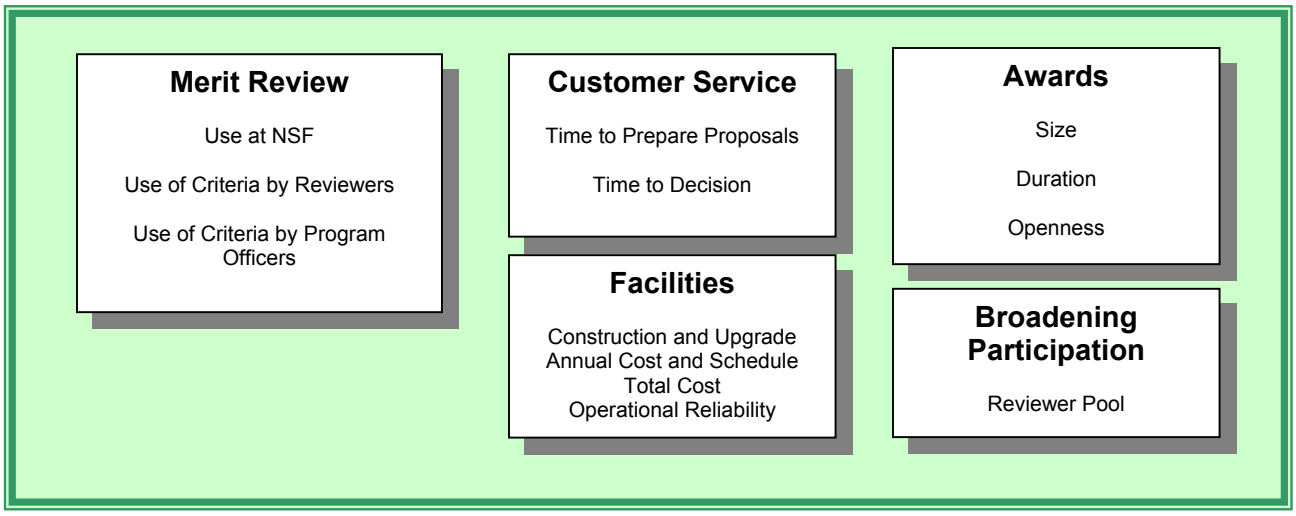
VI. INVESTMENT PROCESS GOALS



Success in achieving our outcome goals is dependent upon the award portfolio developed by our program staff. The following sections provide information on how our investment process shapes the awards portfolio and supports our outcome goals. Investment process goals focus on means and strategies for successful performance – in merit review and award oversight and management processes, broadening participation, and facilities oversight.

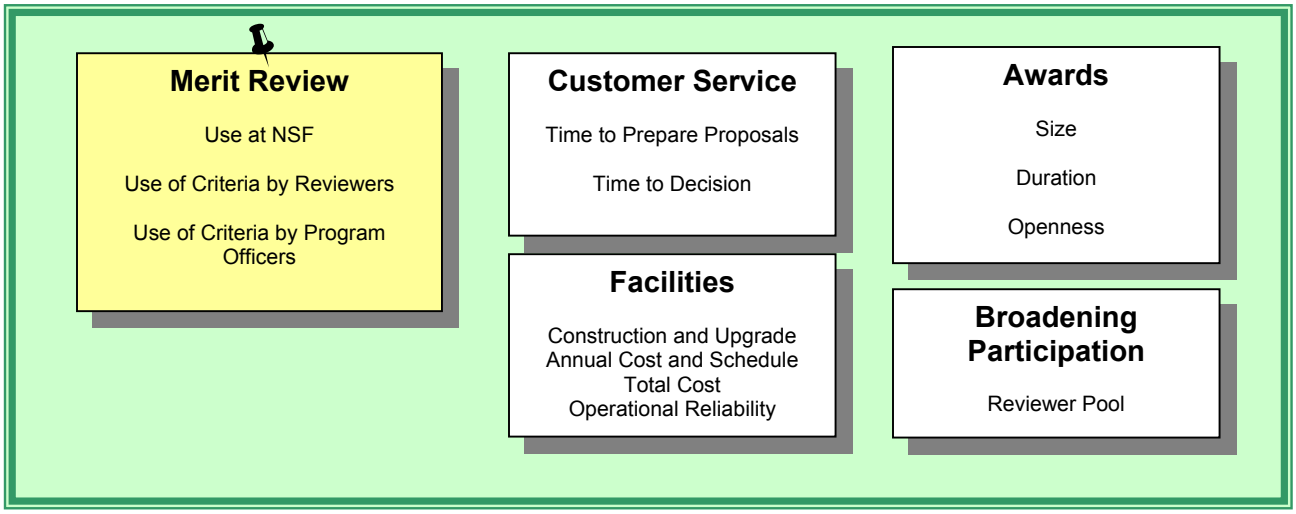
The goals included within this section focus on merit review, customer service, awards managements and oversight, broadening participation of our reviewer pool, and facilities. Success in achieving these goals is dependent upon factors such as high quality merit review, sufficient staff resources and operating expenses, constraints imposed by administrative requirements, and electronic information systems that support the various management processes.

Summary of Results for Investment Process Goals

We achieved seven of our 13 Investment Process Goals in FY 2001. We achieved our goals for allocation of funds to merit-reviewed projects, use of the two merit review criteria by program officers, time for the science and engineering community to prepare proposals, average annualized award size, taking steps to increase the diversity of our reviewer pool, and annual and total cost of construction and upgrade projects. We did not meet our Investment Process Goals for use of the two merit review criteria by reviewers, the time it takes to make a decision on funding a proposal, the average award duration, percent of awards to new investigators, and the annual construction/upgrade schedules and operating efficiency of facilities. As in FY 2000, we engaged an outside accounting firm to verify and validate performance information for most Investment Process goals.

INVESTMENT PROCESS GOALS

A. MERIT REVIEW



Merit review is the keystone to identification of the most promising People, Ideas, and Tools and is critical to fostering the highest standards of excellence and accountability—standards for which NSF is globally recognized. We evaluate proposals for research and education projects using two criteria—the intellectual merit of the proposed activity and the broader impacts of the proposed activity.

Evaluations of proposals and funding decisions made through the process of merit review rely on evaluation by experts. Each year, more than 200,000 merit reviews are conducted to help program officers evaluate the proposals submitted for consideration.

The two merit review criteria are:

What is the intellectual merit of the proposed activity?
How important is the proposed activity to advancing knowledge and understanding within its own field or across different fields? How well qualified is the proposer (individual or team) to conduct the project? (If appropriate, the reviewer will comment on the quality of the prior work.) To what extent does the proposed activity suggest and explore creative and original concepts? How well conceived and organized is the proposed activity? Is there sufficient access to resources?

