HUMAN CAPITAL STRATEGIC PLAN

NATIONAL SCIENCE FOUNDATION

2011 - 2014

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Purpose

This Human Capital Strategic Plan constitutes the framework for managing the National Science Foundation's (NSF's) human capital system through 2015 and builds upon the strength and commitment of NSF's workforce to fulfill the Foundation's mission. This Plan, which supersedes the 2008 Human Capital Strategic Plan, identifies internal and external factors that shape human capital planning and creates an integrated framework of policies and practices that will guide the Foundation in meeting our workforce needs and enable NSF to excel as an organization. The Plan, which seeks to inform NSF managers and staff alike, takes a strategic approach—both in terms of identifying the human capital challenges facing the Foundation as well as how best to maximize the vitality and capabilities of NSF's workforce at all levels. Drawing from the Plan's interdependent goals and the more focused workforce and succession planning action strategies, NSF's individual directorates and offices will be able to develop organizationally-specific human capital implementation strategies. The Plan is intended as a "living" document—one that accommodates changing environments and needs as they arise.

NSF's Human Capital Management System

The National Science Foundation is the premier federal agency supporting fundamental science and engineering research at the frontiers of discovery across all fields, and science and engineering (S&E) education at all levels. For over half a century, NSF's investments have resulted in new knowledge, enabled the production of a world-class scientific and engineering workforce, fostered technology-based innovation, and powered U.S. economic prosperity.

> **NSF Mission**
> **To promote the progress of science; to advance the national health, prosperity, and welfare; to secure the national defense. (NSF Act of 1950)**

> **NSF Strategic Goals**
> **Transform the Frontiers:** Seamless integration of research and education; close coupling of research infrastructure and discovery.
> **Innovate for Society:** Tight linkage between NSF programs and societal needs; highlights the role that new knowledge and creativity play in economic prosperity and society's general welfare.
> **Perform as a Model Organization:** Importance to NSF of attaining excellence and inclusion in all operational aspects.

Many factors contribute to NSF's overall success, but none more so than its high-caliber workforce. In the upcoming decades in an increasingly knowledge-driven global economy, the continued success of NSF and even indirectly the fortunes of the United States, will rest upon the Foundation's ability to execute its overarching human capital vision.

> **Human Capital Vision**
>
> Attract, develop and retain a diverse, world-class workforce that is continually learning and expanding its capacity to shape the agency's future; and
>
> Nurture a culture of integrity and excellence that encourages creativity and initiative and that promotes a healthy work-life environment.

In support of this vision, NSF has developed a comprehensive human capital management system that is consistent with the agency's core values, reflective of its mission and strategic goals, clear in its purposes, and flexible in its implementation. This human capital management system, which is aligned to and informed by NSF's mission and strategic goals, is comprised of four components: 1) data-driven planning, implementation assessment and accountability for human capital management; 2) individual and organizational learning; 3) a high-quality infrastructure that supports human capital management activities; and 4) individual and collective responsibility and accountability.

> **NSF Core Values**
> - **Visionary**
> - **Dedicated to Excellence**
> - **Learning and Growing**
> - **Broadly Inclusive**
> - **Accountable**

The Human Capital Strategic Plan together with the Human Capital Management Plan, the Human Capital Accountability Plan, and the Audit and Assessment Schedule provide a comprehensive scope for agency-level planning and accountability activities. These documents connect to the Office of Personnel Management's Human Capital Assessment and Accountability Framework, as well as NSF's strategic plan.

Human Capital in the 21ˢᵗ Century Context

In the 21ˢᵗ century workplace, managers and staff are immersed in a work environment forged by global competition, knowledge-intensive industries, a mobile labor force, a 24-7 work cycle, and accelerating technological change. NSF human capital planning is shaped by a variety of external and internal drivers.

Competition for Top Talent. With technology-based innovation spurring economic growth, countries and organizations are vying keenly for technically trained workers. When looking to recruit personnel who are working at the forefront of scientific and engineering research and education, NSF competes with higher-paying private sector companies and academic institutions as well as other governmental agencies. NSF faces similar competition for top experts in specific functional fields such as finance, law, and information technology. Other factors that impact NSF's competitiveness as an employer include: cost of housing/living in the Washington, D.C. region; outsiders' perceptions of working in a government agency; the prevalence of dual-professional-career families and requirements for spousal job placement; and work-life balance issues.

A Dynamic Workforce. As a knowledge-intensive organization, NSF requires a highly trained workforce to administer frontier research, education, and infrastructure funding portfolios and the associated merit review process within a dynamic, global science and engineering environment. To fulfill this mission, NSF has structured its workforce to blend effectively permanent and temporary staff. NSF's permanent staff provide broad and deep knowledge in their respective fields (scientific or functional) as well as continuity for NSF activities based on long-term experience. Rotating temporary staff infuse the Foundation with up-to-date insights about science and engineering frontiers and fresh perspectives on U.S. research community needs. While the cadre of rotating staff is a distinctive strength for NSF, continual staffing turnover presents particular human capital planning challenges— e.g., ensuring seamless staffing transitions—particularly for managerial-level positions, sustaining critical organizational knowledge, and enabling effective job assimilation. Human capital planning is critical in assisting NSF to strike the appropriate permanent-rotator staff balance. The dynamic nature of NSF's workforce makes implementation of government-wide mandates on pay and hiring rates particularly challenging.

Expanding and More Complex Workload. In recent years, NSF has experienced tremendous growth in its workload—growth which has far outpaced staffing increases. Proposal load increased 33% between 2005 and 2010 from 41, 722 proposals submitted in 2005 to 55,542 in 2010[1]. During that same period, NSF staff expanded by only twelve percent[2]. Proposal load dropped only slightly in 2011, to 52,196 proposals submitted, however the types of proposals submitted have become increasingly interdisciplinary and multi-institutional in nature—introducing additional complexity both to the proposal review and post-award management processes.

