversight procedures for all Large Facility construction and operations awards. Also, an update will be provided, as requested by the Committee during the Spring 2018 meeting, on activities completed by the Cooperative Agreements to Support Large Scale Investments (NSF implementation) Subcommittee.

Presenter: Matt Hawkins, BFA and Kim Moreland

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Discussant: Mike Holland

Subcommittee on Implementation of NAPA Recommendations

The Subcommittee on Implementation of NAPA Recommendations was charged with preparing a report for the BOAC that recommends actions to NSF for implementing a subset of National Academy of Public Administration recommendations related to NSF-wide oversight of large-scale research facilities in the report, [National Science Foundation: Use of Cooperative Agreements to Support Large Scale Investment in Research](#).

The subcommittee presented its final report to the BOAC at the Spring 2017 Meeting. In response to a request for a status update by the BOAC during the Spring 2018 meeting, the Head, Large Facilities Office, NSF, will provide an informational briefing summarizing NSF's resolution actions with respect to each of the Subcommittee's recommendations.

Subcommittee on NSF's Strengthened Oversight of Major Facility Cost Surveillance

The Subcommittee on NSF's Strengthened Oversight of Major Facility Cost Surveillance was charged with preparing a report for the BOAC that fully evaluates NSF's strengthened "end-to-end cost surveillance policies and procedures" for Major Facility projects (i.e., Large Facilities). The report is to specifically state whether or not the subcommittee feels the strengthened policies and procedures are sufficient. The report may include recommendations to NSF for further improvement depending on the outcome. The review pertained to both construction and operations awards. Specifically, the subcommittee was charged with reviewing and evaluating NSF's current oversight framework relating to Large Facility costs including the following: (1) proposal cost estimates; (2) NSF cost analysis of those estimates; and (3) post-award cost and performance monitoring.

Committee Action/Feedback:

- The BOAC liaison submitted the subcommittee's final report to the BOAC chairs on December 7, 2018, and on behalf of the chairs, NSF BOAC staff shared it with the full BOAC as a pre-read for this meeting.
- During the meeting, the BOAC Liaison, will provide to the BOAC a summary of the subcommittee's findings and recommendations for discussion.
- The BOAC will discuss and deliberate the subcommittee's advice and recommendations at the meeting.
- At the close of the BOAC's discussion, it will:
 - Accept the subcommittee's report;
 - Reject the subcommittee's report; or
 - Send the subcommittee's report back to the subcommittee for revisions.
- The BOAC may also provide additional written feedback to NSF, including any comments or opinions it has to offer regarding the report or its findings and recommendations by way of a cover letter to the NSF Designated Federal Officers (DFOs).
- Once the report is accepted, the BOAC will submit it to NSF for the agency to make it publicly available.
- After receiving the report, the NSF DFOs may, verbally or in writing, comment on or respond to it and its recommendations at any duly organized BOAC meeting.

4:00 pm

Break

4:15 pm

CFO Office of the Future

Presenters/Panel: Dorothy Aronson, CIO/OD; Teresa Grancorvitz, BFA; Mike Wetklow, BFA

Discussant: Adam Goldberg and Doug Webster

Today's Chief Financial Officer (CFO) plays a central role at the crossroads of finance, technology and strategy in support of mission delivery. Although the private sector has adopted technology more quickly, federal CFOs are embracing the opportunity to modernize financial management and services. With the onset of new, emerging technologies, the role of the federal CFO office continues to evolve in the future. In this session, NSF's CFO, Chief Information Officer (CIO), and Deputy CFO discuss some of the

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modernization priorities and exciting new technologies that are being used to leverage and support a modern CFO office of the future.

Specific examples of new developing technologies will be discussed such as robotics process automation (RPA) and blockchain. These and other promising tools have the potential to enhance performance, increase accountability, and improve staff productivity while simultaneously advancing NSF's mission, the President's Management Agenda (PMA) and internal reform efforts such as Renewing NSF.

As background, the Association of Government Accountants (AGA) 2018 Report, "The CFO Office of the Future" examines trends in technology and how they impact the federal CFO. The report examines some of the most important trends in technology and how they impact the federal CFO and in turn, the financial community at large. These trends include emerging technologies such as: secure applications, cloud technology, data analytics, process automation, auditing with blockchain, and more.

Committee Action/Feedback

NSF seeks advice and perspective on financial management modernization priorities and tools for a modern federal CFO office that supports mission delivery and reform efforts.

5:15 pm

Adjourn

6:15 pm

Dinner- Rus Uz



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Thursday, December 13, 2018

8:00 am

Renewing NSF

Update on the status of the Renewing NSF effort.

Presenters: Erwin Gianchandani, CISE and Joanne Tornow, BIO

Discussants: John Kamensky and Joe Mitchell

With an eye on improving government processes, the Office of Management and Budget (OMB) issued a [memorandum](#) in April 2017 requesting Agency Reform Plans as part of the agencies' FY 2019 budget submissions. As NSF Director Dr. France Córdova has since reflected, "At NSF, we saw this as an opportunity to look thoughtfully at our operation and to explore ways we could transform ourselves to better support NSF's long-term research goals. *We call this initiative Renewing NSF.*"

Given this backdrop, NSF undertook an agency-wide brainstorming process last year to think deeply and critically about how we as an organization could transform to support and sustain NSF's long-term research agenda. That process produced over 200 suggestions from NSF staff, which were subsequently synthesized by senior leadership into four thematic pillars:

- Making information technology work for all (IT);
- Adapting the workforce and the work (Workforce);
- Expanding and deepening public and private partnerships (Partnerships); and
- Streamlining, standardizing, and simplifying processes and practices (Streamlining).

In spring 2018, a Renewing NSF Steering Group and four Goal Teams (one for each thematic pillar) were established with staff from across the agency. Using a facilitated visioning process, each Goal Team identified a Vision and Bold Steps for their respective pillar. The Bold Steps are intentionally broad and flexible so as to allow us to explore various approaches and eventually pursue the best solutions for implementation.

Where FY 2017 was the "ideation year" and FY 2018 was the "planning year," FY 2019 is the "go year" in terms of moving forward on implementing several of the Bold Steps in a staged fashion. As part of the transition to implementation, NSF is currently in the midst of an intensive agency-wide engagement period to gather inputs about the Visions and Bold Steps that have emerged from the Goal Teams.

Committee Action/Feedback:

NSF seeks advice and perspective on how to ensure NSF moves forward effectively on implementation of the bold steps. Specifically:

1. What are the key ingredients for successful management of this initiative?
2. Many of the bold steps are interdependent. What mechanisms would you suggest for identifying, cultivating, and managing the relationships among one another, including where resources requirements overlap?
3. What mechanisms would you encourage for internal communication and enhancing employee engagement to avoid "change fatigue"?

8:45 am

Renewing NSF- Partnerships Pillar

Committee provides feedback on Vision and Bold Steps related to one of the four Renewing NSF pillars on Partnerships.

Presenters: Ken Calvert, CISE; Barry Johnson, ENG

Discussants: Lee Cheatham and Theresa Pardo

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NSF's vision for the partnerships pillar is "Expanding partnerships to enhance the impact of NSF's investments and contribute to American economic competitiveness and security". Private industry, foundations, and non-profits, together with other federal agencies and international funding organizations, bring additional expertise, resources, and capacity to NSF-funded research. This, in turn, accelerates discovery and translation of research to products and services, and enhances preparation of the future workforce to benefit society and grow the American economy.

The vision for the partnerships pillar includes:

- A unified strategic vision to guide proactive identification and pursuit of partnerships that advance NSF's mission;
- Streamlined, flexible processes and tools for implementing a range of different types of partnerships, along with mechanisms for sharing knowledge and expertise; and
- Systematic and continual evidence-based improvement of costs and benefits of partnerships, through evidence-based assessment.

The Partnerships Goal Team developed six bold steps toward realization of this vision:

- Conduct a landscape study to explore "out of the box" partnerships.
- Develop a framework and method for identifying advantageous partnerships.
- Explore options for appropriate centralization.
- Build a partnerships toolbox: guidelines, best practices, examples, templates.
- Educate and train workforce to strengthen the culture of partnerships.
- Develop metrics, tools and processes to track all partnerships.

Committee Action/Feedback:

NSF seeks advice and perspective on how to ensure NSF moves forward effectively on implementation of the bold steps. Specifically:

1. What elements of a partnerships program would you consider best suited for centralized management?
2. What metrics do you suggest should be most important for consideration?
3. What mechanisms would you encourage to help strengthen the culture of partnerships?

9:45 am	Break
10:00 am	Preparation for Meeting with Drs. Córdova and Crim
10:30 am	Meeting with Drs. Córdova and Crim
11:30 am	Committee Business/Wrap Up
12:00 pm	Adjourn

**NSF Business and Operations Advisory Committee
Member Biographies ~ Spring 2018**



Dr. Benjamin L. Brown

Acting Facilities Division Director and ESnet Program Manager

U.S. Department of Energy, Office of Science

Dr. Benjamin L. Brown is the program manager for ESnet, an Office of Science User Facility that provides tens of thousands of researchers—both in and outside DOE—with the ability to efficiently transmit extreme scale research data flows and to access unique Department of Energy research infrastructure, including high performance computing resources. Ben is currently detailed to serve as the Acting Facilities Division Director in the Office of Advanced Scientific Computing Research, which supports three major high performance computing user facilities in addition to ESnet. Ben also serves as Senior Science and Technology Advisor to the Deputy Director for Science Programs, providing support for policy development and analysis related to the Office of Science User Facilities, DOE's large scale scientific research infrastructure. Ben is also the program manager for the Department's Project Leadership Institute, a leadership development program in project management, and the Oppenheimer Science and Energy Leadership Program. A common focus in each of these roles is the strategic advancement of science and the DOE mission through cross-institutional knowledge-sharing and partnerships.

Immediately prior to joining the Office of Science in 2008, Ben worked on energy and climate policy in the U.S. Senate as an American Association for the Advancement of Science (AAAS) Congressional Fellow. Ben is an experimental atomic, molecular, and optical physicist with experience working in U.S. government laboratories and academic institutions in both the U.S. and U.K. Ben's postdoctoral and doctoral research focused on control of quantum systems and the optical manipulation of ultracold matter. He received his Ph.D. in optics from the University of Rochester and his bachelor's degree in physics from Harvard University.



Dr. Lee Cheatham

Director, Office of Technology Deployment and Outreach

Pacific Northwest National Laboratory

Lee Cheatham has focused his career on leadership in research management and operations, especially in the translation of that research into high-impact commercial products. Lee currently leads the Office of Technology Deployment and Outreach (TDO) at Pacific Northwest National

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Laboratory (PNNL), a Department of Energy national laboratory focused on making fundamental scientific discoveries and using its foundational capabilities to address key challenges in energy resiliency and national security. TDO's mission is to engage the Laboratory with industry, federal agencies, and state/regional organizations in developing and licensing PNNL's technology as a basis for commercial products and to realize the greater impact of science and technology for economic growth.

Previously Lee served as Director of Strategic Partnerships at Brookhaven National Laboratory, and as Chief Operating Officer and General Manager of Commercialization for The Biodesign Institute at Arizona State University. For twelve years prior to Biodesign, Lee led the Washington Technology Center (WTC), an organization chartered by the State of Washington to accelerate growth and expand economic impact of small and medium-sized businesses. WTC funded these companies' collaborations with university researchers and provided programs to ease their access to growth capital.

Lee has private-sector experience as Vice President of Worldwide Product Engineering for a market-leading library software company and founder of a real estate technology and services company. He has served in scientific, engineering, and development positions, as well research program management roles, for energy systems modeling, large-scale environmental and military information systems, and medical device development programs. Lee received his Ph.D. from Carnegie-Mellon University, MS from Washington State University, and BS from Oregon State University, all in electrical engineering.



Dr. Robert M. Dixon

Interim Chair of the Department of Industrial and Systems Engineering
North Carolina Agricultural and Technical State University

Robert M. Dixon is a consultant with the Registry for College and University Presidents, which is based in Peabody, MA. As a consultant with this organization, he takes on interim leadership assignments at universities that need senior level management while in transition. Among his assignments, he has served as Interim Provost and Vice President for Academic Affairs at Cheyney University and as Vice President for Academic Affairs at the University of Maine at Fort Kent. He is currently serving as Interim Chair of the Department of Industrial and Systems Engineering at North Carolina A & T State University. During the last decade he has developed research interests in Number Theory. His career has involved dual paths of work in teaching and research, and in administrative leadership positions.

He received the baccalaureate degree in mathematics and physics with high honors from Morehouse College; the Master of Science degree in nuclear physics from Rutgers University; and the doctorate in theoretical nuclear physics from the University of Maryland. Dr. Dixon formerly served as the Dean of the School of Science at Hampton University. Prior to his work at Hampton he was Provost and Vice President for Academic Affairs at Grambling State University. During a period

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of sixteen years he was Chair of the Department of Physics at Morehouse College, a period that was characterized by considerable success in the production of graduates in the dual-degree engineering program with the Georgia Institute of Technology, in the production of graduates in physics and mathematics, and the acquisition of funded grants from foundations and federal agencies. In this period he received funding from the Air Force Office of Scientific Research, the Army Research Office, the Office of Naval Research, the AMOCO Foundation, the General Electric Fund, the William Penn Foundation, and the Sherman Fairchild Foundation. His background includes appointments at Morgan State University, Southern Polytechnic University, and Bishop College. Notably, Dr. Dixon is the founding chair of the M. S. degree program in physics at Atlanta University (now Clark Atlanta University). Upon graduation from Morehouse College, he began a long relationship with the Woodrow Wilson National Fellowship Foundation. He received a Woodrow Wilson Fellowship to attend Rutgers University. His first academic appointment was as a Woodrow Wilson Teaching Intern at Hampton Institute (now Hampton University). During his career he has contributed as a consultant to several programs sponsored by the Foundation. After some years in academe he served as a Director with an engineering firm. He developed and managed research projects supported by contract with the Department of Energy on nuclear waste disposal.

Throughout his career he has remained active in teaching and research. He has taught at the undergraduate and graduate levels. He has taught and mentored many students who have obtained the doctorate in physics or engineering. More than fifty of his former students have obtained advanced degrees in engineering, mathematics, or physics. He has maintained an active interest in research in applied mathematics. He is the author of several books and laboratory manuals in physics and articles on many-body scattering theory. He has served as a consultant to many public-school systems and universities on a wide variety of topics, such as diversity, improving the teaching and learning of science and mathematics, the preparation of mathematics teachers, expanding opportunities and increasing diversity in engineering, and improving retention. He is a member of the American Physical Society, the American Association of Physics Teachers, the American Association for the Advancement of Science, and the Mathematical Association of America.



Mr. Adam Goldberg

Director and Executive Architect

Department of the Treasury, Office of Financial Innovation and Transformation

Adam Goldberg is the Executive Architect at the Office of Financial Innovation and Transformation (FIT) at the Treasury Department's Bureau of the Fiscal Service. Within FIT, Adam supports financial management transformation initiatives that lead to government-wide efficiencies. He also serves as a Treasury Advisor to the Minister of Economy and Finance in the Republic of Guinea where he supports the Minister's efforts to improve cash management. Adam joined Treasury after spending six years at the Office of Management and Budget (OMB) as the Chief of the Financial

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Analysis and Systems Branch where he was responsible for policy development and oversight to implement financial systems, reduce improper payments, and right-size real property. Prior to OMB, he held senior leadership positions at Unisys and Andersen supporting financial management and system improvement efforts at Federal agencies. Adam began his career at the Defense Logistics Agency. Adam holds a BA in Political Science and History from the University of Rochester and an MPA from the Maxwell School of Citizenship and Public Affairs at Syracuse University.



Mr. Charles D. Grimes III
Consultant

Charles (Chuck) Grimes is an independent consultant on HR policy and administration. He has worked with MTCI, a human capital management, training support and delivery, and program management firm; *The Public Manager*, a quarterly journal for public sector learning professionals; and the Departments of Justice, Defense, and Homeland Security. Chuck is active in the Partnership for Public Service's Strategic Advisors to Government Executives (SAGE) program in the COO and CHCO communities.

Chuck recently retired from Federal service, having served as the Chief Operating Officer for the U.S. Office of Personnel Management (OPM). In that role, he was responsible for managing OPM's human, financial, and other resources to achieve intended program results efficiently, economically, and effectively.

Previously, Mr. Grimes served as the Deputy Associate Director, Employee Services, and Acting Associate Director, Employee Services and Chief Human Capital Officer at OPM. In those roles, he managed governmentwide staffing, compensation, employee and labor relations, employee development, and executive resources policies; agency outreach and veterans support; and OPM's internal human resources operation. He also headed the Performance and Pay Systems center at OPM.

Prior to joining OPM, Mr. Grimes served as the Assistant Director, Compensation Policy, in the Internal Revenue Service's Strategic Human Resources Division. He spent most of his career in the Department of Defense (DOD), where he last served as the Director, Wage and Salary Division, in DOD's Civilian Personnel Management Service. Mr. Grimes received his B.A. in Biology from the University of Virginia and an M.A. in Management and Supervision from Central Michigan University.



Dr. Michael Holland

Vice Chancellor for Science Policy and Research Strategies
University of Pittsburgh

Mike's responsibilities as Vice Chancellor for Science Policy and Research Strategies include the development and implementation of University of Pittsburgh research policies and strategies to support cross-disciplinary research. This collaboration will include the sciences, medicine, engineering, information technology, humanities and creative arts, social sciences and innovation. The objectives include: the creation of major research initiatives; maintain and increase University research funding; and shape Pitt's response to changing research opportunities in support of its strengths and long-term goals.

Prior to coming to Pitt, Mike was the Executive Director at New York University's Center for Urban Science + Progress. CUSP is a graduate-level program in urban informatics that was announced in April 2012 as part of the Applied Sciences NYC initiative, the first class of 23 Master's students started in September 2013. In helping to design and build this new center, Mike oversaw day-to-day operations, including budget and financial planning, human resources, external relations, development, space planning and design, and strategic planning.

Mike was the Senior Advisor and Staff Director in the Office of the Under Secretary for Science at the Department of Energy. He helped design and execute the first ever Quadrennial Technology Review, which provides context and a framework for DOE's energy programs. He also staffed the Under Secretary on Department-wide executive boards, such as the Operations Management Council (DOE management issues), the Deputy Secretary's Resources Board (agency-wide budget formulation), and the Loan Guarantee Program's Credit Review Board (CRB), where he reviewed more than 25 loan guarantee applications for project readiness and technical eligibility.

At the Office of Management & Budget from 1999-2002 and 2007-2009, Mike was the program examiner for the Department of Energy's Office of Science, the Advanced Research Projects Agency-Energy (ARPA-E), Cerro Grande Fire Activity emergency funding, and DOE contractor pension liabilities. He has reviewed major scientific facilities, such as Brookhaven's National Synchrotron Light Source-II and SLAC's Linac Coherent Light Source, for inclusion in the President's budget. With Dave Trinkle, he developed the R&D Investment Criteria for basic research that were later incorporated into the Program Assessment & Rating Tool (PART).

Mike has also served as a senior policy advisor in the Office of Science & Technology Policy and on the staff of the House Science Committee, where his (minor) impact on the U.S. Code was the H-Prize Act of 2006 (enacted as Section 654 of P.L. 110-140). Mike has a Ph.D. in analytical chemistry from the University of North Carolina at Chapel Hill. His undergraduate degrees are in electrical engineering and chemistry from North Carolina State University.



Mr. E.J. ("Ned") Holland, Jr.

Retired Assistant Secretary for Administration
U.S. Department of Health and Human Services

With extensive, senior-level leadership experience in the public and private sectors, on multiple Boards of Directors, and in Fortune 500 environments, E.J. ("Ned") Holland, Jr. brings a depth and breadth of expertise across many functional areas and organizational levels. His comprehensive background in human capital management, executive compensation, change management, and organizational design, gives him a broad view of business, the ability to identify organizational issues, and insight into structure solutions and frameworks for executing tactical action plans.

In his most recent role as Assistant Secretary for Administration with the United States Department of Health and Human Services, Ned led and managed more than 3,500 Federal employees and contractors with multiple separate operating budgets totaling \$1.4 billion. His responsibilities spanned Human Resources, Diversity Management, Equal Employment Opportunity, Facilities Management & Policy, IT, Business Transformation, Security (including Cybersecurity), and the HHS Program Support Center (the largest federal shared services organization). In this role, he executed the President's mandate to freeze and reduce the federal government's real estate footprint. Working with GSA he led the effort to consolidate the headquarters of 6 HHS operating divisions and 4 staff divisions into two locations, saving approximately \$200M in rent and operating costs over the lease period and terminating 10 commercial leases. He also restructured the HHS Division of Administration; reduced executive headcount 30% by eliminating positions and transferring executives; reduced the number of his SES (Vice President) direct reports from 8 to 4, and made concomitant staff level changes, saving nearly \$100 million

Prior to joining Health and Human Services, Ned was the Senior Vice President of Human Resources and Communications for Embarq Corporation, a \$6 billion spin-off from Sprint Corporation and the then largest independent local telecommunications provider in the country. Ned was a primary leader in designing the structure and culture of Embarq from concept through launch. He served as primary management support to the Compensation Committee of the Board of Directors and played a key role in recruiting and compensation for the Embarq's executive leadership team.

From 1999 to 2006, Ned was Vice President of Compensation, Benefits, and Labor & Employee Relations for Sprint Corporation, where he served as Secretary to the Board's Compensation Committee. During his tenure with Sprint, he took their health care plan to market, restructured how health care was purchased, decreased the number of third-party HMOs from more than 75 to less than 10, produced immediate and short term operating savings and reduced accrued balance sheet liability by approximately \$300M.

Prior to Sprint, Ned served as Chief Administrative Officer and Corporate Secretary for Payless Cashways and was Managing Partner and Co-Chairman of the Health Care Practice at Kansas City law firm, Spencer Fane Britt & Browne.

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In addition to his business career, Ned has served with numerous economic development, community, and health care-related organizations. He helped to establish the Kansas Health Policy Authority, an independent authority Board charged with forming health care policy and administering \$2.5 billion in health care purchasing for the State of Kansas. In that role, he served as Chair of the Finance and Audit Committee and Chaired the Search Committee for the Authority's first Chief Executive Officer. He was Secretary, President, and Chairman of the Board of Truman Medical Center, the Kansas City Missouri public hospital system. In addition, he was Chairman of the Kansas City Area Hospital Association, and Board Member of Joint Commission Resources, the educational and consulting arm of the Joint Commission (formerly JCAHO).

Currently, Ned is retired and serves on three other boards. He holds a Juris Doctorate from Boston College Law School in Brighton, Massachusetts and graduated from Rockhurst College in Kansas City, Missouri with a Bachelor of Arts in Philosophy.



Ms. Jan E. Jones

Federal Senior Executive (Retired)

Ms. Jones is a 38-year veteran of the federal government, having held key leadership roles in the development and implementation of innovative administrative management systems, methodologies, and solutions for complex and rapidly changing organizations, mobilizing key resources in support of meeting mission goals through the effective integration of cross-cutting management initiatives within the agency's overall management plan and operational programs. Her career includes assignments in both line and staff positions within the executive and legislative branches of government spanning diverse operating environments such as research and development (R&D), facilities management, and law enforcement. Due to her diverse background and experience, she is frequently called on to advise top agency management—as well as to congressional entities and staff—in the identification, development, and execution of strategic and transformational efforts to effectively shape and achieve both operational and administrative goals and objectives of the subject organization.

Ms. Jones possesses specialized skills and experience in the areas of policy administration, communications, change management, strategic planning and program evaluation, force development, internal control systems, business process engineering, automated business systems acquisition, implementation, and management, corporate records management, law enforcement accreditation, human capital management and organizational design, civilian employee development and law enforcement career development.

Some of her notable career achievements include the development and management of an innovative, comprehensive, and integrated system of agency program planning, evaluation, and budget activities; the restructure and implementation of a new agency policy, directives, and internal communications system; the design and implementation of an updated, NARA-compliant agency-wide records management system; the attainment of successive Commission on the

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Accreditation of Law Enforcement Agencies (CALEA) accreditation awards (with honors); design of a progressive leadership development program for the supervisor-through-executive ranks; establishment of a new agency human capital office and leading the implementation of modernized HR practices, programs, and services; implementation of groundbreaking statutory requirements involving new pay and leave entitlements and programs; consultant to congressional committees on federal HR and HRIS; presenter at numerous national federal and private-sector conferences; management of acquisitions of major, multi-million dollar business systems and modernization initiatives; leading seven different migrations of separate agency personnel/payroll/finance functions and systems into a single, integrated management system, on-time and within budget; and the development and conduct of a national HRIS training program.

Ms. Jones' professional work history consists of the United States Capitol Police from 1995 – 2013, where she served as Director, Office of Policy and Management Systems, the Director, Office of Human Resources, and the Associate Director, Office of Information Systems. The Architect of the Capitol from 1991 – 1995 where she served as a special assistant to the Chief Administrative Officer, and a Branch Chief in the Human Resources Division. The U.S. Department of Commerce, Office of the Secretary, from 1985 – 1991, and the U.S. Department of Commerce, Boulder Laboratories, from 1976 – 1985 where she served in various functions as a Personnel Management Specialist.

Ms. Jones is the recipient of numerous awards and recognition throughout her federal career, to include the DoC's Assistant Secretary for Administration's award for Outstanding Administrative Management, the DoC Silver Medal award, and numerous sustained superior performance and special act or service awards. While at the USCP, she was the recipient of the Chief's award for Outstanding Administrative Management, a Meritorious Service Award, the USCP Distinguished Service Award, and an official recognition of appreciation for services rendered to the U.S. House of Representatives from the Chief Administrative Officer of the House.



Mr. John M. Kamensky

Senior Fellow

IBM Center for The Business of Government

Mr. Kamensky is a Senior Fellow with the IBM Center for The Business of Government in Washington, DC, which sponsors research on management challenges facing government leaders.

During 24 years of public service, he had a significant role in helping pioneer the U.S. federal government's performance and results orientation. He is passionate about creating a government that is results-oriented, performance-based, customer-focused, and collaborative in nature. Prior to 2001, Mr. Kamensky served for eight years as deputy director of Vice President Gore's National Partnership for Reinventing Government. Before that, he worked at the U.S. Government Accountability Office for 16 years where he played a key role in the development and passage of the Government Performance and Results Act of 1993.

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During his time with the IBM Center, he has edited or co-authored seven books and writes and speaks extensively on leadership, performance management, and government reform. He is currently involved in the Center's work developing preparatory materials for the 2016 presidential transition.

Mr. Kamensky is a fellow of the National Academy of Public Administration and is a public member of the Administrative Conference of the United States, where he chairs the Collaborative Governance Committee.

He received a Masters in Public Affairs from the Lyndon B. Johnson School of Public Affairs at the University of Texas at Austin, and a Bachelors of Arts in Government at Angelo State University, in San Angelo, Texas.



Ms. Rachel Elizabeth Levinson

Executive Director, National Research Initiatives
Arizona State University

A twenty five-year veteran of science policy at the national level, Rachel Levinson is the Executive Director of National Research Initiatives for Arizona State University, operating in the university's Washington, D.C. office. She came to ASU in 2005 as the director of the Government and Industry Liaison Office for the Biodesign Institute at Arizona State University. Levinson heads an office responsible for developing policies and strategies that advance the University's research agenda.

Prior to coming to ASU, Levinson was with the Office of Science and Technology Policy in the Executive Office of the President of the United States, where she was the assistant director for life sciences, while on detail from the Office of the Director of the National Institutes of Health. In this capacity, she identified science and technology priorities, developed and advocated Administration objectives, and resolved policy issues in life sciences focusing on laboratory biosecurity, bioterrorism preparedness, biotechnology, biomedical research and technology development and transfer.

Levinson began her career as a biologist for the National Cancer Institute within the National Institutes of Health (NIH) and later moved into the policy arena. She advanced to positions at NIH including deputy director of the NIH Office of Recombinant DNA and senior policy advisor in the Office of Technology Transfer.

Levinson earned her B.S in Zoology from the University of Maryland at College Park, and her M.A in Science, Technology and Public Policy from George Washington University, School of Public and International Affairs.



Dr. Joseph P. Mitchell, III

Director of Strategic Initiatives

National Academy of Public Administration

Joe Mitchell is Director of Strategic Initiatives at the National Academy of Public Administration—an independent, nonpartisan, and nonprofit organization chartered by the U.S. Congress to improve government performance. In this role, Dr. Mitchell leads the organization’s Grand Challenges in Public Administration program, which is identifying and developing ways to address the most challenging issues facing government today. He also advances cutting edge thought leadership and develops partnerships with other good government groups, American universities, and universities in other countries.

Over the course of his career, he has worked with a wide range of federal cabinet departments and agencies to develop higher-performing organizations, implement organizational change, and strengthen human capital and teams. Most recently, he was at the General Services Administration to stand up its new Office of Shared Solutions and Performance Improvement within the Office of Government-wide Policy. As an Associate Director of this new office, he built and led a team to manage multi-functional and cross-agency projects and initiatives in support of the President’s Management Agenda. His team established governance and accountability mechanisms for federal Cross-Agency Priority Goals, revamped performance.gov to become more user-friendly and provide additional information to the public, upgraded and expanded the White House Leadership Development Program and CXO Fellows program, provided technical and management support to the federal executive management councils, and established a procurement vehicle that federal agencies can use to acquire commercial software-as-a-service capabilities for their payroll and work schedule/leave management.

Previously, Dr. Mitchell led and managed the National Academy of Public Administration’s organizational studies program, overseeing all of its congressionally-directed and agency-requested reviews and consulting engagements. He has served as project director for studies of the Government Publishing Office, the U.S. Senate Sergeant at Arms, the U.S. Agency for International Development, the National Park Service’s Natural Resource Stewardship and Science Directorate, and the Natural Resources Conservation Service at the U.S. Department of Agriculture.

He holds a Ph.D. from the Virginia Polytechnic Institute and State University, a Master of International Public Policy from the Johns Hopkins University School of Advanced International Studies, a Master of Public Administration from the University of North Carolina at Charlotte, and a B.A. in History from the University of North Carolina at Wilmington. He is a member of Phi Kappa

Member Biographies

Phi, the national academic honor society; Pi Alpha Alpha, the national honor society for public affairs and administration; and the American Society for Public Administration.



Ms. Kim Moreland

Associate Vice Chancellor, Director
University of Wisconsin - Madison

Kim Moreland is the Associate Vice Chancellor for Research and Sponsored Programs at the University of Wisconsin - Madison. She has an MBA from the University of Kansas.

Kim is on the Board of Directors of the Council on Governmental Relations and serves as chair of the Costing Policies Committee. She is also on the Board of the Federal Demonstration Partnership and serves as chair of the Finance Committee. She is a lecturer for Johns Hopkins University in the Master's degree program in Research Administration.

Kim has served as a member of the National Council of University Research Administrators (NCURA) national and international teaching faculty and the national peer review faculty. She is a recipient of NCURA's national Award for Distinguished Service in Research Administration and the Award for Outstanding Achievement in Research Administration. She is a former president of NCURA, and she currently chairs the NCURA Select Committee on Global Affairs.