What are the broader impacts of the proposed activity?
How well does the activity advance discovery and understanding while promoting teaching, training, and learning? How well does the proposed activity broaden the participation of underrepresented groups (e.g., gender, ethnicity, disability, geographic, etc.)? To what extent will it enhance the infrastructure for research and education, such as facilities, instrumentation, networks, and partnerships? Will the results be disseminated broadly to enhance scientific and technological understanding? What may be the benefits of the proposed activity to society?

A merit-based review involves a scientist, engineer, or educator serving as an NSF Program Officer who reviews all proposals within his/her program, and includes review by three to ten other persons outside NSF who are experts in the particular fields represented by the proposal and are without conflicts of interest. Proposers are invited to suggest names of persons they believe are especially well qualified to review the proposal and/or persons who should not review the proposal. These suggestions may serve as an additional source in the reviewer selection process at the Program Officer's discretion. Program Officers may obtain comments from assembled review panels or from site visits before recommending final action on proposals. Senior NSF staff further review recommendations for awards and declines. When a decision has been made (whether an award or a declination), verbatim copies of reviews, excluding the names of the reviewers, and summaries of review panel deliberations, if any, are provided to the proposer.

Goal V-1 – Use of Merit Review
✓ Goal Achieved

Goal V-1: At least 85% of basic and applied research funds will be allocated to projects that undergo merit review.

The vast majority of proposals we receive undergo external merit review. The Foundation makes a few exceptions to this general requirement in situations where timeliness is crucial such as for studies of volcanic eruptions or earthquakes or where objective external reviewers may be difficult to find. It also considers exceptions when researchers propose such new ideas that knowledgeable external reviewers do not exist.

Data is collected using OMB's government-wide merit-review definition[22] that measures merit-reviewed scientific research as a percentage of basic and applied research[23]. This performance goal applies to federal science, space, and technology agencies. NSF has established the 85% target to be consistent with the OMB recommended range of 70% to 90%.

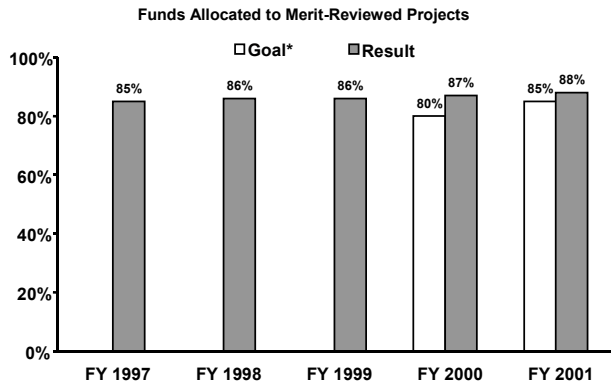
RESULTS: NSF is successful for this goal. In FY 2001 we revised our goal from having 80% of funds allocated to merit-reviewed projects to 85% of funds allocated to merit-reviewed projects. We exceeded that goal by 3%.

PERCENT OF FUNDS TO PROJECTS THAT UNDERGO MERIT REVIEW						
	FY 1997	**FY 1998**	**FY 1999**	**FY 2000**	**FY 2001**	**FY 2002**
Baseline	85%					
Goal			N/A	80%*	85%	85%
Result		86%	86%	87%	**✓88%**	

* The 80% estimated goal, recalculated from NSF's original goal of 90%, is based on the FY 2000 OMB definition of merit-reviewed scientific research.

[22] *"Merit-reviewed scientific research with competitive selection and external (peer) evaluation. Intramural and extramural research programs where funded activities are competitively awarded from a pool of qualified applicants following review by a set of external scientific or technical reviewers (often called peers) for merit. The review is conducted by appropriately qualified scientists, engineers, or other technically-qualified individuals who are apart from the people or groups making the award decisions, and serves to inform the program manager or other qualified individual who makes the award."*

[23] NSF's original definition included both merit-reviewed projects with competitive selection and external evaluation and projects with limited competitive selection as a percentage of all NSF funding. The revised OMB merit-review definition as of FY 2000 does not include funds for merit-reviewed scientific research with limited competitive selection (*e.g.*, applicants that are limited to organizations that were created to largely serve Federal missions, such as Federally-Funded Research and Development Centers [FFRDCs]). It also does not include merit-reviewed scientific research with competitive selection and internal evaluation (for example, reviews conducted from within the agency program, without additional independent evaluation, such as NSF's Small Grants for Exploratory Research [SGERs]). The revised definition measures merit-reviewed research as a percentage of basic and applied research funds rather than as a percentage of all NSF funding.



IMPLICATIONS FOR THE FY 2002 PERFORMANCE PLAN: An examination of our performance over the last four years shows that we have consistently exceeded our current goal of 85%. Furthermore, we are showing a small increase in the funds allocated to merit-reviewed proposals each year. We will continue to maintain the goal of at least 85% in FY 2002.

* Goal not established for FY 1997 – FY 1999.

Goal V-2 – Reviewer Use of Both Merit Review Criteria
🗝 Goal Not Achieved

Goal V-2: NSF performance in implementation of the merit review criteria is successful when reviewers address the elements of both generic review criteria.

On September 20, 1999, NSF issued Important Notice #125 to Presidents of Universities and Colleges, encouraging Principal Investigators to address the merit review criterion, "the broader impacts of the proposed activity", in their proposals and reviews. This criterion addresses the extent to which proposed activities will: advance discovery and understanding while promoting teaching, training, and learning; broaden participation of underrepresented groups; enhance the infrastructure for research and education; enhance scientific and technological understanding; and benefit society.

RESULTS: This goal was revised for FY 2001[24]. For FY 2001 external groups of experts reviewed 70 NSF programs with respect to this performance goal. In analyzing these reports we concluded we were unsuccessful in achieving this goal[25].

WHY WE DID NOT ACHIEVE THIS GOAL: The two merit review criteria were not implemented until FY 1998. The FY 2001 assessment includes proposals reviewed in FY 1998, FY 1999, and FY 2000, and is the first assessment to review the full implementation of the two criteria.

We believe that a critical factor in our failure to achieve this goal is the time required for our community to become aware of the importance that we assign to discussing both merit review criteria within proposals and within reviews. There are indications that discussion of both criteria by reviewers has increased since the criteria were implemented in FY 1998. During FY 2001 we examined a random sample of FY 2001 reviews to determine the extent of reviewer response to the broader impacts criterion. We found, overall, that approximately 69% of reviews provided evaluative comments on proposer attention to the broader impacts criterion. We expect, therefore, that full usage should become more apparent in the FY 2002 assessments.

STEPS WE WILL TAKE IN FY 2002 TO ACHIEVE THIS GOAL: In response to a directive by the Senate Appropriations Committee that NSF review the procedure and criteria for merit review once the new criteria had been in place for a year, we issued a contract to the National Academy of Public Administration (NAPA) to conduct a study of the impact of the new merit review criteria on the nature of the projects NSF supports. Their key finding was that it is too soon to make valid judgments about the impact and effectiveness of the new criteria. The NAPA report also highlighted the need to improve quantitative measures and performance indicators to track the objectives and implementation of the new criteria.