Looming Retirement Wave. NSF's current workforce, which embodies decades of professional experience and knowledge, reflects a nation-wide phenomenon—a graying workforce. Today, we are witnessing the leading edge of the baby-boom retirement wave. Within the U.S. government workforce, the impact of the baby-boomer retirement wave is anticipated to be acute. At NSF, 22% of all permanent employees are eligible to retire in 2011 and 26% will be eligible in 2017[3]. Potential changes in federal retirement systems could have significant impact on NSF.
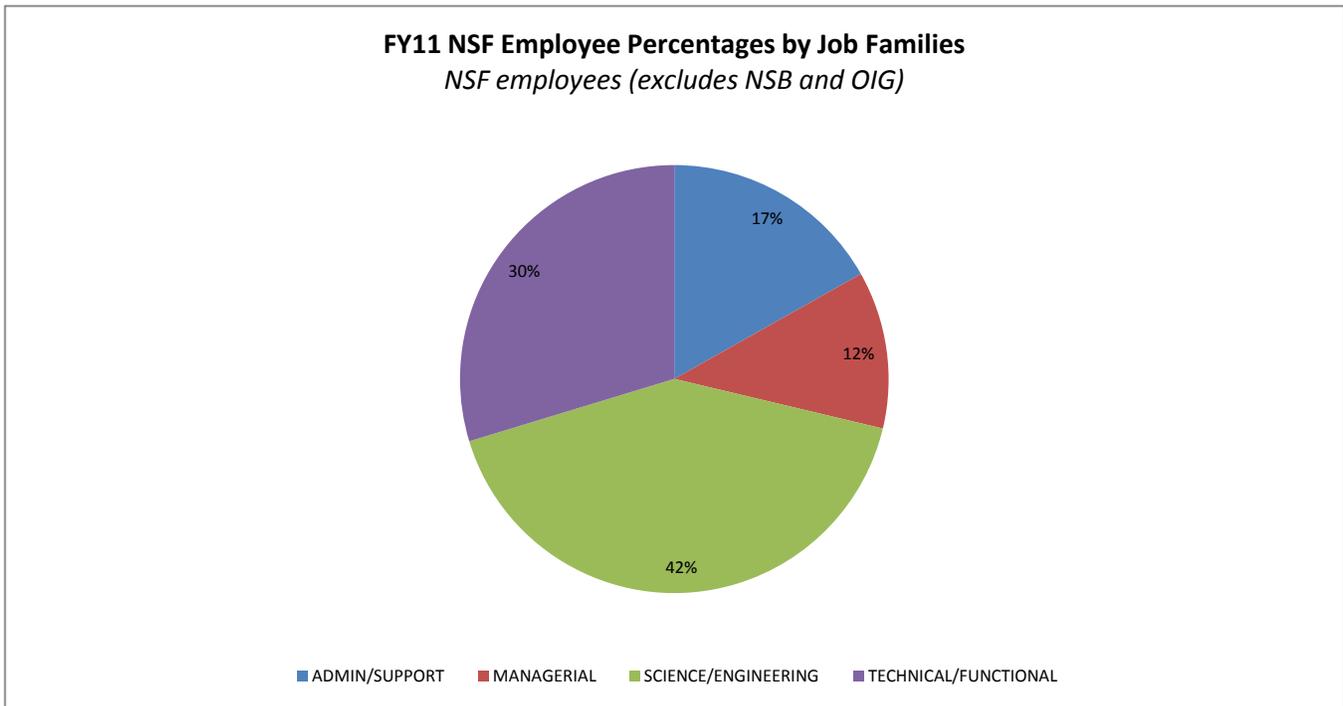
Federal Government Human Capital Initiatives. Mindful of the implications of human capital planning and workforce development, the federal government embraces human capital management policies and initiatives that seek to advance organizational performance. Key principles and policies are articulated in the Human Capital Assessment and Accountability Framework developed by the Office of Personnel Management and the Government Performance and Results Modernization Act. As a federal government agency, NSF's human capital plan reflects these principles and policies in order to effect a diverse, results-oriented, adaptable workforce.

NSF's Workforce

Overview of NSF's Workforce

NSF's workforce is characterized by constant change as evidenced by the ever-changing scientific landscape, new workplace technologies, and rotating staff. Uniquely structured, NSF's workforce is comprised of permanent and temporary staff including "rotators" who typically work up to four years as Intergovernmental Personnel Act (IPA) researchers or Visiting Scientists, Engineers and Educators (VSEEs). NSF's workforce consists of four primary job family groupings: Management; Science and Engineering; Technical/Functional; and Administrative/Support[2]. NSF also relies upon external sources to assist in fulfilling its mission including contractors who provide services such as information technology support, and members of the U.S. research and education community who advance NSF's work by participating in NSF's merit review process as well as by providing advice through advisory committees and committees of visitors. The following charts provide a snapshot of NSF's workforce by job families and various demographic characteristics.
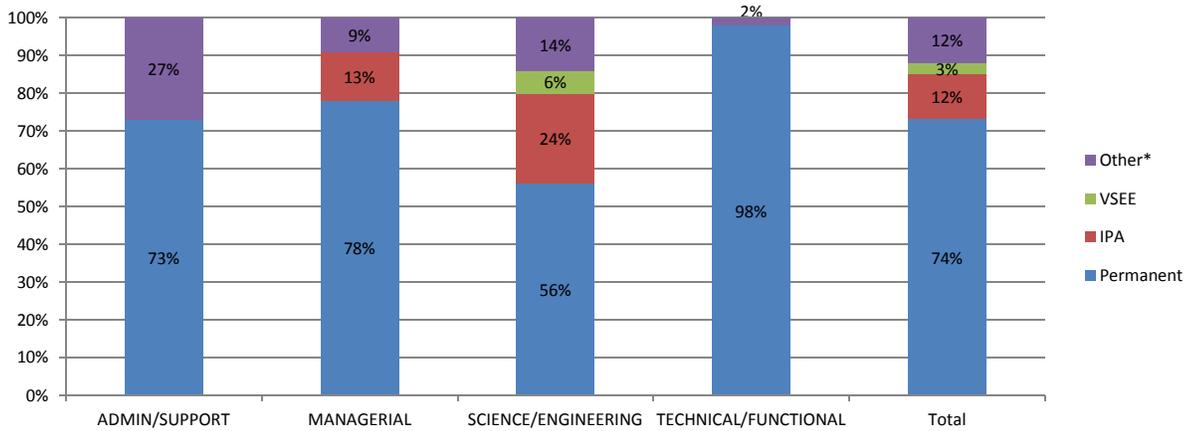
Snapshot of NSF 2011 Workforce[4]