Mr. John M. Palguta

Adjunct Professor
Georgetown University
Vice President for Policy (Retired)
Partnership for Public Service

John Palguta is an adjunct professor in Georgetown University's McCourt School of Public Policy, where he teaches a graduate seminar titled, "Effective People Management in Government." John is also a former Vice President for Policy at the Partnership for Public Service, a non-profit, non-partisan organization dedicated to meeting the workforce needs of government by inspiring a new generation to serve and transforming the government workplace. Prior to his retirement in February 2106, John had responsibility for a comprehensive program of review and analyses of the human resource management issues in the federal government. John was also instrumental in setting up the Partnership's *Best Places to Work* rankings initiative first issued in 2003 and had been involved until his retirement. He also managed the Partnership's *Federal Human Capital*

Member Biographies

Collaborative, a consortium of 33 federal departments and agencies of which the National Science Foundation is a member.

Prior to joining the Partnership in December 2001, John was a career member of the federal senior executive service and Director of Policy and Evaluation for the U.S. Merit Systems Protection Board (MSPB), the culmination of a federal career spanning almost 34 years devoted to federal human resources management and public policy issues. He is a recipient of the MSPB's Theodore Roosevelt Award, the agency's highest honor. John previously held positions in the U.S. Office of Personnel Management and the U.S. Civil Service Commission.

John received a B.A. degree in Sociology from California State University at Northridge and a Master of Public Administration degree from the University of Southern California. He is a Fellow of the National Academy of Public Administration; a former Vice President for the Coalition for Effective Change; a past President of the Federal Section of the International Public Management Association for Human Resources (IPMA-HR); and an adjunct professor at Georgetown University's McCourt School of Public Policy. He received the 2006 Warner W. Stockberger award which is the highest honor presented annually by IPMA-HR to recognize an individual who has made outstanding contributions in the field of public sector HR management.



Dr. Theresa A. Pardo

Director, Center for Technology in Government
University at Albany

Theresa A. Pardo, Ph.D., serves as Director of the research institute CTG UAlbany. She is also a full research professor in Public Administration and Policy at Rockefeller College of Public Affairs and Policy. Under her leadership, CTG UAlbany works closely with multi-sector and multi-disciplinary teams from the U.S. and around the world to carry out applied research and problem solving projects focused on the intersections of policy, management, and technology in the governmental context. The institute has broken ground in information and knowledge sharing, smart cities, open government and open data, e-government, social media policy, and mobile technologies and human services delivery.

Dr. Pardo serves as OpenNY Adviser to New York State's Governor Andrew Cuomo and is Chair of the U.S. Environmental Protection Agency's National Advisory Committee. She serves as a member of the User Working Group of the NASA Socioeconomic Data and Applications Center (SEDAC), the Business and Operations Advisory Committee of the U.S. National Science Foundation and the Steering Committee of the U.S. National Science Foundation funded North East Big Data Innovation Hub. Dr. Pardo is founder of the Global Smart Cities Smart Government Research Practice Consortium and has served on numerous UN Expert Groups on a range of digital government and sustainable development related issues.

Member Biographies

Dr. Pardo is an International Advisor to the E-Government Committee for the China Information Association and served as the first female Chair of Oman's Excellence in E-Government Award Jury. She is also a member of the U.S. Government Accountability Office Executive Council on Information, Management, and Technology and the Series Steering Committee for the International Conference on Theory and Practice of Electronic Governance (ICEGOV), a UNU initiative. Dr. Pardo is a Past-President of the Digital Government Society and a member of the Board of Champions for the New York State Science, Technology, Engineering, Arts, and Math (STEAM) Girls Collaborative.

Dr. Pardo serves on a number of editorial boards for top journals in the fields of digital government and public administration including Government Information Quarterly and Public Management Review. She is co-developer of the top ranked academic program in Government Information Strategy and Management offered by the University at Albany, has published over 200 articles, research reports, practice guides, book chapters and case studies and is ranked among the top five scholars in her field in terms of productivity and citations to her published work.

In 2018 Dr. Pardo was named as one of the Top 100 Influencers in Digital Government globally. She is also a recipient of Government Technology Magazine's Top 25 Doers, Drivers, and Dreamers Award which recognizes individuals throughout the U.S. who exemplify transformative use of technology that's improving the way government does business and serves its citizens. Dr Pardo is a recipient of the University at Albany's Distinguished Alumni Award, the University at Albany's Excellence in Teaching Award, and the Rockefeller College Distinguished Service Award.

Pardo holds a Ph.D. in Information Science from the University at Albany, SUNY.



Dr. Susan Wyatt (Sedwick) Linehan
Senior Consulting Associate
Attain, LLC

Dr. Susan Wyatt (Sedwick) Linehan is a senior consulting associate for Attain, LLC with over 24 years of experience in research administration. She retired in 2015 as an associate vice president for research and director of the Office of Sponsored Projects at The University of Texas at Austin, where she was responsible for both pre- and post-award financial administration units with oversight of over \$630 million in annual sponsored projects expenditures. Prior to her tenure at UT Austin, she served in a similar capacity at the University of Oklahoma, Norman, where she also had responsibility for research compliance. She received her Ph.D. in Higher Education Administration from Texas A&M University and is a Certified Research Administrator (CRA). Her previous academic appointments include serving as a clinical professor in the Department of Educational Administration for the Higher Education Administration Program at The University of Texas at Austin and as an adjunct professor for Johns Hopkins University, Rush University in Chicago and The University of Oklahoma, Norman. Dr. Sedwick is a frequent speaker on the topic of research data security, export controls as they apply to universities, human capital development, and strategic planning. She authored the chapter on export controls included in the NCURA/AIS

Member Biographies

publication, *Sponsored Research Administration: A Guide to Effective Strategies and Recommended Practices*.

Dr. Sedwick served as chair of Phase V of the Federal Demonstration Partnership (FDP), as a member of the initial strategic planning committee and as co-chair of the Membership Committee. She was active in the Council on Governmental Relations (COGR) having served on the Board of Directors, Research Compliance and Administration and Contracts and Intellectual Property Committees, Uniform Guidance working group, nominating committee and chair of the export controls working group. She was a co-chair for the annual international meeting of the Society for Research Administrators International (SRAI) held in Vancouver, British Columbia, Canada in October 2017, is a member of the SRAI Board of Directors, Speakers Bureau, and received SRA International Distinguished Faculty Designation in 2017. She received the National Council of University Research Administrators (NCURA) Distinguished Service award in 2012 and the NCURA Region V Distinguished Service Award in 2014. She has served that organization as an at-large representative to the national Board of Directors, as chair of the Professional Development Committee, as a member of the Nominating and Leadership Development Committee and as a contributing editor for NCURA Magazine.

She is a graduate of Leadership Texas, a past trustee for the Texas A&M University-Kingsville Foundation, and founding president of the FDP Foundation. She is co-chair of the National Science Foundation Business and Operations Advisory Committee. She was recognized as the 2012-2013 distinguished alumnae by the Texas A&M University-Kingsville Dick and Mary Lewis Kleberg College of Agriculture, Natural Resources and Human Sciences Hall of Honor.



Dr. David B. Spencer
Chairman, wTe Corporation

Dr. David Spencer founded wTe Corporation in 1981 and served as its CEO for 27 years, now serving as Chairman. wTe is a \$100 Million privately held technology company focusing on recycling of metals and plastics. Educated at Lafayette College (B.S. 1967) and MIT (Sc.D. 1971), he invented the Rheocasting® / Thixocasting® processes as part of his doctoral thesis, a new casting technology deployed worldwide for high performance metal castings. Prior to forming wTe, Dave was a co-founder of Raytheon Corporation's Resource Recovery Business where from 1971-1981 he managed the development and operation of large 1000-2000 ton per day trash to energy and recycling technologies. At wTe, working for the world's largest petroleum and plastics producers, wTe developed novel plastics recycling projects for PET, polystyrene, polyethylene and poly-vinyl chloride. wTe's UltrPET® operations are ranked among the largest recycled PET re-claimers in the world turning 7 million old soda bottles per day into resins to make new bottles for Coke, Pepsi and others. wTe's automobile shredding and metal recycling operations can shred and recycle a car per minute and are ranked among the largest in New England. With funding from the NSF SBIR program, NIST ATP and NIST TIP programs the company has been developing patented high-speed automated optoelectronic sensing and metal sorting technologies, called Spectramet® and Melt

Member Biographies

Cognition®, to automatically sort metals by type in milliseconds. Dave was nominated for Entrepreneur of the Year by Arthur Young and Venture Magazine in 1988 and was selected as a Finalist for Entrepreneur of the Year in 1990 by Ernst & Young, *Inc. Magazine* and Merrill Lynch. He served on the editorial board of Elsevier Press' *Journal of Solid Waste Management* and authored over 60 technical papers including the Recycling Chapters of McGraw-Hill's first award-winning *Handbook of Solid Waste Management*. He serves on the Board of Directors of several privately held companies, and also serves on the NSF AdCom for the SBIR Program. He served on NSF's AC/GPA for five years -- the highest level AdCom within NSF assessing overall agency performance, the last two years as Chair. He served on the AdCom for the NSF Engineering Directorate and is the longest serving member of the NSF SBIR AdCom. Recently Dave completed a 7-year term on the Executive Committee of the Government University Industry Research Roundtable (GUIRR) which is an outgrowth of the National Academies of Science, Engineering and Medicine. He is an "Honorary Member" of ASM International, its highest honor, "in recognition of distinguished service to the materials science and engineering profession, to ASM International and to the progress of mankind for an outstanding career in invention and entrepreneurship in materials manufacturing and recycling and for dedicated governmental service in promoting effective government-industry collaborations." He is now past Chair of the ASM Materials Education Foundation aimed at exciting young people about science, engineering and materials. Dave was elected to several honorary and professional organizations including Tau Beta Pi, Sigma Xi, Alpha Sigma Mu, and others. Dave was recently elected to the National Academy of Engineering and has served on its elections committee and most recently, in 2017-18 chaired its Peer Review Committee for Materials. He was recently asked to serve on the Advisory Board of MIT's Materials Research Laboratory. His most recent efforts are aimed at diversity for underserved minorities and women in STEM fields, serving on the boards of many education focused organizations, schools, foundations and societies.



Dr. John C. Tao

President, O-Innovation Advisors LLC

Dr. Tao is currently a private consultant working for private clients, agencies including NSF, DOE and USDA as panel reviewer and Panel Manager. He Also serves as a Principal Advsiors for LAETA, where he advises SBIR grantees for commercialization. In addition he is on the Board of Directors of the Chemical Heritage Foundation. He stepped down as V.P., Open Innovation for Weyerhaeuser in 2011, where he was responsible for crafting Weyerhaeuser's bio-based products portfolio through Early Business/Venture Development, Licensing (in and out), Technology Partnering, Government Contracts, and Intellectual Asset Management. Dr. Tao and his group also work across Weyerhaeuser's business units to commercialize economically viable innovation. Within Weyerhaeuser, Dr. Tao is affiliated with bio-based products, forest-based feedstock development and supply, bio-based fuels and the economies associated with these technologies. Weyerhaeuser is an \$8 billion integrated Forest Products Company.

Prior to joining Weyerhaeuser, Dr. Tao was the Corporate Director of Technology Partnerships for Air Products and Chemicals, Inc., a \$10 billion company headquartered in Allentown, Pennsylvania,

Member Biographies

He was responsible for worldwide external technology development, Intellectual Asset Management, government contracting and licensing/ technology transfer. His contributions in over 30 years included the venture that commercialized a new family of polymers, a JV that the company profited with over \$200MM in invested capital and IP value extraction of over \$100MM in tax credits.

Dr. Tao holds a B.S. in chemical engineering from Carnegie-Mellon University, an M.S. in chemical engineering from the University of Delaware, and a Ph.D. in chemical engineering from Carnegie-Mellon. During his tenure with Air Products, Dr. Tao has been involved in engineering management, R&D management, commercial development, venture management, and planning and business development. Dr. Tao was a board member of the Industrial Research Institute and the Lehigh Valley Ben Franklin Technology Partnership, and was a Board member and a Fellow of the American Institute of Chemical Engineers. He served on the Advisory Committee for the National Science Foundation's IIP/SBIR, the Biomass R&D TAC and the Advisory Board of the Chem. Eng Dept of Carnegie Mellon University. He is also a member of the Licensing Executive Society and of the Commercial Development and Marketing Association.

Previously, Dr. Tao served two terms as a board member of the Commercial Development Association, the Advisory Board of Yet2.com, and the Penn State Research Foundation. He was the chair of the External Technology Directors Network and the Science and Technology Policy Committee of the Industrial Research Institute (IRI), chair of Chemical Industry Environmental Technology Projects (a LLC), and chair of the Management Committee of the Air Products/Imperial College Strategic Alliance, The Air Products Alliance with Georgia Tech and the Air Products/Penn State Research Alliance. Dr. Tao has also held the positions of voting representative and member of the Governing Board of the Council of Chemical Research.



Ms. Pamela A. Webb

Associate Vice President for Research
University of Minnesota

Pamela A. Webb is the Associate Vice President for Research at the University of Minnesota. In this capacity, she is responsible for pre-award and post-award non-financial services supporting about \$790M in research awards annually, as well as negotiation of F&A rates, effort reporting, and research policy and education. Prior to her appointment at the University of Minnesota in 2007, Pamela led pre-award and post-award administration in the Office of Sponsored Research at Stanford University. Pamela has been involved in research administration for 33 years, including 12 years at the University of California-Los Angeles as well as UC Santa Barbara, Northwestern University, and Stanford.

Pamela has served as a national officer of her professional association (the National Council of University Research Administrators, NCURA) and served two terms on NCURA's Board of Directors.

Member Biographies

In 2009, she received NCURA's *Distinguished Service* award, and in August 2016, she received NCURA's highest honor, the *Outstanding Achievement in Research Administration Award*. She currently serves on the Council of Governmental Relations Board of Directors, and chairs their Research Compliance and Administration Committee. She has co-chaired a national conference on Electronic Research Administration; serves as a reviewer for NCURA's Peer Review program; and as faculty for their national Leadership Workshop. Pamela previously served on the Federal Demonstration Partnership Executive Committee and currently co-chairs their Expanded Clearinghouse initiative (an institutional profile system designed to expedite subaward risk assessment and monitoring.) Pamela is a frequent presenter at the national and regional level, specializing in subawards, policy development and deployment, as well as helping research administrators learn the complex regulatory environment.

Member Biographies



Dr. Douglas W. Webster
Retired, Chief Financial Officer
U.S. Department of Education

Doug Webster has over 20 years of experience focused on federal financial management, risk management, strategic planning, cost management, and process improvement. He began his professional career by serving 21 years in acquisition management and flight operations as a US Air Force officer. He then entered management consulting and has provided nearly 20 years of advice and support to over two dozen federal and state agencies. In 2004, he served with the DoD Coalition Provisional Authority as the Principal Finance Advisor to the Iraq Ministry of Transportation, thereby serving as the de facto CFO of a ministry of nearly 40,000 employees. In 2007, Doug was appointed as the Chief Financial Officer of the US Department of Labor. He subsequently entered the Senior Executive Service and served as the Deputy Director of the DoD Business Transformation Agency. Most recently, he was appointed in 2017 as the CFO of the US Department of Education.

Doug co-founded the Federal ERM Steering Group in 2008, which led to the annual Federal ERM Summits from that year since. In 2011 he led the founding of the Association for Federal Enterprise Risk Management (AFERM) and then served two terms as the association's first president. In 2012 he was elected a Fellow of the National Academy for Public Administration. In 2014 he joined the George Washington University Center for Excellence in Public Leadership as a Senior Fellow, where teaches courses in the Enterprise Risk Management certificate program. He also serves on the board of directors of the Pentagon Federal Credit Union, a \$17B financial services organization with over 1,200,000 members, and chairs the board risk management committee. He additionally serves on the board of the PenFed Foundation, a charitable organization dedicated to helping our nation's veterans, wounded warriors, and their families.

Doug has a BS in Engineering, a MS in Systems Management, and a Doctorate in Business Administration. He is a co-author of the books *Activity Based Costing and Performance* (AMS, 1994), *Chasing Change: Building Organizational Capacity in a Turbulent Environment* (Wiley and Sons, 2009), and *Managing Risk and Performance: A Guide for Government Decision Makers* (Wiley and Sons, Feb. 2014). He is also co-author of *Improving Government Decision Making through Enterprise Risk Management* (IBM Center for the Business of Government, 2015).

Committee on Equal Opportunities in Science and Engineering (CEOSE) Liaison to the NSF Advisory Committee on Business and Operations:



Dr. Alicia J. Knoedler

Executive Associate Vice President for Research

Executive Director of the Center for Research Program Development and Enrichment

University of Oklahoma

Dr. Alicia J. Knoedler is the Executive Associate Vice President for Research and Executive Director of the Center for Research Program Development and Enrichment at the University of Oklahoma. Within the Center, she works with faculty, students, and other investigators to significantly enhance the research enterprise, focusing on changing the research culture as well as assisting investigators in their efforts to develop more competitive research programs and proposals for external funding. Dr. Knoedler is a member of the NSF Business and Operations Advisory Committee as a liaison from the NSF Committee on Equal Opportunities in Science and Engineering (CEOSE), drawing a connection between the Foundation's commitment to broadening participation and the commitment to broadening participation from external audiences across the nation.

Prior to joining OU in 2010, Dr. Knoedler was the Associate Director for Strategic Initiatives and Research Program Development and Affiliate Assistant Professor in the Department of Human Development and Family Studies at Penn State University. In this role, she specialized in assisting Penn State investigators across the university in the development of large, collaborative, and multidisciplinary grant proposals. She worked to identify high profile funding opportunities and match them with Penn State research strengths.

Dr. Knoedler holds a B.A. in psychology from Trinity University (San Antonio), and an M.S. and Ph.D. in cognitive psychology from Purdue University. Her research expertise focused on various memory processes and optimal conditions for remembering. She taught quantitative research methodology, statistics, and grant writing for many years at Purdue University, San Jose State University, University of California Santa Cruz, Indiana University, University of Notre Dame, and Penn State University and has an appointment as Adjunct Associate Professor in the Department of Psychology at OU. Dr. Knoedler has over 18 years of experience in developing grant proposals for a variety of funding sources, including federal sources, private foundations, and corporations and is a Certified Research Administrator (CRA). From 2014-2018, Dr. Knoedler was is the Co-PI of Oklahoma's NSF EPSCoR Research Infrastructure Improvement Track 1 award, which focuses on the socio-ecological approaches to studying climate variability in Oklahoma.

In service and leadership to research development and the national research enterprise, Dr. Knoedler is a founding member, former member of the Board of Directors, and has been president (2013-2014) and immediate past-president (2014-2015) of the National Organization of Research Development Professionals (NORDP). She is also a member of APLU's Council on Research, through which she develops and offers training, professional development, and leadership opportunities for senior research leaders across the nation.

Spring 2018 Recommendations from the Business and Operations Advisory Committee

Title	Meeting Date	Recommendation	NSF Contact(s)	Status	Explanation/Outcome	Theme
President's Management Agenda (PMA) - Overview	Spring 2018	Grantees are the customer base. NSF should use interagency discussions and OMB to leverage work of other agencies and gain better understanding of cross agency processes. Consistent language to the extent possible across agencies supports good government. It's important for NSF to question not only how to improve processes but whether those are needed. NSF should remain inclusive in engaging varying viewpoints. NSF is urged to empower its representatives involved in cross agency teams with the authority to make decisions on NSF's behalf.	Butler, D., Grancorvitz, T.	Completed	NSF has a point of contact on all cross-agency priority groups associated with the President's Management Agenda. NSF has a leadership role on two of these groups that are of particular importance to NSF's mission: Leverage Data as a Strategic Asset and Results-Oriented Accountability for Grants. NSF has been a lead agency in the development of the Government Effectiveness Advanced Research (GEAR) Center. NSF's Career Compass Challenge (https://challenge.gov/a/buzz/challenge/86/ideas/top) is the first project in the Federal Government that points to the GEAR Center.	Advice on President's Management Agenda (PMA)
Deeper Dive-Cross-Agency Priority (CAP) Goal - Results-Oriented Accountability for Grants	Spring 2018	The committee recommended that NSF: 1) continues to leverage its strong position with the Federal Demonstration Partnership (FDP); 2) obtains input from grantee constituencies (e.g., Council on Governmental Regulations; the EPSCoR community); 3) pushes for the release of the proposed Research Policy Board; and 4) looks at external community examples (e.g., FDP Faculty Workload Survey, UMetrics, the University Industry Demonstration Partnership). NSF should: 5) ensure meaningful input from grantees; 6) use standard definitions in place via the Uniform Guidance and the NSF Higher Education Research Development Survey; and 7) eliminate duplicate data entry. The committee noted that across all stakeholders, there is a common understanding of "acceptable" performance with risk stratified. NSF was cautioned on use of data analytics with examples provided on burdensome and little-yielding audits. Historical performance is useful but care must be taken so that it does not lead to the detriment of funding new scientists. NSF can provide input to balance compliance risk with performance.	Bell, D.	In Progress: Recommendations 1, 2, 4, 5, 6, and 7. Completed by OMB for 3.	Overall: NSF is in regular communication with the research community and its membership organizations on PMA grants related topics such as administrative burden reduction, risk management, evidence based grants, and audit management. OMB, as the driver of the PMA, has taken the lead on several issues including: interaction with organizations such as COGR; the creation of a Research Policy Board (which repurposed the Research Business Models NSTC subcommittee); and data standardization. NSF will continue to look for ways to gather and transmit research community input and feedback, and implement streamlined processes through its proposal modernization initiative. Specific Responses: 1) NSF and other federal stakeholders are in regular contact with the FDP. 2) 4) 5) This is occurring primarily at the governmentwide level, with OMB taking the lead. 3) The Research Business Models subcommittee of the National Science and Technology Council has been re-chartered to serve the function. 6) Data definition standardization is a subgroup of CAP Goal #8; OMB released 417 data definitions for agency review, with public posting next. 7) NSF is working on pre-population in its proposal modernization; governmentwide, GSA is streamlining the System for Award Management (SAM) to push institution information into agency systems.	Advice on Cross-Agency Priority Goal: Results-Oriented Accountability for Grants
Deeper Dive-Cross-Agency Priority (CAP) Goal - Modernize IT to Increase Productivity and Security	Spring 2018	A committee member suggested that data mined from prior funded research can be provided to Program Officers and reviewers as part of the grant selection process. NSF was urged to work on data security. Greatest risks to IT security are from internal threats (e.g., downloaded software, devices connected to the network). Challenges exist since NSF does not have a Chief Data Officer and there is a need for data governance and data connectivity.	Aronson, D., Hofherr, D.	Completed	NSF has considered the Committee's advice and used it to help shape ongoing agency initiatives related to data governance and security.	Advice on Cross-Agency Priority (CAP) Goal - Second - Modernize IT to Increase Productivity and Security

Spring 2018 Recommendations from the Business and Operations Advisory Committee

Title	Meeting Date	Recommendation	NSF Contact(s)	Status	Explanation/Outcome	Theme
Interaction of Agency CFO and CIO	Spring 2018	NSF should build upon the positive relationship between the CFO and CIO and share its value with executive NSF staff. NSF should anticipate future data needs and areas of integrations. A motivated workforce is more productive than one that is low-risk, well-controlled, and constrained. NSF must continue to listen and be open to customer's perceptions of NSF.	Aronson, D., Grancorvitz, T.		NSF should anticipate future data needs and areas of integrations. -- We've now established a cross-NSF Data Governance team which is building an Enterprise Data Inventory and Data Strategy. The CIO is the "Data Captain". Ahoy. NSF must continue to listen and be open to customer's perceptions of NSF. -- We are working to open up IT governance to make it more transparent and "democratized".	Advice on maximizing opportunities for CFO and CIO and related organizations to work together and add value
BFA/OIRM/OLPA/Budget Updates	Spring 2018	A BOAC member noted that a draft FACA termination executive order was circulated among Association of Public Land/Grant universities (APLU). The Acting Office Head, OIRM agreed to follow up and report back to BOAC.	Butler, D., Grancorvitz, T., Moller, R., DiGiovanni, T.		There is a proposed Congressional bill to reduce/terminate advisory committees. No progress has been made in advancing that bill to-date.	Advice on FACA.
Framing Leadership in Customer Service: BFA and OIRM	Spring 2018	In response to "framing" questions regarding BFA and OIRM customer service, the Committee advised NSF to: continue to strive for FEVS full participation; avoid over-measuring and instead collect both qualitative and quantitative data via focus groups or interviews, particularly given limited financial resources. Good resources include: the American Customer Satisfaction Survey and Benchmarks and Data.gov. In sorting survey results, NSF should pay attention to the middle. NSF should think of risk in the context of a larger, government-wide heat risk map. Good risk mitigation strategies include accountability and post mitigation intervention predictors. Transformation research involves risk and strong leadership's understanding of risk-taking.	Gardner, W., Miller, B.	Completed	In line with the Committee's recommendations, NSF put additional effort into encouraging full FEVS participation in 2018. This effort showed clearly in improvements in NSF scores the recently released 2018 FEVS results. NSF's 2018 response rate remained among the highest across the Federal Government. NSF's 2018 scores increased on Employee Engagement and most of the other core FEVS question areas. NSF again ranked among the top five medium-sized agencies and in the top ten across the entire Federal Government on Employee Engagement, Inclusion, and Satisfaction. NSF also continued to develop its Enterprise Risk Framework to transform agency risk management.	Advice on Customer Service.
Establishing and Maturing an Enterprise Risk Management (ERM) Culture at NSF	Spring 2018	The Committee's advice was sought to help NSF mature its ERM framework and develop a community of practice as we obtain full buy-in from NSF senior managers. NSF was complimented on its long-term as opposed to annual cyclical risk model and was cautioned having IG as the framer for risk discussions. External risks identified included the PMA, changes to FACA, and changes to IP law. In the private sector, risk is an integral part of doing business, in contrast to public opinion on risk. The Committee recommended considering having an external consultant (e.g., an up-and-coming SES candidate) to give NSF a fresh perspective on ERM.	Wetklow, M., Cotto, R., Carney-Nunes, C.	In Progress	NSF is currently socializing the following next steps for ERM with NSF leadership, 1) Continue to build an ERM Community of Practice (NSF Charge Model); 2) Establish a link with existing efforts: NSF Renewal, NSF's 10 Big Ideas, NSF Strategic Plan; 3) Conduct monthly risk chats with each Directorate (1 x month); 4) Develop and execute NSF DATA Act Data Quality Plan; 5) Participate in President's Management Agenda efforts: ERM, Shift from Low to High Value, and Leverage Data as a Strategic Asset.	Advice on Enterprise Risk Management maturation and community of practice engagement

CFO Update
B&O Advisory Committee Meeting Fall 2018
(November 30, 2018)

Topics:

- BFA Senior Staff Changes
 - Financial Statement Audit
 - Digital Accountability and Transparency Act
 - Government Accountability Office Review of NSF Major Projects
 - Evaluation of NSF's Enhanced Cost Surveillance Policies and Procedures via a Subcommittee of BOAC
 - Enterprise Risk Management
 - Centralized Receivables Service
 - Issuance of the FY 2018 Agency Financial Report
 - Proposal & Award Policies & Procedures Guide 2019 Revision
 - Performance
 - FY 2019 Appropriations
 - FY 2020 Budget Request to Congress
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BFA Senior Staff Changes

- *BFA leadership*
 - Janis Coughlin-Piester began as the BFA Deputy Office Head in July 2018. Janis joined NSF from the Department of Health and Human Services where she was the Director for Budget Policy, Execution, and Review.
- *Budget Division*
 - Beth Blue has been selected as the new Program Analysis Branch Chief, replacing Janice Hagginbothom who retired from NSF in June 2018. Ms. Blue has been acting in the Branch Chief role since Janice's retirement.

➤ **Financial Statement Audit**

FY 2018 Financial Statement Audit

On November 14, 2018, the OIG audit contractor Kearney & Company (Kearney) issued its Independent Auditor's Report on NSF's FY 2018 financial statements. For the 21st consecutive year NSF achieved an unmodified (clean) audit opinion on its financial statements. This accomplishment includes the continuation of no material weaknesses or significant deficiencies in NSF's internal control over financial reporting. The Independent Auditor's Report is in [Chapter 2 of NSF's FY 2018 Agency Financial Report](#).

FY 2019 Financial Statement Audit

As part of the FY 2019 Financial Statement audit and Federal Information Security Act review, Kearney and the OIG traveled to McMurdo and South Pole Stations November 19 - 26.

➤ **Digital Accountability and Transparency Act (DATA Act)**

NSF is currently developing its own financial assistance data quality plan, to be completed in the first quarter of FY 2019. This plan will provide a foundation on which the agency and OIG will be able to verify and validate the completeness, timeliness, quality, and accuracy of NSF data. NSF is continuing to support cross-governmental efforts to develop government-wide DATA Act guidance via a Data Quality Playbook. The OIG plans to review NSF-certified FY 2019 first quarter data. The OIG review will likely begin around April 2019.

➤ **Government Accountability Office (GAO) Review of NSF Major Projects**

In June 2018, GAO issued its final report, entitled, "[Revised Policies on Developing Costs and Schedules Could Improve Estimates for Large Facilities](#)" (GAO-18-370) as a result of the GAO review of the Major Research Equipment and Facilities Construction (MREFC) account started in September 2017. BFA developed a corrective action plan to address the report's recommendations and provided this to Congress in July 2018. GAO engagement with NSF following the issuance of the report is ongoing, based on Congressional direction.

Also, in June 2018, GAO initiated a new engagement with NSF, in conjunction with direction it received ([Senate Report 114-239](#) and [House Report 114-605](#)) to annually report on major research equipment and facilities construction at NSF. Information is being provided to GAO and briefings with NSF and project staff are being conducted. An exit conference with GAO is scheduled for December 5th with the draft report anticipated in January 2019. The final report is targeted for release in March 2019.

➤ **Evaluation of NSF's Enhanced Cost Surveillance Policies and Procedures via a Subcommittee of BOAC**

The subcommittee will present its findings at December's BOAC Meeting.

Background: This BOAC subcommittee was formed to independently evaluate the effectiveness of NSF's current cost surveillance policies and procedures in providing sound oversight of all NSF major facility construction and operations awards.

➤ **Enterprise Risk Management (ERM)**

NSF completed its second year of implementing an ERM program that will effectively identify risks; assess and evaluate those risks; and address and monitor the risks. In FY 2018, NSF expanded its risk reporting to include management challenges from across the Foundation. NSF also improved its communication process by reaching out to more staff about the importance of ERM and involving other stakeholders such as the OIG. As a result, an ERM community of practice has started to emerge within the agency. Going forward, NSF will continue to expand its discussions about risk across the agency with the goal of fully integrating ERM into its strategic planning, budget formulation, performance assessment, and quality control improvements.

➤ **Centralized Receivables Service (CRS)**

NSF transferred the collection of all new non-federal debt to Treasury's CRS program in the second quarter of FY 2018. CRS manages all aspects of debt collection using an automated system from issuing the initial invoice to the payment or the transfer of delinquent debts to the Treasury Cross-Servicing system. The payment methods are configured so that CRS tracks payments, but NSF receives payments directly from debtors. By participating in the CRS program, the agency has increased the amount of debt collected, while decreasing the average time to collect a debt, risk of non-compliance with regulations, risk of errors, costs and employee workload.

➤ **Issuance of FY 2018 Agency Financial Report (AFR)**

NSF's [FY 2018 Agency Financial Report](#), focuses on financial management and accountability and was published on November 15, 2018.

➤ **Proposal & Award Policies & Procedures Guide 2019 Revision**

NSF has released the 2019 revision of the [Proposal & Award Policies & Procedures Guide \(PAPPG\)](#). The new PAPPG will be effective for proposals submitted, or due, on or after January 28, 2019. Among the significant changes are: implementation of NSF's policy on sexual and other forms of harassment or sexual assault as well as emphasis on the importance of training faculty in the responsible and ethical conduct of research. A webinar to brief the community on these and other changes was held on November 27, 2018.