We are continuing to educate reviewers and proposers on the use of both merit review criteria. We have clarified the meaning of the broader impacts criterion and stressed the importance of

[24] In FY 1999 and FY 2000 the goal required that both reviewers *and* program officers use both criteria in order for NSF to be successful. In FY 2001 this goal was separated into two distinct goals.
[25] The auditing firm of PricewaterhouseCoopers LLP (PwC) reviewed the data collection, maintenance, processing, and reporting procedures used to calculate results for this goal. They concluded that the procedures related to this goal were sufficient and adequate and yielded valid results. We provide the Executive Summary of their entire report, as well as a table listing their conclusions as to whether the processes we used for selected goals were verifiable and the results valid, in Appendix IV.

using both criteria. We will also collect examples of broader impacts and develop a plan to disseminate them. We have modified program announcements to encourage proposers to provide information on all relevant aspects of the merit review criteria in their proposals.

We have added separate screens in FastLane to enable reviewers to address each merit-review criterion separately. Information for this goal will be collected from the FastLane database. In FY 2002, we expect most reviews to be submitted electronically via FastLane. Since there are separate sections for responses to each of the merit review criteria, we expect to see an increase in the response rate by reviewers to both criteria. This will also significantly increase the ease and reliability with which we will be able to track and count reviews that address both criteria. External expert judgment will also be used to enable assessment of our progress towards achieving this goal.

IMPLICATIONS FOR THE FY 2002 PERFORMANCE PLAN: This goal will be modified to reflect our expectation of increasing use of both criteria in FY 2002.

Goal V-3 – Program Officer Use of Merit Review Criteria
✓ Goal Achieved

Goal V-3: NSF performance in implementation of the merit review criteria is successful when Program Officers address the elements of both generic review criteria when making their award decisions.

After a proposal has been subjected to external peer review a NSF Program Officer makes a recommendation concerning support of the proposal. The matters to be discussed in this recommendation are described in our Proposal and Award Manual, Chapter VI, Section B-4. We state that "*Program Officers must comment on the intellectual merit of the proposed activity and the broader impacts of the proposed activity*."

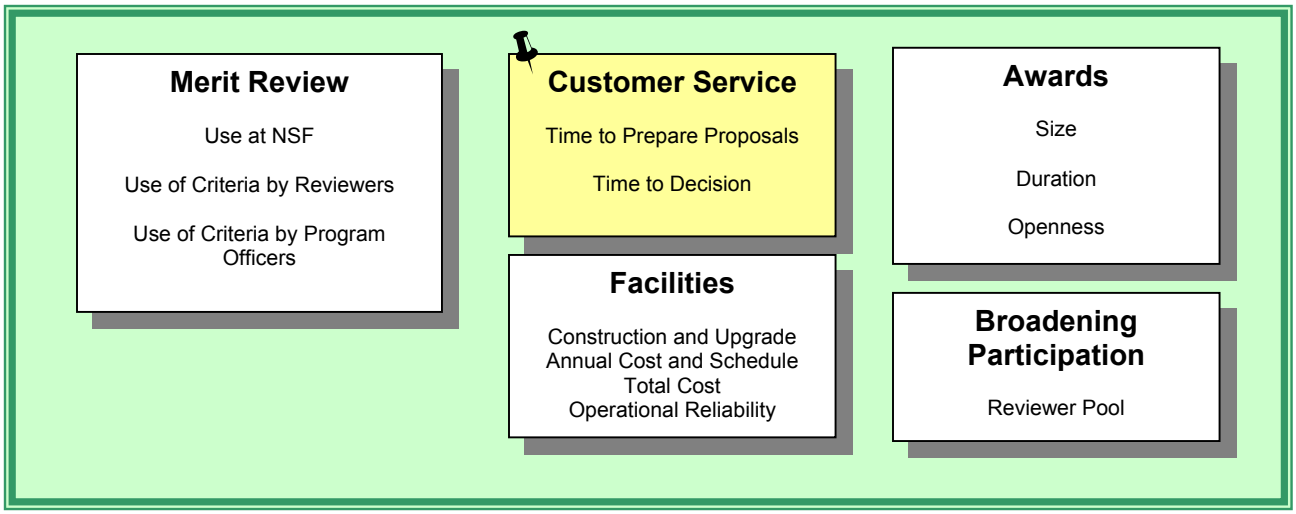
RESULTS: NSF is successful for this goal. This goal was revised for FY 2001[26]. For FY 2001 external groups of experts reviewed 70 NSF programs with respect to this performance goal. Program reports prepared by external experts during FY 2001 GPRA reporting indicated an assessment of successful for the Foundation in implementation of both merit review criteria by Program Officers.

IMPLICATIONS FOR THE FY 2002 PERFORMANCE PLAN: This goal will be continued for FY 2002, and we will take initial steps towards quantifying this goal.

[26] In FY 1999 and FY 2000 the goal required that both reviewers *and* program officers use both criteria in order for NSF to be successful. In FY 2001 this goal was separated into two distinct goals.

Investment Process Goals

B. Customer Service



Customer service has a potential impact on the number and quality of proposals received and thus on our ability to meet all Outcome goals. In 1995, we adopted a set of customer service standards, primarily related to the merit review process, treating grantees and potential grantees (*applicants*) as the primary *customers* for NSF's administrative processes. In a survey, applicants valued three standards most highly: (1) clear guidelines for proposal content and preparation, (2) a minimum of three months between release of program announcements and proposal deadlines, and (3) notification of proposal funding recommendation within six months of proposal submission.

For our FY 2001 Performance Plan, we focused on the latter two of these standards, ones to which our staff have devoted special attention since the standards were adopted. The first of these standards (provision of clear guidelines) is being addressed in internal processes.

Goal V-4: – Time to Prepare Proposals
✓ Goal Achieved

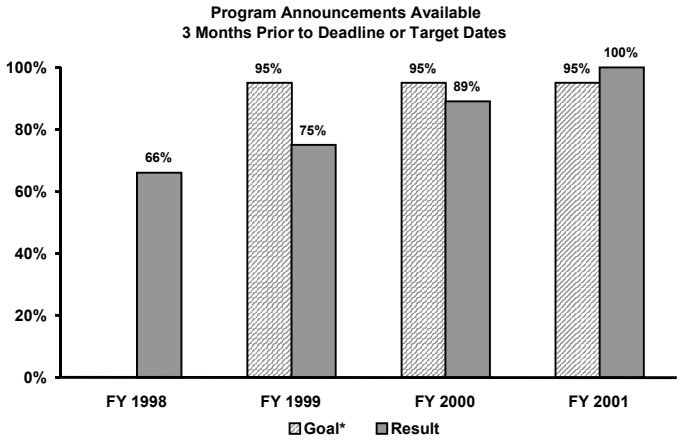
Goal V-4: Ninety-five percent of program announcements will be available to relevant individuals and organizations at least three months prior to the proposal deadline or target date.