FY11 NSF Employee Percentages by Job Families
NSF employees (excludes NSB and OIG)

- ADMIN/SUPPORT
- MANAGERIAL
- SCIENCE/ENGINEERING
- TECHNICAL/FUNCTIONAL

FY11 NSF Rotator Percentages by Job Families
NSF employees (excludes NSB and OIG)

1%
10%
89%

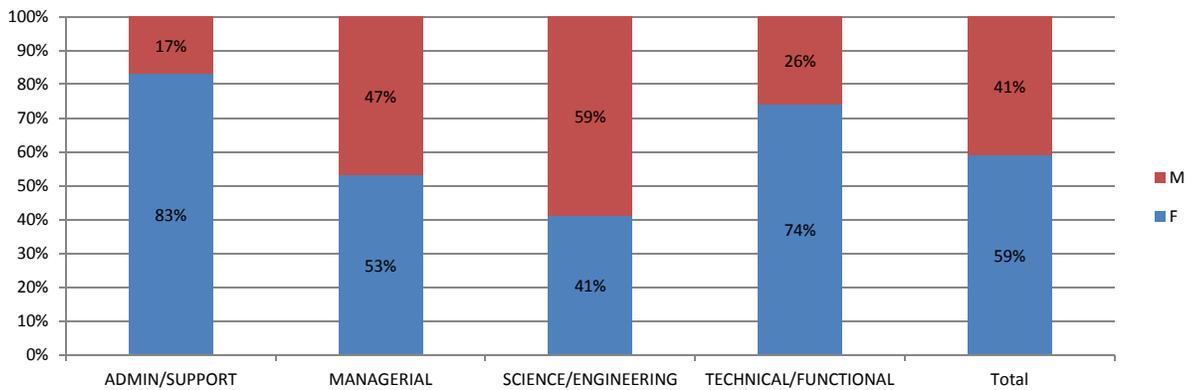■ ADMIN/SUPPORT   ■ MANAGERIAL   ■ SCIENCE/ENGINEERING   ■ TECHNICAL/FUNCTIONAL
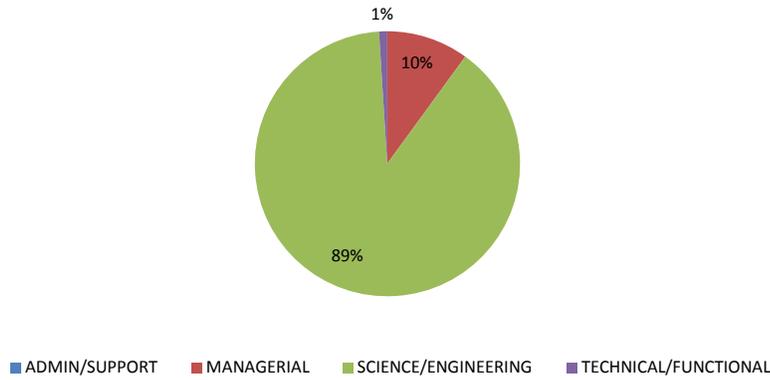
FY11 NSF Appointment Types Percentages by Job Families
NSF employees (excludes NSB and OIG)
* "Other" category includes Student, Federal Temporary, and other non-VSEE/IPA temporary appointments

	ADMIN/SUPPORT	MANAGERIAL	SCIENCE/ENGINEERING	TECHNICAL/FUNCTIONAL	Total
Other*	27%	9%	14%	2%	12%
VSEE			6%		3%
IPA		13%	24%		12%
Permanent	73%	78%	56%	98%	74%

FY11 NSF Gender Percentages by Job Families
NSF employees (excludes NSB and OIG)

	ADMIN/SUPPORT	MANAGERIAL	SCIENCE/ENGINEERING	TECHNICAL/FUNCTIONAL	Total
M	17%	47%	59%	26%	41%
F	83%	53%	41%	74%	59%

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FY11 NSF Race and National Origin Percentages by Job Families
NSF employees (excludes NSB and OIG)

Legend:
- WHITE
- HISPANIC or LATINO
- BLACK or AFRICAN AMERICAN
- ASIAN/PACIFIC ISLANDER
- AMERICAN INDIAN or ALASKA NATIVE

Job Family	WHITE	HISPANIC or LATINO	BLACK or AFRICAN AMERICAN	ASIAN/PACIFIC ISLANDER	AMERICAN INDIAN or ALASKA NATIVE
ADMIN/SUPPORT	33%	4%	57%	5%	1%
MANAGERIAL	75%	3%	16%	6%	
SCIENCE/ENGINEERING	80%	3%	5%	11%	1%
TECHNICAL/FUNCTIONAL	45%	2%	46%	7%	1%
Total	61%	3%	27%	8%	1%
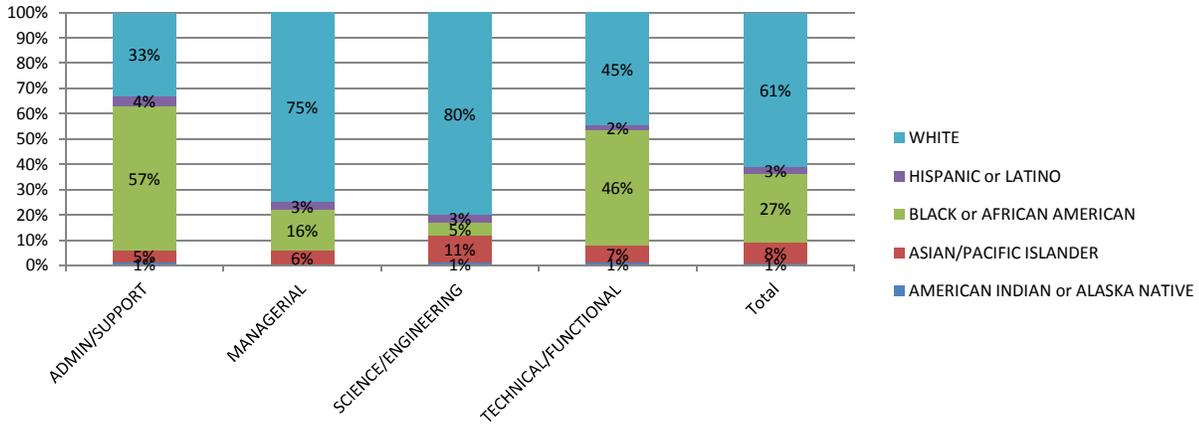
FY11 NSF Education Percentages by Job Families
NSF employees (excludes NSB and OIG)