➤ **Performance**

OMB Annual Management Meeting

In July, NSF's Chief Operating Officer, Dr. Fleming Crim, met with OMB to discuss a range of management issues in a required annual meeting about Strategic Reviews and related topics. He was supported by Chief Financial Officer and Performance Improvement Officer Ms. Teresa Grancorvitz, Chief Information Officer Ms. Dorothy Aronson, and Drs. Anand Desai, Erwin Gianchandani, and Amber Baum. The agenda covered NSF's management model and described how NSF supports relationships between domains such as Performance and Strategic Reviews, ERM, *Renewing NSF*, the Big Ideas, Learning Agendas, the President's Management Agenda, and the [Program Management Improvement and Accountability Act](#) (PMIAA). After the meeting, OMB engaged NSF for its partnerships management expertise to advise in conceptualizing OMB's forthcoming GEAR (Government Effectiveness Advanced Research) Center.

NSF submitted its PMIAA Implementation Plan to OMB on November 30, 2018.

Strategic Reviews

In August, the results from four Strategic Reviews supporting *Renewing NSF* were presented to NSF senior leadership. The Strategic Review process provides an opportunity to use data and evidence to inform strategy, planning, decision making, and improvement. *Renewing NSF* is the Foundation's agency-wide process that responds to the Administration's government-wide Agency Reform efforts.

Priority Goal

NSF identified one Priority Goal for the current cycle (FY 2018-2019): "Expand public and private partnerships to enhance the impact of NSF's investments and contribute to American economic competitiveness and security. By September 30, 2019, NSF's number of partnerships and award actions with other federal agencies, private industry, and foundations/philanthropies will grow by 5 percent, relative to the FY 2017 baseline, to make available infrastructure, expertise, and financial resources to the US scientific and engineering research and education enterprise." This goal is in alignment with the *Renewing NSF* activity.

➤ **FY 2019 Appropriations**

The House and Senate have both marked up their versions of the Commerce, Justice, Science and Related Agencies (CJS) Appropriations Bills.

- The CJS Appropriation Bill passed the full House of Representatives on May 17, 2018.
- The CJS Appropriation Bill passed the Senate on June 14, 2018.
- Details on each with comparisons to the FY 2019 Request and the FY 2018 Enacted are in the table below.
- Noteworthy items:
 - Supports NSF's overall investment

- Preserves flexibility in directorate allocations
- \$405 million - \$500 million in R&RA over FY 2019 Request
- \$222 million - \$317 million in R&RA above FY 2018 Current Plan
- Strong support for Major Research Equipment & Facilities Construction (MREFC)
 - House forward funds Large Synoptic Survey Telescope
 - Senate funds Antarctic Infrastructure Modernization for Science (AIMS) in MREFC rather than R&RA
 - Includes support for 3 Regional Class Research Vessels
- Tools to “drive NSF’s long-term research agenda and investment in fundamental research” in Senate language
 - Ten Big Ideas
 - Two convergence accelerators
- Continued emphasis on broadening participation in EHR.
- Support for STEM Education pre-K through grade 12.
- Support education, teacher development, and undergraduate instruction.

**National Science Foundation
Summary Table**
(Dollars in Millions)

NSF by Account	FY 2018 Enacted	FY 2019 Request	FY 2019 House Mark	FY 2019 Senate Mark
Research & Related Activities	\$6,334	\$6,151	\$6,652	\$6,556
Education & Human Resources	\$902	\$873	\$902	\$915
Major Research Equipment & Facilities Construction	\$183	\$95	\$268	\$249
Agency Operations & Award Management	\$329	\$334	\$334	\$329
National Science Board	\$4	\$4	\$4	\$4
Office of Inspector General	\$15	\$15	\$15	\$15
Total, NSF	\$7,767	\$7,472	\$8,175	\$8,069

- The current FY 2019 Continuing Resolution goes through December 7, 2018.

➤ **FY 2020 Budget Request to Congress**

- NSF submitted the FY 2020 Budget Submission to OMB in September. NSF is working with the Administration to prepare the President’s FY 2020 Budget which is due to Congress on February 4, 2019.

OIRM Update
for the B&O Advisory Committee Meeting (Fall 2018)

OIRM Senior Staff Changes

- There have been several changes to OIRM Senior Staff since we last saw you in June.
 - Donna Butler, Head of OIRM, left NSF in July to take a position with the U.S. State Department, Office of Inspector General. I (Wonzie Gardner) have moved over to be Acting Head of OIRM after serving as Acting Deputy Head of OIRM.
 - Linnea Avallone is Acting Deputy Head of OIRM. Linnea is on detail from the Directorate of Geosciences.
 - In the Division of Administrative Services (DAS), Peggy Gartner is currently Acting Division Director of DAS.
 - In the Division of Human Resource Management (HRM), Dianne Campbell Krieger, Division Director, has left NSF to take a position at the U.S. Marshals Service. In addition, Sanya Spencer, Deputy Division Director, is retiring at the end of December.
 - Javier Inclan, previously the Acting Division Director in DAS, will be Acting Division Director in HRM.

Transit Kiosks

- In collaboration with the City of Alexandria, NSF installed two transit kiosks on the first floor to help commuters plan their travel. The kiosks are part of a larger demonstration project to install transit displays in key locations around Alexandria to make traveling more convenient for residents, workers, and visitors. The City of Alexandria identified NSF as one of those key locations because of our size and number of visitors.

Emergency Preparedness Training

- NSF conducted a number of emergency preparedness activities over the past five months. We held several Active Shooter training sessions, with the support of the Department of Homeland Security's Federal Protective Service. We conducted a hazmat training exercise with the Alexandria Fire Department. And we held an Emergency Preparedness Town Hall in conjunction with National Preparedness Month. During these sessions, NSF and its partners shared information about the proper steps to take in emergency situations and addressed questions from participants regarding agency evacuations, visitor screening, safety, security, and other emergency preparedness topics.

NSF.gov Website Modernization

- OIRM's Division of Administrative Services is continuing its effort to modernize the NSF website. Since we last met, we have selected a contractor to provide user-centered agile

development services to build out the site. The first phase is focusing on the Career Opportunities pages, which provide information for potential permanent and rotator staff.

FEVS 2018 and Employee Engagement

- The results of the 2018 Federal Employee Viewpoint Survey (FEVS) were released this Fall and disseminated across NSF. All results are available to staff via the FEVS Center website.
- NSF has four straight years of sustained improvement across all key indices tracked – Employee Engagement, Global Satisfaction, New Inclusion Quotient, Career Development, Performance & Recognition, and Workload.
- NSF is ranked seventh among all Federal agencies on Employee Engagement and Global Satisfaction.
- Each of the directorates and offices is looking at its data and updating its employee engagement action plan. Our Employee Engagement Program Manager is meeting with each directorate and office to advise them on opportunities to continue to build engagement. We provide support where requested for facilitation of focus groups, development of solutions, or conducting more extensive analysis of employee engagement data.
- NSF has implemented an ongoing communications campaign releasing articles on engagement topics related to career development, building productive employee/supervisor relationships, and promoting collaborative teamwork. We also have a module in NSF's Federal Supervision course directly addressing employee engagement practices.

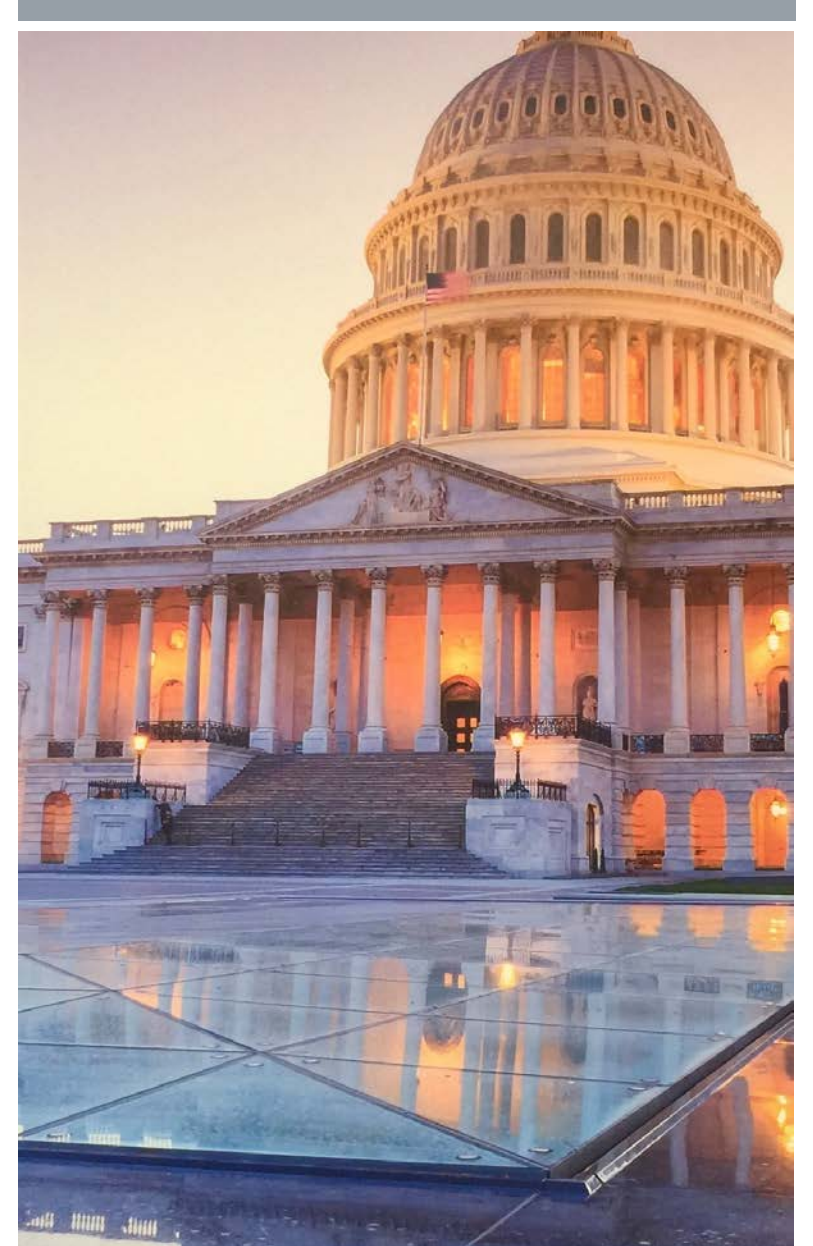
IT News

- Our ongoing focus in FY19 and beyond is preserving secure, reliable day-to-day operations for our IT systems and services, while maintaining flexibility to respond to emerging agency priorities.
- We continue to introduce **modernized IT services that improve the external research community's experience when interacting with NSF while allowing NSF's workforce to realize efficiencies in grants management processes.**
 - Since April, as a new release under the Proposal Submission Modernization (PSM) initiative, proposers may prepare and submit full, non-collaborative proposals in Research.gov. This web application provides easier and more powerful features to prepare and submit proposals. The streamlined, intuitive user interface provides real time feedback from automated compliance checks and inline help, and links guide the proposer through the submission process. The application has not experienced any unscheduled outages since its release in April. To date, 552 proposals have been submitted in Research.gov through PSM.

- In March, NSF introduced new account management functionality for external grant systems to streamline maintenance of user accounts and to provide a central point of access for managing user profile data and permission information. This helps NSF improve account and profile data accuracy, eliminate duplicate accounts, and increase data pre-population opportunities to reduce administrative burden for PIs. The profile management functionality will be the foundation for the initiative to standardize Biographical Sketch and Current and Pending Support for NSF PIs, under development in FY19.
- The Suggest Reviewer Dashboard, which went live in August, automates and streamlines the process of identifying potential reviewers. The tool finds similar past proposals based on project summary, project description, and proposal title to identify potential reviewers and to detect potential conflicts of interest.
- Enterprise Reporting (ER) has brought in additional business application datasets, created new dashboards, enhanced existing standard reports, and introduced innovative capabilities to help support the merit review process. This functionality is used to produce reports that assist with award funding, meeting preparation, and financial tracking, helping NSF staff to make data-driven decisions.
- NSF remains focused on **building resiliency and redundancy in our IT infrastructure**. With the move to Alexandria and introduction of new facility power systems, NSF will benefit from increased systems availability and reduced planned outages for maintenance. NSF continues to modernize legacy systems and implement cloud solutions where practicable.
- We continue to **explore ways to bring emerging technologies to NSF**, using agile approaches and pilot efforts to speed deployment. For example, BFA and OIRM are partnering on the introduction of Robotic Process Automation (RPA) as an approach to automate repetitive, previously manual tasks. These “intelligent bots” may have broad utilization throughout NSF, enabling us to redirect our energies toward strategic efforts.
- While modernizing and maintaining secure operations, NSF also **maintains a strong compliance profile among Federal agencies**. Last summer, NSF was recognized for progress in exceeding Data Center Optimization Initiative (DCOI) targets for systems virtualization and consolidation under the Federal IT Acquisition Reform Act (FITARA). In IT security, the NSF OIG rated NSF's IT Security Program as "Effective" in their FY18 Federal Information Security Modernization Act (FISMA) review and report.

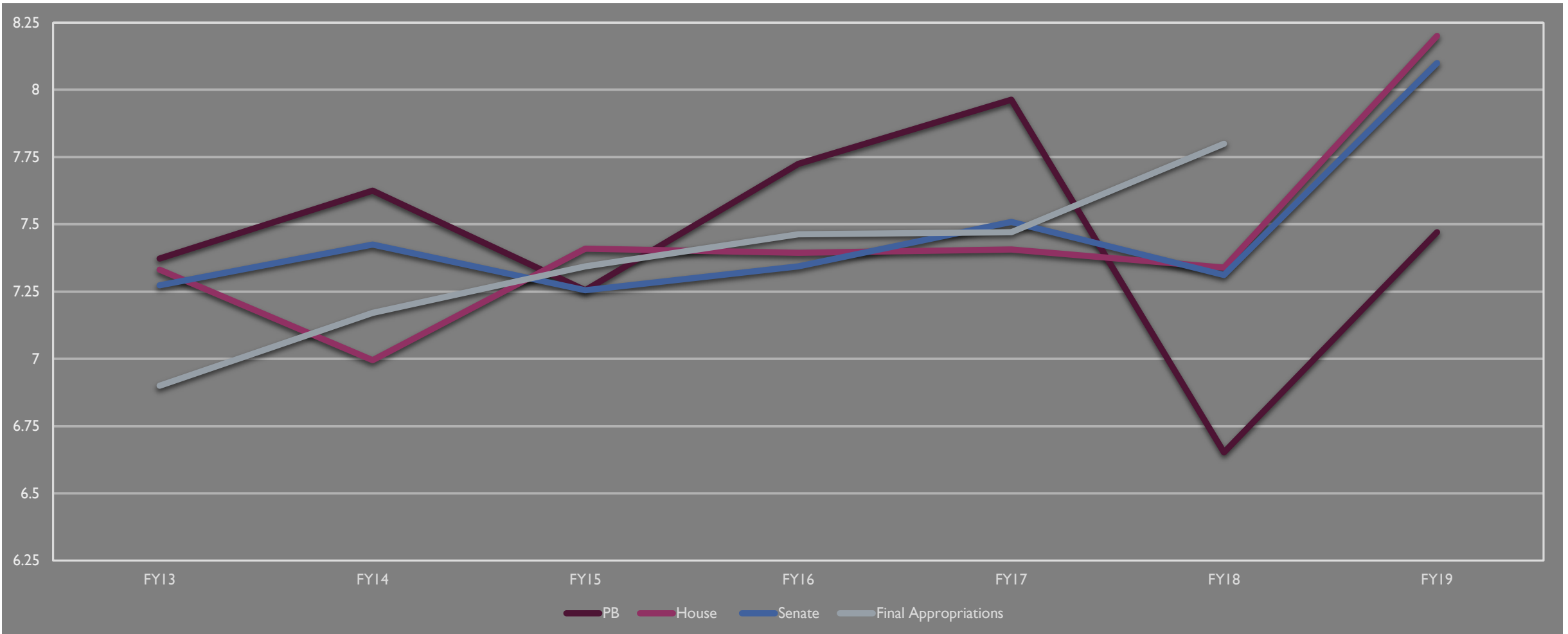
BUDGET UPDATE:

- House and Senate passed, and the President signed, an extension of the current continuing resolution that extends funding for NSF and other agencies until Dec. 21st. Congressional leaders will take the next two weeks to try to reach a deal to finalize FY 2019 spending before the 21st.



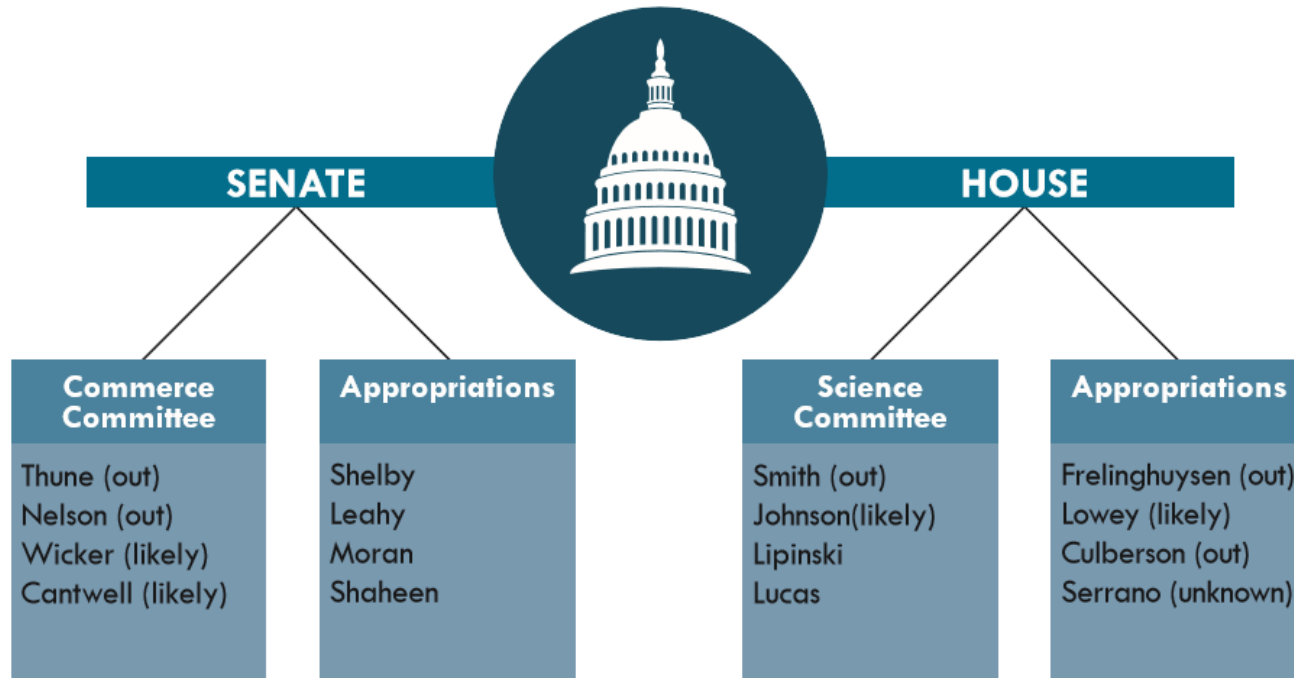


APPROPRIATIONS REQUESTS AND OUTCOMES FY13-18





NSF'S COMMITTEES OF JURISDICTION CHANGES IN THE 116TH CONGRESS



CONNECT WITH US ONLINE

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[nsf.gov/transform.pdf](https://www.nsf.gov/transform.pdf)

POST ELECTION LANDSCAPE:

OLPA UPDATES:

- Strategic Communications Meetings
- Hill Events/Outreach
- Directorate Managed Competitions
- Strategic Team Retreats
- Office Reorganization
- New Correspondence System
- Branding Guidelines
- Branded Fact Sheets
- Sexual Harassment Terms & Conditions
- NSF Boeing MOU/Partnership
- South by Southwest (SXSW)
- Website Overhaul
- AI & Quantum Summit
- Town Halls

National Science Foundation @NSF

NSF announces new measures to protect research community from harassment. Term and condition requires awardee institutions to report findings of sexual harassment: bit.ly/2QJ6C5y #sciencetoo



12:07 PM - 19 Sep 2018

79 Retweets 97 Likes

4 79 97

National Science Foundation @NSF · Sep 19
Submit your questions about our new steps here. We are live now: facebook.com/US.NSF/



National Science Foundation | **FACT SHEET**

NSF AT A GLANCE

FAST FACTS

- 1950**
Year Congress created NSF
- \$8B**
NSF's approximate annual budget
- 93%**
Percent of budget committed to research, education and related activities
- 11,000**
Number of awards NSF funds each year





COMMENTS/QUESTIONS:

AMANDA HALLBERG
GREENWELL

703-292-8070

Backgrounder: Fall 2018
NSF Advisory Committee for Business and Operations

Nature of Agenda Item: NSF results from the 2018 Federal Employee Viewpoint Survey (FEVS)

Presentation:

The Federal Employee Viewpoint Survey (FEVS) is an annual measure of NSF staff's engagement across several dimensions. Each year, all staff are invited to share their perspectives on their work unit, supervisor and leadership, and NSF culture. FEVS results are a major input into employee engagement action planning by each directorate and office. Senior leaders see the connection between engagement and productivity, willingness to change and innovate, and retention of our talent.

NSF staff are invested in the employee engagement process, as evidenced by the 76% response rate on the FEVS, compared to the government average of 41%. We have achieved four years of sustained improvement across all the engagement areas of focus – career development; performance and recognition; workload; and inclusion.

OIRM continues to build out resources that support the directorates and offices as they work to improve engagement. Along with providing full transparency on all NSF FEVS results, we also have incorporated a module on effective employee engagement strategies in our Federal Supervisor training course, published a curated engagement website with resources touching many topics, and are providing consulting support to the directorates and offices.

Committee Action/Feedback

1. What promising practices have you seen organizations like NSF use to sustain improvements in engagement?
2. NSF has a workforce with a diverse set of people and life experiences. How have you seen organizations successfully integrate STEM and non-STEM staff working side-by-side on the same mission?
3. NSF has made good progress on improving the FEVS Workload Index, which is a measure of staff perceptions of workload. NSF still sees room for working more efficiently through better tools, streamlined processes, and increasing staff capabilities. In today's climate of "do more with less", how have you seen organizations successfully balance additional effort to gain efficiency when staff already see their workload as being difficult to complete?

Contact Person(s) [name, phone, e-mail]: Bill Malyszka, Strategic Human Capital Planning Chief, 703-292-7142, wmalyszk@nsf.gov



2018 FEVS Results Briefing



BOAC

December 2018



Bottom Line Up Front

- NSF continues to make positive gains across the FEVS
 - Index scores demonstrate improvement for over 5 years
- Among medium-sized agencies NSF ranks:
 - 4th on Global Satisfaction
 - 5th on both the Employee Engagement index and the New IQ index
- Across the entire federal government NSF ranks
 - 7th on Employee Engagement and Global Satisfaction
 - 9th on the NEW IQ index
- Workload index scores continue to improve, but remain low (Index score 59)
 - I have sufficient resources (for example, people, materials, budget) to get my job done (Item 9)
 - 2017 (57%) and 2018 (61%)
 - My workload is reasonable (Item 10)
 - 2017 (53%) and 2018 (56%)
- Supplemental FEVS
 - Scores on the supplemental FEVS are higher than scores from the main FEVS

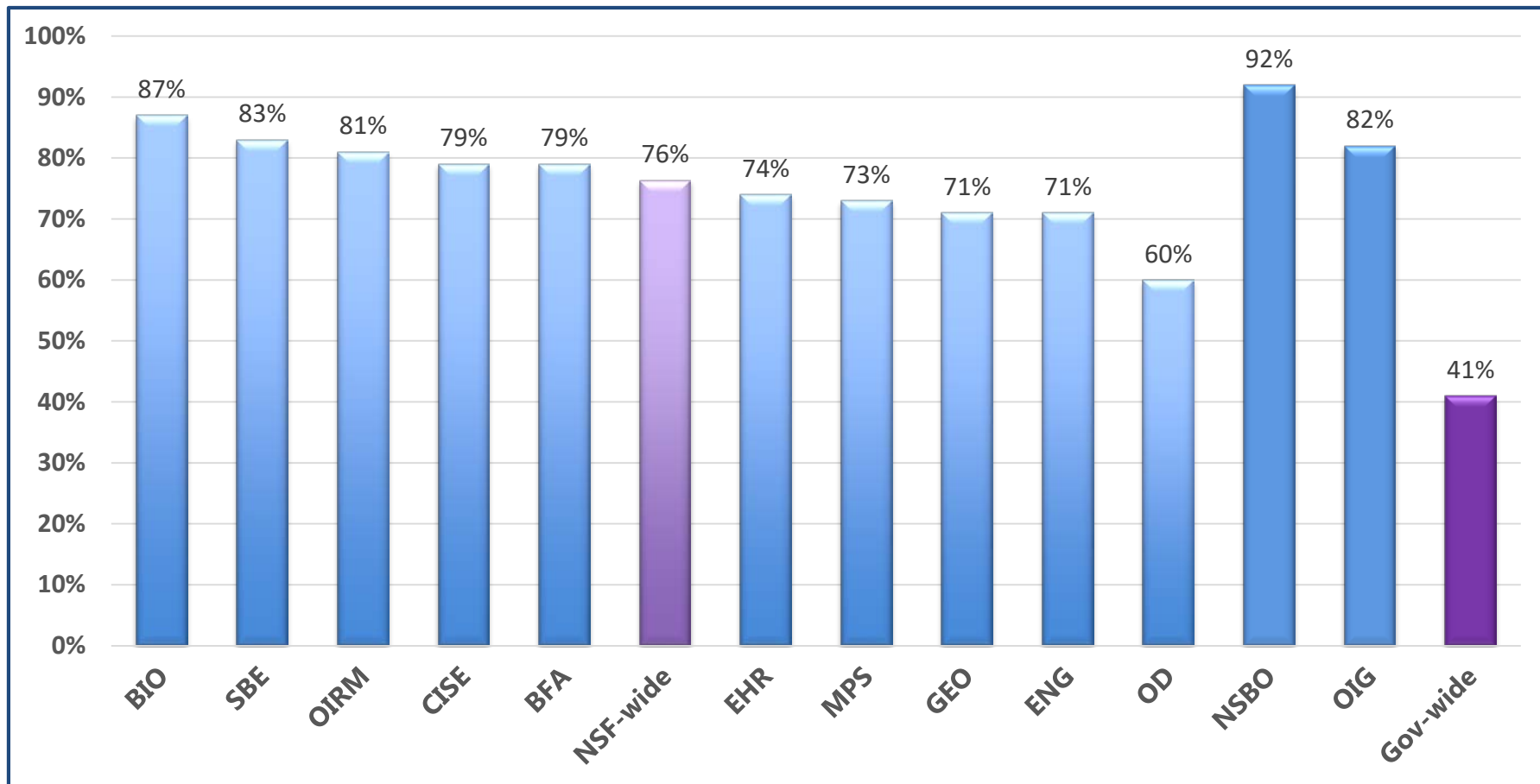


Bottom Line (continued)

- Item Level Results
 - NSF is higher than the government-wide average on all but two items in 2018
 - My workload is reasonable.
 - NSF 56% and Gov-wide Avg. 59% (Q10)
 - My organization has prepared employees for potential security threats.
 - NSF 76% and Gov-wide Avg. 80% (Q36)
- NSF's response rate remains high at 76% (76% 2017)
 - Highest response rate in BIO at 87%
 - Lowest response rate in the OD at 60%
 - Government-wide rate dropped in 2018 to 41% (down from 46% in 2017)