We realize that researchers and educators require sufficient time to prepare submissions. To encourage new investigators and solicit quality proposals, and based on responses to customer surveys, program announcements and solicitations should be available a minimum of 90 days prior to the deadline for submission. We define this time as the time between the posting of the announcement on the web and the deadline for proposal submission given in the web posting. This goal is identical to the FY 1999 and FY 2000 goals.

RESULTS: NSF is successful for this goal. After two years of failing to achieve this goal, we exceeded our goal. All of our program announcements and solicitations were made available at least 90 days before the proposal deadline[27].

PERCENT OF PROGRAM ANNOUNCEMENTS AND SOLICITATIONS AVAILABLE AT LEAST 3 MONTHS PRIOR TO PROPOSAL DEADLINE OR TARGET DATES

	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002
Baseline	66%				
Goal		95%	95%	95%	95%
Actual		75%	89%	**✓100%**	



*No goal established for FY 1998

IMPLICATIONS FOR THE FY 2002 PERFORMANCE PLAN: This goal will be maintained in FY 2002.

We are also considering enhancement of one of our corporate systems in order to track data for this goal. The Foundation is developing a Program Information Management System (PIMS), which is a relational database designed to collect information and could be used to track the progress of publications such as program announcements and solicitations.

[27] A number of continuing programs have standing or previously established deadline dates. Some of these programs reissue announcements within 90 days of a proposal due date. As long as that deadline date was previously announced, thereby providing the community with at least 90 days to prepare a proposal, the announcement is considered to be in compliance with this GPRA goal.

Goal V-5 – Time to Decision
✕ Goal Not Achieved

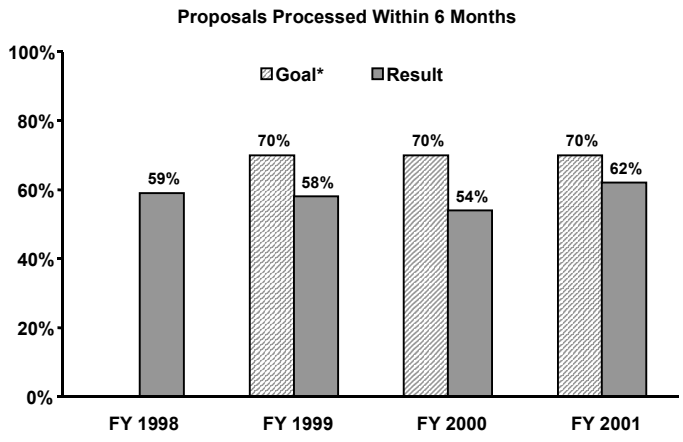
Goal V-5: For 70 percent of proposals, be able to tell applicants whether their proposals have been declined or recommended for funding within six months of receipt.

One of the most significant issues raised in customer satisfaction surveys is the amount of time it takes us to process proposals. We recognize the importance of this issue, and we are continually reviewing the steps needed to decrease proposal processing time.

RESULTS: We were not successful in achieving this goal. In FY 2001 we processed 62% of all proposals within six months of receipt, a significant improvement over FY 2000. Nevertheless, we fell short of the 70% goal.

PERCENT OF PROPOSALS PROCESSED WITHIN 6 MONTHS OF RECEIPT

	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002
Baseline	61%					
Goal			70%	70%	70%	70%
Actual		59%	58%	54%	✕**62%**[28]	



*No goal established for FY 1998

WHY WE DID NOT ACHIEVE THIS GOAL: One factor leading to delay in processing is that some programs prefer to conduct merit review by mail rather than by convening review panels. Mail reviews often take longer to complete. For example, in FY 2001, 70% of all proposals reviewed by panel-only were processed within six months, compared to 58% for mail-plus-panel review and 52% for mail-only review. Another factor is that some programs tend to hold a few highly rated proposals until the end of the fiscal year, or even into the next fiscal year, in anticipation that more funds might become available.

STEPS WE WILL TAKE IN FY 2002 TO ACHIEVE THIS GOAL: This represents the third consecutive year we have not achieved this goal. However, we are encouraged by the fact that

[28] The auditing firm of PricewaterhouseCoopers LLP (PwC) reviewed the data collection, maintenance, processing, and reporting procedures used to calculate results for this goal. They concluded that the procedures related to this goal were sufficient and adequate and yielded valid results. We provide the Executive Summary of their entire report, as well as a table listing their conclusions as to whether the processes we used for selected goals were verifiable and the results valid, in Appendix IV.

in FY 2001 we processed a greater percentage of our proposals within six months than in each of the preceding three years. Furthermore, a review of our FY 2001 data shows that 77% of our proposals were processed in less than seven months. Thus, an additional 15% of our proposals came within one month of being processed within our goal.

In FY 2002, we will continue to focus on improving the efficiency of proposal processing, including the dissemination of best practices to program staff. We have implemented a series of new electronic processes designed to improve the efficiency and effectiveness of the merit review process. New FastLane modules such as the Interactive Panel System and Electronic Declination, as well as the pilot project to provide proposals to reviewers electronically (with print-on-demand available), are reducing processing time and helping our staff to cope with increasing workloads.

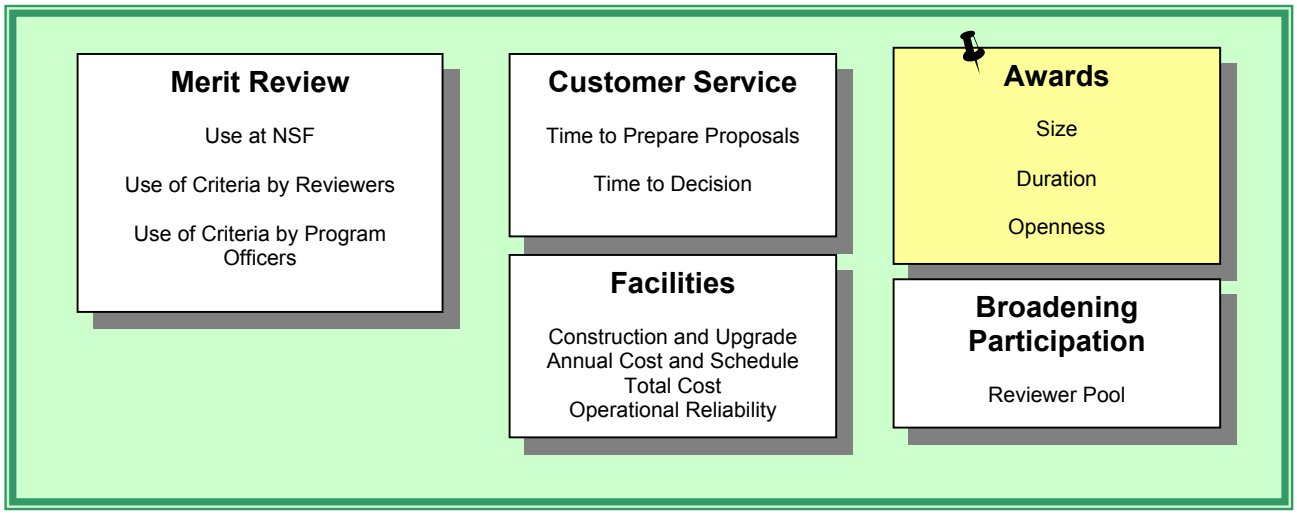
We have sponsored a series of brainstorming sessions for staff at all levels within the organization to discuss issues, concerns, and effective practices related to proposal processing time. The results of these sessions, including effective practices employed by organizations with excellent processing times, have been widely disseminated throughout NSF. The sessions also identified a number of key management issues related to processing time such as the need for timely processing of declinations and better tracking information on proposals in process. We have developed a report that tracks proposals through major processing stages and identifies those that are close to exceeding recommended timeframes for each stage. This report is produced centrally and periodically distributed to division directors throughout NSF.