Legend:
- 8. POST DOCTORATE
- 7. PH.D/PROFESSIONAL MD OR JD
- 6. POST MASTERS DEGREE
- 5. MASTERS DEGREE
- 4. BACHELORS DEGREE
- 3. ASSOCIATES DEGREE
- 2. SOME COLLEGE
- 1. HIGH SCHOOL

Job Family	8. POST DOCTORATE	7. PH.D/PROF MD OR JD	6. POST MASTERS	5. MASTERS	4. BACHELORS	3. ASSOCIATES	2. SOME COLLEGE	1. HIGH SCHOOL
ADMIN/SUPPORT	2%	3%		10%	22%	2%	44%	17%
MANAGERIAL		16%	28%	4%	16%	22%	3%	9%	2%
SCIENCE/ENGINEERING	33%	51%	3%	8%			0%
TECHNICAL/FUNCTIONAL	0%		4%	17%	32%	5%	29%	10%
Total	16%	26%	3%	12%	17%	2%	17%	6%

FY11 NSF Pay Plan Percentages by Job Families
NSF employees (excludes NSB/OIG, and IPA's)

Legend:
- GS
- ES
- AD

Job Family	GS	ES	AD
ADMIN/SUPPORT	86%		14%
MANAGERIAL	52%	43%	5%
SCIENCE/ENGINEERING	5%	3%	92%
TECHNICAL/FUNCTIONAL	97%		3%
Total	58%	6%	36%

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FY11 NSF Loss Type Percentages by Job Families
NSF employees (excludes NSB/OIG, and IPA's)

Legend:
- Voluntary Departure
- Transfer Out
- Retirement
- Other
- Appt Expiration

	ADMIN/SUPPORT	MANAGERIAL	SCIENCE/ENGINEERING	TECHNICAL/FUNCTIONAL	Total
Voluntary Departure	40%	16%	21%	22%	29%
Transfer Out	13%	47%	3%	56%	17%
Retirement	6%	26%	10%	15%	11%
Other	3%	11%	6%	7%	5%
Appt Expiration	39%		60%		38%

FY12 NSF Predicted Retirement Percentages by Job Families
NSF Permanent employees (excludes NSB/OIG, and IPA's)

Legend:
- Ineligible
- Eligible

	ADMIN/SUPPORT	MANAGERIAL	SCIENCE/ENGINEERING	TECHNICAL/FUNCTIONAL	Total
Ineligible	80%	68%	62%	85%	75%
Eligible	20%	32%	38%	15%	25%

In addition to the above snapshot, a few noteworthy highlights about NSF's workforce merit attention.

- Rotators comprise 15% of NSF's total workforce. This percentage has been relatively stable since 2006.
- Overall NSF workforce diversity has remained constant despite growth in NFS's workforce.
- In 2011, employees in Race and National Origin categories other than white comprised 39% of the NSF staff, with employees categorized as Black or African American concentrated mainly in Administrative/Support and Technical/Functional positions.
- Females account for 59% of NSF's workforce, but only 41% of employees in Science/Engineering categories.
- Persons with disabilities made up 11% of NSF's workforce.
- 39% of NSF's workforce is over age 55; as opposed to 25% in the federal workforce and 14% in the total US labor market. The average age of an NSF employee is 50 years.
- The percentage of staff eligible to retire who actually retire each year has decreased from 14% in FY10 to 9% in FY11. The government-wide average is 9% retiring.

NSF Human Capital Goals

NSF's human capital goals draw from and align with NSF's strategic plan[5]. Reflecting the strategic goals set out in *Empowering the Nation through Discovery and Innovation*, NSF's human capital goals are organized to follow the NSF strategic plan's mission-focused strategic goals and organizational performance strategic goals.

NSF has two mission-focused strategic goals: **Transform the Frontiers** and **Innovate for Society**. To implement the programs that will allow NSF to meet these goals, the Foundation needs staff that understands and operates on the frontiers of science and engineering; NSF staff must also have a sense of workforce needs and the role of science and engineering in the innovation ecosystem. NSF meets these needs through a combination of permanent staff and rotators; the intensive use of rotators in science and engineering positions helps to ensure that NSF has the scientific and technical competencies needed for mission accomplishment. NSF also requires staff who can adapt to new priorities and new ways of doing business, as the world of science and engineering is inherently marked by change.

NSF strongly believes in attaining excellence and inclusion in all operational aspects and has as a goal to **Perform as a Model Organization**. NSF needs effective practices to ensure high performance as a science-based organization while maintaining high performance as a federal agency. Staff must exhibit a willingness to experiment and adapt current scientific findings to the NSF environment. Learning and growing remain a priority for all staff.

To meet the Perform as a Model Organization strategic goal, NSF has identified a number of Human Capital Goals as described below:

> ## Human Capital Goal #1:
>
> **Integrate personal responsibility and leadership accountability throughout NSF's human capital management system in order to promote organizational excellence and to make NSF a great place to work.**

Contributing to the overall vitality of NSF's human capital is a shared responsibility. NSF's strategic plan aims to achieve management excellence through leadership, accountability and personal responsibility (Perform as a Model Organization, M1). The Foundation's leadership is accountable for NSF human capital management. Improvement in human capital activities (learning, recruitment, retention, knowledge transfer) and human capital infrastructure is an unending endeavor. Periodically, NSF evaluates progress made toward realizing its human capital vision and the alignment of NSF human capital objectives with the goals of the NSF Strategic Plan, and incorporates the findings into its performance reporting scheme and future human capital plans. The OPM Employee Viewpoint Survey (EVS) is an important tool for this assessment process, Results from the 2010 EVS identified both workload and diversity as areas requiring increased attention. Since that time, NSF has laid the groundwork for addressing these issues long term in the NSF Action Plan on Employee Satisfaction and Wellness and the NSF Diversity Strategic Plan.