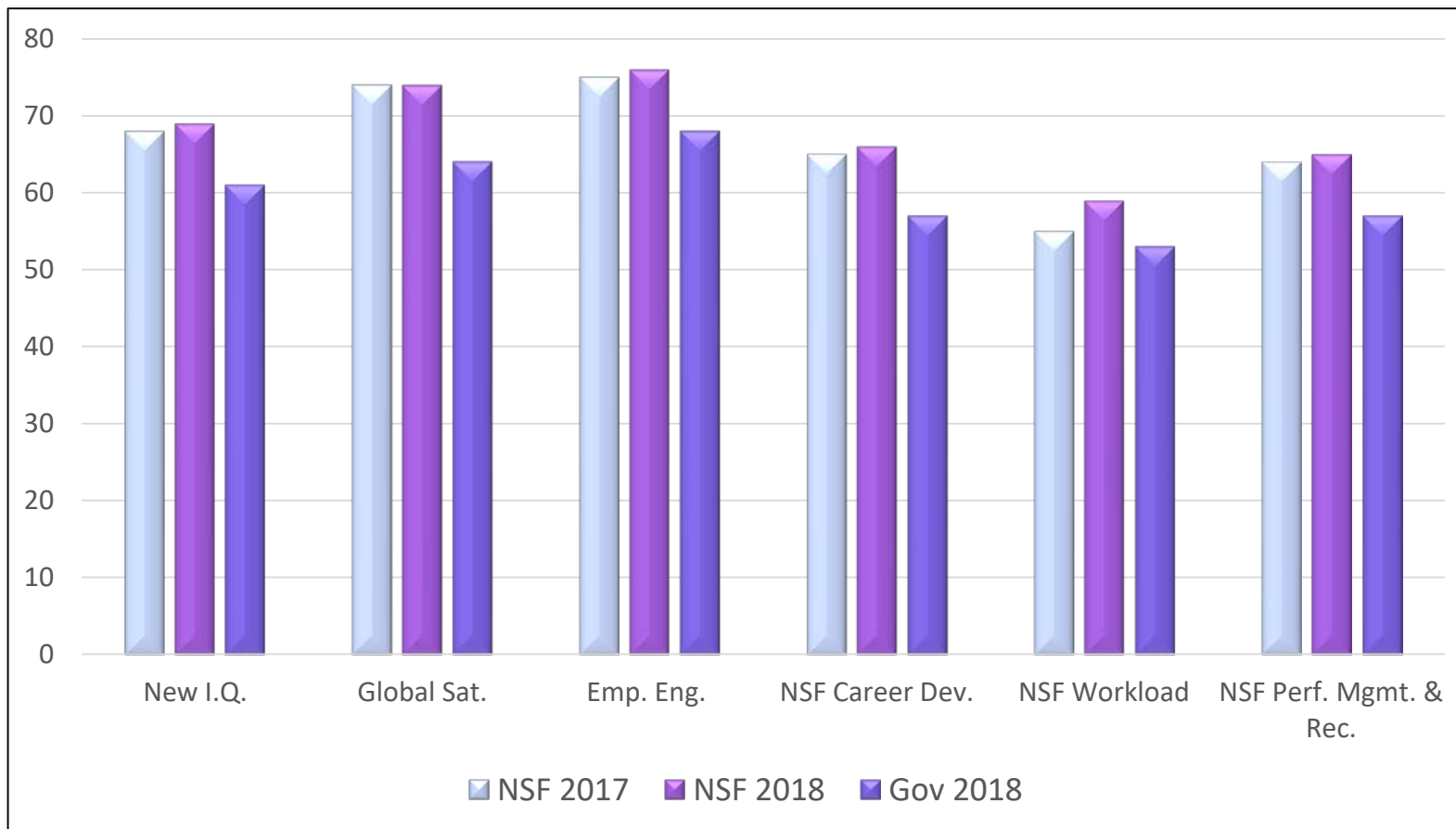


NSF 2018 FEVS Final, Adjusted Response Rates



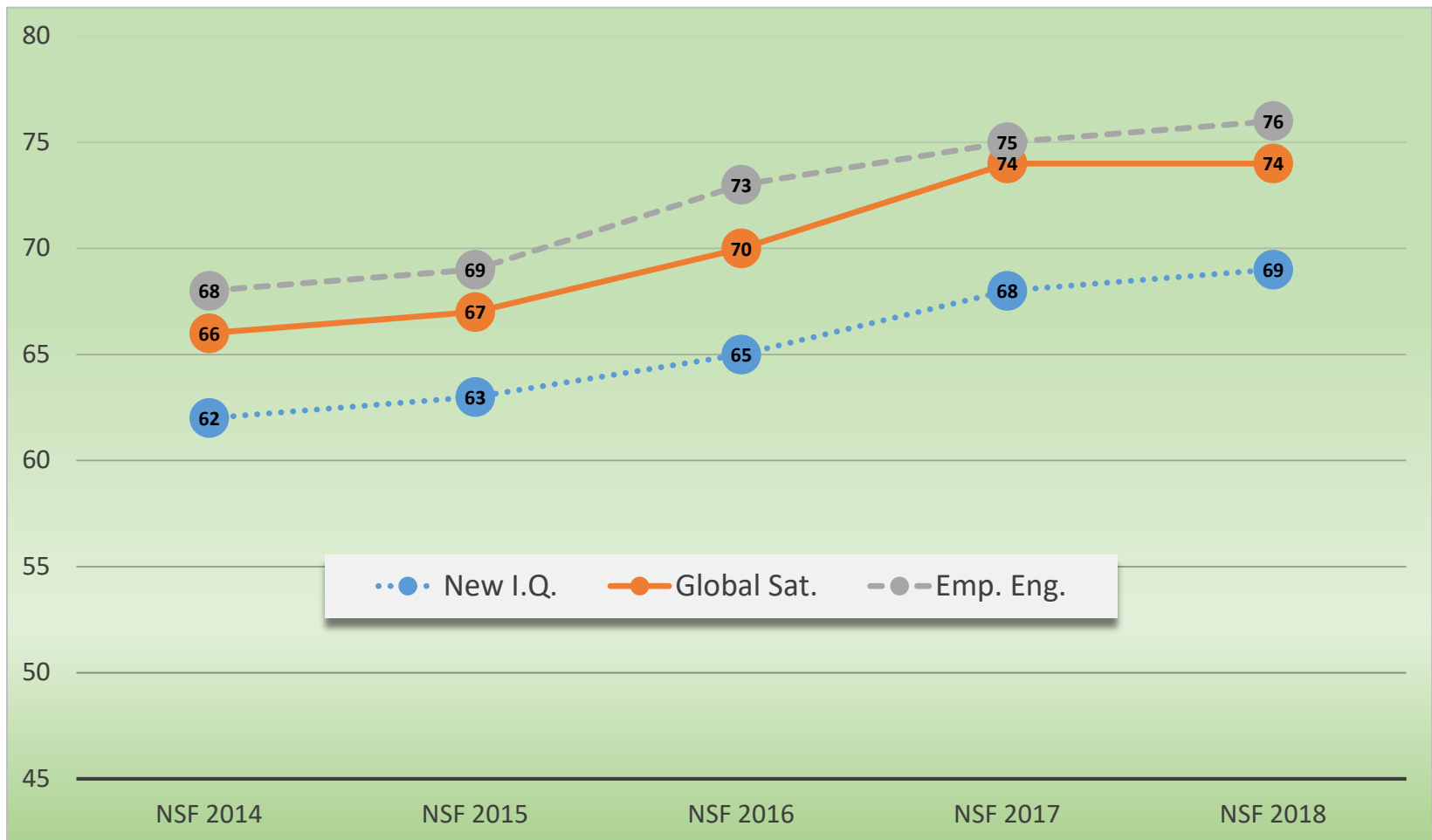


FEVS Index Scores for NSF Compared to Gov-wide



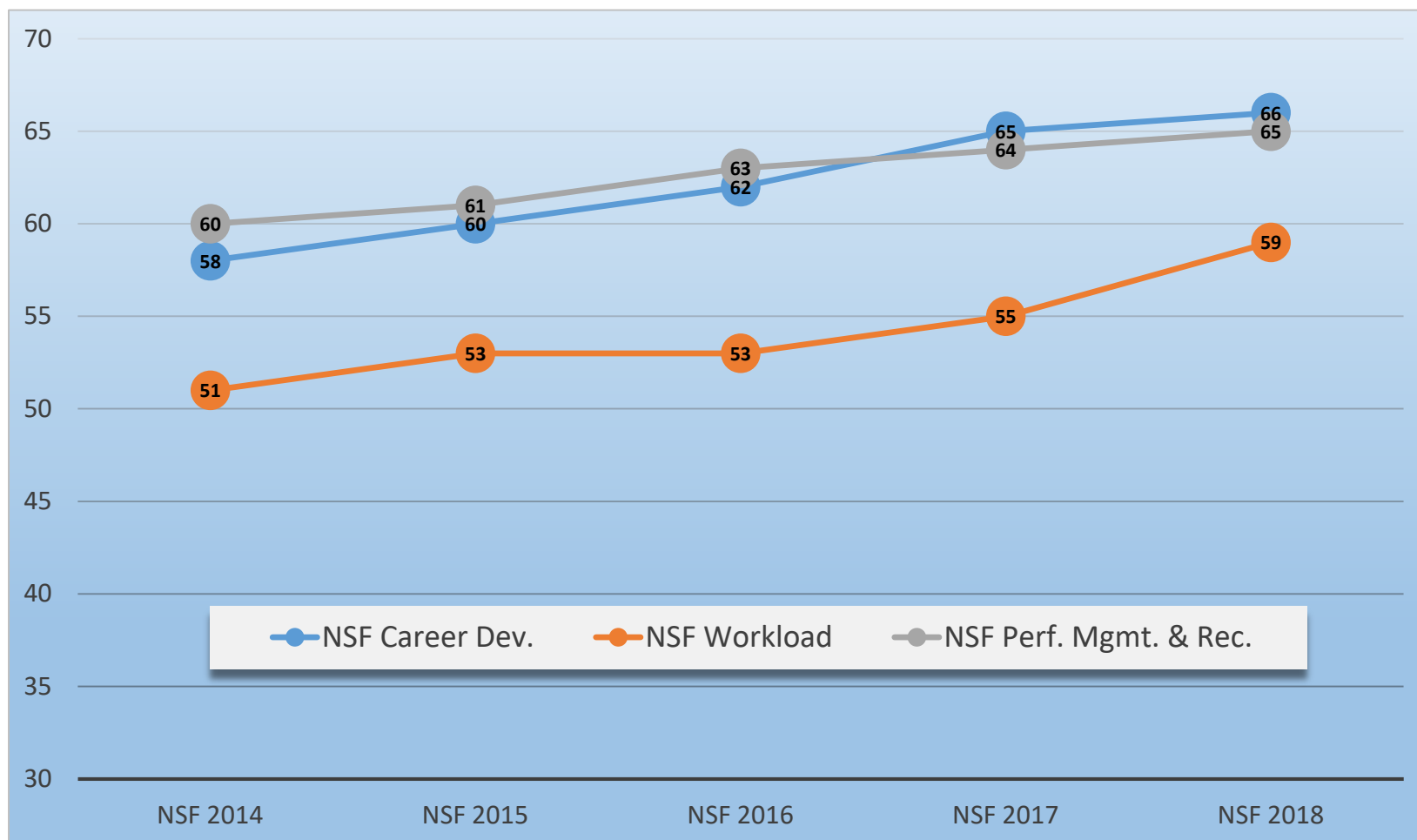


NSF Scores on OPM's Indices by Year





NSF Scores on NSF's Indices by Year





2018 FEVS Sections Results

Section	NSF 2018	GOV 2018	BIO 2018	CISE 2018	EHR 2018	ENG 2018	GEO 2018	MPS 2018	SBE 2018	BFA 2018	OD 2018	OIRM 2018
My Work Experience	78.8%	72.3%	79.2%	78.5%	80.6%	80.6%	74.8%	76.8%	77.4%	77.6%	79.1%	79.7%
My Work Unit	62.0%	54.2%	68.9%	64.4%	58.8%	59.3%	52.6%	60.8%	59.9%	58.3%	65.4%	64.6%
My Agency	69.2%	59.7%	72.5%	67.7%	67.1%	70.0%	61.6%	70.9%	63.7%	65.5%	75.1%	71.2%
My Supervisor/Team Leader	80.5%	73.8%	84.5%	82.9%	80.3%	80.5%	74.7%	81.7%	76.4%	80.3%	75.8%	82.5%
Leadership	68.3%	58.7%	71.9%	77.2%	65.6%	70.7%	55.8%	68.9%	58.1%	66.8%	71.5%	69.4%
My Satisfaction	63.9%	54.3%	64.2%	63.0%	67.0%	67.1%	56.3%	62.3%	57.4%	61.0%	64.8%	65.6%

Section	NSF 2014	NSF 2015	NSF 2016	NSF 2017	NSF 2018	Δ 2014-2018	Δ 2017-2018	GOV 2014	GOV 2015	GOV 2016	GOV 2017	GOV 2018	Δ 2014-2018	Δ 2017-2018
My Work Experience	73.7%	75.7%	76.3%	77.5%	78.8%	↑ 5.1	→ 1.3	69.6%	70.4%	71.0%	72.1%	72.3%	→ 2.7	→ 0.2
My Work Unit	56.6%	57.0%	59.4%	61.3%	62.0%	↑ 5.4	→ 0.7	49.7%	50.6%	51.7%	53.0%	54.2%	↑ 4.5	→ 1.2
My Agency	61.6%	63.6%	65.0%	68.4%	69.2%	↑ 7.6	→ 0.8	54.3%	55.1%	56.4%	58.2%	59.7%	↑ 5.4	→ 1.5
My Supervisor/Team Leader	75.0%	75.8%	78.0%	80.0%	80.5%	↑ 5.5	→ 0.5	69.1%	69.9%	70.6%	72.3%	73.8%	↑ 4.7	→ 1.5
Leadership	59.6%	60.9%	63.6%	68.3%	68.3%	↑ 8.7	→ 0.0	52.8%	53.7%	55.1%	57.7%	58.7%	↑ 5.9	→ 1.0
My Satisfaction	55.6%	56.8%	60.7%	64.1%	63.9%	↑ 8.3	→ -0.2	48.4%	49.8%	50.9%	53.1%	54.3%	↑ 5.9	→ 1.2



2018 Index Results by Directorate/Office

Index	NSF 2018	GOV 2018	BIO 2018	CISE 2018	EHR 2018	ENG 2018	GEO 2018	MPS 2018	SBE 2018	BFA 2018	OD 2018	OIRM 2018	GOV 2018	NSF 2018	NSF Δ 2014-2018	NSF Δ 2017-2018
OPM New Inclusion Quotient ("New IQ")	69	61	72	72	68	70	61	69	64	68	72	70	61	69	+ 7	+ 1
OPM Global Satisfaction Index	74	64	76	72	78	74	68	76	72	70	76	73	64	74	+ 8	0
OPM Employee Engagement Index	76	68	80	78	76	77	67	78	71	74	75	76	68	76	+ 8	+ 1
NSF Career Development Index	66	57	68	68	69	62	58	62	59	65	65	70	57	66	+ 8	+ 1
NSF Workload Index	59	53	63	58	59	56	56	47	61	59	57	65	53	59	+ 8	+ 4
NSF Performance Management & Recognition Index	65	57	67	68	63	64	56	63	63	63	67	67	57	65	+ 5	+ 1

Index	NSF 2014	NSF 2015	NSF 2016	NSF 2017	NSF 2018	Δ 2014-2018	Δ 2017-2018	GOV 2014	GOV 2015	GOV 2016	GOV 2017	GOV 2018	Δ 2014-2018	Δ 2017-2018
OPM New Inclusion Quotient ("New IQ")	62	63	65	68	69	↑ 7	→ 1	56	57	58	60	61	↑ 5	→ 1
OPM Global Satisfaction Index	66	67	70	74	74	↑ 8	→ 0	59	60	61	64	64	↑ 5	→ 0
OPM Employee Engagement Index	68	69	73	75	76	↑ 8	→ 1	62	63	65	67	68	↑ 6	→ 1
NSF Career Development Index	58	60	62	65	66	↑ 8	→ 1	52	53	55	56	57	↑ 5	→ 1
NSF Workload Index	51	53	53	55	59	↑ 8	↑ 4	51	52	52	53	53	→ 2	→ 0
NSF Performance Management & Recognition Index	60	61	63	64	65	↑ 5	→ 1	53	54	55	56	57	↑ 4	→ 1



2018 Supplemental FEVS Index & Section Scores

	Index	NSF Supplemental 2018	NSF Supplemental 2017	NSF -Sup Δ 2017-2018	NSF Perm 2018	GOV 2018
Indices	OPM New Inclusion Quotient (“New IQ”)	82	78	4	69	61
	OPM Global Satisfaction Index	89	89	0	74	64
	OPM Employee Engagement Index	88	86	2	76	68
	NSF Career Development Index	75	72	3	66	57
	NSF Workload Index	72	65	7	59	53
	NSF Performance Management & Recognition Index	73	71	2	65	57

	Section	NSF Supplemental 2018	NSF Supplemental 2017	NSF -Sup Δ 2017-2018	NSF Perm 2018	GOV 2018
Sections	My Work Experience	86.5%	83.2%	3.3	78.8%	72.3%
	My Work Unit	71.4%	70.5%	0.9	62.0%	54.2%
	My Agency	82.5%	80.7%	1.8	69.2%	59.7%
	My Supervisor/Team Leader	88.0%	87.9%	0.1	80.5%	73.8%
	Leadership	85.6%	81.5%	4.1	68.3%	58.7%
	My Satisfaction	77.9%	74.3%	3.6	63.9%	54.3%
	Worklife	76.3%	66.1%	10.2	67.0%	52.7%



2018 FEVS Item-Level Results Overview

Greatest Increases 2014-2018	<p>Tie: (29) The workforce has the job-relevant knowledge and skills necessary to accomplish organizational goals. (56) Managers communicate the goals and priorities of the organization."</p>	<p>#29 in 2018: 88 #56 in 2018: 73 (Both up almost 12 pts.)</p>
Greatest Decrease 2014-2018	<p><i>(14) Physical conditions (for example, noise level, temperature, lighting, cleanliness in the workplace) allow employees to perform their jobs well.</i></p>	<p>-2 <i>In 2018: 77</i></p>
Greatest Increases 2017-2018	<p>(29) The workforce has the job-relevant knowledge and skills necessary to accomplish organizational goals. (9) I have sufficient resources to get my job done.</p>	<p>+6 (from 82 to 88) +4 (from 57 to 61)</p>
Greatest Decrease 2017-2018	<p>(36) My organization has prepared employees for potential security threats.</p>	<p>-4 (from 80 to 76)</p>



Action Planning

Start FY19 Employee Engagement Cycle



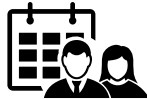
Customized Support (options range from hands-on advising to self-directed guidance/tools)

November



Release 2018 FEVS results to all NSF staff and brief senior leaders.

December



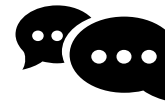
- Schedule Action Planning advising meetings
- Assess results achieved under current action plan
- Define support needs to assist action planning

January



- Assess progress, diagnose challenges, and update FY17-19 Action Plans
 - Conduct advising meetings
- Updated Action plans due 1/31/18

April-Sept



Promising practices series

October-December



Conduct check-in meetings based on 2017 FEVS



Helping Build Engagement



Engagement Site
Tools
Resources
Action plans



FEVS Center
Annual results



Maximizing Employee Engagement (online, 30 min)
Motivating and Engaging Employees (online, 105 min)

Backgrounder: Fall 2018
NSF Advisory Committee for Business and Operations

Nature of Agenda Item:

Update on the Status of NSF's Resolution of Recommendations from the BOAC Subcommittee on Implementation of National Academy of Public Administration (NAPA) Recommendations

Presentation:

The Subcommittee on Implementation of NAPA Recommendations was charged with preparing a report for the BOAC that recommends actions to NSF for implementing a subset of National Academy of Public Administration recommendations related to NSF-wide oversight of large-scale research facilities in the report, [National Science Foundation: Use of Cooperative Agreements to Support Large Scale Investment in Research](#).

The subcommittee presented its final report to the BOAC at the Spring 2017 Meeting. In response to a request for a status update by the BOAC during the Spring 2018 meeting, the Head, Large Facilities Office, NSF, will provide an informational briefing summarizing NSF's resolution actions with respect to each of the Subcommittee's recommendations.

Committee Action/Feedback:

None

Contact Person:

Matthew Hawkins, Head, Large Facilities Office, NSF
703-292-7407
mjhawkin@nsf.gov

Backgrounder: Fall 2018
NSF Advisory Committee for Business and Operations

Nature of Agenda Item:

Presentation of the Report from the BOAC Subcommittee on NSF's Strengthened Oversight of Major Facility Cost Surveillance

Presentation:

The Subcommittee on NSF's Strengthened Oversight of Major Facility Cost Surveillance was charged with preparing a report for the BOAC that fully evaluates NSF's strengthened "end-to-end cost surveillance policies and procedures" for Major Facility projects (i.e., Large Facilities). The report is to specifically state whether or not the subcommittee feels the strengthened policies and procedures are sufficient. The report may include recommendations to NSF for further improvement depending on the outcome. The review pertained to both construction and operations awards. Specifically, the subcommittee was charged with reviewing and evaluating NSF's current oversight framework relating to Large Facility costs including the following: (1) proposal cost estimates; (2) NSF cost analysis of those estimates; and (3) post-award cost and performance monitoring.

Committee Action/Feedback:

- The BOAC liaison submitted the subcommittee's final report to the BOAC chairs on December 7, 2018, and on behalf of the chairs, NSF BOAC staff shared it with the full BOAC as a pre-read for this meeting.
- During the meeting, the BOAC Liaison, will provide to the BOAC a summary of the subcommittee's findings and recommendations for discussion.
- The BOAC will discuss and deliberate the subcommittee's advice and recommendations at the meeting.
- At the close of the BOAC's discussion, it will:
 - Accept the subcommittee's report;
 - Reject the subcommittee's report; or
 - Send the subcommittee's report back to the subcommittee for revisions.
- The BOAC may also provide additional written feedback to NSF, including any comments or opinions it has to offer regarding the report or its findings and recommendations by way of a cover letter to the NSF Designated Federal Officers (DFOs).
- Once the report is accepted, the BOAC will submit it to NSF for the agency to make it publicly available.
- After receiving the report, the NSF DFOs may, verbally or in writing, comment on or respond to it and its recommendations at any duly organized BOAC meeting.

Contact Person(s):

Neil Albert, Chair

BOAC Subcommittee on NSF's Strengthened Oversight of Major Facility Cost
Surveillance

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mjhawkin@nsf.gov



2017 & 2018 BOAC Subcommittee Reports Related to Major Facilities

Matthew Hawkins, Head, LFO
Kim Moreland, Subcommittee Liaison
December 12, 2018



Overview

- Subcommittee Report on NAPA Implementation – March 2017
 - NSF Resolution of Recommendations
 - New Governance Structure
- Subcommittee Report on Cost Surveillance – Dec 2018
 - Initial discussion on Findings & Recommendations



Subcommittee Report on NAPA Implementation – March 2017



Related Legislation

- American Innovation and Competitiveness Act (AICA) – Jan 2017
 - Close alignment with NAPA Recommendations
 - **§ 109 – Mid-Scale Project Investments:**
 - Defines a new category of funding research instrumentation, equipment, and facilities upgrades
 - **§ 110 – Oversight of NSF Major Multi-User Research Facility Projects:**
 - Strengthens oversight and accountability over the **full life-cycle**
 - **Calls for senior agency official appointment**
 - GAO Cost Estimating and Assessment Guide
 - **Independent Cost Estimates** > Flexibility on timing and scope
 - **Incurred Cost Audits** > Risk-based, at Completion, NTE 3 years
- Program Management Improvement and Accountability Act – Dec 2016



Resolution of Subcommittee Recommendations

- Completed per the Recommendation = 8
- Completed with Alternate Approach Taken = 6
- In Development = 2
- Under Consideration = 2
- Not Implementing = 3

See Summary Table Provided



Chief Officer for Research Facilities (CORF)

- **Purpose:** Advise the NSF Director on all aspects of NSF major and mid-scale facilities throughout their life-cycle, and collaborate with all at NSF who are involved in oversight and assistance for the NSF research facilities portfolio.
- **Appointed starting in January 2018:** Fulfills AICA requirement and BOAC subcommittee recommendation for major research facilities full life-cycle oversight and Senior Official in the Office of the Director.
- Duties:
 - Ensure that oversight and accountability for the major facilities portfolio are addressed at all levels of the agency
 - Chair the Facilities Governance Board (FGB) and Facilities Readiness Panel (FRP)
 - Chair the Major Facilities Working Group (MFWG) composed of Accountable Directorate Representatives (ADRs)
 - Observer of the Director's Review Board (DRB)
- Bridge between BFA and Science Directorates
- Routine engagement with Head of LFO and Directorate Staff



Facilities Governance Board (FGB) - New

- **Purpose:** Oversee full life-cycle of Major & Mid-scale research facilities
- Duties:
 - Advise the Director on strategy, governance, implementation
 - Approve Large Facilities Manual (Major Facilities Guide) and Major Facility SOGs/SOPs
 - Provide oversight & maintain situational awareness
 - Recommend to Director on renewal, competition, or divestment
- Membership:
 - CORF (Chair)
 - Assistant Directors for MPS, GEO, BIO, CISE, ENG
 - Chief Financial Officer (CFO)
 - As required, other members of NSF leadership
- Meetings: As required, typically ~quarterly. Approval processes generally conducted by e-mail rather than face-to-face, with advice from ADRs for each directorate.

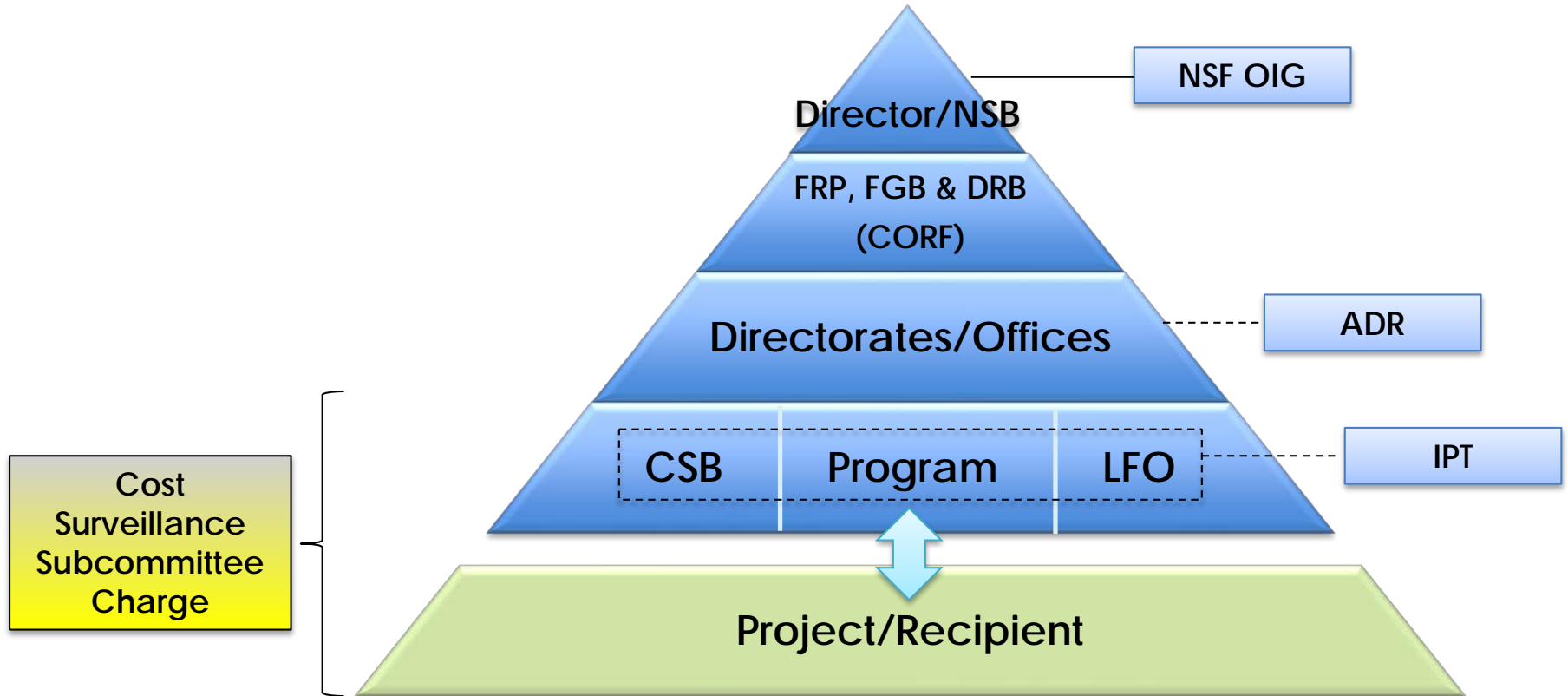


Facilities Readiness Panel (FRP) – Formerly MREFC Panel

- **Purpose:** Advise Director on readiness to advance projects within the formal Design Stage including advancement to Construction:
 - Assess if risks identified and properly considered
 - Consensus assessment of Recipient & Program
- Membership:
 - CORF (Chair)
 - Head, LFO (Vice-Chair)
 - Head, Office of General Counsel (or Designee)
 - Division Director, Division of Acquisition & Cooperative Support
 - At least 4 senior Program Officers, Section Heads, Deputy Division Directors or Division Directors (at least 3 from MPS, GEO, BIO, CISE, or ENG) selected based on expertise required for review of a specific project
- Meetings: Ad hoc



NSF Oversight & Governance Structure





Subcommittee Report on Cost Surveillance – December 2018



First and foremost...
Thank You!!



Internal and External Drivers of Strengthened Oversight

- NSF Office of the Inspector General (OIG) reports focusing on NSF's cost oversight of policies and practices **(2010-2015)**:
 - OIG Alert Memo “NSF’s Management of Cooperative Agreements” issued September 28, 2012
- NEON potential \$80M cost overrun – **March 2015 (Managing organization replaced)**
- NAPA Report - **December 2015**
- Congressional interest
 - American Innovation & Competitiveness Act (AICA) – **January 2017**



Subcommittee Charge

*“The Committee hereby charges the Subcommittee to prepare a report for the Committee in support of the Foundation’s goal to ensure that its current cost surveillance policies and procedures are sufficient to ensure sound, end-to-end oversight of all NSF Large Facility construction and operations awards. Specifically, the Subcommittee should review and **evaluate NSF’s current oversight framework** relating to Large Facility costs including the following: **(1) proposal cost estimates; (2) NSF cost analysis of those estimates; and (3) post-award cost and performance monitoring.**”*



What the Charge did not intend to include:

- NSF use of Cooperative Agreements
- NSF oversight & governance Structure
- NSF determination of indirect cost rates
- Fee (“above cost”)
- **No Cost Overrun Policy**



Findings & Recommendations:

- ***NSF's processes are sufficient to ensure compliance with their intent and application as well as the continued improvement and use of cost estimating/analysis and surveillance procedures going forward***
- Continue the appropriate implementation, verification and utilization of EVMS
- Consider consolidating SOGs, manuals, and other policies and procedures into a single document or series of focused documents



Findings & Recommendations:

- Revise hierarchy preferences for methodology used for estimating purposes:
 - 1st - Actual/historical data
 - 2nd - Analogous data
 - 3rd - Parametric data
 - 4th - Expert opinion
- An ICE should be **conducted as early as possible** to inform possible trades and descopes
- An independent schedule estimate (ISE) should be performed in concert with the ICE for enhanced confidence
- Consideration needs to be given to updating the IMP on a regular basis



Findings & Recommendations:

- “...evaluation process and its documentation was less than satisfactory.”
 - Processes not closely/consistently followed
 - Misinterpretation of what is intended?
 - Time available?
 - Knowledge of the personnel performing the analysis?
- “The traceability of **non-negotiable science and or technical performance requirements** is not apparent or traceable from the products.”



Findings & Recommendations:

- *“Estimating only known risks will lead to underestimating the costs, as there is uncertainty in all complex developmental projects; this discovery is understood in project management and cost estimating communities and such risks are known as “unknown-unknowns.”*
- Core competency recommendations for recipient staff who support the administrative and management aspects of large facilities projects: *“The magnitude of the awards and the tremendous complexities of the projects requires that **recipients bring the necessary expertise to the management, including post award responsibilities, of any large facility activity.**”*



Questions?

Report of the Subcommittee on NAPA Implementation – March 13, 2017

Summary of Recommendations & Resolution

Matt Hawkins, Head, LFO

Rev: 12/07/18

#	Pg	Text of Recommendation	Life-cycle Stage	Resolution
3.1	10	Strengthen the role of the MREFC Panel during the project development stage by amending §2.2.1 of the LFM to require approval from the MREFC Panel prior to development activities. The focus of this approval should be on defining the capability gap and preliminary functional requirements needed by the Directorate.	Development	ALTERNATE APPROACH: The Chief Officer for Research Facilities (CORF) was appointed in December 2017 as the “Senior Official” in OD responsible for full life-cycle oversight. Late stage development activities are discussed with the CORF and formal transition to the Design Stage is considered a strategic agency decision not involving the new Facilities Readiness Panel (See 3.3 below). The CORF is an integral part of Senior Leadership and shares information on Development Stage activities through close, routine interaction with the Accountable Directorate Representatives (ADRs).
3.2	10	Strengthen the role of the MREFC Panel during the operations stage by amending §2.4.2 of the LFM to require review and recommendation by the MREFC Panel of each project’s Transition to Operations Plan as part of their review of final design and again at the completion of construction.	Construction & Operations	ALTERNATE APPROACH: See 3.1 above on the CORF. Strengthened review of the transition to operations is also being handled through improved internal NSF Standard Operating Guidance on external panel reviews.
3.3	10	The MREFC Panel Charter should be brought into alignment with the LFM by specifically enumerating each of the stage-gates where MREFC Panel review and recommendation is required.	Design	COMPLETE: The MREFC Panel was reconstituted into the Facilities Readiness Panel (FRP). The charge and membership are crafted to assess project readiness (both Recipient and Program) for advancement through the Design Stage including the transition to Construction. The FRP charter and latest Major Facilities Guide (MFG; formerly the Large Facilities Manual) have been brought into alignment.