In FY 2002 NSF staff will work towards shortening the award processing time by making more effective use of electronic mechanisms in conducting the review, working cooperatively to reduce overloads and bottlenecks, and by carefully tracking the stage of processing and receipt date of all proposals. Some internal organizations are considering eliminating the practice of holding over proposals for potential funding until the next fiscal year. Some have added “performance on prompt handling of proposals” to the performance evaluation criteria of their staff.

IMPLICATIONS FOR THE FY 2002 PERFORMANCE PLAN: This goal will be maintained in FY 2002. We believe the expanded use of key electronic processes and adoption of effective practices identified in the FY 2001 brainstorming sessions will lead to our meeting or exceeding the 70% goal.

INVESTMENT PROCESS GOALS

C. AWARDS



The size and duration of NSF awards impact research and education activities at many institutions. Increasing award size and duration will allow scientists and engineers to devote more time to productive research and education in comparison to the time spent preparing proposals. Adequate award size and duration are important both to obtaining high quality proposals and to ensuring that proposed work can be accomplished as planned.

In FY 2002, NSF will continue efforts to address Foundation-wide concerns about research and education grant size and duration – this priority is highlighted in NSF's Strategic Plan and is one of the new management reform activities for NSF highlighted by OMB.

Goal V-6a – Increased Average Annualized Award Size
✓ Goal Achieved

Goal V-6a: NSF will increase the average annualized award size for research projects to $110,000.

Increasing award size is a new goal[29]. We want to reach an average annualized award size of $150,000 by FY 2005.

Adequate award size is important both for attracting high-quality proposals and for ensuring that proposed work can be accomplished as planned. Larger awards increase the efficiency of the system by allowing scientists and engineers to devote a greater portion of their time to actual research rather than to proposal writing and other administrative work.

RESULTS: We were successful in achieving and exceeding this goal.

AVERAGE ANNUALIZED AWARD SIZE FOR RESEARCH PROJECTS					
	FY 1998	**FY 1999**	**FY 2000**	**FY 2001**	**FY 2002**
Baseline	$90,000				
Goal				$110,000	$113,000
Actual		$94,000	$105,800	✓**$113,601**[30]	

IMPLICATIONS FOR THE FY 2002 PERFORMANCE PLAN: Our new goal for FY 2002 is based on our performance in FY 2001. Our goal for FY 2002 will be an average annualized award size of $113,000.

[29] The award size and duration performance goals are applicable only to competitive research grants (a subset of awards that focuses on awards to individual investigators and small groups).

[30] The auditing firm of PricewaterhouseCoopers LLP (PwC) reviewed the data collection, maintenance, processing, and reporting procedures used to calculate results for this goal. They concluded that the procedures related to this goal were sufficient and adequate and yielded valid results. We provide the Executive Summary of their entire report, as well as a table listing their conclusions as to whether the processes we used for selected goals were verifiable and the results valid, in Appendix IV.

Goal V-6b – Increased Average Award Duration
✕ Goal Not Achieved

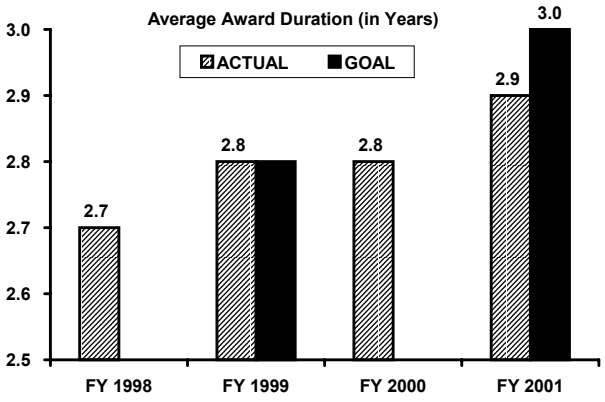
Goal V-6b: NSF will increase the average duration of awards for research projects to at least three years.

Our goal is to reach an average award duration of 4 years by FY 2005[31]. Increasing award duration was a new goal in FY 2001. The award duration goal built on a FY 1999 goal (the duration goal was dropped in FY 2000 and reinstated in FY 2001).

Longer award terms are important in increasing the effectiveness of Principal Investigators and graduate students. Less time is spent preparing proposals, and graduate students are able to have more time to do their thesis work.

RESULTS: We were not successful in achieving this goal.

AVERAGE AWARD DURATION FOR RESEARCH PROJECTS					
	FY 1998	**FY 1999**	**FY 2000**	**FY 2001**	**FY 2002**
Baseline	2.7 years				
Goal		2.8 years	N/A	3.0 years	3.0 years
Actual		2.8 years	2.8 years	**✕2.9 years**[32]	



WHY WE DID NOT ACHIEVE THIS GOAL: Sufficient resources were not available to achieve both the award size and award duration goals. NSF focused its efforts on increasing average annualized award size and reached its goal for FY 2001.

STEPS WE WILL TAKE IN FY 2002 TO ACHIEVE THIS GOAL: Progress on this goal is budget dependent. Program Directors must balance competing/multiple requirements: increasing award size, increasing duration of awards, or making fewer awards. We will continue to focus on increasing award size and duration in order to improve the efficiency of the research process.

[31] The award size and duration performance goals are applicable only to competitive research grants (a subset of awards that focuses on awards to individual investigators and small groups).
[32] The auditing firm of PricewaterhouseCoopers LLP (PwC) reviewed the data collection, maintenance, processing, and reporting procedures used in this goal. They concluded that the procedures related to this goal were sufficient and adequate and yielded valid results. We provide the Executive Summary of their entire report, as well as a table listing their conclusions as to whether the processes we used for selected goals we report were verifiable and the results valid, in Appendix IV.

We have contracted with Mathematica Policy Research, Inc. to assist in the development and administration of two surveys – one for Principal Investigators and one for institutions – on issues related to the appropriate size and duration of awards. The goal of the study is to understand how to improve the overall efficiency of the research process and to understand the impact of NSF research and education awards.

IMPLICATIONS FOR THE FY 2002 PERFORMANCE PLAN: We will maintain the FY 2001 goal of 3.0 years for the average duration of awards for research and education grants.