> ## Human Capital Goal #2:
>
> **Infuse learning as an essential element in NSF's workplace, emphasizing that growth and inspiration are critical to developing both organizations and individuals as world-class performers.**

NSF aspires to be a robust learning organization with a strong learning culture that is integrated Foundation-wide and embraces all employees. Learning—by individuals and organizations—typically results in better performance, advancement, and/or enhanced capacity for action. Planning for learning opportunities in conjunction with human capital management changes and organizational development is critical to the successful execution of such change. In accord with the NSF strategic plan, the emphasis will be on professional development and personal growth (Perform as a Model Organization, M-2).

The learning portfolio at NSF is comprised of a wide variety of development experiences including—but not limited to—task and competency-specific training; education leading to the broader development of employee capabilities; leadership development; practical, hands-on experience gained through details or job shadowing; and coaching and mentoring. Options include both formal and informal learning approaches accessed through NSF-sponsored or externally-offered mechanisms. On-line learning promises to be a growing resource for task-based training and "just-in-time" learning needs. The NSF Academy[6], Division of Human Resource Management, offers access to learning opportunities for all NSF staff and contributes to advancing NSF as a learning organization. Defining clearly the Academy's role and enabling it to fulfill that role will be important to meeting this goal.

> ## Human Capital Goal #3:
>
> **Exhibit leadership and foster innovation in human capital management by exploring, testing, evaluating, refining, and implementing novel and inventive human capital policies, processes, and programs.**

Recognizing that NSF's human capital needs will change in the future, a high-quality human capital management system at NSF must be dynamic. Inquiry and experimentation with human capital programs and processes are valued tools for human capital improvement and decision-making. This approach is consistent with current processes of gathering information on NSF's workforce, practices, and systems which then serve as the basis for human capital planning. Areas where inquiry-based planning is being undertaken include: administrative functions, workload, diversity, and succession planning. In accord with the NSF strategic plan, the aim is to encourage and sustain a culture of creativity and innovation across the agency to ensure continuous improvement and achieve high levels of customer service.

> ## Human Capital Goal #4:
>
> **Develop and implement effective human capital processes, tools, and technologies that enable a first-rate, end-to-end human capital management system.**

NSF's human capital activities require and are founded upon a solid, continually improving human capital management infrastructure. Key components of NSF's human capital infrastructure include:

- An established, agency-wide practice of workforce and succession planning that enables NSF leaders to make informed and timely decisions about type, number and required competencies of NSF positions;
- A performance management system that facilitates NSF employees in meeting current and future organizational goals;
- A high-quality, IT infrastructure to support human capital management transactions;
- An easily accessible, IT-based portal that provides information pertaining to human capital development (e.g., competencies, learning maps, professional training/growth experiences, career paths, etc.) that staff and managers use in assessing career and professional growth opportunities.
- Reinforcement for providing high quality customer service in all NSF's processes and interactions.

While existing processes and systems are strong, they need continual refreshing and updating to remain current with NSF and government requirements.

NSF Workforce Plan

NSF Workforce Plan Purpose

Since its establishment, NSF's high-performing workforce has enabled the Foundation to achieve its mission, be a world leader in advancing discovery and innovation, and empower future generations in science and engineering. Given today's rapidly changing scientific and engineering landscape and the demand for a diverse, globally-engaged, competitive U.S. S&E workforce, NSF's need for skilled, visionary, and motivated employees is greater than ever.

This Workforce Plan sets out the goals and action strategies that will enable NSF to attract, develop, and retain a diverse, adaptable, world-class workforce that is continually learning, expanding its capacity to shape the agency's future, and striving for excellence as stewards of the nation's investment in S&E research. Specifically, the Workforce Plan identifies the steps needed to align NSF's workforce to NSF's current and projected work requirements, which are:

- Determining the needed make-up of NSF's workforce by examining continually required work functions, staffing levels, competencies, workloads, and workforce surpluses/gaps;
- Formulating strategies to develop/sustain NSF workforce capacity, improve recruitment processes and outcomes, and promote employee retention;
- Identifying processes and tools to support workforce planning and workforce planning assessment.

NSF Workforce Needs

NSF's leadership in advancing the frontiers of science and engineering research and education is complemented by its commitment to excellence in administration and management. To sustain outstanding performance and results, NSF's workforce planning approaches and processes must identify work requirements and challenges today and in the future, as well as produce a workforce that possesses the required competencies to address effectively current and future needs. Managing NSF's workforce needs successfully – whether they are related to the composition of NSF's staff, the nature and type of functions performed at NSF and their associated competencies, or human capital programs and processes – will result in a stronger agency. Workforce-related challenges facing NSF include:

- Managing change within a dynamic, rotating workforce—including timely recruiting of top scientists and engineers, retaining job-critical knowledge, and insuring seamless staffing transitions—particularly at the management level.
- Ensuring that NSF is a learning organization by offering robust and diversified professional developmental experiences in spite of NSF's small agency status and constrained resources.

- Properly aligning NSF's workforce with current and projected strategic functional requirements and enabling NSF staff to develop and to have the breadth of knowledge and skills needed to fulfill their responsibilities—such as administering research portfolios that are increasingly complex in scope and spanning multiple disciplines, managing a dedicated, diverse team within the federal context, or adopting new workplace technologies.
- Fielding a vibrant senior executive leadership corps through the development of in-house staff and effective external recruitment.
- Increasing the diversity of NSF's workforce, especially among scientific and engineering executive and program staff.
- Striking a sustainable work-life balance during this period of increasing workload.
- Providing NSF management and staff with easily accessible information on workforce policies and practices—especially regarding job-related competencies, career progressions, competency-based performance, and professional development opportunities.

NSF Workload

Proposal load increased 33% between 2005 and 2010 from 41, 722 proposals submitted in 2005 to 55,542 in 2010. During that same period, the NSF workforce increased by only twelve percent. Proposal load dropped only slightly in 2011, to 52,196 proposals submitted, however the types of proposals submitted have become increasingly interdisciplinary and multi-institutional in nature—introducing additional complexity both to the proposal review and post-award management processes. NSF staff not only manage the merit review process and shape scientific and engineering funding portfolios that strengthen research and education but also bear responsibility for a broad range of activities including: program budget management, post-award oversight, community outreach, fostering accountability and excellence through evaluations by advisory committees and committees of visitors, and stimulating diversity in science and engineering. To better understand NSF's workload and associated workforce implications, NSF has developed a workload analysis methodology. The methodology's components are:

- Understanding NSF's work and how it gets done;
- Establishing a baseline of current workload and workload drivers;
- Identifying current staffing gaps and future workload changes;
- Defining staffing options; and
- Determining staffing plans.