Report of the Subcommittee on NAPA Implementation – March 13, 2017

Summary of Recommendations & Resolution

Matt Hawkins, Head, LFO

Rev: 12/07/18

#	Pg	Text of Recommendation	Life-cycle Stage	Resolution
3.4		The Deputy Director/COO should meet at least monthly with the Head of the LFO and the chairs of all active IPTs to review progress, including all earned value management tracking, on projects under design and under construction.	Construction	COMPLETE: The CORF and Head of LFO have a weekly tag-ups and dialog daily on Major Facilities issues. LFO’s bi-monthly report now goes to the CORF and includes EVM metrics.
3.5	11	The LFM can be clearer in assigning responsibility for the composition of and the authorship of external review panel charges to the LFO to ensure that the NSF Director has direct access to independent project and cost estimating expertise during the pre-design and construction phases.	Design and Construction	NOT IMPEMENTING. The LFO Liaison works jointly with the Program Officer to develop the panel charge, agenda and membership with input from the IPT. The LFO Liaison then generates an independent assessment of the review (including the cost estimate) to the Head, LFO who then evaluates as a member of the FRP. With closer NSF internal coordination, this method is now working well. Having LFO solely responsible for panel reviews would remove too much responsibility from Program and disconnect the process from the science objectives.
3.6	12	Directorates and Divisions should define their discipline-specific processes for the development stages of their large research infrastructure projects and for the general performance criteria against which facilities or suites of facilities will be evaluated during their operations phase.	Development & Operations	ALTERNATE APPROACH: The CORF is now responsible for full life-cycle oversight. The ADRs play a critical role in communicating performance of existing major facilities in conjunction with planned upgrades and future facilities still in the Development Stage. Additionally, the NSB-approved Guidelines for Facilities Management Competition Decisions Major Facilities incorporates an assessment of operational performance.
4.1	13	Although the Subcommittee does not specify any particular threshold for inclusion in the MREFC account, all relevant thresholds should be clearly documented in §1.4 or §2.7 of the LFM. All research infrastructure investments above the MREFC	Construction	COMPLETE: The current Large Facilities Manual (NSF 17-66) defines the manual’s applicability against the Total Project Cost (TPC) thresholds defined by the American Innovation and Competitiveness Act (AICA) and NSF policy on the MREFC threshold.

Report of the Subcommittee on NAPA Implementation – March 13, 2017

Summary of Recommendations & Resolution

Matt Hawkins, Head, LFO

Rev: 12/07/18

#	Pg	Text of Recommendation	Life-cycle Stage	Resolution
		threshold, regardless of the NSF budgetary source, should follow the NSF LFM guidance and process.		
4.2	14	The Large Facilities Office, working on behalf of the Deputy Director/COO, should work with Program Staff and NSF Management to assure that the skill sets included on IPTs are matched to the risk spectrum of the project being reviewed.	Construction	COMPLETED. Standard Operating Guidance entitled “ <i>Minimum Core Competencies for Major Facilities Oversight</i> ” has been finalized and approved. This guidance covers all skills, training and certifications for key members of the IPT. NSF will reassess competencies on the IPT’s and requirements in the SOG as part of Program Management Accountability Act (PMIAA) implementation.
4.3	14	The NSF should develop a set of risk “tracks” that group projects not by size or funding source, but rather based on the Foundation’s risk exposure. These tracks should consider the risk and the size of the project, and the risk monitoring and oversight should be suitably tailored. The requirements for these alternative tracks should be added to the LFM and clearly documented.	Development	ALTERNATE APPROACH: Using project definition thresholds for “Major Facilities” and “Mid-scale Research Infrastructure” from AICA, NSF has imbedded assessment of risk as a criterion in determining the appropriate level of NSF oversight, particularly for Mid-scale projects.
4.4	14	NSF should expand its enterprise risk management in research infrastructure investments to include monitoring facility operations and productivity, as well as progress on facility upgrade investments above the recommended threshold level.	Operations	IN DEVELOPMENT: NSF’s ERM system is still in development. The CORF is now responsible for full life-cycle oversight and for bringing any risks to the attention of NSF Leadership. Regarding risks being brought to the CORF, the Head of LFO focuses on business-related risks while the Accountable Directorate Representatives (ADRs) focus on programmatic and operational risks. This process will eventually inform NSF’s broader ERM system.

Report of the Subcommittee on NAPA Implementation – March 13, 2017

Summary of Recommendations & Resolution

Matt Hawkins, Head, LFO

Rev: 12/07/18

#	Pg	Text of Recommendation	Life-cycle Stage	Resolution
4.4.1	14	<p>The Deputy Director/COO should meet at least every six months with the Head of the LFO and the chairs of all IPTs to review performance metrics of operating large-scale research facilities. These metrics, which should be developed in consultation with the relevant research community, must reflect both the scientific productivity of the facility (e.g. number of user proposals, number of users served, publications, high-impact research results) as well its operational efficiency (e.g. beam-up time, number of operating hours vs. scheduled, etc.) for all operating large facilities.</p>	Operations	<p>ALTERNATE APPROACH: Operational performance metrics vary widely. The CORF and Head of LFO have a weekly tag-ups and dialog daily on Major Facilities issues. LFO now also produces a bi-monthly Operations Status report that goes to the CORF in concert with the bi-monthly Design and Construction report. The Ops report has a “dash board” format that identifies key issues. These reports are reviewed by the ADRs.</p>
4.4.2	14	<p>Each Large Facility should report on facility performance annually to NSF. NSF should report large facility performance to the NSB in summary form. Results from facility operational reviews should also be reported in summary form to NSF leadership and the NSB.</p>	Operations	<p>ALTERNATE APPROACH: The CORF develops a periodic summary report to the NSB. The Facilities Synopses are up-loaded to the NSB portal annually and routine oversight documents are routinely added to the portal.</p>
4.4.3	15	<p>The IPT’s purview and lifespan should be extended to the operational phase of the project with a mandate to regularly review operational performance of NSF large facilities; and the membership of the ITP should include members who have experience operating large facilities.</p>	Operations	<p>COMPLETE: Standard Operating Guidance for IPT’s has been up-dated to include the Operations Stage.</p>

Report of the Subcommittee on NAPA Implementation – March 13, 2017

Summary of Recommendations & Resolution

Matt Hawkins, Head, LFO

Rev: 12/07/18

#	Pg	Text of Recommendation	Life-cycle Stage	Resolution
4.4.4	15	At least once every five years after the initial ten years of operations, the annual review should evaluate whether divestment should be considered for the facility. Any resulting plan developed by a Directorate or Division that proposes significantly repurposing and redirecting a facility or its decommissioning, disassembly, and disposal – any of which can involve significant expenditures of resources – to go through the MREFC Panel for review and recommendation to the Director	Operations & Divestment	IN DEVELOPMENT: Divestment considerations are imbedded in the Guidelines for Facilities Management Competition Decisions finalized in December 2017. Standard Operating Guidance is planned for development in 2019 based on these Guidelines.
4.5	16	NSF should work with the research communities, including consultation with the Directorate advisory committee, to explore and document approaches and best practices for managing facility end of life and divestment from large research facilities. NSF should develop policy and guidance for programs to support divestment consideration and decision making.	Operations & Divestment	UNDER CONSIDERATION. Directorates and Divisions have significant experience and many successes with well-considered and properly executed divestment strategies. These “best practices” could be consolidated into Standard Operating Guidance similar to the Competition SOG described in 4.4.4 above.
5.1	16	The Subcommittee believes that there should be a clearly-designated senior official in the Office of the Director with direct visibility into and accountability for the Foundation’s facilities and research infrastructure – which would encompass significant projects in the directorates as well as in the MREFC account. This official would serve a role analogous to the Acquisition Executive role in DOE and NASA	Full life-cycle	COMPLETE: The Director appointed the CORF in December 2017. The CORF advises the Director on all aspects of NSF major and mid-scale facilities throughout all life-cycle stages and collaborates with all at NSF who are involved in oversight and assistance for the NSF research facilities portfolio. The CORF chairs the Facilities Readiness Panel, the Facilities Governance Board (FGB) and the Major Facilities Working Group (MFWG).

Report of the Subcommittee on NAPA Implementation – March 13, 2017

Summary of Recommendations & Resolution

Matt Hawkins, Head, LFO

Rev: 12/07/18

#	Pg	Text of Recommendation	Life-cycle Stage	Resolution
6.1		<p>Instead of creating a new Large Facilities FACA, NSF should utilize BOAC subcommittees as needed to periodically review the rigor of NSF’s large facilities oversight processes in a manner analogous to the role a Committee of Visitors has in providing external expert assessment of the quality and integrity of program operations and program-level technical and managerial matters pertaining to proposal decisions. BOAC, like other FACA committees, has a mechanism for creating subcommittees as necessary.</p>	Full life-cycle	<p>COMPLETE: A BOAC subcommittee was charged to undertake the “independent third-party review” of NSF’s strengthened cost surveillance procedures as agreed to by Audit Follow-Up Official. The report was delivered to NSF in December 2018.</p>
6.2		<p>To ensure that the NSF Director has full awareness of all such BOAC subcommittee assessments, NSF should re-charter BOAC so that the NSF Director, through the BFA and OIRM Heads, becomes the official to whom the committee reports as recommended by the General Services Administration’s Committee Management Secretariat guidance.</p>	Full Life-Cycle	<p>NOT IMPLEMENTING. The BOAC appropriately reports to the CFO per NSF practice on Advisory Committees. The CFO can increase OD engagement and information exchange without re-chartering the BOAC.</p>

Report of the Subcommittee on NAPA Implementation – March 13, 2017

Summary of Recommendations & Resolution

Matt Hawkins, Head, LFO

Rev: 12/07/18

#	Pg	Text of Recommendation	Life-cycle Stage	Resolution
		Additional Considerations/Observations		
		<p><u>MREFC Review Packages</u>: The subcommittee recommends that LFM §2.3.2.6 be revised to make more explicit the responsibility of the Director’s Review Board to prepare cover memos for packages advancing to the Director and NSB that focus executive attention on cost, scope and schedule risks, mitigation options analyzed, and remediation actions taken to manage those risks.</p>		<p>COMPLETE: The role of the DRB is codified in the Proposal Award Manual (PAM) and the language in the LFM is based on the PAM since the DRB considers more than Major Facilities. The PAM has been up-dated to give more detailed guidance on the Director’s memo for Major Facilities packages and the Standard Operating Procedure for the FRP now includes a detailed document list for the NSB (which the DRB reviews) that helps focus the review on cost, scope and schedule risks, mitigation options analyzed, and remediation actions taken to manage those risks.</p>
		<p><u>MREFC Ranking Criteria</u>: The subcommittee recommends that the international leadership question be considered as one criterion for approval to enter the Conceptual Design Phase.</p>		<p>UNDER CONSIDERATION: Formal entrance to the Design Stage is considered a strategic decision to be addressed by the CORF in consultation with NSF Leadership and Senior Management.</p>
		<p><u>FACA Committees</u>: Consistent with recommendation 6.2 that NSF re-charter BOAC so that the NSF Director be the official to whom the committee reports in compliance with the General Services Administration’s Committee Management Secretariat guidance, the Subcommittee recommends that NSF consider re-chartering the advisory committees reporting to the Associate Directors as well as the two joint NSF/DOE FACAs.</p>		<p>NOT IMPLEMENTING. The BOAC appropriately reports to the CFO per NSF’s policy on Advisory Committees.</p>

Report of the Subcommittee on NAPA Implementation – March 13, 2017

Summary of Recommendations & Resolution

Matt Hawkins, Head, LFO

Rev: 12/07/18

#	Pg	Text of Recommendation	Life-cycle Stage	Resolution
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Acronyms:

ADR = Accountable Directorate Representative

CDR = Conceptual Design Review

CORF = Chief Officer for Research Facilities

PDR = Preliminary Design Review

FDR = Final Design Review

FGB = Facilities Governance Board

FRP = Facilities Readiness Panel

IPT = Integrated Project Team

LFM = Large Facilities Manual

MFG = Major Facilities Guide

MREFC = Major Research Equipment and Facilities Construction

SOG = Standard Operating Guidance

SOP = Standard Operating Procedure

**Final Report to the National Science Foundation
Business and Operations Advisory Committee on
Cost Surveillance Policy and Procedures**

5 December 2018

**Prepared By:
Cost Surveillance Policy and Procedures Subcommittee**

**Neil F. Albert
Mark Davis
Dr. Debra L. Emmons
E.J. (Ned) Holland, Jr.
Ronald Lutha
Kim Moreland
William G. Roets II**

Report on Cost Surveillance Policy and Procedures

Subcommittee Report to National Science Foundation - Business and Operations Advisory Committee on Cost Surveillance Policy and Procedures

I. Charge of the Subcommittee

The National Science Foundation (NSF) initiated the formation and operation of an ad hoc Subcommittee of the NSF Business and Operations Advisory Committee (BOAC) on End-to-End Cost Surveillance.

The purpose of the Subcommittee is to issue a report to the Committee that fully evaluates NSF's strengthened "end-to-end cost surveillance policies and procedures" for Major Facility projects (i.e., Large Facilities).

In accordance with the charge, the report was intended to specifically state whether the Subcommittee feels the strengthened policies and procedures are sufficient to ensure compliance with their intent and application as well as the improvement and use of cost estimating/analysis and surveillance procedures within the NSF. The report includes recommendations to NSF for further improvement depending on the outcome. The review pertains to design, construction and operations awards. See Summary Section V.

Specifically, the Subcommittee reviewed and evaluated NSF's current oversight framework relating to Large Facility costs including the following: (1) cost analysis of recipient's proposal cost estimates; (2) independent cost estimate/analysis of those recipient estimates; (3) performance monitoring (earned value management) and (4) post-award cost assessments (incurred cost). Although not specifically included in the charge documents, the subcommittee also found value in review of the Program's Internal Management Plans. Figure 1 shows the Lifecycle Stages for each project as well as the Award process flow. Figure 2 provides the anticipated timeframe for the cost analysis process as well as what organization has the responsibility for performing cost analysis requirements within NSF.

Facility and Award Life-cycles:

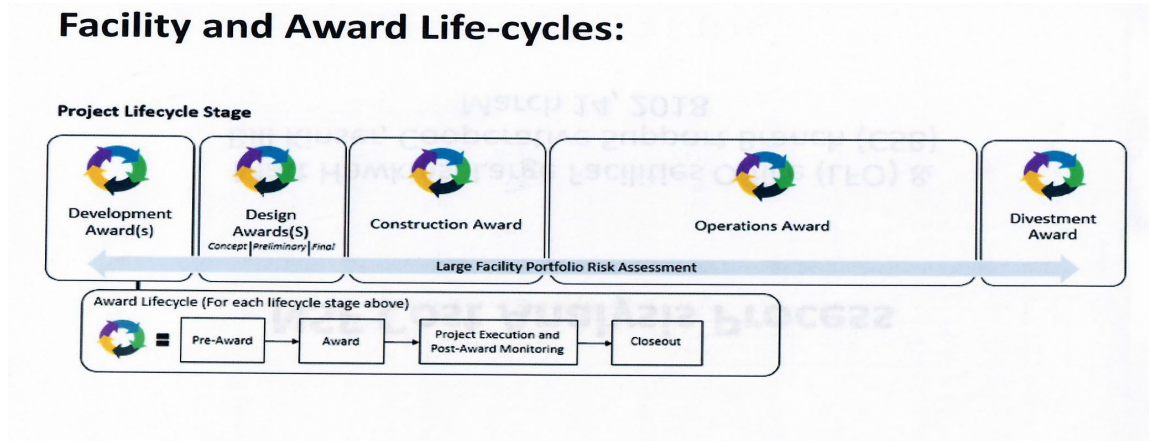


Figure 1: Project Lifecycle Stages – Award Phases

Report on Cost Surveillance Policy and Procedures

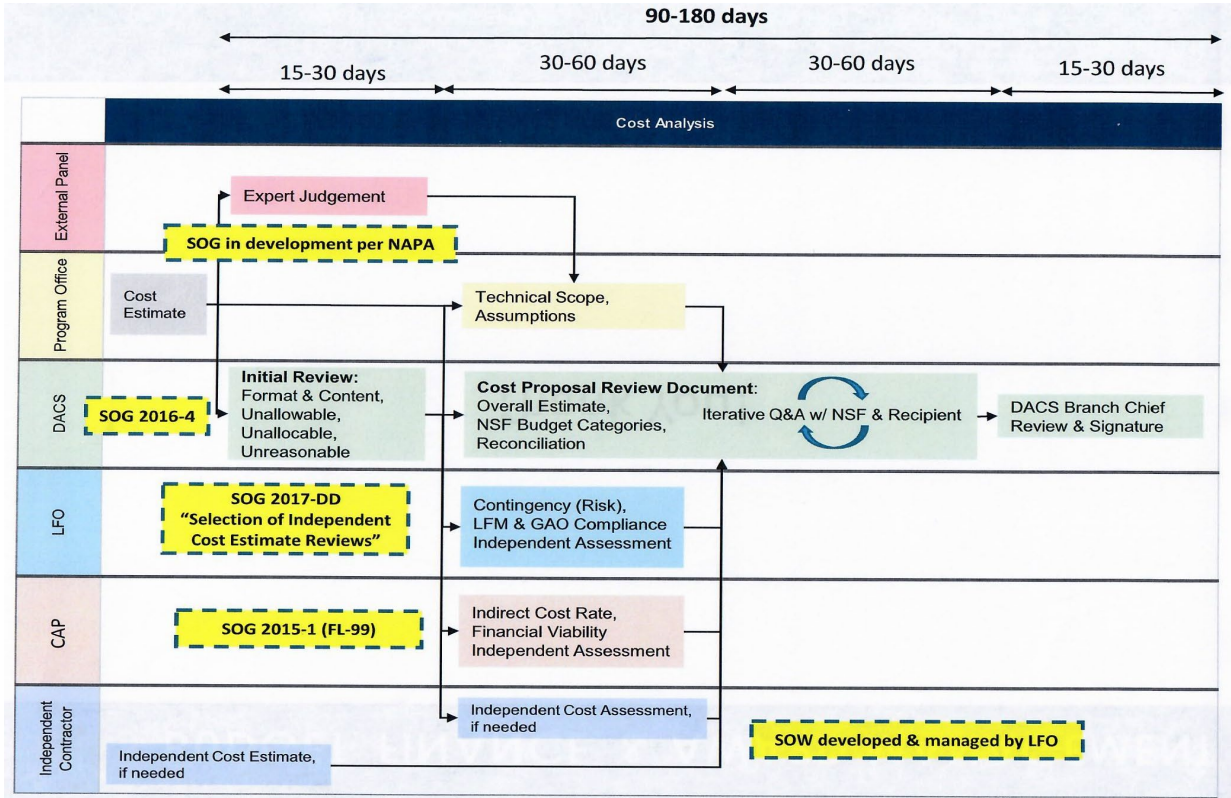


Figure 2: Cost Analysis Process Flow

II. Participants in the Study

Neil F. Albert – President/CEO of NFA Consulting, LLC. (Study Lead) (Cost Estimating)

Specializes in cost estimating, financial analysis, acquisition/program management, project performance management, and risk assessment; consulted for a broad array of government and industry organizations; recognized for contributions to the GAO Cost Estimating and Assessment Guide, DoD Standard for Work Breakdown Structures (WBS), Project Management Institute (PMI) Earned Value Management (EVM) Practice Standard, and the Society of International Organizations (ISO) WBS Standard, EVM Standard, and Program Management Standard.

Mark Davis – Partner, Education, Non-Profits and Commercial Services at Attain, LLC. (Incurred Cost)

Specializes in federal cost policy, reimbursement, and regulatory compliance, finance and grants operations improvement, strategic project outsourcing, and information technology applications, and reporting. He is a certified Government Financial Manager.

Report on Cost Surveillance Policy and Procedures

Dr. Debra L. Emmons – Assistant General Manager, Strategic Assessments & Studies Division, Civil Systems Group, The Aerospace Corporation (Independent Cost Estimate/Independent Cost Assessment)

Specializes in systems engineering, technical analysis, acquisition, program management, and strategic studies for NASA and Civil Space Programs; as well as developing and managing programs across all the NASA Science & Technology focused centers and universities and non-profit entities. Also manages the Programmatic & Technical Assessment Center of Excellence (COE) for strategic studies and analysis.

E.J. (“Ned”) Holland, Jr. - Retired Assistant Secretary for Administration, U.S. Department of Health and Human Services (Independent Cost Estimate/Independent Cost Assessment)

Specializes in human capital management, executive compensation, change management, and organizational design, which gives him a broad view of business, the ability to identify organizational issues, and insight into structure solutions and frameworks for executing tactical action plans.

Ronald Lutha – Project Director, U.S. Department of Energy (Earned Value Management)

Responsible for federal project management for the execution of projects through cooperative agreements, obtaining Critical Decision 1 (Approve Alternative Selection and Cost Range), Critical Decision 2 (Approve Project Baseline) and Critical Decision 3 (Approve Start of Construction); assisted in the development of the Environmental Assessments; work closely with DOE Office of Nuclear Physics program and provide close oversight of the project construction status; and developing and implementing organizational strategies, objectives, and action plans.

Kim Moreland - Associate Vice Chancellor, Director University of Wisconsin – Madison (Cost Incurred)

Responsible for leadership of all grants and contracts management activities at the University of Wisconsin – Madison, including proposal review and submission, contract negotiations, award set up and interpretation, accounting and financial reporting, F&A proposal and negotiation, closeout and audit. Member of the Board of Directors of the Council on Governmental Relations and served as chair of the Costing Policies Committee, also on the Board of the Federal Demonstration Partnership and serves as chair of the Finance Committee. Former president of the National Council of University Research Administrators.

William G. Roets II – Deputy Assistant Administrator for Procurement (SES), National Aeronautics and Space Administration (NASA) Headquarters (Cost Estimating)

Responsible for providing executive senior leadership and direction to the Office of Procurement by planning, coordinating, reviewing, evaluating, and ensuring the timeliness and effectiveness of the full spectrum of NASA procurement activities. Served as Director of the Contract and Grant Policy Division at the NASA Headquarters Office of

Report on Cost Surveillance Policy and Procedures

Procurement where he directed the development of NASA procurement policies and procedures and oversaw Agency-wide contract pricing procedures and strategies.

III. Background and Status of Programs Assessed

The BOAC Subcommittee assessed four projects using products and documents from across the projects' respective lifecycle stages; namely Design, Construction and Operations. Interviews were also conducted to ensure a clear understanding of the projects and the actions taken, specifically related to the Subcommittee charge. The four projects evaluated were:

A. The Antarctic Infrastructure Modernization for Science project (AIMS)

The AIMS project is currently in the final design phase. It was initially managed by the Geosciences/Office of Polar Programs Antarctic Infrastructure and Logistics (GEO/OPP AIL) Section as the primary activity lead, but the actual design, construction, and project management is provided by Leidos Corporation (formerly Lockheed Martin Corporation) as the current awardee of the NSF Antarctic Support Contract (LEIDOS). The LEIDOS contract was awarded in December 2011 and they currently are the Antarctic Support Contractor (ASC). The Conceptual Design Review (CDR) (Cost Analysis #1) was completed in March 2015 and the Preliminary Design Review (PDR) (Cost Analysis #2) was completed in December 2016. The AIMS project is expected to submit a listing of activities for the development of the final design review in October 2018.

B. Regional Class Research Vessel (RCRV)

In 2001, the Federal Ocean Facilities group came to an agreement that the Navy would support larger research vessels, and NSF would build up to three smaller, regional class research vessels. The solicitation for those three vessels was issued in 2012, and Oregon State University (OSU) has now received a cooperative agreement to build two vessels. There will likely be a third vessel authorized as well. While OSU is very experienced in operating research ships, there is not that same history with construction. Accordingly, OSU has issued a contract to a shipyard for a sizeable portion of the total amount of the first cooperative agreement for the construction of the first vessel. The RCRV project is now in the construction stage of the cooperative agreement that was effective on July 1, 2017 with an expiration date of September 30, 2023. The project had passed many of the early design phase milestones prior to the NSF's strengthened cost oversight procedures.

C. Large Synoptic Survey Telescope (LSST)

The National Science Foundation (NSF) is the lead agency and principal funding source for the LSST project; through this award NSF is responsible for the site, the building and all physical plant, the telescope and all supporting infrastructure, the data management, transport, archiving and delivery systems, and the Education and Public Outreach (EPO) program. The DOE Office of High Energy Physics is providing the camera for LSST and will support its installation, maintenance, and future operations. The Association of

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Universities for Research in Astronomy (AURA) is responsible for accomplishing the project objectives and managing the project throughout construction and commissioning. AURA will coordinate communications with all associated organizations, international organizations and governments, and the scientific and engineering communities. The Stanford Linear Accelerator Center (SLAC) National Accelerator Laboratory is responsible for managing the LSST Camera Major Item of Equipment fabrication project for the DOE, and for coordinating with AURA to ensure the successful integration of the LSST system. Since LSST was in later Construction phase the project passed through early milestones prior to the cost strengthened oversight, except for budget contingency.

D. Gemini Observatory (Gemini)

The Gemini Observatory is an international partnership that operates two large-aperture (8 m) telescopes in Hawaii and Chile. Operation of the observatory is a collaborative effort (using a Cooperative Agreement) between the United States, Canada, Argentina, Brazil, and Chile; other nations also take part as limited-term collaborators. A Cooperative Agreement (CA) was signed January 1, 2017 with an expiration date of December 31, 2022. The purpose of the CA is for the Management and Operations of the Gemini Observatory. The recipient is Association of Universities for Research in Astronomy, Inc. (AURA). Since Gemini was in the Management and Operations phase, the project passed through early milestones prior to the strengthened cost oversight.

The Subcommittee was provided several thousand pages of materials. These materials ranged from guidance documents (e.g. Standard Operating Guidance (SOGs)), to project documents, to new policies. Many of these products and guidance documents were generated by NSF in direct response to American Innovation and Competitiveness Act (AICA) and Government Accountability Office (GAO) reviews that called for strengthened oversight. The NSF should be commended for its efforts to redress identified deficiencies in its project management and oversight of Major Facilities projects.

IV. Review of Process Sufficiency

A. Antarctic Infrastructure Modernization for Science (AIMS)

1) Cost Estimating

The AIMS program is currently in the Final Design phase as it was executed through a sole-source modification to the Leidos Antarctic support contract. Since this was a contract rather than a cooperative agreement, using SOG 2016-4 was not required. However, in order to perform a good cost analysis and estimate on the ASC deliverable, some level of review and analysis would be appropriate to determine if the costs were reasonable and supportable. After reviewing the Cost Analysis Memorandum for the Preliminary Design Review (Feb 2017), we found that the NSF evaluators did not sufficiently document the analysis they performed. Even though SOG 2016-4 was not required, much could have been learned from the intent of the SOG. Specifically, as a good practice, a documented estimate assessment would be accomplished to validate ASC's level of cost realism and risk for the work to be accomplished. As a result, we could not find the support needed on the evaluation of the ASC proposal. If any documented assessment was completed by the evaluators, in order to justify their conclusions of ASC's proposal, we did not see it.

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Nearly all evaluations of the ASC estimates were considered “comprehensive, accurate, and credible” by the NSF evaluators. This gave the estimate a level of optimism that was not justified due to the lack of documentation by NSF evaluators of the costs anticipated. Except for issues with assumptions, clarifications of risk, staff positions, minor differences in interpretation, etc. justification was not provided as to why the estimates were “comprehensive, accurate and credible”.

However, estimates such as direct labor, subcontract costs, infrastructure, facilities, etc. were based on current and historical labor rates, factors, and usage rates. For direct labor, using historical rates may be appropriate on behalf of ASC. Yet the review team did not appear to validate whether the hours applied for direct labor were assessed for realism for the next phase of the project. Subcontractor rates were based on a mix of multiple methodologies, but without a documented review of these methodologies and how they were applied, we have little confidence in the government assessment and conclusion.

ASC applied rates and factors to utilities and facilities based on current types of labor expectations. In addition, ASC brought in an independent company to provide many of these estimates. Again, we saw no evidence that any assessment as to the assumptions applied, ground rules used and estimating techniques for each element of cost were evaluated for applicability.

Recognizing the lack of documentation of the evaluator’s assessment, and consideration for providing a reasonable approach for assessing this information, we found that the evaluators tried to follow a formal cost analysis review process, but without documentation, it was not supportable.

2) Independent Cost Estimate/Independent Cost Assessment (ICE/ICA)

The current NSF policy indicates that... “NSF will obtain an independent cost assessment (ICA) of large facility projects, in accordance with LFO Standard Operating Guidance, and the results of the independent assessment will be included in the Cost Proposal Review Document (CPRD) analysis. To ensure maximum usefulness of the ICA, it will be generally obtained prior to CPRD Approval #2 to ensure that analysis from the assessment is available for feedback to the awardee prior to Final Design Review.”

An Independent Cost Estimate (ICE) and Reasonableness Review are required to be reconciled with the Recipient estimate during the NSF cost analysis, prior to making an award to the Recipient for construction. An ICA could be used in lieu of a Reasonableness Review since it, by definition, encompasses a Reasonableness Review.

It is important to note that an ICA is not a cost estimate; it is an assessment of the project’s existing cost estimates and the documentation and practices used to generate them. In contrast, an ICE is derived by an independent party using the same detailed technical information as the Recipient (or Project) estimate. The technical information typically includes the technical baseline description; i.e., a clear definition of the

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project's scope and the selected technical approach in sufficient detail to enable a credible cost estimate. Technical information also usually includes requirements, drawings, specifications, key assumptions, WBS, any high-level schedule constraints, overall acquisition strategy, and descriptions of system design, technology, and operations.

The AIMS project evolved through key milestones as part of the Design Phase:

- April 2014 - AIMS gained approval for Concept Design Review
- March 2015 – NSF Analysis #1 – Concept Design Review
- Dec 2016 – NSF Analysis #2 – Preliminary Design Review (PDR)

NSF commissioned Kforce Government Solutions, Inc. (KGS), to perform an ICA at the 15% design point in time, and then the 35% design point in time. Our committee reviewed the ICA document, but an ICE had not yet been conducted.

The KGS ICA provides an independent review of the construction, and construction support, cost estimates provided by Leidos for the Antarctic Infrastructure Modernization for Science (AIMS) project.

The ICA does an adequate role of identifying the optimism in the point design, and critical issue that needs to be addressed in contingency development and risk analysis. However, in the important conclusion areas about the baseline cost estimate, it is contradictory in nature. It states... "The very small probability that costs will occur at the Baseline level (\$246.9M) implies an optimism in the point cost estimates included in the Monte Carlo simulation that has not generally been observed in other large facility cost estimates, subject to ICA analyses." yet simultaneously also concludes, we "would conclude that the Project Baseline Cost Estimate is credible."

3) Internal Management Plans and Earned Value Management

The AIMS project is being overseen by the GEO/OPP AIL Section as the primary activity lead, but the actual design, construction, and project management will be provided by Leidos Corporation (formerly Lockheed Martin Corporation) as the current recipient of the NSF Antarctic Support Contract (LEIDOS). The LEIDOS contract was awarded in December 2011. The AIMS project is in the final design phase with the submission of activities for the development of the final design review in October 2018.

In order to better understand the how the EVM process is applied at NSF, we reviewed the Internal Management Plan (IMP). A draft IMP for the AIMS project was developed highlighting the NSF organizational structure to provide oversight of the project. Since the IMP is the primary document that describes how NSF will oversee a facility through the various life cycle stages and is regarded as a living document that will be updated as the project matures, we felt that using the IMP was essential to our review process for two reasons, the IMP:

- defines in specific detail how NSF will conduct oversight of a project, and
- provides budgetary estimates for developing, construction and operating the facility, identifies divestment liabilities, and lays out a strategy for financing these

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activities as well as the associated NSF oversight reporting requirements, including:

- Monthly financial reports, which include Earned Value Management (EVM)
- Weekly summaries including design reports and design/build report
- Quarterly risk management reports.