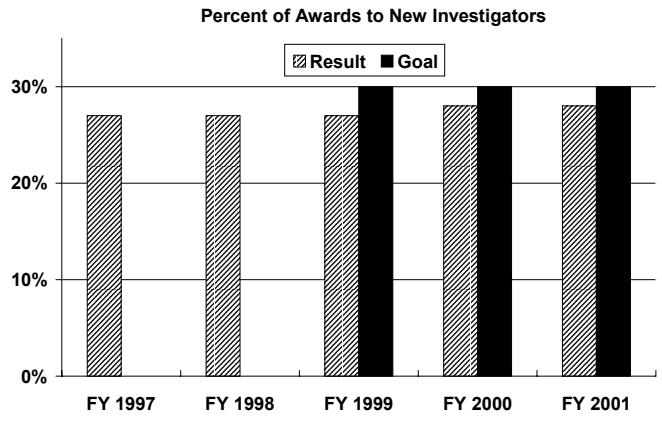
Goal V-7 – Maintaining Openness in the System
🗝 Goal Not Achieved

Goal V-7: NSF will award 30% of its research grants to new investigators.

We believe it is important that the proposal and award process be open to new people and new ideas to help ensure that NSF is supporting research and education at the frontier of science and engineering. We are committed to maintaining openness in the system and will strive to increase the percentage of awards to new investigators.

RESULTS: We were not successful in achieving this goal. The percentage of competitive research and education grants issued to new investigators was 28%, the same as in FY 2000, and one percent higher than in FY 1999.

PERCENTAGE OF COMPETITIVE RESEARCH GRANTS ISSUED TO NEW INVESTIGATORS					
	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001
Baseline	27%				
Goal			30%	30%	30%
Actual		27%	27%	28%	🗝28%



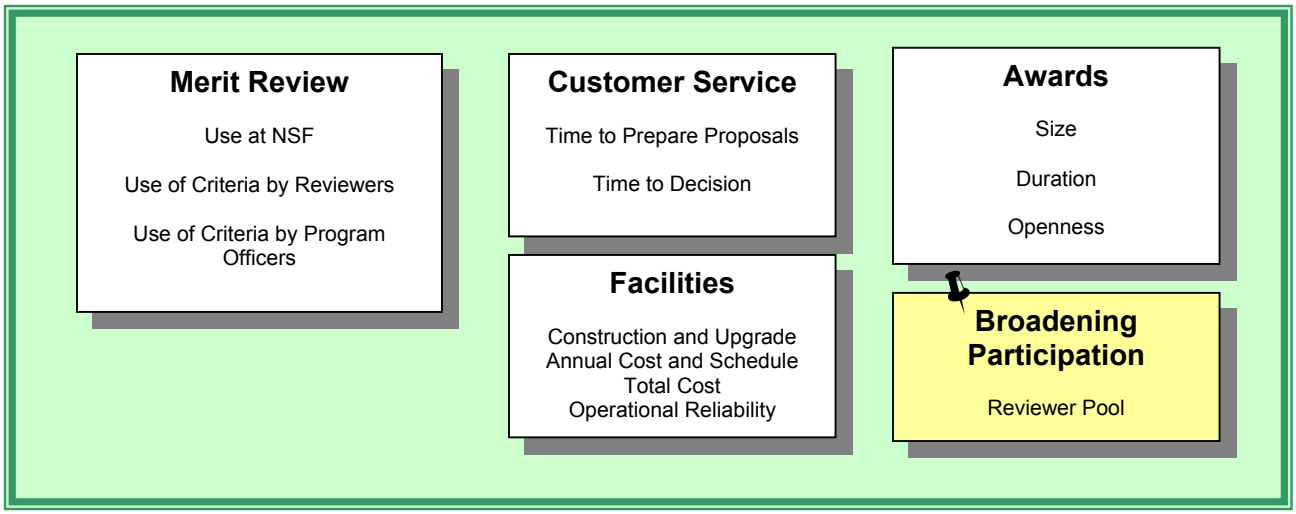
WHY WE DID NOT ACHIEVE THIS GOAL: This has been a difficult and challenging goal for NSF. In spite of our focused efforts, we have been unable to achieve this goal, although we have come close in the past few years. It is not clear why we have not attained the goal, as budgets, quality of proposals, experience of Principal Investigators, and other factors all come into the equation.

WHAT WE WILL CONTINUE TO DO IN FY 2002: We will continue to actively seek creative and innovative proposals from new investigators. We will continue our outreach efforts. Program staff will continue to attend scientific meetings, conferences, and conventions and will conduct site visits to promote awareness of the research opportunities at NSF and to encourage new investigators to submit proposals. We will examine trends, such as whether the pool of new investigators is smaller than in previous years or whether they are submitting fewer proposals.

IMPLICATIONS FOR THE FY 2002 PERFORMANCE PLAN: This openness goal is not included in the FY 2002 Performance Plan because we wish to fully consider whether this goal provides a good measure of openness in the system. Thus, we intend to examine a variety of interrelated parameters that affect it, and on that basis consider another.

INVESTMENT PROCESS GOALS

D. BROADENING PARTICIPATION



We are strongly committed to increasing the participation of science and engineering researchers, educators and students from groups currently underrepresented in the science and engineering enterprise in all NSF activities. Congress has enacted legislation giving NSF explicit responsibility for addressing issues of equal opportunity in science and engineering. This assignment of responsibility reflected the serious underrepresentation of women, minorities, and persons with disabilities in the science and engineering workforce, and, although progress has been made, underrepresentation persists.

Recognizing that progress toward all outcome goals for research and education requires maximum diversity of intellectual thought, NSF is focusing its attention on enhancing the participation of groups currently underrepresented in science and engineering in all its programs. In order to realize this increased participation, and so contribute to the development of a dynamic, diverse, human resource pool in science and engineering over the next decade NSF seeks to:

- Increase the participation of scientists and engineers from underrepresented groups in NSF's merit review process;
- Increase the participation of scientists and engineers from underrepresented groups in NSF's workshops and conferences;
- Increase the number of proposals submitted by and awards made to scientists and engineers from underrepresented groups; and
- Increase the number of scientists and engineers from underrepresented groups appointed by NSF to its staff.

At present we are focusing on the first and fourth of these efforts. NSF is committed to maintaining openness in the system and strives to increase the percentage of awards to new investigators.

Goal V-8 – Broadening Participation: Reviewer Pool Diversity
✓ Goal Achieved

Goal V-8: NSF will begin to request voluntary demographic data electronically from all reviewers to determine participation levels of members of underrepresented groups in the NSF reviewer pool.

NSF is strongly committed to increasing the participation of science and engineering researchers, educators and students from groups currently underrepresented in the science and engineering enterprise in all NSF activities. Congress has enacted legislation giving NSF explicit responsibility for addressing issues of equal opportunity in science and engineering.