Workforce planning at NSF is a continuous process. While the following goals set out the strategic parameters for workforce planning at NSF, some critical elements of the plan will require further attention and refinement such as: the workload analysis model; the composition and impact of the permanent-rotator staffing model for scientific and engineering as well as executive positions; and job position competencies.

Workforce Plan Goals

Goal 1: Identify the workforce needed to fulfill NSF's mission in a changing landscape.

Focus: Knowing the needed workforce profile for NSF.
- Determine the functions needed to fulfill NSF's mission – now and in the future;
- Identify the competencies necessary to perform current and projected functions;
- Examine the current agency workload and develop scenarios for the future at given staffing levels available to manage the workload;
- Evaluate current workforce skills and demographic trends, and identify any projected skill gaps in light of the changing nature of work and NSF's workload;
- Monitor continuously NSF's workforce profile as a means to identify current and future needs.

Goal 2: Effectively recruit a diverse, world-class, forward-looking and adaptable workforce.

Focus: Identifying and attracting world-class talent in a wide variety of fields from diverse backgrounds and experiences.
- Recognize that recruiting is an ongoing activity needed to sustain and augment staff levels and competencies;
- Develop staff position descriptions that make maximal use of the latest practices and technologies and align with NSF's functional needs;
- Plan for meeting succession needs, both anticipated and unanticipated, from in-house and/or external candidate pools;
- Strengthen recruiting aimed at increasing NSF staff diversity;
- Develop recruitment practices that are flexible and embrace traditional and non-traditional approaches;
- Identify, strengthen and implement incentives that attract top quality candidates to NSF including competitive benefits, quality of work experience, and work/life balance;
- Capitalize on the NSF "brand" (e.g., NSF = high quality within the U.S. research community, a great place to work, and a positive career opportunity) to attract exceptional candidates to apply for NSF positions;
- Leverage and strengthen long-term relationships with NSF alumnae.

Goal 3: Build and sustain a capable, diverse, well-trained, forward-looking, and adaptable NSF workforce and enhance retention through learning and professional development opportunities

Focus: Developing the skill sets necessary for excellence at all levels and in all roles with particular focus on addressing identified skill gaps.
- Provide mission-requirements-based professional growth and learning opportunities including for targeted groups (i.e., NSF executives/leadership, managers/supervisors, scientists and engineers, technical/functional staff, and administrative/support staff);
- Communicate to NSF employees the options for career advancement and the means to achieve desired personal goals within the context of Foundation goals (e.g., establishing milestones by which advancement towards goals can be assessed);

- Post available professional development opportunities in a centralized, well-organized, easily accessible site;
- Provide opportunities to practice in-class learning on the job;
- Establish the NSF Academy as a leading facility among federal government agencies for professional development and training and operating at a level equivalent to university standards.

Goal 4: Develop and implement effective workforce planning processes, techniques and tools.

Focus: Building an effective and efficient infrastructure for workforce planning and workforce planning assessment.

- Establish transparent, agency-wide workforce planning processes with a clear annual cycle and easy-to-use tools that enable NSF leaders to make informed and timely decisions about type, number and required competencies of NSF positions;
- Develop efficient infrastructure to support workforce planning activities including an easily accessible, IT-based portal that provides information pertaining to human capital development (e.g., competencies, professional training/growth experiences, career paths, etc.) that staff and managers use in assessing career and professional growth opportunities;
- Reduce time, effort and costs required to complete key human resources processes (e.g., time to fill vacancies);
- Ensure high quality communications between human resources professionals and agency "customers;"
- Implement a high quality performance evaluation system that emphasizes achievement, results, and constructive performance feedback, and meaningfully addresses poor performance when necessary;
- Continuously improve workforce planning activities (learning, recruitment, retention, knowledge transfer) and human capital infrastructure through feedback and use of meaningful metrics and evaluation;
- Assess the alignment of NSF workforce activities in light of NSF's Strategic Plan goals.

NSF Succession Plan

The National Science Foundation has demonstrated success in recruiting national science and engineering leaders to one-to-four-year appointment terms with NSF to ensure a continued fresh scientific perspective. This means changes in the senior leadership team and scientific personnel are relatively routine.

This Succession Plan describes the integrative planning processes the agency will establish to manage effectively and efficiently staffing transitions for all NSF's job families. It identifies core strategies to be used in succession planning by managers at all levels within the agency. The Plan has been created as a supplement to the agency's Workforce

> Approximately 15-20% of NSF's executives and ~14% of S&E staff change annually due to rotator turnover and attrition/retirements by career personnel.

Plan, which describes the needs assessments, recruitment, development, and retention strategies, as well as business processes and tools that the agency uses to execute its human capital actions. Like all new efforts though, the success of this endeavor can only be assured through the allocation of sufficient new resources.

GOALS AND STRATEGIES

The agency's succession planning activities are motivated by two goals:

- to ensure seamless staffing transitions, and thereby enable continuity of operations, facilitate rapid job assimilation, and preserve critical organizational knowledge; and

- to develop and nurture a cadre of leaders at all levels within the organization and within all job families with the skills and competencies necessary to boldly lead the agency into the future.

Implementation is guided by three core strategies:

- *Implement an effective transition process*: prepare and implement staffing transition processes—anticipating both the possible need to make interim appointments and to recruit new leaders, and identifying roles, responsibilities and best practice timelines.

- *Support a comprehensive leadership development program*: broaden and deepen the agency's leadership cadre within all NSF job families through the implementation of a comprehensive leadership development program.

- *Institute sound knowledge management and transfer practices*: establish comprehensive knowledge management and transfer strategies for all positions.

Managers at all levels in the agency draw upon these flexible strategies to enhance their effectiveness in managing succession planning for key positions as determined by the individual organizations. While the focus of agency-wide succession planning is on the executive leadership corps, succession planning at the directorate and division level targets key positions among the science/engineering, administrative/ support and technical/functional

staff. Succession planning implementation activities and their outcomes will be widely shared, promoting the identification and utilization of best practices across the Foundation.