The April 2018 AIMS monthly report, which is produced by the project, includes the status, integrated project schedule along with critical path – project or program milestones, a program summary master schedule (PSMS), financial summary and projections which included a top level EVM data table, schedule and cost variance graph, WBS sub-system level EVM data including Schedule Performance Index (SPI) and Cost Performance Index (CPI) along with variance analysis based on the thresholds of cumulative cost and schedule variance +/- \$50,000 and +/- 20% and cost variance at complete +/- \$50,000 and +/- 20%. The key risks are discussed in the monthly report along with the associated risk update. A program summary is also included which highlights the activities of the NSF in moving the project forward. It should be noted that the LFM requires that the baseline be established at the start of construction, however the EVM data is now being monitored by the program for the final design phase effort to be prepared for the construction stage currently scheduled for the spring of 2019.

The EVMS data is being provided during the preliminary design stage of the project which is encouraged in the EVMS SOG LFO-017-2. The development of EV data at this stage of the project will help the project be ready for a Compliance Evaluation Review (CER) during the final design phase before the award of construction funds. This is a good practice and is in line with NSF guides.

The IMP states that during construction, weekly project status reports to the program officer will be required of LEIDOS which will contain more detailed information.

The AIMS Configuration and Contingency Management Plan (CCMP), dated November 2016, is described in appendix 1 of the IMP. The AIMS CCMP defines the steps and the activities required to implement and perform configuration and contingency management. The CCMP also defines the methodology for configuration identification, configuration control and change management, configuration status accounting and configuration verification and auditing for the contract, contract requirements and delivered work products.

It appears that all the LFM requirements have been satisfied by the AIMS project team. EVM reporting has been initiated based on the funding through fiscal year 2018

4) Incurred Cost Audits, Indirect Costs and Budget Contingency

As stated previously, this is a contract, not a cooperative agreement. Because this is a contract, there are far fewer flexibilities available to the recipient. Additionally, the

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Federal Acquisitions Regulations (FAR) have provisions for oversight of the contract. Currently, contracting officers receive invoices with backup data from LEIDOS on a bi-monthly basis, and they work in consultation with Program on the reasonableness of costs. There are times when costs are questioned, and additional explanation is required.

The Defense Contract Management Agency (DCMA) and Defense Contract Audit Agency (DCAA) have the responsibility for auditing and negotiating Indirect Cost rates for the project. AIMS construction, which begins in March 2019, will have a very sophisticated EVM process, including a baseline structure and verification against invoices. There are multiple projects within the construction plan, and there is a commitment for science to continue during the construction phase. There will be physical inspectors from NSF on site.

Project invoices are generated bi-monthly. The contracting officer reviews billable costs and supporting documentation. The DCAA is behind on audits, but the contracting officers should receive the audit reports on this project for FY's 2014, 2015 and 2016 in the Fall of 2018. There were no findings on the Lockheed contract for FY's 2012 and 2013; that contract was transferred to LEIDOS, which is a spin-off from Lockheed. There is little concern about allowable and allocable costs incurred because of the level of project oversight and annual audits by DCAA.

B. Regional Class Research Vessel (RCRV)

1) Cost Estimating

The RCRV CDR was completed in December 2013, the PDR was completed in August 2014 and Post FDR Pre-award CPRD was completed in June 2017. The NSF assessment for the PDR and Post PDR cost proposal activities were prior to construction and developed in line with the SOG 2016-4. Based on our review, we could not determine the validity of many of the evaluator's assessments due to lack of data available. This included assessment of inflation indices, labor rate comparisons to other systems (presumably similar or like systems), fringe rates, travel, escalation of Crewing and Shore support rate increases, etc.

Where we did see the basis of the evaluator's assessments, it was based on an undocumented single conversation with a presumed subject matter expert. We recognize subject matter experts, who are knowledgeable about certain aspects of this estimate, can provide advice and clarity on the estimates submitted. However, without documentation of the conversations with these individuals we have no basis for their assessments and conclusions that were made.

In any review, the more specifics, directly related to the estimate in question, will provide more confidence in the reviewer's evaluation efforts. Without visibility into the process of how the assessment and analysis that the evaluator took, we found little substantiation (documentation) of their conclusions.

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2) Independent Cost Analysis/Independent Cost Estimate (ICA/ICE)

The RCRV project evolved through key milestones as part of the Design Phase:

- Preliminary Design Review - August 2014 -- NSF Cost Analysis #2
- Final Design Review (FDR) Nov 2016 CPRD -- -NSF Cost Analysis #3

NSF commissioned an Independent Cost Estimate (ICE), which was produced in its final form in June 2014 to align with the PDR design phase. The BOAC subcommittee assessed the ICE. The ICE was to only cover the scope of the vessel construction.

The ICE appears to do an adequate part in covering different risk-driven scenarios. However, the treatment of risk events, in general, is limited and appears to address only material and production risks during construction. In addition, historical data should be used to validate the approaches. Overall, the subcommittee believes there are areas for improvement in the ICE approach.

3) Internal Management Plans and Earned Value Management

In accordance with SOG LFO-2017-2 a review was performed by two people from NSF -- one contractor who is an Earned Value Specialist, and the other who is a Project Management Control System (PMCS) Expert. The review resulted in an EVMS Assessment Report dated January 19, 2017. The review team found that the RCRV project is positioned to, but does not yet, meet NSF requirements for EVMS verification and acceptance based on the thirty-two (32) EIA-748 guidelines. The review team identified seven (7) individual guidelines with critical findings and nine (9) individual guidelines with non-critical findings that require follow-up on the part of the project prior to NSF acceptance of RCRV's EVMS.

The EVMS Corrective Action Plan was submitted by Oregon State University (OSU) on June 29, 2017 and NSF accepted the OSU EVM system as compliant with the intent of EIA-748B. SOG 2017-2 Earned Value Management System (EVMS) dated March 2017 states that "The frequency and focus of surveillance reviews are determined by the Program Officer in consultation with the Large Facilities Office. Yearly surveillance as part of annual reviews are the norm, but a different frequency may be judged to be beneficial." According to documentation provided during the review the EVMS Surveillance Review for RCRV is planned for July 2018.

Monthly project Report #4 dated November 27, 2017 and Report #5 dated December 21, 2017 were provided to the committee. An outline of the monthly report including the EV information is stated in the Cooperative Agreement. The two reports provided during the review provided the required information from the recipient on project status, current photos, Integrated Project Schedule, Financial summary and projections, EV data with an analysis of cost and schedule variances, risk management and narrative/tracking of risks, and cost/schedule/scope contingency status. At the end of the monthly report is a Program Summary highlighting the analysis of the NSF Program Officer which should be adopted as a best practice.

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The reviewed monthly project reports were found to be comprehensive and informative. Based on the extensive financial and earned value management data presented in the Monthly Project Reports, the NSF can provide, using EVM, adequate oversight of the RCRV project during the construction phase.

One concern however related to the EVM review was that the RCRV Internal Management Plan (IMP) has not been updated in the last four years. According to the Large Facilities Manual (NSF 17-066, dated March 2017) table 2.1.6 "Roles and Responsibilities for NSF Staff for Management and Oversight of Large Facilities" the IMP should be developed during the Conceptual Design stage and updated during the Preliminary Design, continues to monitor in accordance IMP during the Final Design and update the IMP during the construction/implementation stage.

4) Incurred Cost Audits, Indirect Costs and Budget Contingency

The total award to OSU is about \$353 M, and of that about \$230M goes to the shipyard in a contract for fabrication. NSF has negotiated a separate indirect cost rate for this project, a 2% General & Administrative rate for the contract. All of this is within current policy. There will be an incurred cost audit conducted in 2019.

Contingency funds require multiple approvals before being released. Once they are made available, they are expended in the same way as regular project funds, and they are subject to the same regulations and policies. All funds are subject to multiple layers of oversight through monthly reports, annual risk assessments, EVM reports, 3 quarterly site visits to the shipyard and 1 annual visit to OSU as well as the incurred cost audits.

The contract for actual construction was issued on a fixed price basis, with NSF approval, for the fabrication; payments are based on progress. OSU has field office staff in Louisiana who look at the invoices and compare the costs to actual progress

C. Large Synoptic Survey Telescope (LSST)

1) Cost Estimating

The LSST cost assessment effort was started prior to the release of SOG 2016-4. As a result, we were not able to evaluate the documentation.

2) Independent Cost Estimate/Independent Cost Assessment (ICE/ICA)

The LSST project evolved through key milestones as part of the design phase:

- September 2007: Prior to strengthened procedures – Cost Analysis #1 Concept Design Review
- September 2011: Prior to strengthened procedures – Cost Analysis #2 Preliminary Design Review
- December 2013: Cost Analysis #3 Final Design Review (FDR)

**NSF Commissioned a Sufficiency review on LSST but the BOAC subcommittee did not review the document.

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3) Internal Management Plans and Earned Value Management

The effective date of the Cooperative Agreement is July 1, 2014 with an expiration date of September 30, 2022 for the construction of the Large Synoptic Survey Telescope (LSST). The recipient is Association of Universities for Research in Astronomy, Inc. (AURA).

The LSST EVMS was assessed in February 2016 by an independent review team (performed by two NSF PMCS experts and one external contractor that was an earned value specialist) in accordance with NSF draft internal standard operating guidance *Earned Value Management System (EVMS) Validation, Surveillance, and Acceptance Guide* that was in draft at the time of the review. The review team determined that the LSST EVMS is effectively implemented and the Project Team is appropriately using the associated tools and processes. Furthermore, the LSST Project Team has satisfactorily addressed the recommendations made by the review team to fully meet the intent of the EIA-748 Standard for Earned Value Management. After the project appropriately responded to the review committee recommends, NSF-LFO accepted the LSST EVMS as meeting the intent of EIA-748 on January 25, 2017.

The review committee was provided one monthly report dated November 15, 2017 as an example of monthly reports submitted to NSF by LSST. The monthly report followed a similar format as the RCRV, AIMS projects and stated in the Cooperative Agreement Section 6 "Reporting and Review Requirements." The details in the monthly report are good and informative. The EV information is appropriate along with the cost and schedule variance analysis and updated risk analysis information. The Program Summary at the end of the monthly report demonstrated NSF oversight of the project and interagency active on the project.

No Integrated Management Plan (IMP) was provided to the committee for the LSST.

4) Incurred Cost Audits, Indirect Costs and Budget Contingency

NSF is the cognizant agency for AURA, except for the NASA activities. The indirect cost proposals are reviewed annually, and indirect rates are negotiated with the NSF Cost Analysis and Pre-Award (CAP) branch. AURA has over 30 separate rates in use with each rate specific to a project and location. In addition, there is one corporate rate. There is a long-term relationship between AURA and Chile, and there is a special rate for this Chilean-based telescope. There were established rates that pre-dated the LSST project, and those rates recognized the impact on costs of Chilean labor unions. The complexities are enormous.

The AURA management fee for LSST is about \$150,000/year for this very complex project, currently valued at over \$600 M; the AURA administrative rate is about 2%.

The project has been subject to Accounting System Reviews, a financial viability study, business systems reviews on a schedule, regular financial reports, and an incurred cost audit.

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Hamilton Enterprises, LLC, performed an Incurred Cost Audit on the LSST for the period July 1, 2014 to June 30, 2016. The audit, which followed a standard approach to incurred costs, looked at internal controls in relationship to incurred costs and to issues of allowability, allocability and reasonableness. In addition, the audit looked for instances of fraud, waste, and abuse as well as any instances of material misstatement of costs. Total costs for the period under review exceeded \$90 M, and auditors questioned costs of \$6,844 in fringes, \$5,233 in exchange rate costs, and \$7,029 in costs associated with a Chilean non-profit. Auditors also noted that LSST undercharged indirect costs in the amount of \$22,177 for that same period, ending in a net of <\$3,081> for the audit.

The incurred cost audit was in accordance with NSF policy. However, auditors strongly recommended that AURA switch to full accrual accounting in accordance with GAAP. NSF has also recommended that AURA make that change.

D. Gemini

1) Cost Estimating

The Gemini cost assessment effort was started prior to the release of SOG 2016-4. As a result, we were not able to evaluate the documentation.

2) Independent Cost Estimate/Independent Cost Assessment (ICE/ICA)

The Gemini project review started with the Operations Award in April 2017. Since the Operations phase is not associated with the stage gate review process, there were no independent cost estimates/analysis reviewed for the Gemini project.

3) Internal Management Plans and Earned Value Management

Quarterly and Annual reports are used to communicate efforts to maintain and improve the performance of the observatory, its telescopes and instruments, and to enhance user and stakeholder services. Reporting includes deliverables and milestones and will assess the risks associated with all major development activities at the observatory and detail the steps being taken to mitigate these risks.

Required reports include:

- Risk Management Plan
- Annual Progress Reports and Plans
- Finance Reports
- Operations and Development Reports
- Final report – within 90 days of the expiration date of the CA.

The committee was provided the 2017 Annual Progress Report of the Gemini Observatory and the 2018 Program Operations and Development Plan of the Gemini Observatory. Both documents were very detailed of the past and potential future activities at the observatory in accordance with the CA. EVMS is not required under an operating CA.

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4) Incurred Cost Audits, Indirect Costs and Budget Contingency

The Gemini Observatory is an international partnership that operates two large telescopes located on the summits of Maunakea, Hawaii and Cerro Pachon, Chile. There is currently in place a 6-year, \$208 million cooperative agreement to the Association of Universities for Research in Astronomy, Inc. (AURA) for the management and operation of the Gemini Observatory.

Gemini was constructed under a contract, not a cooperative agreement, but the current operations award is a cooperative agreement. Gemini participants include the U.S., Canada, Chile, Brazil, Argentina, and Korea. Astronomers in those countries and at the University of Hawaii have ongoing access to Gemini, and any astronomer in those countries can apply for time on Gemini.

Gemini is an observatory, but it is also an instrument that needs upgrades. There was a suggestion of utilizing a contingency fund, but NSF does not do contingencies for operations awards. Instead, Gemini has included a complexity factor in the budget.

The indirect cost rates, as with LSST, are negotiated between AURA and NSF CAP on an annual basis. Prior approvals are required generally as outlined in 2 CFR 200, the Uniform Guidance, and include categories such as sub awards, change in Principal Investigator, change in the scope of work, etc. Costs are monitored for allowability, allocability and reasonableness through quarterly financial reports, the indirect cost negotiations, and incurred cost audits. There is a continual emphasis on outcomes in relation to costs.

V. Summary

NSF has many policies, provisions, and practices in place to assess, support, justify modify, and monitor internal controls that support appropriate spending at the recipient organization. There is a comprehensive network of audits and reviews that provides strong and sufficient policies and procedures for large facilities projects. Among the monitoring policies, there are certain requirements that are especially noteworthy:

- The Cost Proposal Review Document (CPRD; SOG 2016-4) that contains a discussion of the recipient's cost proposal estimating reasonableness, justification of costs and overheads, use of independent estimates/analysis, and post award issues and incurred cost audits
- SOG – Selection of Independent Cost Estimate Reviews (Draft)
- SOG – Budget Contingency
- SOG – FL 99
- Section 4.2 of the LFM
- Internal Management Plan (IMP) for construction awards the lays out a plan for post award monitoring activities including reviews and audits.
- Communication documentation to maintain and improve the performance of the program depending on the life cycle stage including:
 - Project Execution Plan (PEP)
 - Risk Management Plan and other plans
 - Annual Progress Reports
 - Finance Reports

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- Operations and Development Reports
- Accounting System Reviews, typically for new recipients, led by the Cost Analysis and Pre-award Branch (CAAR) staff.
- Business System Reviews, which can be focused or general in scope, designed to provide oversight of the people, processes, and technologies that support the administrative management of a Facility.
- Review of the status of recent recipient single audit reports or program-specific audits.
- Frequent financial and progress reports that are reviewed by advisory committees and NSF staff with a focus on the relationship of expenditures to project progress.
- Incurred cost audits based on risk or in accord with recent AICA standards that require an audit of construction awards during the life of the award and at least every three years.
- The addition of BFA 2018-YY, Minimum core competencies for Oversight and Management of Major Research Infrastructure, a SOG document. The document, developed in response to a NAPA report, establishes a set of core competency guidelines for project management expertise needed by NSF staff in various roles on the project. These core competencies, in the subcommittee's opinion, are critical to the future success of this cost analysis process. The more NSF trained analysts that apply these competencies, the better the process will be accomplished. The result will be a clearer understanding of what the requirements are to provide supportable and justifiable assessments, as well as ensure the results meet the SOGs and LFM intent.

The Subcommittee review process included evaluation of all the documents above (including the programmatic data associated with each of the four projects being assessed) as well as face-to-face interviews with NSF staff. Overall, all NSF personnel were very helpful and open about their efforts, issues and expectations they had for their recipients. It also included a detailed review of the data provided by NSF on their external SharePoint site. Each team evaluated individually the project against the policies, procedures and processes defined for their portion of the cost analysis activity (i.e., Cost Estimating, Independent Cost Estimate/Analysis, Internal Management Plans and Earned Value Management, and Incurred Cost Audits, Indirect Costs and Budget Contingency).

The subcommittee concluded that overall, the processes were followed. However, the level of rigor applied to each process varied depending on who and what was required.

Specifically, the EV requirements are stated in SOG LFO-2017-2 (Earned Value Management System Verification, Acceptance, and Surveillance, dated March 21, 2017) and the reporting requirements are stated in the Project Execution Plan (PEP). NSF's policy and procedures for verification and utilization of an Earned Value Management System (EVMS) has been appropriately implemented on the project's that were reviewed. The EVMS verification process by NSF of the recipient is beneficial since it ensures that the data is accurate and is timely reported with analysis by the Program Officer's.

The Internal Management Plan (IMP) is the primary document that describes how NSF will oversee development, construction, operation and eventually divestment and closeout (described in section 2.3.1 for MREFC and in section 2.7 for non-MREFC projects). As stated previously, an IMP was an important document for understanding on how EVM is implemented and managed. Most of the projects reviewed developed an IMP, however not all the IMPs were kept up to date

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as required in the Large Facilities Manual. Keeping these documents up to date is important to ensure consistency of management application and execution.

The Cost Estimating and Independent Cost Estimate/Analysis portions of the review were not as well accomplished. For example, a key purpose of the CPRD is to document the evaluator's review, provide justification of their assessments, and support or propose changes to the recipient's proposal for award. These were not accomplished to the level that garnered confidence in their assessment and did not totally meet the intent of the CPRD. While decisions were made using this documentation, the subcommittee did not see enough detail developed to support the NSF evaluator's position with either cost estimating rigor or the use of independent cost estimates or analysis. However, based on the results, the costs approved by NSF and applied to each project seemed to be within reason for execution. While that is good, the process used did not support how their assessment justified the cost of these projects.

The NSF should be commended for doing a good job of documenting what is required and providing support to the reviewers by enabling them to keep the process moving forward to ensure basic research and science is accomplished within a wide variety of disciplines.

Given the results, the BOAC subcommittee believes **that NSF's processes are sufficient to ensure compliance with their intent and application as well as the continued improvement and use of cost estimating/analysis and surveillance procedures going forward.** At the same time, the subcommittee offers some considerations for more effective cost estimating and analysis, performance measurement and programmatic oversight in the future.

VI. Considerations for Improvement

As previously discussed, the subcommittee believes the processes are sufficient to ensure compliance with their intent and application as well as the continued improvement and use of cost estimating/analysis and surveillance procedures going forward. However, to understand these processes and procedures one must read and review a plethora of paperwork to understand the full aspects and purpose of the documentation. We recognize that each document has its own intent and use, but to review these documents individually can lead to confusion and misapplication of the requirements. Therefore, as our only overarching recommendation, NSF should consider consolidating SOGs, manuals, and other policies and procedures, as appropriate, into a single document or series of focused documents addressing "cost analysis" or at a minimum, the four major areas of our review. This would reduce the amount of paper to review and bring cohesion into the process and eliminate redundancy across multiple policies, procedures, and manuals.

The following are further considerations for improving the cost analysis process in the four major areas of review.

A. Cost Estimating

The documentation describing what is required to perform cost estimating and analysis on recipients' proposals is clearly documented in the Large Facilities Manual (LFM) NSF 17-066 (March 2017) and Standard Operating Guidance (SOG) 2016-4. While the LFM provides guidance for supporting, justifying and evaluating Recipient cost estimates; the

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SOG provides the reporting format, cost analysis techniques, and evaluation criteria by which the Division of Acquisition and Cooperative Support/Cooperative Support Branch (DACS/CSB) can provide their evaluation of the recipient's cost estimates for the Conceptual, Preliminary, and Final Design Phases of the program. The Subcommittee determined that neither of these documents were followed consistently. Whether it was due to a misinterpretation of what is intended or the time available or the knowledge and training of the personnel performing the analysis, the evaluation process and its documentation was less than satisfactory. Based on the documentation it was difficult to understand how the recipient's estimate was either allowable, allocable, or reasonable. Analyses were not provided to ascertain this information.

Some considerations to improve this process are as follows:

The CPRD template is documented in the SOG. For the purpose of documenting the Proposed, Objective and Final Result of the dollars required for the recipient and NSF Program Officer's negotiation, it is relatively reasonable. However, to document the realism, reasonableness and justification the evaluator has provided of the recipient's estimate is neither considered nor supported in the document. It is up to the recipient to provide supportable evidence that the amount of dollars estimated would be reasonable and justifiable to receive the dollars required. It is the role of the evaluator to determine whether the quality and supportability of the recipient's estimate is strong enough to accept their proposed dollars. This should be accomplished whether it is a contract or a grant. In doing so the evaluator needs to show how they determined the reasonableness and by what means they used to substantiate or not, the recipient's estimate. Without this documentation by the recipient and the evaluator, it leaves speculation as to the validity of the process. It is recommended that the recipient provide a well-documented, quantitative justification and support as to how they derived the dollars and hours for each element of their proposal. In the same way, it is recommended that the evaluator provide a well-documented, quantitative justification and support as to how they substantiated the recipient's proposal or what quantitative or qualitative justification they used to change the recipient's recommendation.

What little of the recipient's justifications we were able to exam was based on one of two estimating techniques: engineering estimates (expert opinion) or engineering build-up. The engineering build-up methodology used factors, quotes, expert opinion, and estimates to support the analysis. By its nature, expert opinion is the least supportable methodology as it is based on one or many people's opinion. This is clearly documented in the GAO Cost Estimating and Assessment Guide. Yet NSF may inadvertently encourage the use of Expert Opinion since it is usually the first option when listed as a recommended approach. By the fact that it is listed first, we are assuming that the recipient could believe this is what NSF's first preference is. On the other hand, for those items that are being purchased or are based on some form of factual data, engineering build-up estimate has value – assuming the analyst has validated the information used and normalized the data to address the element being specifically estimated. It is not appropriate to use data to support an estimate without showing the relevance of the data to the estimate it supports.

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It is recommended that the methodology used for estimating purposes be required in this hierarchy of preference:

- Actual/historical data for the system/subsystems being estimated,
- Analogous data (like or similar to the system/subsystem which closely represents the data being proposed) with adjustments to reflect the technical and complexity differences between the analogous and actual system/subsystem being estimated,
- Parametric data which should be used for higher level work breakdown structure estimating. This data should generically reflect the system being estimated, but modified to reflect the technical, size, weight, quantity and/or schedule of the system being estimated,
- Expert opinion which should be used only if a secondary methodology is used to substantiate the expert opinion provided by the recipient or evaluator.

The same order of methodology should be used by the recipient as well as for the NSF evaluator. Most evaluators are using their own expert opinion to justify the recipient's expert opinion. This unfortunately is a redundant approach to the process. A different methodology should always be used to substantiate/justify another estimate whether it is a recipient's estimate or an evaluator's estimate.

As a recommended improvement, use of cost analysts/estimators that are certified through qualified organizations (i.e., International Cost Estimating and Analysis Association (ICEAA) or American Association of Cost Engineering, International (AACEI)), should be encouraged. Using certified and qualified estimators provides assurance that the estimating process is followed, and best practices are applied to estimates, reviews and analyses. The SOG on "Minimum core competencies for Oversight and Management of Major Research Infrastructure" states that certification is desired. Follow through of this recommendation will greatly enhance and improve the estimating and analysis capabilities of NSF analysts. This applies to those who perform Independent Cost Estimates/Analysis.

Finally, the most compelling portion of any estimate is its documentation. It needs to tell a story, so the reader can understand the analysis and if possible, reproduce the results of the estimate. This means both the recipient and the evaluator need to be clear in their documentation of their approach, analysis and results they provide to clearly and succinctly describe their estimate. Without this, it is hard to determine the estimate is allowable, allocable, or reasonable. Whatever methodology used, it should provide the best supporting documentation available to ensure confidence in the estimate it supports

B. Independent Cost Estimates/Analysis (ICE/ICA)

In its current form, the ICA utility appears limited. It is boilerplate in nature and doesn't appear to really address the complexity of the projects, their project management and risk identification. The ICAs are useful in the initial phases as an Agency begins to strengthen its oversight and project management processes and learn how to do the programmatic oversight. Over time, the NSF should migrate to ICE products even if higher-level in nature and early in the project lifecycle. The independent cost products

Report on Cost Surveillance Policy and Procedures

need to focus on the “how of the estimating”, the risk identification and evaluation, and address the “credibility” side of cost estimating. By design the ICA is focused on process, not content, and the issues at this point in NSF’s oversight processes should migrate to content.

An ICE should be conducted as early as possible in the project lifecycle of the project to inform possible trades and descopes. The BOAC subcommittee expected to see an ICE product, even if preliminary, for the AIMS project.

- The ICE product should also be used to foster discussions about risks between the independent agent and the Project. It is currently unclear how the ICE products are used to drive dialogue and reconciliation around risks and assumptions.
- An independent schedule estimate (ISE) should be performed in concert with the ICE for enhanced confidence. Schedule is often a driver of cost and it should be assessed accordingly. The NSF should consider budgeting to an independent probabilistic schedule analysis.
- The traceability of non-negotiable science and or technical performance requirements is not apparent or traceable from the products. Since there is such a strong reliance on scoping (design phase) and descoping (construction phase) to meet the cost caps (see 6) below), there should be more clearly defined criteria around scoping/descoping decisions. Threshold or Non-negotiable requirements are the level of requirements below which the project isn’t worth doing.
- NSF has implemented a “No Cost Overrun Policy” on MREFC-funded construction projects. This policy requires that the Total Project Cost (TPC) estimate developed at the Preliminary Design Stage has adequate contingency to cover all foreseeable risks, and that any cost increases not covered by contingency be accommodated by reductions in scope. However, descoping well into the implementation phases of a project has been studied and typically doesn’t yield the cost savings forecasted.

The other issue with this approach is as follows. All foreseeable risks can be captured or categorized as “known-unknowns” risks. Estimated costs to cover “known-unknowns” are included in the cost contingencies. Estimating only known risks will lead to underestimating the costs, as there is uncertainty in all complex developmental projects; this discovery is understood in project management and cost estimating communities and such risks are known as “unknown-unknowns.”

In summary, this “No Cost Overrun policy” is misleading, and sends a confusing message both internally to Project Managers and to Stakeholders. If the overall objective is to have Major Facilities projects which are cost-capped, then a specific process for trading off between science/technical requirements, and programmatic performance should be codified.

For additional benchmarking on policy and guidance, NASA Science Mission Directorate has made progress in two key areas which could offer additional insights to NSF project oversight, a) Research that demonstrated the reasons for cost and schedule changes on

Report on Cost Surveillance Policy and Procedures

projects, and b) budgeting policy that enables more effective portfolio project management.

Regarding a) for complex aerospace, transportation, and major facilities projects, uncertainty always surrounds the project developments. The NASA Explanation of Change study demonstrated that 1/3 of the cost change impacts were due to external project events, that is, events outside the project manager's direct control, (e.g. funding profile interruptions), 1/3 of the cost changes were due to project planning, and 1/3 of the cost changes were due to project execution.ⁱ Nine considerations were made with the objective to decrease the potential for cost change in future missions.ⁱⁱ

Regarding b), currently, it appears from the BOAC subcommittee assessment of the four projects that there are no additional Unallocated Future Expenses (UFE) held at the NSF Headquarters level for portfolio management across its set of Major Facilities projects. UFE is the portion of resources identified in the probabilistic calculations that cannot yet be allocated to a specific Work Breakdown Structure (WBS) sub-element as the specific risks have not been realized. Managing at portfolio level and maintaining UFE has improved programmatic performance for a large set of complex NASA science missionsⁱⁱⁱ.

C. Internal Management Plans and Earned Value Management

The Earned Value Management process has been accomplished effectively. Analysis has been completed and data is being used to better understand the recipient's performance. The recommendations for this area are:

- Continue the appropriate implementation, verification and utilization of EVMS.
- Consideration needs to be given to updating the IMP on a regular basis.

D. Incurred Cost Audits, Indirect Costs and Budget Contingency

We recommend that NSF initiate a dialogue with the recipient community in preparation for the establishment of a set of core competency recommendations for recipient staff who support the administrative and management aspects of large facilities projects. The magnitude of the awards and the tremendous complexities of the projects requires that recipients bring the necessary expertise to the management, including post award responsibilities, of any large facility activity. These projects are managed according to a host of regulatory and contractual provisions in addition to the NSF policies and procedures for operations. Those provisions may be well beyond the experience of many financial managers, and the development of competencies would reflect the skill sets necessary for the management of these projects.

ⁱ "Explanation of Change (EoC) Study: Approach and Findings", Bitten, R., Emmons, D., Bordi, F., Scolese, C., IEEE Aerospace Conference, March 2013

ⁱⁱ "Explanation of Change (EoC) Study: Considerations and Implementation Challenges", Bitten, R., Emmons, D., Bordi, F., Scolese, C., Hart, M., Hinners, N., IEEE Aerospace Conference, March 2013

ⁱⁱⁱ "The Effect of Policy Changes on NASA Science Mission Cost & Schedule Growth", Bitten, R., et. al, IEEE Aerospace Conference, March 2018

Backgrounder: Fall 2018
NSF Advisory Committee for Business and Operations

Nature of Agenda Item: The CFO Office of the Future

Presentation:

Today's Chief Financial Officer (CFO) plays a central role at the crossroads of finance, technology and strategy in support of mission delivery. Although the private sector has adopted technology more quickly, federal CFOs are embracing the opportunity to modernize financial management and services. With the onset of new, emerging technologies, the role of the federal CFO office continues to evolve in the future. In this session, NSF's CFO, Chief Information Officer (CIO), and Deputy CFO discuss some of the modernization priorities and exciting new technologies that are being used to leverage and support a modern CFO office of the future.

Specific examples of new developing technologies will be discussed such as robotics process automation (RPA) and blockchain. These and other promising tools have the potential to enhance performance, increase accountability, and improve staff productivity while simultaneously advancing NSF's mission, the President's Management Agenda (PMA) and internal reform efforts such as Renewing NSF.

As background, the Association of Government Accountants (AGA) 2018 Report, "The CFO Office of the Future" examines trends in technology and how they impact the federal CFO. The report examines some of the most important trends in technology and how they impact the federal CFO and in turn, the financial community at large. These trends include emerging technologies such as: secure applications, cloud technology, data analytics, process automation, auditing with blockchain, and more.

Committee Action/Feedback

NSF seeks advice and perspective on financial management modernization priorities and tools for a modern federal CFO office that supports mission delivery and reform efforts.

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CFO OFFICE OF THE FUTURE



The AGA “CFO Office of the Future” report examines trends in technology and how they impact the federal CFO. The report examines some of the most important trends in technology and how they impact the federal CFO and in turn, the financial community at large. These trends include emerging technologies such as:

- secure applications,
- cloud technology,
- data analytics,
- process automation,
- auditing with blockchain, and more.