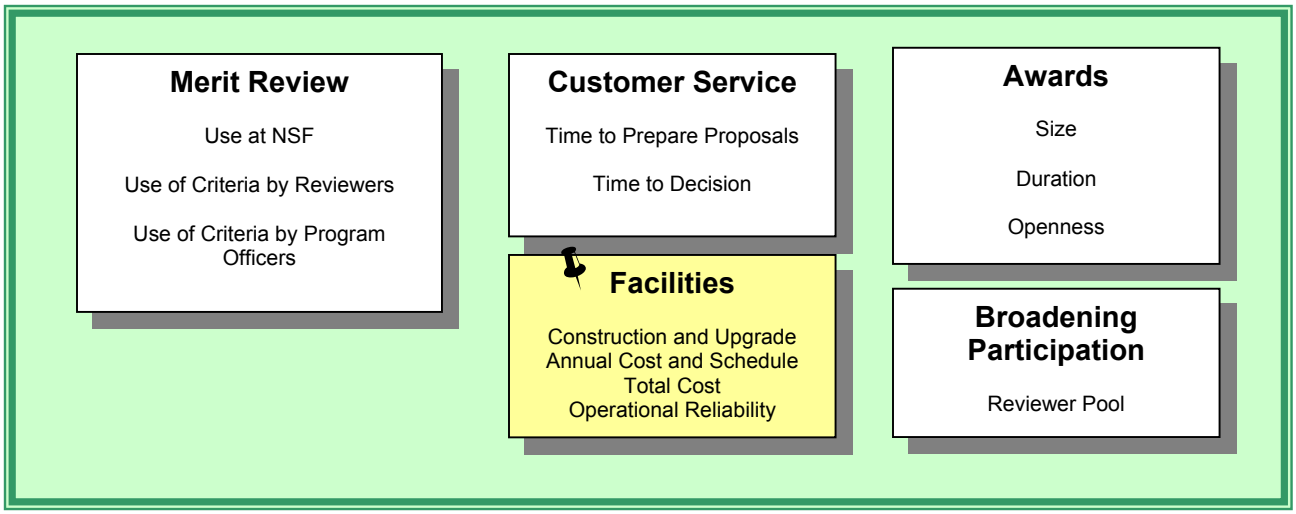
FY 2001 marks the first time we have focused attention on reviewer pool data. To establish the baseline, we have begun to gather the appropriate voluntary data from the reviewers. A baseline for FY 2002 will be derived from this data.

RESULTS: We were successful in achieving this goal. The reviewer system in FastLane was revised to gather voluntary demographic data.

IMPLICATIONS FOR THE FY 2002 PERFORMANCE PLAN: We will continue a related goal in FY 2002. Our FY 2002 goal is to establish a baseline for participation of members of underrepresented groups in NSF proposal review activities. We will seek voluntary demographic data from all reviewers electronically, and encourage increased participation of members of underrepresented groups in NSF conferences and workshops where they may come into contact with NSF program staff. We will continue to encourage members of underrepresented groups in science and engineering fields to participate in the NSF merit review system as reviewers and widely disseminate information about opportunities to participate in our merit review process as a reviewer or panel member.

INVESTMENT PROCESS GOALS

E. FACILITIES



NSF has responsibility for supporting the operation of multiple user facilities that provide state-of-the-art equipment with unique capabilities. In addition, we put a high premium on initial planning for construction and upgrade of facilities. Planning for unique, state-of-the-art facilities must take into account the exploratory nature of the facilities themselves as such facilities test the limits of technological capability.

Every year, in the President's Budget Request, we set out a cost plan and schedule for major construction and upgrade projects currently underway or planned for initiation in the Major Research Equipment and Facilities Construction account. Cost plans and schedules are also developed for other construction and upgrade projects funded through the Research and Related Activities Account. We have established performance goals and measurements with respect to these plans and expect each construction and upgrade activity to meet these performance goals. We consult with other agencies to avoid duplication and to optimize capabilities available to American researchers and educators, and cooperate with other agencies and international partners in construction of facilities where it will facilitate use across broad communities of researchers. We manage facilities in the Antarctic that are used by all federal agencies.

In FY 2001 24% of our budget was allocated to the support of "Tools." Within Tools, FY 2001 funding for the Major Research Equipment (MRE) account was approximately $119 million, an increase of $14 million over FY 2000.

Although we have done well in the past in keeping large projects on schedule and within budget, OMB asked us to develop a plan for costing, approval, and oversight of major facility projects. In response, we have completed a Large Facility Projects Management and Oversight Plan that was submitted to OMB in September 2001. This new facilities plan has four major foci:

- Enhance organizational and staff capabilities to improve coordination, collaboration, and shared learning among our staff and external partners;
- Implement comprehensive guidelines and procedures for all aspects of facilities planning, management, and oversight;
- Improve the process for reviewing and approving Large Facility Projects; and
- Practice coordinated and proactive oversight of all facility projects to ensure success.

Further development and implementation of the plan is continuing.

We have established a new position–Deputy, Large Facility Projects–to enable the efficient and effective evolution of our large facility projects from their pre-formulation through operations. This position will be filled in FY 2002.

In order to report on the government performance goals related to Facility Operations and Construction and Upgrades, we initiated, in FY 1999, development of a new Facilities Reporting System. This is linked to the Performance Reporting System, a module of the existing FastLane system. The module is used to collect information on operations and construction from Facilities Managers external to NSF. As is the case with any new data collection effort, we expect the quality of the information provided to improve as NSF's Program Officers and external facilities managers gain experience with gathering and reporting the required data.

In FY 2001 NSF engaged PricewaterhouseCoopers LLP (PwC) to review the process for collection and reporting of GPRA data for the facilities goals. PwC's recommendations, along with NSF's own review of the facilities goals and associated data collection methods, will be examined in FY 2002. Necessary changes will be identified and an implementation plan for the changes will be developed.

The facility goals that follow are organized in two categories – (1) *Construction and Upgrade of Facilities and (2) Operations and Management of Facilities*. Our goals are based on the general goals for facilities construction and operations outlined in the "General Science, Space and Technology" (Function 250) chapter of the President's FY 2001 Budget Request. These goals apply to the federal science, space and technology agencies (NSF, NASA, DoE).

Goal V-9a – Annual Construction and Upgrade Expenditures
✓ Goal Achieved

Goal V-9a: For 90 percent of facilities, keep construction and upgrades within annual expenditure plan, not to exceed 110 percent of estimates.

This FY 2001 goal was slightly revised from the FY 2000 goal. In FY 2000 one hundred percent of facilities were required to meet the goal for NSF to be considered successful. In FY 2001 the goal was revised so that we were considered successful if at least 90% of facilities kept construction and upgrade expenditures within 110% of their estimates. This change was made because while we place great importance on accurate planning for construction and upgrade of facilities we recognize that the unique, state-of-the-art projects being supported stretch the limits of technological capability. As a result there may be unforeseen expenditures. Nevertheless, we expect that the vast majority of our projects will be within budget. However, we do not believe the agency should be considered unsuccessful overall in this area if a small percentage of facilities are unable to meet the goal. Therefore, to assure that we have realistic and achievable goals, we reestablished the target level of success at 90% of the facilities for FY 2001. We will evaluate this goal over time to determine if 90% is the appropriate level.