The following sections elaborate upon the three core strategies essential to effective succession planning.

I. Implement an Effective Transition Process

Effective transition processes provide critical continuity of operations and are essential for all NSF positions. These processes support: the recruitment of new staff; interim contingencies in the event that a position is unexpectedly vacated or a search for new staff takes longer than originally planned; and, for executive-level staff, possible permanent reassignment of existing executive leaders into newly vacated leadership positions.

Recruitment to fill anticipated vacancies: NSF recruitments to fill pending position vacancies are guided by a number of best practices, as follows.

- Formal recruitments begin at least three to twelve months in advance of a planned staffing transition—depending upon the type of position to be filled. For example, searches to fill executive leadership positions are initiated at least nine months in advance of a planned transition.
- Where appropriate, formal search committees are established. In the case of an unexpected transition, NSF initiates search committee action within three weeks of the event precipitating the transition.
- All searches are open and competitive.
- Executive leadership searches are national in scale.
- Development of a diverse candidate pool is essential in all recruitments, and diversity in the workplace is a consideration in filling vacancies.
- Strong candidates from both outside and within NSF are sought. Accordingly, NSF's workforce development programs are essential to prepare a strong, diverse internal candidate pool.
- NSF "alumni" from panels, committees of visitors, advisory committees, reviewers, and former program managers, etc. are being integrated as part of the communication strategy in publicizing opportunities through the newly developed Ambassador Program
- Transition overlaps of one to three months may be desirable for key positions.

Reassignment of existing executive leaders to fill vacated executive positions.

In certain cases, NSF executive positions may be filled through non-competitive reassignments of on-board executive leaders. When an executive leadership position is vacated, on a case-by-case basis NSF considers the merits of the non-competitive reassignment of a well-qualified individual from the agency's cadre of existing executive leaders.

Interim executive appointments: The appointment of an interim executive leader is also guided by agency best practices as follows.

- Interim leaders are typically identified from an in-house candidate pool.
- NSF's leadership development programs are essential to prepare a strong internal candidate pool of executive leaders.
- Wherever possible, interim leadership appointments are announced at least five business days prior to the departure of the outgoing leader.

Implementation and Accountability: Although effective transitions depend upon the contributions of a number of NSF's stakeholders, including members of the Administration and the Congress and the national research and education community, responsibility and accountability for the transition planning and management resides with a core team of NSF senior executives, including the NSF Deputy Director and the highest ranking career executives within each of the agency's directorates and offices.

NSF Director and NSF Deputy Director Transitions – For urgent situations, in order to ensure continuity of operations, the NSF Deputy Director is accountable for ensuring interim leadership plans are in place for the NSF Director and NSF Deputy Director positions. A list of succession for the Director position is maintained by the NSF Continuity Officer (currently in the NSF Division of Administrative Services).

Assistant Director and Office Director Transitions - The NSF Deputy Director is also responsible for ensuring that leadership transition plans, including the recruitment of new leaders and the appointment of interim leaders, are in place for the Assistant Director and Office Director positions of NSF's directorates and offices. The Deputy Director is responsible for ensuring that these plans are consistent with the best practices described herein, and is accountable for their effective implementation.

Other Positions – The highest ranking career official in each of the agency's directorates and offices, in consultation with the Deputy Director, is responsible for ensuring that transition plans, including plans for both recruitment and interim appointments if necessary, are in place for all key positions within their organizations. These officials are also responsible for ensuring that a succession planning process—consistent with best practices described herein—is in place for all positions within their organizations.

NSF's Division of Human Resource Management maintains and regularly updates an executive incumbent list, including Not-To-Exceed (NTE) dates for rotator or temporary assignments.

II.   Support a Comprehensive Leadership Development Program

Leadership occurs at all levels within an organization and within all job families. NSF will invest new resources in the development of a comprehensive leadership development program designed to identify, enhance the capabilities of, recruit and retain current and future generations of leaders, through a combination of training and experience models, as well as best practices demonstrated through new leadership programs developed by the NSF Academy and in contemporary development programs offered by other agencies.

The agency will be diligent to provide promising scientists and engineers with executive leadership development opportunities because NSF experience with OPM Qualifications Review Boards has demonstrated that the competencies and experiences of promising science and engineering research and education administrators do not always align with the core executive competencies and qualifications (ECQs) required for Senior Executive Service (SES) status. Furthermore, the agency will invest additional new resources in the continuing professional development of current executive leaders and of staff aspiring to become organizational leaders.

Core Competencies Needed and Specific Competencies Desired: At the executive level, the ECQs define the competencies and characteristics which senior federal executives should possess and which promote a federal corporate culture that strives for results, serves customers, and builds successful teams and coalitions within and outside the organization. The qualifications required for entry into the Senior Executive Service are: Leading Change;

Leading People; Results Driven; Business Acumen; and Building Coalitions. Many of these competencies are addressed in training programs supplied by or through the NSF Academy. A centrally located, comprehensive listing of ECQ-related training opportunities (including those provided within the Foundation and those offered by external vendors) has been developed and has been incorporated into the Executive Development Plan process which is managed and maintained by the NSF Academy. In addition, NSF staff are able to take advantage of OPM's Federal Executive Institute and related executive training programs, long-term development opportunities, details in executive offices at NSF, and participation in NSF-wide groups with varying responsibilities.

For other NSF job families and to ensure specific organizational needs are fulfilled, other competencies may also be necessary or desirable (e.g., legislative, financial, large project management, working in teams, etc.) In addition, participants must have the opportunity to apply their new knowledge within an appropriate context. With this in mind, NSF's leadership development programs provide part-time training assignments and detail opportunities both inside and outside the agency, in order to broaden the outlook, perspective, and experience of potential leaders. Formal mentoring, shadowing, counseling, and focused Individual Development Plans (IDPs) are now being used to advance the development of potential career leaders.

Implementation and Accountability: Within the agency's directorates and offices, the highest ranking career official, or designee, is responsible for developing and implementing a directorate/office plan to identify individuals who may benefit from leadership training. The most senior career official is also responsible for ensuring that all potential leaders within their organization have IDPs that take into consideration the future and current leadership needs of the agency.