CFO OFFICE OF THE FUTURE... Supported by IT Modernization

	FY 2019	FY 2020
Secure Applications	Continuous modernization of IT security program	
Cloud Technology	Continue to migrate cloud-ready capabilities	Migrate more complex applications Introduce new NSF.gov
Data Analytics	Introduce Data Science Desktop Establish Data Governance	Support continuous innovation
Process Automation	Release initial BOTs Establish RPA Governance	BOTs to the people!
Blockchain	Evaluate Block Chain Feasibility Develop prototype	Pilot Grants Community Blockchain
Workforce Reskilling	Launch NSF Career Challenge Udacity Experiment Cyber Reskilling Academy	Implement continuous reskilling



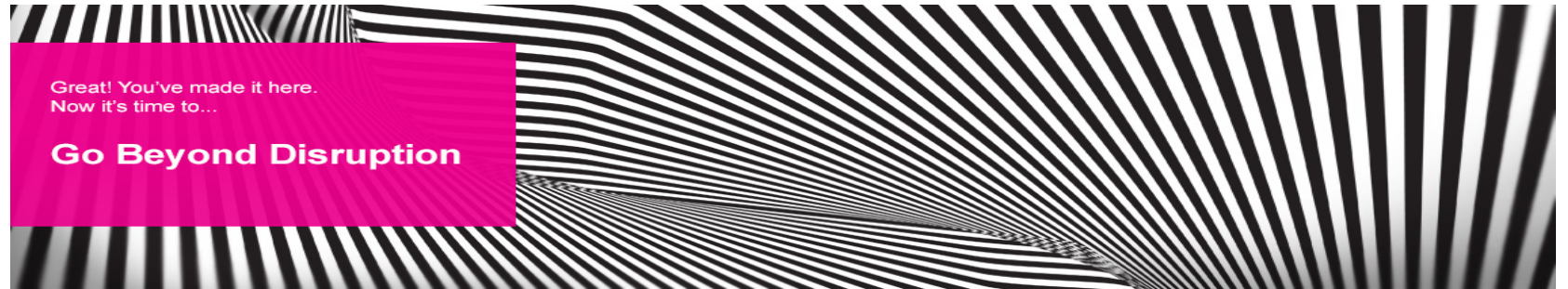
Today's Financial Management Environment

The Washington Post

MBA enrollment is down again. What's the future of the degree?

JOURNAL OF ACCOUNTANCY®

Prepare accounting students for working with data analytics



accountingTODAY

Audit dead in a decade?



Shifting from Low-Value to High-Value Work



Federal Governance Environment



A collage of images and icons related to the President's Management Agenda. It includes a photo of people in a greenhouse, a photo of people in a meeting, a yellow square with binary code, a blue square with a database icon, a dark blue banner with the text "PRESIDENT'S MANAGEMENT AGENDA" and gear icons, a photo of a soldier, a photo of a woman and a man, a photo of two veterans, a green square with a people icon, and a photo of a person in a yellow raincoat.

Cover of the report "The Future of Federal Financial Management" by the Fiscal Assistant Secretary of the U.S. Department of the Treasury, dated April 2018. The cover features a blue background with a large portrait of Benjamin Franklin, overlaid with a grid and data charts.

Cover of the report "RENEWING NSF" (National Science Foundation). The cover features a white background with a blue and yellow NSF logo at the bottom. The title "RENEWING NSF" is at the top. Below the title is a horizontal bar with four colored segments (orange, purple, green, blue) each containing an icon and text: "Making information technology work for all", "Adapting the workforce and the work", "Inventing, re-inventing and simplifying processes and practices", and "Expanding and deepening public and private partnerships".



DFM 2026 Plan

2019

2020



2021

2022

2023

2024

2025



A is for Artificial Intelligence

B is for Blockchain

C is for Cybersecurity

D is for Data Analytics

E is for ERM

S is for Shared Services

W is for Workforce

Source: The Impact of Technology on Contemporary Accounting: An ABCD Perspective, Lawrence Gordon

Shift from:
Low Value
As Is
Compliance
Good



To:
High Value
to Be
Value
Great



BOAC Discussion

NSF seeks advice and perspective on financial management modernization priorities and tools for a modern federal CFO office that supports mission delivery and reform efforts.

1. Is the proposed transformation framework clear?
2. What, if anything, is missing?
3. Beyond the framework, what are the critical first steps?
4. What assistance should be sought out?
5. What are some ways to ensure this gets engrained in the culture?

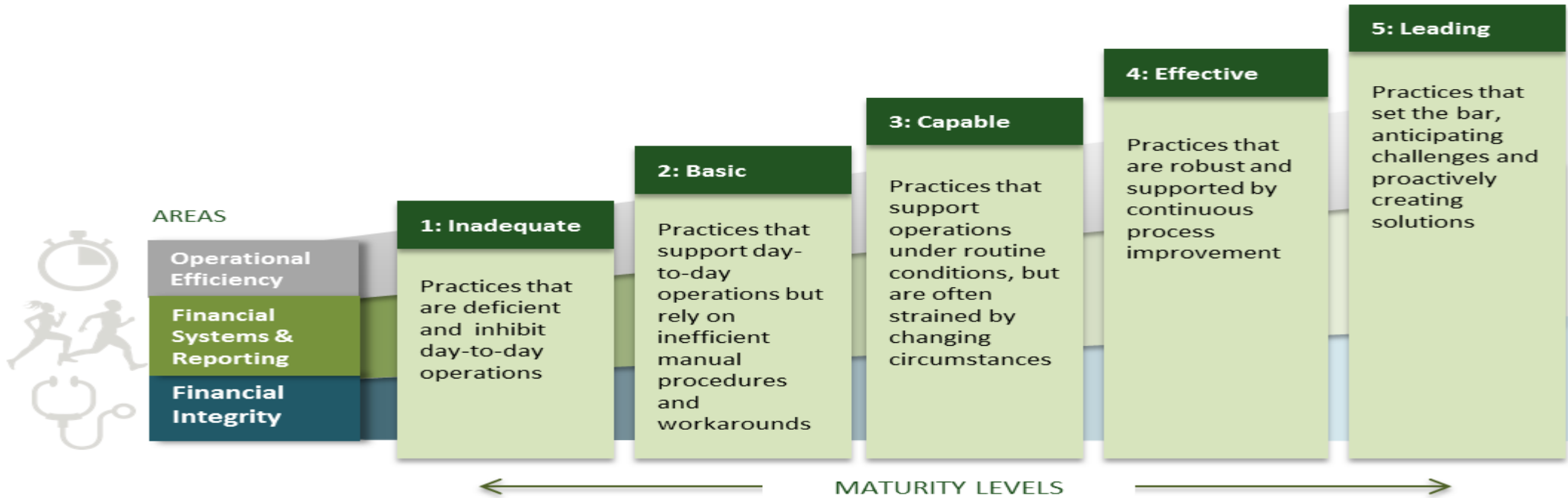
THANK
YOU!



Attachment: Case Study Reference Slides



Treasury FM Management Maturity Model Example



Start up/Turnaround vs. Realignment/Sustaining Success



A is for Artificial Intelligence/Automation

1. NSF participation in Treasury Innovation Program
2. RPA Tools Selected
3. DFM Pilots in Process – NSF's first robot IPP-88 (named after IG-88) went into production on 12/4
4. Infrastructure Platforms in Process
5. Center of Excellence and Governance Model in Progress
6. Ongoing NSF RPA Program Under development



B is for Blockchain

1. NSF participation in GSA Innovation Program and OMB-Treasury Blockchain Project
2. Exploring the hypothesis that implementing a blockchain solution has the potential to improve the grants payment process and spending information sharing. Identify
 - Impacts to grants management functions/activities related to grant recipient payments and reporting spending information
 - Impacts to financial management functions/activities performing grant payment processes and reporting payment disbursement information
 - Programmatic, economic, organizational, technical, and operational implications for the Federal agency and grant recipient entities overseeing, managing, or using the grant payment blockchain solution
3. Develop recommendations should the Federal government seek to pursue a grant payment blockchain solution



C is for Cybersecurity

1. NSF eliminated and sustained progress on recent information technology security significant deficiency
2. NSF was one of first agencies certified as FedRamp compliant
3. In 2018 NSF implemented a SSAE 18 service provider report reducing workload while simultaneously strengthening iTrak financial system security
4. There is no space between OCFO/DFM and OCIO/DIS teams.

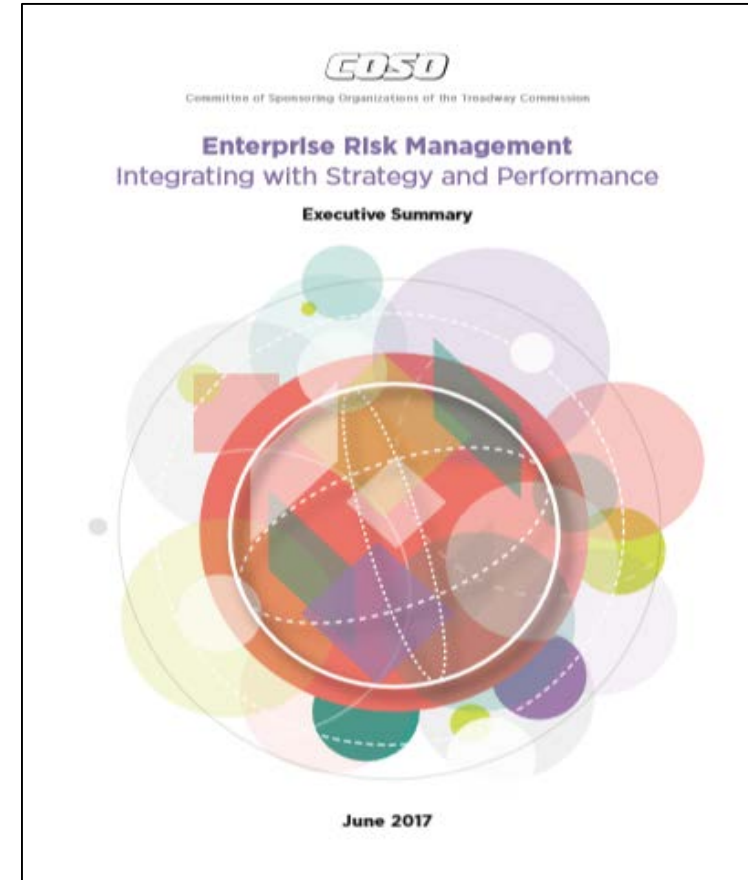


FedRAMP



E is for ERM

1. Deal with the proliferation of data
2. Leverage AI and automation
3. Manage the cost of risk management
4. Build a stronger organization




W is for Workforce

1. Strategic Workforce Planning
2. Succession Planning and Leadership Development
3. Career Development and Training
4. Work Life Balance
5. Planning an AGA-AICPA-OMB-CFOC/CIOC workforce initiative



Leading Change Why Transformation Efforts Fail

Harvard Business Review 
www.hbrreprints.org

BEST OF HBR

Leaders who successfully transform businesses do eight things right (and they do them in the right order).

Leading Change Why Transformation Efforts Fail

by John P. Kotter

Included with this full-text *Harvard Business Review* article:

- 1 [Article Summary](#)
The Idea in Brief—the core idea
The Idea in Practice—putting the idea to work
- 2 [Leading Change: Why Transformation Efforts Fail](#)
- 10 [Further Reading](#)
A list of related materials, with annotations to guide further exploration of the article's ideas and applications

Reprint [R0701](#)

1. Establish a sense of urgency
2. Form a powerful guiding coalition
3. Create a vision
4. Communicate the vision
5. Empower others to act on the vision
6. Plan for and create short term wins
7. Consolidate improvements and produce more change
8. Institutionalize new approaches





EXECUTIVE REPORT 2018



The CFO Office of the Future

ACKNOWLEDGMENTS

AGA is proud to recognize our Corporate Partner Advisory Group's (CPAG) Financial Systems & Technology Committee for supporting this effort.

The mission of CPAG is to bring industry and government executives together to exchange information, support professional development, improve communications and understanding, solve issues and build partnership and trust, thereby enhancing AGA's focus on advancing government accountability. The committee supports the CPAG mission by providing an objective, industry-neutral and ethical forum to collaborate on issues of common interest to government and the private sector surrounding financial systems and technology.

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CPAG is a network of public accounting firms, major system integrators, IT companies, management consulting firms, financial services organizations and education and training companies that all have long-term commitments to supporting the financial management community and choose to partner with and help AGA in its mission.

AGA is *the* member organization for financial professionals in the government. We lead and encourage change that benefits our field and all citizens. Our networking events, professional certifications, publications and ongoing education help members build their skills and advance their careers.



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INTRODUCTION

Today's Chief Financial Officer (CFO) occupies a unique position at the intersection of finance, technology and strategy. The age of digital transformation increasingly impacts agencies as technology advances at a rapid pace. Since developing technology influences the CFO's tasks, the role of the CFO office will inevitably continue to evolve.

This topic has been addressed in several ways in recent publications. The U.S. Department of the Treasury Fiscal Service's report, *The Future of Federal Financial Management*,¹ covers the evolving role of the federal CFO in budget/accounting operations, controls and reporting, and data-driven decisions for improved performance. The 2018 *President's Management Agenda* (PMA) outlines three focus areas for reform — mission, service and stewardship,² while the *Cross-Agency Priority (CAP) Goals to implement the PMA: Information Technology Modernization, Data Accountability & Transparency, and the Workforce of the 21st Century* calls for updates in three key areas.

AGA conducted two recent surveys — one online and one among attendees of our 2018 Financial System Summit (FSS) — to gauge perceived relevance of various technologies and their respective states of adoption. Of the 324 respondents in total, 90% work in federal civilian agencies, 9% in DOD, and 1% in Intelligence agencies. When asked about the importance of modernizing systems to meet citizens' needs and enhance overall mission capabilities, more than 75% responded it is "very important," while 20% said "important."

Modernization of government services is not new. Agencies and CFOs have been prioritizing overhauls for years. For a decade or more, cloud, data analytics and process automation have trended because advancements keep these technologies at the forefront.



In this paper, we examine some of the most important trends in technology and how they impact the federal CFO. Many of these trends also affect chief financial officers, controllers, comptrollers, and the financial community at large in government entities across the country. Although these technologies have been more widely adopted in the private sector for numerous reasons, ranging from agility to less restrictive procurement rules, the move into the public sector should be welcomed for the potential to improve performance, minimize redundancies, lower cost, and increase staff productivity.

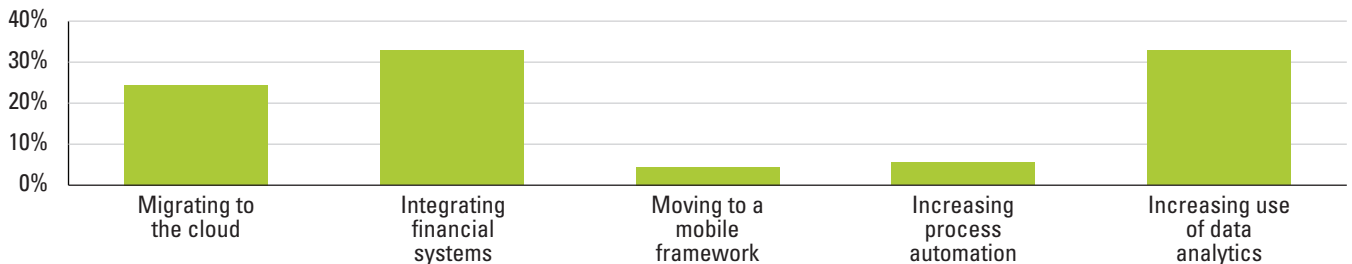
¹ <https://fmvision.fiscal.treasury.gov/>

² <https://www.whitehouse.gov/wp-content/uploads/2018/03/Presidents-Management-Agenda.pdf>

MODERNIZATION PRIORITIES

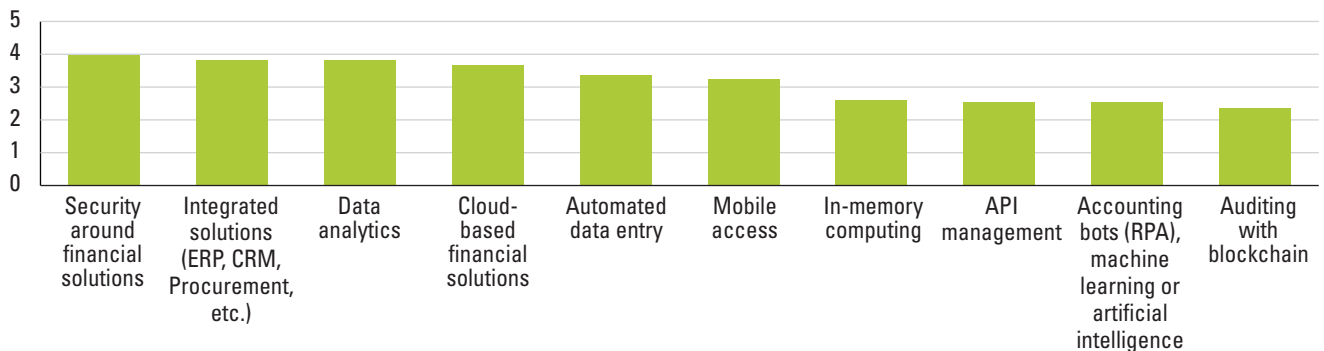
When asked for the top financial management modernization priority in the next three years, respondents tended to choose one of three major issues. The top two priorities cited, each with 30% of the tally, were: 1) increased use of data analytics; and 2) integrating financial systems. Just under 25% of respondents chose migrating to the cloud as the most pressing need.

What is the top financial management modernization priority in the next three years? (*Responses*)



The other two options offered in the top priorities survey were: 1) process automation; and 2) mobility. While these subjects scored much lower, the need for them was evident when participants were asked to prioritize financial management technologies. There, automated data entry and mobile access became priorities over in-memory computing, blockchain and application programming interface (API) management.

For each item below, rate from 1 to 5 the following financial management technologies you envision impacting your office, in order of implementation? (*Weighted Average*)



It is important to note that among the top ten financial management technologies that respondents envisioned impacting their office operations, security around financial solutions ranked first. It is not surprising that, as CFOs tackle all modernization efforts, security must be maintained and improved to manage potential risks to the critically important data supported within these systems. CFOs are clearly not willing to trade or compromise security for any of the identified advancements in technology.

In this paper, we will further break down modernization priorities and the tools that enable and support them. Since government leaders view creation of the modern workforce as critical to achieving PMA goals, our survey questions aimed to identify which of (and how) the following technologies will most likely impact the CFO office:

- Security
- Cloud Accounting
- Data Analytics
- In-Memory Computing
- Integrated Applications
- Process Automation
- API Management
- Mobility
- Auditing with Blockchain

SECURE APPLICATIONS

Security is top-of-mind within the CFO organization. Federal cybersecurity governance is encouraged and expected from both the U.S. Office of Management and Budget (OMB) and Chief Information Officer (CIO) communities, including continuous diagnostics monitoring (CDM) requirements, National Institute of Standards and Technology (NIST) security, and the Federal Risk and Authorization Management Program (FedRAMP) for the cloud.

The CFO office of both present and future must work very closely with the CIO (OCIO) and Chief Information Security Officer (CISO) offices to utilize technology to secure data, transactions, applications and systems. Because security reflects a small part of an overall agency IT budget, CFOs and CIOs should not make investment decisions in a vacuum. Instead they should plan their enterprise risk management (ERM) efforts and engage members of their technology teams in every investment discussion and decision in order to capitalize on limited investment dollars and ensure important security capabilities.

The CFO community cannot be expected to understand all details and implications of emerging and evolving technologies; however, CFOs should understand why it matters. This includes the role each new investment plays in closing the cyber-exposure gap and

setting up agency posture for long-term success and resiliency. Data breaches, especially those focused on financial data, occur on a regular basis and can incur significant cost in recovery activities as well as reputation. It is, therefore, critical for those looking at cloud migration to, at a minimum, house financial data in FedRAMP cloud-based platforms with appropriate security measures. The CFO office must understand the risks of a potential cybersecurity attack and how to mitigate and manage them.

When looking to deploy new systems and solutions, CFOs need to understand how they could improve business processes and how they might introduce security risks. Developing technologies, such as blockchain (discussed later in the paper) and the Internet of Things (IOT), show promise by providing more efficient ways to conduct and manage business activities. But despite their inherent promise, security remains a foremost concern for CFOs considering them.

New technologies provide an unprecedented level of data access. Yet, simultaneously, they pose risks for intrusion, data destruction, disruption, theft, and exposure. CFOs must look beyond the protection of financial data to any information that can be extracted and manipulated by hackers.

CLOUD ACCOUNTING

Migration of applications to the cloud has grown increasingly popular in government agencies. The trend is reaching government financial applications as cloud security becomes evermore robust. In the commercial arena, applications hosted in the cloud are processing everything from payroll and invoicing to taxes and benefit payments. Moreover, cloud accounting is now impacting government CFO offices. By moving an agency's accounting application to the cloud, the OCIO's workload, including infrastructure maintenance responsibilities, can shift to the cloud service provider.

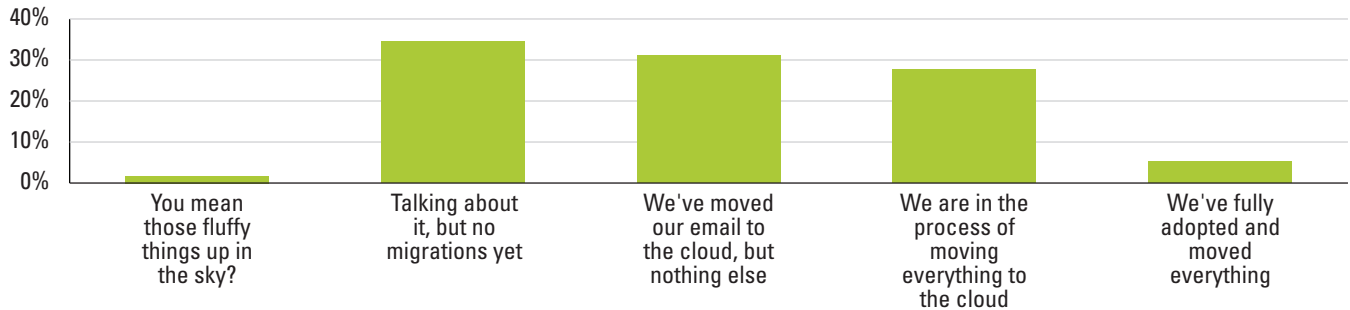
Our survey results display an equal distribution of cloud adoption progress. Approximately 28 percent of those surveyed reported their agency was moving "everything" to the cloud, while some 34 percent indicated they were only beginning to talk about cloud migrations. Another 31 percent said only email applications had been moved thus far.

Cloud adoption continues to expand. In 2010, OMB released its *25 Point Implementation Plan to Reform Federal Information Technology Management*,³ which requires agencies to adopt a "Cloud First" policy

³ <https://www.dhs.gov/sites/default/files/publications/digital-strategy/25-point-implementation-plan-to-reform-federal-it.pdf>



How would you characterize your agency's cloud adoption? (Responses)



to increase cloud-based solutions wherever cost-effective. Additionally, OMB Memorandum M-17-22 requires agencies to streamline mission support functions by examining shared IT infrastructure to promote greater security and efficiency while maintaining or improving quality. Financial management solutions are not an exception, as the three predominate solution vendors (CGI, Oracle, and SAP) each have deployments in public cloud environments.

As the current administration promotes adoption of shared services, it is encouraging to find that more than 70 percent of survey respondents believe moving agency financial systems to the cloud is important.

The PMA CAP Goal 5 aims to improve quality and delivery of shared quality services. It also promotes establishment and implementation of modernized commercial core FM solutions, with a transition to common financial management solutions. This encourages agencies to make deliberate decisions on how much of the technology stack (infrastructure, platform, and software) to procure “as a service” (aaS), balancing risk and reward. Specifically, a focus of the administration is Software as a Service (SaaS) applications, which are wholly maintained at the software, platform and infrastructure levels by a service provider.

It is easier to consume innovation using a SaaS business model because it allows all users to leverage new functions and capabilities as soon as they become available. This eliminates or reduces upfront acquisition and implementation costs. It also heads-off upgrade costs for hardware and software as well as the resources required to implement and execute the upgrade. SaaS can prevent agencies from falling behind along the upgrade path, which often leads to large catch-up projects.

A shared environment makes security monitoring and patching throughout the technology stack easier to achieve. It can also save money. For example, most SaaS applications are pay-as-you-go, allowing CFO offices to reduce the cost of wasted or un-used licenses. Looking ahead, the PMA sets targets in 2019 for commercial technology solutions to cover payroll and time and attendance and, in 2010, for financial management (AP, AR, GL, and reporting).

To fully benefit from SaaS delivery models, some level of standardization is required, but not absolute. Agencies should discuss individual requirements with their providers to ensure they get the benefits of cloud and SaaS adoption while maintaining accountability for mission support.

Software-as-a-Service
 Software:
 • End-user-ready applications
 (Typically consumed via browser or API)

Platform-as-a-Service
 Platform:
 • Middleware
 (Tools for build or customization)

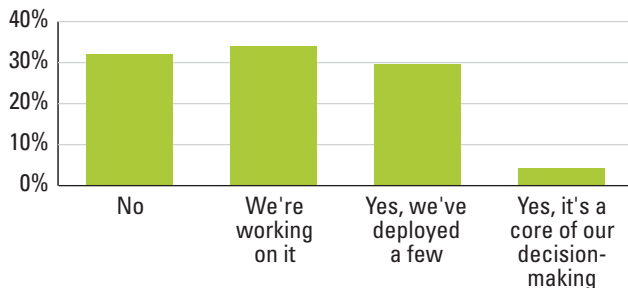
Infrastructure-as-a-Service
 Infrastructure:
 • Servers
 • Storage
 • Networks
 (Core computing resources)

DATA ANALYTICS

Data analytics informs predictions and identifies trends, anomalies and similarities. Complementary to data analytics is data visualization, allowing results of an analysis to be quickly and visually digested. Data visualization can be a powerful tool for communicating relationships and insights from large amounts of data. With increased computing capacity offered by cloud solutions, the accessibility of advanced analytics and the ability to learn more about data relationships, anomalies, and outliers becomes more feasible.

These capabilities are demonstrating to financial managers that the vast amount of data and information managed across multiple financial systems needs to be harvested to inform agency decision-makers. Yet, when asked whether CFO and agency leadership have access to real-time dashboards and data visualizations, nearly one-third of survey respondents answered no.

Do your CFO and leadership have access to real-time dashboards and data visualizations? (*Responses*)



The concept of developing a culture of data-driven decision-making is only now being adopted by federal agencies. Yet, for centuries organizations have used data to make informed business decisions. Likewise, goals and objectives are well established for incorporating and improving data analysis and analytics into agency operations.

Today, as advances in data collection and storage technology accelerate the growth of big data, agencies note greater data availability and a need to report on activities ranging from Mars missions to pension insurance. Such advances have given rise to value-driven practices, such as Evidence-Based Decision-Making and Data-Driven Decision Management, that accelerate data governance practices and drive data quality standards. As a result, business units are being empowered with flexible data management tools to consolidate disparate data sets from CIOs, CFOs and Chief Technology Officers (CTOs) into a single environment for investigation.

Proper understanding of the data available to financial managers and the ability to resolve or work around systems limitations are key to effective data analytics. The process for implementing such a program can be summarized as follows:

Phase 1: Understand the Problem

Risk Questions:

- What are the risks we want to manage?
- Which risks have highest priority?
- How do we assess and prioritize actionable risks?

Solutions:

- Identify risk areas based on mission priorities.

Phase 2: Understand the Data Landscape

Data Questions:

- Does required data exist?
- Is the data complete, error-free and valid?
- Is the data analytic capability maturity level within the organization adequate for the intended effort?

Solutions:

- Determine which data is available and plan collection efforts for missing data.
- Perform data cleansing and error removal.
- Determine additional data analysis to be conducted without affecting project timelines.

Phase 3: Leverage Applied Analytics

Turn data into intelligence through multiple techniques and technologies

Process Example:

1. Identify Data Standards

Identify elements of disparate data systems and adopt data standardization across the enterprise.

2. Establish Data Architecture

Develop data architecture with a data repositories strategy to pull together data from multiple sources.

3. Perform Statistical Analysis

Assess data sets using proven statistical analysis methods to identify past, existing, and future risks.

4. Communicate Findings

Leverage data visualization best practices and technology to create dashboard tools for easily understandable and actionable intelligence for decision-making.

Successful development of data analytics programs revolves around the ability to harness financial data from the agency's financial systems to create meaningful outputs, including standard reports,

custom reports, ad-hoc queries, statistical analysis, plus real-time and/or interactive dashboards.

Investment in analytic technologies is far easier in today's market as open source software emerges as the tool of choice for most data scientists. Despite relatively heavy development time required to code in open source languages, the flexibility of such tools and the advent of online communities has driven adoption beyond the higher education community into the federal government. Whether directly complemented by business intelligence (BI) platforms that afford users a graphical user interface (GUI) for dynamic data visualizations, these advanced tools often cause CFOs who leverage analytics to ask "What happened?" rather than "What will happen?" Gone is the historical concept of 'dabbling' in analytics; we now test advanced

analytics such as artificial intelligence (AI) without a clear goal or definition of success.

Current technology trends and rapid adoption provide access to massive amounts of data. Analytics and visualization can be leveraged to harness that data to become a powerful tool to inform decision-making. CFOs and other financial managers will be able to monitor the financial health of their agencies or organizations. For example, CFOs can monitor overall budget and obligation and disbursement rates, accounts receivables, and reimbursable agreements across an agency or department. Agency efforts can then shift from collecting and managing data to making evidence-based discoveries and offering strategic advice to mission leaders.

IN-MEMORY COMPUTING AND DATABASES

Until recently, retrieving data from a database required the server to read the data directly from disk. Older SAS hard drives had physical limitations based on how fast the drive could spin. Even newer SSD with data stored in memory has physical limitations. While these technologies still exist, the needs of Big Data analytics require newer methods with faster access to data.

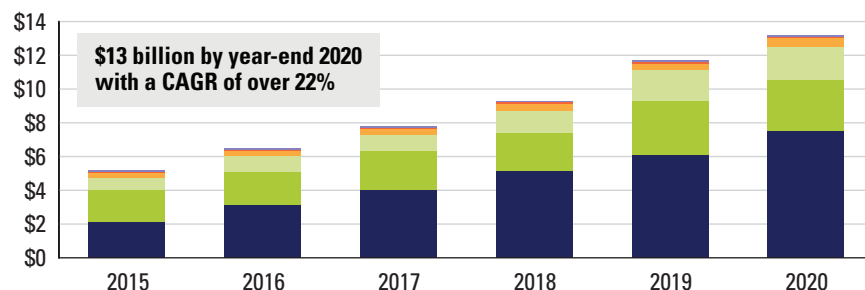
In-Memory Computing (IMC) offers an enhanced method of access for performing on-premises. This technology caches data into memory at the RAM and CPU levels, providing faster access to the database as well as computations without the physical limitations of

disk. This has resulted in significant improvement to data reads and a large reduction in network activity.

The use cases for IMC are growing every day. Although originally employed for data analytics, IMC provides solutions for today's data warehouse databases, which have grown exponentially. With IMC, data resides and computation efforts take place in memory. Moreover, IMC allows use cases to grow to numerous other applications, including data visualization, predictive analytics, and other BI applications.

More recently, IMC moved from analytical processor to transactional processor. This shift will transform hybrid transaction/analytical

The rapidly growing in-memory technology market (\$ in billions)



"Market Guide for In-Memory Computing Technologies" – Gartner, 2015

- In-Memory Application Servers
- High-Performance Message Infrastructure
- Event Stream Processing
- In-Memory Data Grids (standalone)
- In-Memory Analytics (visual data discovery)
- In-Memory DBMS

processing (HTAP), in which the transactional and analytical database will be one and the same. This technology evolution will eliminate nightly jobs to populate data warehouses; and it will enable execution of real-time reports in seconds. Additionally, by moving IMC to the transactional processor, existing enterprise resource programs (ERP) and customer relationship management (CRM) products will process data on a massive scale.

How will these changes impact CFO office operations? Several potential benefits await:

- Reports will run in milliseconds instead of seconds, minutes instead of hours, allowing employees to perform better analysis and what-if scenarios.
- Nightly interfaces will process significantly faster, allowing for improved data quality and faster error handling.
- User and customer acceptance and satisfaction will improve.
- Limitations of data models will disappear, allowing more business-focused rather than technical processes.
- Improved search capabilities will offer Google-like searches for financial transactions and master data.
- Analysts will have data mining and analysis capabilities that were not possible with standard databases.

INTEGRATED APPLICATIONS

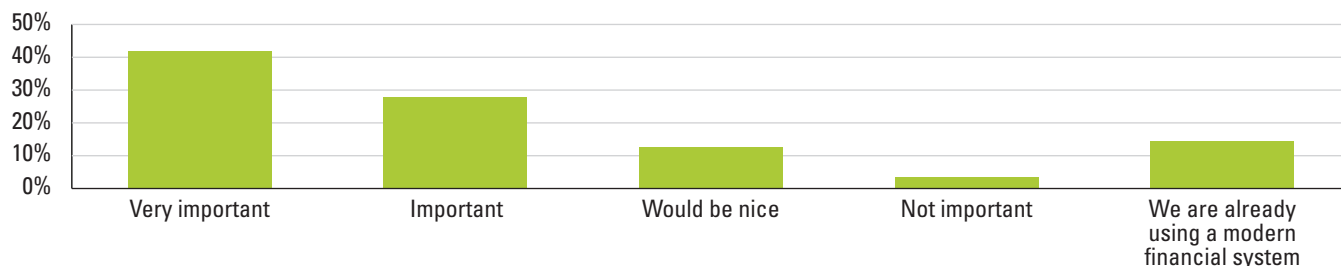
One of the most significant areas of cost savings that the CFO office can expect is in the integration of financial applications. Survey results support this conclusion, but only when data analytics coupled with integrated financial systems was the top answer given. When asked about the priority of migrating from legacy systems to a modern financial solution, 42 percent of respondents said it was “very important.” Only 14 percent reported that their agencies had already moved to a modern financial system.

The desired environment of the future will feature further integrated applications across core back office and mission functions. In light of challenging budget realities, the ability to integrate legacy systems with newer technology and modernized systems

will be a critical success factor. These administrative data support systems include core financials, human resources, acquisition and procurement, supply chain and logistics, and even customer relationship management (CRM).

Integration will be key to connecting more than one service; it will increase operational efficiency and accuracy while reducing manual or duplicative data processing. Modern ERP systems, which provide more streamlined processes that increase productivity, hold the potential to reduce redundant data and cut the number of disparate systems being maintained. ERPs, leveraged to their full potential, can provide real-time access to data from all areas of the organization (i.e., centralized or distributed offices.)

What is your priority to migrate from legacy to a modern financial solution? (Responses)



PROCESS AUTOMATION

Process automation tools streamline integration of multiple financial systems. They range from solutions on individual desktops with limited ability to accept different data feeds to solutions on enterprise servers that can perform multiple scheduled tasks and meet enterprise security criteria. These systems can be as simple as screen-scraping technology. Or they can be as intricate as optical character recognition (OCR), which captures data, supports complex processes to manipulate and exchange data across applications, triggers responses, documents audit trails, conducts calculations, and schedules downstream activities.

Robotics process automation (RPA) emulates the human execution of repetitive tasks through configurable business rules. Traditional process automation generally requires a lengthy project with significant development, whereas RPA enables business stakeholders to configure computer software robots to perform a variety of manual, repeatable processes. In RPA, programmers and analysts map out a process for the robot to follow between screens and data repositories, using the presentation layer or user interfaces. The robot contains logons and passwords for client servers, mainframes and websites needed to execute the process. With a little training, a well-defined process often can be completed and operational in weeks.

Processes most suited to RPA solutions generally contain structured data. They are rule-based, high in volume, and consistent in the sequence of events and user interfaces utilized. Many routine business processes in accounting and financial management are great targets for automation, such as staff on-boarding, accrual posting, budget planning, data consolidation across disparate systems, and accounts reconciliation. Manual processes that are good candidates for RPA have the following attributes:

- high volume transactions
- well-defined steps and rules with minimal exceptions
- steps and rules that rarely change
- structured data and readable electronic inputs
- high data quality and availability

Before embarking on a process automation effort, it is important to review current processes and ensure they are thoroughly documented, including task dependencies and sequences. All inefficiencies and inconsistencies in current processes must be identified, so they can be addressed *prior* to automation for maximum benefit.

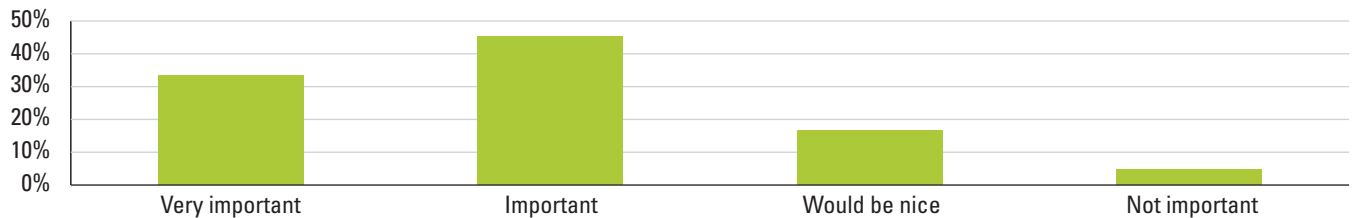
Although cost savings are often touted as one of the benefits of RPA, an organization assessing automation should focus on improving operational efficiencies and minimizing risk of errors. Automating mundane, repetitive tasks enables the workforce to attend to more creative and strategic activities. RPA may replicate what people do, but these robots have neither intuitional nor institutional knowledge. As an example, an account reconciliation robot can identify when data anomalies exist but cannot apply institutional knowledge or subject matter expertise to assess the cause. Human effort and skill will still be needed to assess causes, resolve discrepancies and make suggested process adjustments where needed. But research suggests that process automation of manual tasks is proven to increase employee engagement, morale, productivity, and regulatory compliance.

RPA promises to deliver greater efficiency to finance and accounting organizations by expediting transaction processing, reducing potential for manual errors, and strengthening the integration of an agency's financial and administrative systems, software applications, and external sources of information. All of the above result in improvements to the data that CFOs evaluate when they make management decisions and offer strategic input to the CXO community and agency leaders.

Expect the accountants of the future to be even more tech-savvy than they are today, as business stakeholders learn to use various automation tools. These will play an important role in creating automated rules and processes that support and enhance the timeliness, integrity and availability of agency data. As noted in the survey results, 84 percent of respondents clearly recognize the need to require specialization and specific services from agency financial professionals.

Benefit of Automation	Considerations
Cost Reduction	Primarily a result of labor reduction and increased production. Frequently those costs are reassigned to other efforts.
Increased Throughput	Automated processes do not need breaks and result in much more timely data to inform decision-making.
Error Reduction	Although automated processes do exactly what they are programmed to do, thorough testing is necessary to ensure accuracy of the process.
Improved Compliance	With ability to capture and log audit trails, RPA facilitates auditability.
No Emotion, Just Logic	Although utilizing artificial intelligence (AI) and machine learning eliminates emotion from decisions, it comes at the expense of creativity and judgment of right vs. wrong.

With more automated financial operations, how important will it be to require specialization and specific services from the financial office? (Responses)



RPA tools have evolved and will continue to develop over time. Already they enhance data analytics and handle automation of more complicated processes by incorporating AI or machine learning, both of which have advanced considerably. As software robots are developed with more complex code, they also become tools of AI. Progressing to the use of complex algorithms in certain applications will allow these robots to take on forms of machine learning. Some of the more promising AI applications use machine learning to iterate algorithms from a large collection of data. Over time, it improves accuracy and uncovers connections among data that humans may fail to notice.

As machine learning and AI are adopted, we will witness greater levels of productivity and efficacy. Across large volumes of data, AI insights and activities can drive efficiencies, deliver convenience, and support better decisions. Given data volumes across government, CFOs should expect substantial hardware and processing power, even if accessed in a cloud environment. As a result, AI and machine learning investments will likely focus on areas offering the biggest cost reduction opportunities, or those crucial to mission delivery.

Transactional accounting data is a promising starting point for developing new models because of its high quality and structure.

However, the same data is also challenged because of complex and unintegrated legacy systems so many financial offices work with today. Despite the rush of many organizations to select RPA software and start a project, the process demands careful scrutiny. Learning about RPA suitability and functionality should be completed in conjunction with building a broader enterprise automation roadmap (EAR). This would require a hard look at the various automation technologies as well as an understanding of how the technologies work together.

Significant benefits await organizations that put in the effort to comprehend technologies like RPA, business process management (BPM) and AI. These innovations can be combined to execute an overall enterprise automation strategy, so agency leaders should collaborate. They need to share experiences and lessons learned to help other leaders who might also be attempting to leverage RPA.

CFOs and their executive counterparts will be paying close attention to the way process automation can be applied to improve operational efficiencies. When it comes to making government programs more effective, streamlined and sustainable, RPA tools will play a growing role in the future of both the CFO office and government operations in general.

API MANAGEMENT

Application programming interfaces (APIs) have been around for decades. API is a method of communicating with a system to provide specific functionality. APIs are “windows” into a system with a defined set of rules. For instance, Google Maps has an API that lets a user send a coordinate or an address, and it sends back a map. But not just an image. It sends a fully functioning map with interactions. Twitter has an API which allows the user to download tweets. Users can send it a hashtag, and it sends back a listing of all tweets that can be pulled into a database to perform sentiment analysis. Twilio has an API which allows the user to send a text message to someone. Grants.gov provides APIs to publish new opportunities and receive applications. And these are just a few of the millions of APIs available for consumption.

So, since APIs have been around for a long time, what has changed and why would a CFO need to know about them?

The newer RESTful APIs have grown in popularity, due to their increased simplicity and flexibility over previous API models. For the CFO, APIs simplify the way systems talk to each other by providing a layer that hides complexity. Integration between financial systems becomes more straightforward. Most of the current API management vendors provide standard connectors into legacy as well as modern on-premise and cloud systems to reduce development costs. Additionally, APIs reduce the costs of interfaces and conversions by providing a single set of reusable code for developers.

The simplicity of managing APIs has allowed for the significant increase in their use. In terms of the benefits of their management, APIs are:

- **Discoverable:** Prior to API Management, APIs were developed in a programming office and made available only to those who knew they existed. With API Management, APIs are published to a console which allows internal and external developers to leverage them.

- **Well Documented:** The published API provides a common language approach to inputs, expected outputs, allowed actions and sample test data.
- **Data Analytics:** With the API Management system, users can run analytics on the use of each API, the users who call the API, the performance metrics, and more.

From the standpoint of the CFO, implementing APIs and API Management into the financial system can have a significant impact on the ability to service customers, whether they are individual agencies or external stakeholders (taxpayers, vendors, etc.) With internal development, CFOs may want to employ published API's for creating documents in the system, such as commitments, obligations or invoices.

Moreover, methods to create master data or read information are possible. For external development, a decision could be made to create an API that allows an external grantee to call into a grants management system to read data about the status of an application. API Security facilitates it with the same (if not better) security layer utilized today in existing systems.

Most large commercial companies are already developing an API strategy, recognizing lower development, operations and maintenance costs. Making APIs available to internal and external developers allows the CFO office to provide better customer service while reducing cost.

MOBILITY

The advent of mobile technology and its rapid adoption has pushed the financial management function to evolve. Today, CFOs manage responsibilities “on the go” through cloud-based mobile applications that provide unprecedented access to data. As a result, the status of these applications has improved from add-on feature to integral part of the CFO office.

Some of the most popular areas of mobile adoption in the CFO office include mobile time and attendance, expense reporting, and reviewing and approving travel and financial reports. Now employees can enter information from the field on their mobile devices, and organizations can track total expenses as they happen, affording CFOs a real-time, more accurate picture of expenditures. CFOs are prioritizing the adoption of mobile functionality because it:

- **Provides real-time data:** With current applications, when an expense is approved, it is immediately recorded in the ERP and agency expenditures are updated;
- **Reduces human error:** The traditional expense report process entails collecting physical receipts, scanning them, and matching them with transactions. This process is cumbersome

and error-prone. Statistics suggest approximately 19 percent of traditional expense reports contain error. In contrast, smartphone cameras allow ease of collection and capture of receipts, reduced errors and zero occurrence of lost receipts;

- **Reconciles P-card charges faster:** With real-time submission (versus delayed batch process), overall processing time can be reduced, employees can be reimbursed more quickly, and the CFO office gets a real-time view of agency expenditures;
- **Accessibility and flexibility:** Employees on travel can use mobile applications to instantly review and report before returning to the office. In an increasingly mobile world, being able to work effectively increases total productivity and employee morale.

The CFO office of the future needs to assess its processes and systems with an eye toward mobile devices as a primary tool to conduct business. Multiple financial processes, approvals, and reporting can be simplified with mobile accessibility to transform the user experience while also improving the accuracy and speed of transactional security.

AUDITING WITH BLOCKCHAIN

An emerging technology that CFOs should start tracking, due to its potential impact on the CFO office of the future, is blockchain. Best known through its use to implement bitcoin and other digital currencies, blockchain is an encrypted data structure that acts as a distributed ledger. It organizes and tracks time-stamped batches of records called blocks. Each block references the previous block using a cryptographic hash to form a chain.

Key requirements for blockchain adoption include:

- processes to validate users in the blockchain network and verify digital signatures of participants;
- standards for financial accounting and reporting to provide guidance on managing blockchain transactions;

- guidance on existing laws and regulations that would apply to the use of the technology;
- processes to audit cybersecurity and software so blockchain transactions have the necessary security and encryptions.

The core advantages of blockchain are its decentralization and cryptographic security, which together provide transparency and immutability. This means that even minor alterations of data within a block results in self-evident, visible changes, ensuring that unauthorized edits are easily detected and able to be repudiated.⁴

Blockchain enables currencies built on computer code to be programmed to help automate an entity’s system of internal controls. Blockchain also provides assurance that management’s objectives

⁴ <https://www.mckinsey.com/business-functions/digital-mckinsey/our-insights/blockchain-beyond-the-hype-what-is-the-strategic-business-value>



are met and an audit can be passed. One such feature is multi-signature accounts, whereby funds can be deposited into an account which requires more than one valid private key to authorize spending. This feature can enforce segregation of duties by requiring two or more parties to approve a transaction before it can be accepted by the network as a valid transaction.

Another useful blockchain application is time-locking funds. Here, funding cannot be spent before a designated date and time has passed. This feature might be used to ensure compliance with the Anti-Deficiency Act and approved spend plans. For example, the budget office could apportion funds to an agency and cryptographically ensure that only one-fourth of the agency's annual appropriations can be spent in the first fiscal quarter of the year. After three months have elapsed, the time-lock on the next 25 percent of annual appropriations could be programmed to release for expenditure, and so on. As opposed to many of the internal control systems which have traditionally been implemented by CFO offices, a blockchain can cryptographically guarantee that laws, regulations, and agency policies are enforced by building in rules which prohibit the spending of funds in ways that violate established rules.

Finally, blockchain reduces the need for financial reconciliations, potentially saving governments and their auditors incalculable time, money, and headaches. Blockchain is designed to generate agreement among disparate actors without the need for a centralized party. If different computers on a blockchain network have conflicting views of the state of the ledger, defined processes will resolve those conflicts. Over time, a consensus about the agreed-upon state of the network emerges. Reducing reconciliations also diminishes the number of repeat reconciliations by auditors and oversight bodies. Furthermore, to the extent that accounts receivable or payable balances can be validated through review of blockchain data, time-consuming and costly audit procedures, such as third-party confirmations, decrease.

Blockchain is a fascinating new technology with potential to help the future CFO office automate internal controls, reduce reconciliations, and minimize the cost of financial audits. CFOs of tomorrow would be wise to take notice!

CONCLUSION

The CFO office is typically quick to adopt technology advances that improve the quality of the data overseen and managed. The advent of cloud computing, improved process automation and other promising technologies are making it easier to find the right answers and integrate disparate systems. When they are used in conjunction with the necessary security, these technologies can lead to:

- reduced operating costs;
- more timely access to higher quality data;
- increased customer service and satisfaction.

Advances in technology over the last several years provide CFOs with unprecedented access to data and enable more timely, informed decision-making. Increased monitoring capabilities through data visualization dashboards allows for accurate measurement of the organization's activities and their impact on the agency's mission. The CFO office of the future, without doubt, will utilize these technologies to streamline financial management and audit activities, release agency personnel to focus on mission-critical activities, and empower the CFO as a strategic partner across the C-suite in support of mission delivery.



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Backgrounder: Fall 2018
NSF Advisory Committee for Business and Operations

Nature of Agenda Item: Renewing NSF: Status Update

Presentation:

With an eye on improving government processes, the Office of Management and Budget (OMB) issued a [memorandum](#) in April 2017 requesting Agency Reform Plans as part of the agencies' FY 2019 budget submissions. As NSF Director Dr. France Córdova has since reflected, “At NSF, we saw this as an opportunity to look thoughtfully at our operation and to explore ways we could transform ourselves to better support NSF’s long-term research goals. *We call this initiative Renewing NSF.*”

Given this backdrop, NSF undertook an agency-wide brainstorming process last year to think deeply and critically about how we as an organization could transform to support and sustain NSF’s long-term research agenda. That process produced over 200 suggestions from NSF staff, which were subsequently synthesized by senior leadership into four thematic pillars:

- Making information technology work for all (IT);
- Adapting the workforce and the work (Workforce);
- Expanding and deepening public and private partnerships (Partnerships); and
- Streamlining, standardizing, and simplifying processes and practices (Streamlining).

In spring 2018, a Renewing NSF Steering Group and four Goal Teams (one for each thematic pillar) were established with staff from across the agency. Using a facilitated visioning process, each Goal Team identified a Vision and Bold Steps for their respective pillar. The Bold Steps are intentionally broad and flexible so as to allow us to explore various approaches and eventually pursue the best solutions for implementation.

Where FY 2017 was the “ideation year” and FY 2018 was the “planning year,” FY 2019 is the “go year” in terms of moving forward on implementing several of the Bold Steps in a staged fashion. As part of the transition to implementation, NSF is currently in the midst of an intensive agency-wide engagement period to gather inputs about the Visions and Bold Steps that have emerged from the Goal Teams.

Committee Action/Feedback

NSF seeks advice and perspective on how to ensure NSF moves forward effectively on implementation of the bold steps. Specifically:

1. What are the key ingredients for successful management of this initiative?
2. Many of the bold steps are interdependent. What mechanisms would you suggest for identifying, cultivating, and managing the relationships among one another, including where resources requirements overlap?
3. What mechanisms would you encourage for internal communication and enhancing employee engagement to avoid “change fatigue”?

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National Science Foundation

RENEWING NSF

Erwin Gianchandani & Joanne Tornow
Co-chairs, Renewing NSF Steering Group

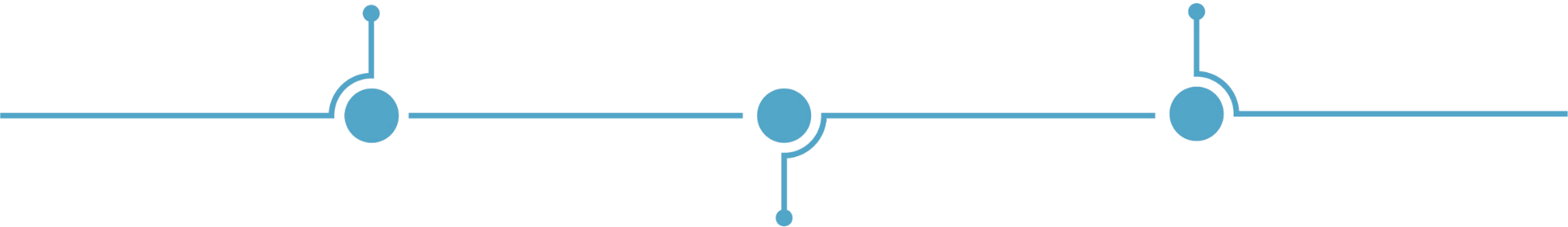
Business & Operations Advisory Committee (BOAC)

Dec. 13, 2018

Overview of Renewing NSF Activities

FY17: Ideation year

FY19: Go year



FY18: Planning year



Renewing NSF



Transform NSF into an agile organization capable of responding to the evolving landscape so that we can enable the Nation's continued global leadership in scientific research and innovation.





A Renewed NSF

- A culture of continuous learning
- Appreciation for the value and contributions each staff member
- Timeliness and intentionality in responding to changes
- Strategic decision-making with coordination and centralization where appropriate.





The Strategy and Bold Steps



Making information technology work for all



Adapting the workforce and the work



Streamlining, standardizing and simplifying processes and practices



Expanding and deepening public and private partnerships



Examples of Deliverables Underway



Making information technology work for all



Adapting the workforce and the work



Streamlining, standardizing and simplifying processes and practices



Expanding and deepening public and private partnerships

- **IT:** Proposal Submission Modernization
- **Streamlining:** Our internal “Form 10” clearance process
- **Partnerships:** A partnerships toolkit



Agency Engagement Underway



Weekly Wire



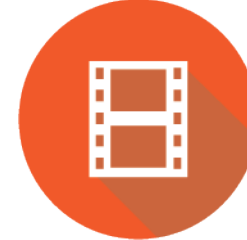
Pollination wall



Website



Email



Video



Meetings/
conversation

- What excites you?
- What innovative approaches are you already using in these areas?
- How do you see yourself in this effort going forward?



Committee Action/Feedback

- What are the key ingredients for successful management of this initiative?
- Many of the bold steps are interdependent. What mechanisms would you suggest for identifying, cultivating, and managing the relationships among one another, including where resource requirements overlap?
- What mechanisms would you encourage for internal communication and enhancing employee engagement to avoid “change fatigue”?



Questions?





National Science Foundation

RENEWING NSF

Erwin Gianchandani & Joanne Tornow
Co-chairs, Renewing NSF Steering Group

Business & Operations Advisory Committee (BOAC)
Dec. 13, 2018

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Backgrounder: Fall 2018
NSF Advisory Committee for Business and Operations

Nature of Agenda Item: Renewing NSF – Partnerships Pillar

Presentation:

NSF's vision for the partnerships pillar is "Expanding partnerships to enhance the impact of NSF's investments and contribute to American economic competitiveness and security". Private industry, foundations, and non-profits, together with other federal agencies and international funding organizations, bring additional expertise, resources, and capacity to NSF-funded research. This, in turn, accelerates discovery and translation of research to products and services, and enhances preparation of the future workforce to benefit society and grow the American economy.

The vision for the partnerships pillar includes:

- A unified strategic vision to guide proactive identification and pursuit of partnerships that advance NSF's mission;
- Streamlined, flexible processes and tools for implementing a range of different types of partnerships, along with mechanisms for sharing knowledge and expertise; and
- Systematic and continual evidence-based improvement of costs and benefits of partnerships, through evidence-based assessment.

The Partnerships Goal Team developed six bold steps toward realization of this vision:

- Conduct a landscape study to explore "out of the box" partnerships.
- Develop a framework and method for identifying advantageous partnerships.
- Explore options for appropriate centralization.
- Build a partnerships toolbox: guidelines, best practices, examples, templates.
- Educate and train workforce to strengthen the culture of partnerships.
- Develop metrics, tools and processes to track all partnerships.

Committee Action/Feedback

NSF seeks advice and perspective on how to ensure NSF moves forward effectively on implementation of the bold steps. Specifically:

1. What elements of a partnerships program would you consider best suited for centralized management?
2. What metrics do you suggest should be most important for consideration?
3. What mechanisms would you encourage to help strengthen the culture of partnerships?

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Renewing the National Science Foundation

Expanding and Deepening Public and Private Partnerships

Barry W. Johnson

Division Director

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Division Director

Division of Computer and Network Systems (CNS)

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Science and Engineering (CISE)



NSF's Mission and Vision

Mission

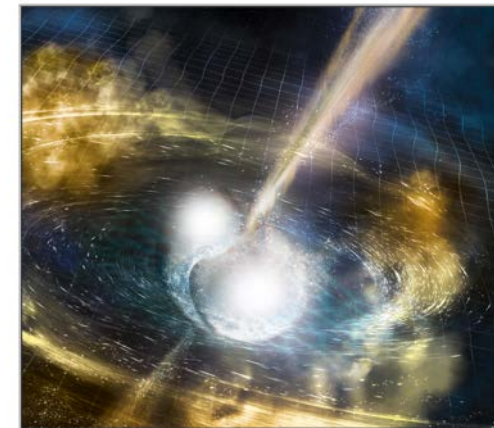
“to promote the progress of science; to advance the national health, prosperity, and welfare; to secure the national defense; and for other purposes.”

“Partnerships with other federal agencies, nonprofits, private-sector collaborators, industry partners and the public will help advance these research areas.”

Dr. France Córdoba
Director, National Science Foundation

Vision

“A Nation that is the global leader in research and innovation.”



Core Values: Excellence, Public Service, Learning, Inclusion, Collaboration, Integrity, Transparency



Partnerships Strategic Goal Team

- Kenneth L. Calvert – Division Director, CISE/CNS
- Barry W. Johnson – Division Director, ENG/IIP
- Carl Anderson – Staff Associate for Operations, CISE/OAC
- Erin Dawson – Assistant General Counsel, OD/OGC
- Anne Doyle – Senior Policy Analyst, BFA/DIAS
- Theresa Good – Deputy Division Director, BIO/MCB



Vision

- Unified strategic vision
 - Strategy for choosing partnerships
 - Move from reactive to proactive
 - Partnerships that advance mission
- Assessment of value metrics
 - Built in from the beginning
 - Systematic and continuous
 - Evidence-driven improvement
 - Preserve mission, merit review integrity
 - Quantified value of partnerships
- Streamlined and flexible mechanisms
 - Streamlined processes
 - Range of partners supported
 - Tools, capacity building, and knowledge
 - MOU policy guides
 - Communication strategy
- Global leadership in research, innovation, and societal impacts
 - Diverse partners and networks
 - Government and industry recognition
 - Enable research and discovery
 - Increase pace of discovery
 - Increase leverage and impact

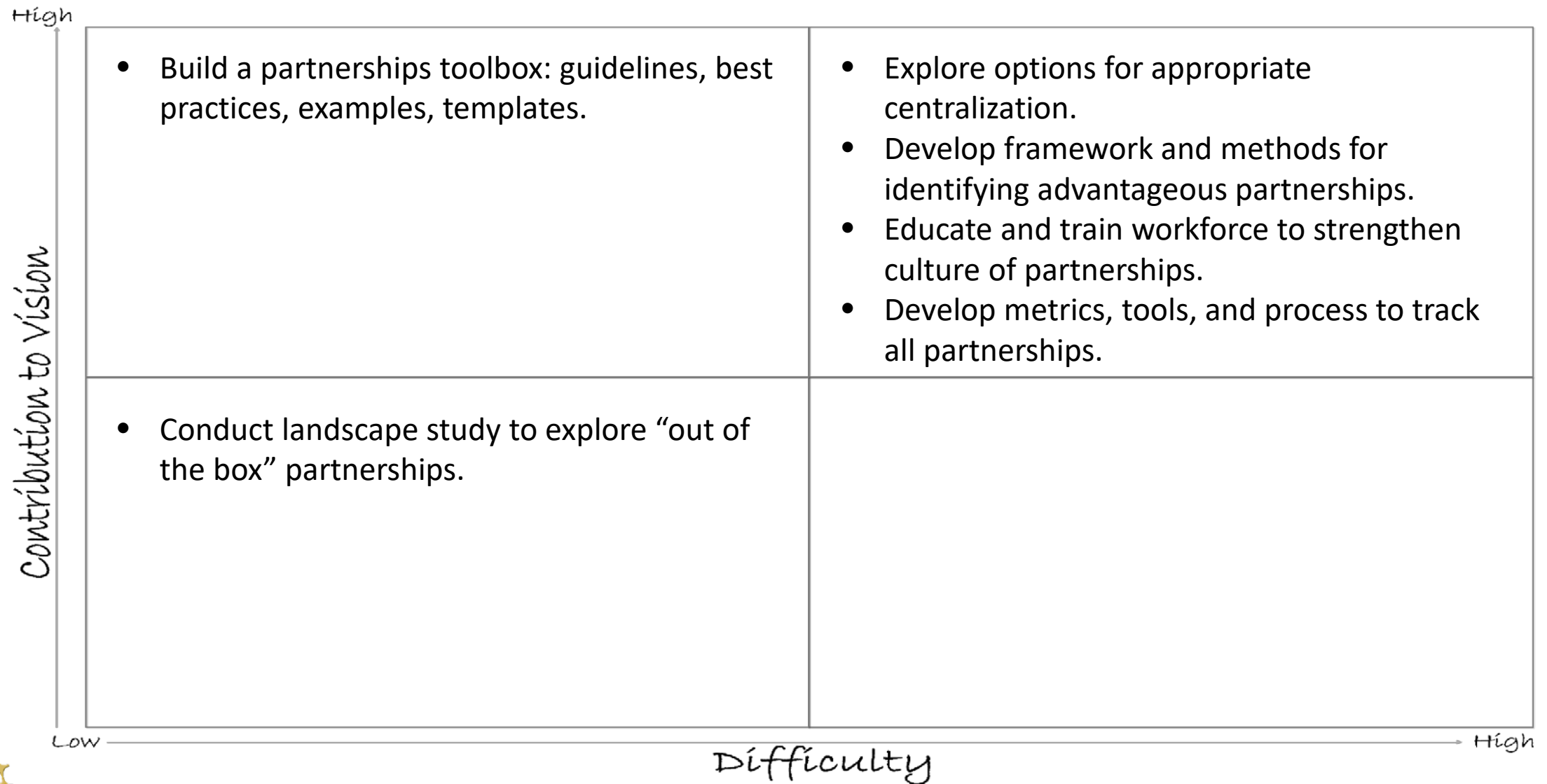


Bold Steps

- Conduct landscape study to explore “out of the box” partnerships.
- Develop framework and methods for identifying advantageous partnerships.
- Explore options for appropriate centralization.
- Build a partnerships toolbox.
 - Guidelines
 - Best practices
 - Examples
 - Templates
- Educate and train workforce to strengthen culture of partnerships.
- Develop metrics, tools, and process to track all partnerships.



Prioritization of Bold Steps



Questions for the Committee

- What elements of a partnerships program would you consider best suited for centralized management?
- What metrics do you suggest should be most important for consideration?
- What mechanisms would you encourage to help strengthen the culture of partnerships?



Thank You!