NSF's senior career officials work together with the Director of the Division of Human Resource Management to identify potential developmental assignments or details (within or outside NSF) that align with the future leadership needs of the agency and ensure that aspiring leaders have the opportunity to take advantage of such assignments or details. In some cases, directorates and offices will make resources available to backfill for the individuals being developed for leadership roles.

Individually and collectively, the most senior executive officials in the directorates and offices report to NSF leadership (the NSF Director and Deputy Director) on the progress being made in leadership development on a semi-annual basis.

III. Institute Sound Knowledge Management and Transfer Practices

In order to enable the effective transition of incoming staff into their new roles and organizations, to assure efficient continuity of programmatic and/or business operations, and to safeguard against the loss of job-critical information, sound and commonly adopted knowledge management and transfer practices are being developed and instituted across NSF, as available resources permit. Knowledge transfer strategies target both explicit and tacit job-related knowledge, and address knowledge transfer needs for staff new to the organization as well as those promoted from within.

Best Practices: A number of best practices will guide the development and implementation of the knowledge management and transfer process.

- Pre-arrival: Pre-arrival meeting(s) are scheduled with predecessors to facilitate information exchange. For executive leadership transitions, a process is established and

implemented within the relevant directorate or office to identify organizational strengths, weaknesses, opportunities and threats. Findings of the survey are provided to the incoming executive prior to his/her arrival and set the stage for transition meetings that shorten manager's acclimation to the new job, reduce anxiety of staff, and provide for strategic planning.

- Brand-new-to-NSF: Incoming staff are provided with access to NSF orientation and training materials regarding agency strategic goals and other units' programmatic goals and activities, as well as to specific information about the new employee's own organization and job portfolio. For new executive leaders, "door-knock"/introductory meetings are scheduled with peers in other organizations within NSF, and access is provided to a trained pool of executive, in-house "flash mentors[7]" and/or coaches.

- Working within the federal context: Orientation/training is provided to new staff on norms and practices encountered within the federal work environment. For new executives at NSF (whether new to NSF or promoted to executive ranks from within) the Executive Leadership retreat and other mandatory training on managing within the federal context is provided, and covers such topics as: performance management (e.g., standards and accountability); coaching and counseling; the federal budget process; personnel management within the federal government; Equal Employment Opportunity and Labor Relations; and ethics.

- On-the-job phase: Staff draw upon critical informal knowledge networks, through mechanisms such as retreats, roundtables, support/best practice communities, and through technology-based knowledge repositories such as job dossier documents, an NSF-centralized job info bank, job-family chat-rooms, video conversations, and the New Executive Transition Website available to all NSF employees. Just-in-time training and development experiences are also used—such as the Program Management Seminar, Merit Review Basics Workshop for Program Staff, topic-focused training (performance review, recruitment, budget formulation, addressing Congress/the press, etc.), and e-business/IT systems training (ejacket, EIS, Fedtraveler, etc.)

- Departure phase: As staff transition out of NSF, a one-to-three month overlap with their successors may be desirable. When not feasible, a structured debriefing—including a "note to successor"—of the departing official is strongly recommended. A knowledge transfer checklist is now available on the web. NSF is exploring other mechanisms for conveying particularly sensitive information or information the executive might not capture on his or her own.

Implementation and Accountability: Within the agency's directorates and offices, the highest ranking career official, or designee, is responsible for developing and implementing a directorate/office plan for knowledge management and transfer. This individual will draw upon centralized resources provided by the Office of Information and Resource Management.

NSF's cohort of senior career officials will work together and with the Director of the Office of Information and Resource Management to identify critical knowledge management and transfer resources that map to the needs of the agency.

Incumbents in NSF positions are responsible for populating technology-based knowledge repositories throughout their assignment at NSF as well as providing critical job information to successors during the transition phase.

Investing in NSF's Human Capital Management System

Investment in human capital is essential to fielding a high-caliber, responsive, and effective workforce. Such investment can take different forms including: funding; allocating time to pursue development experiences; support from managers, mentors, coaches; creating pilot human capital programs; and tools.

Investments in human capital are made at both the NSF-level and within NSF's individual organizations. Examples of the former are Academy-sponsored training and human resources management processes; examples of the latter include funding support for external training and employee absences from the unit during an external assignment.

Yet, while such investment is critical, it competes with other essential NSF requirements for finite resources. In recent years, that competition and the trade-offs facing NSF leadership have been more acute. With flat Agency Operations and Award Management budgets for multiple years, rising costs associated with certain fixed administrative, personnel, and operational needs have squeezed available discretionary administrative funds.

This Human Capital Strategic Plan incorporates ongoing and potential strategies for NSF to pursue in creating a vibrant human capital management system with the potential to make all human capital investments more effective. Realizing and sustaining those strategies will require increased investment that is informed by a system-level perspective.

Endnotes

[1] *NSF Performance Highlights* (FY2005, FY2007); *Report to the National Science Board on the National Science Foundation's Merit Review Process, Fiscal Year 2010.*

[2] National Science Foundation workforce databases.

[3] National Science Foundation Workforce Profile 2010.

[4] National Science Foundation Workforce Profile 2010. Percentages may not equal 100% due to rounding. Additional notes on this section:
Rotators by Job Category: Provided data represents the number and percentage of rotators in each job family; for example, 23 of NSF managers are rotators and, correspondingly, rotators comprise 15% of NSF's management job family.
Pay Grade Category: Employee compensation at NSF is based upon one of three U.S. Government-established pay scales: "GS" or General Schedule which is the federal pay scale used for most U.S. Government civil servants; "AD" which is the pay scale used for scientific and engineering professionals designated to be in the Excepted Service; and "ES" or Executive Schedule which is the pay scale used for senior executives.

[5] NSF Strategic Plan *Empowering the Nation Through Discovery and Innovation Investing in America's Future* can be accessed at:
http://www.nsf.gov/news/strategicplan/nsfstrategicplan_2011_2016.pdf

[6] The NSF Academy serves as a catalyst for enhancing NSF as a learning organization and as a hub for training and development activities for NSF staff. More information about the NSF Academy is available at: http://www.nsf.gov/oirm/academy/ or http://www.inside.nsf.gov/oirm/hrm/academy/index.jsp.

[7] "Flash mentors" are mentors who provide, for a short-term duration, information, insights, and/or guidance to individual staff recently assigned to a new position and/or about a focused issue/activity.