RESULTS: We were successful in achieving this goal. Of the twenty-five construction and upgrade projects supported by NSF, twenty-four (96%) were within 110% of annual expenditure plans. The expenditures of nine projects were equal to the planned annual cost, twelve projects' expenditures were less than the estimated cost and three projects had annual costs greater than but within 110% of their estimate.

ANNUAL CONSTRUCTION AND UPGRADE EXPENDITURES				
	FY 1999	**FY 2000**	**FY 2001**	**FY 2002**
Goal	Keep within annual expenditure plan, not to exceed 110% of estimates.	Keep within annual expenditure plan, not to exceed 110% of estimates.	For 90% of facilities, keep within annual expenditure plan, not to exceed 110% of estimates.	For 90% of facilities, keep within annual expenditure plan, not to exceed 110% of estimates.
Actual	Majority of projects were within 110% of estimates.	11 of 11 (100%) projects were within 110% of estimates.	**✓24 of 25 (96%) projects were within 110% of estimates**[33].	

IMPLICATIONS FOR THE FY 2002 PERFORMANCE PLAN: This goal will be maintained in FY 2002. We have established a new position–Deputy, Large Facility Projects–to enable the efficient and effective evolution of our large facility projects from their pre-formulation through operations.

[33] In their report of January 2002, the auditing firm of PricewaterhouseCoopers LLP (PwC) stated: "For the four goals related to facilities management, we identified significant data limitations, which impaired our ability to verify the processes. However, we believe that NSF's reported outcomes are consistent with the data they collected." We are in the process of refining the data collection procedures for FY 2002.

Goal V-9b – Meeting Annual Schedule Milestones
✕ Goal Not Achieved

Goal V-9b: Ninety percent of facilities will meet all annual schedule milestones by the end of the reporting period.

The FY 2001 goal is slightly revised from the FY 2000 goal. In FY 2000, for NSF to be considered successful, one hundred percent of facilities were required to meet all annual schedule milestones within 110% of estimates. In FY 2001 we have modified this goal and consider successful achievement to be when at least 90% of facilities meet all major schedule milestones by the end of the reporting period. This change was made because while we place great importance on accurate planning for construction and upgrade of facilities we recognize that the unique, state-of-the-art projects being supported stretch the limits of technological capability and there may be unexpected construction delays. While we expect the vast majority of projects to be on schedule, we do not believe we should be considered unsuccessful overall in this area if a small percentage of facilities are unable to meet the goal. Therefore, to assure that we had realistic and achievable goals, we reestablished the target level of success at 90% of the facilities for FY 2001. We will evaluate this over time to determine if 90% is the appropriate level.

RESULTS: For FY 2001, of the 25 construction and upgrade projects we supported, 21 (84%) met all annual schedule milestones by the end of the reporting period.

ANNUAL SCHEDULE MILESTONES				
	FY 1999	**FY 2000**	**FY 2001**	**FY 2002**
Goal	Construction and upgrades within annual schedule, time required for major components within 110% of estimates.	Construction and upgrades within annual schedule, time required for major components within 110% of estimates.	90% of facilities will meet all major annual schedule milestones by the end of the reporting period.	90% of facilities will meet all major annual schedule milestones.
Actual	Majority of projects were within 110% of estimates.	7 of 11 (64%) projects were within 110% of estimates.	**✕21 of 25 (84%) projects met all major annual schedule milestones by the end of the reporting period[34].**	

WHY WE DID NOT ACHIEVE THIS GOAL: In some cases, projects were unable to meet all major annual schedule milestones within the reporting period due to circumstances beyond the control of the facility manager, such as an earthquake. Other examples of why some projects

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were not able to meet annual schedule milestones are underestimates of project complexity, technical problems and personnel vacancies.

STEPS WE WILL TAKE IN FY 2002 TO ACHIEVE THIS GOAL: We will continue to work with our awardees to identify obstacles to successful performance and together implement plans to avoid these same obstacles or to mitigate their consequences in the future.

IMPLICATIONS FOR THE FY 2002 PERFORMANCE PLAN: The FY 2002 goal will be revised because of our experiences during FY 2001. We found that the definition of “reporting period” was somewhat ambiguous. As a result, the goal for FY 2002 has been changed to “Ninety percent of construction/upgrade projects will meet all major annual schedule milestones.” Relevant definitions of terms used in reporting will be clarified.

Goal V-9c – Total Cost
✓ Goal Achieved

Goal V-9c: For all construction and upgrade projects initiated after 1996, when current planning processes were put in place, keep total cost within 110 percent of estimates made at the initiation of construction.

We recognize that construction and upgrade projects may experience both cost and schedule overruns. Our goal, since FY 1999, is that all projects/upgrades will keep within 110% of their initial estimated total costs.

RESULTS: We were successful in achieving this goal. One project was completed in FY 2001. The total cost of the project was equal to the estimated total cost. This goal was not applicable in FY 1999 and FY 2000 since no projects were completed.

CONSTRUCTION AND UPGRADE TOTAL COST				
	FY 1999	**FY 2000**	**FY 2001**	**FY 2002**
Goal	For all construction and upgrade projects initiated after 1996, keep total cost within 110% of estimates made at the initiation of construction.	For all construction and upgrade projects initiated after 1996, keep total cost within 110% of estimates made at the initiation of construction.	For all construction and upgrade projects initiated after 1996, keep total cost within 110% of estimates made at the initiation of construction.	For all construction and upgrade projects initiated after 1996, keep total cost within 110% of estimates made at the initiation of construction.
Actual	No projects completed.	No projects completed.	**✓ One project was completed. The actual total cost was equal to the estimated total cost[35].**	

IMPLICATIONS FOR THE FY 2002 PERFORMANCE PLAN: This goal will be maintained in FY 2002. We have established a new position – Deputy, Large Facility Projects – to enable the efficient and effective evolution of our large facility projects from their pre-formulation through operations.

[35] In their report of January 2002, the auditing firm of PricewaterhouseCoopers LLP (PwC) stated: "For the four goals related to facilities management, we identified significant data limitations, which impaired our ability to verify the processes. However, we believe that NSF's reported outcomes are consistent with the data they collected." We are in the process of refining the data collection procedures for FY 2002.

Goal V-10 – Operating Time
✕ Goal Not Achieved

Performance Goal V-10: For 90 percent of facilities, keep operating time lost due to unscheduled downtime to less than 10 percent of the total scheduled operating time.

Our FY 2001 goals are based on government-wide goals established by OMB for science and technology agencies (NSF, NASA and the Department of Energy) that support construction projects and have responsibility for managing facilities.

The "operating time" goal has been revised from 100% of facilities to 90% because we recognize that while some facilities may occasionally have a failure rate greater than 10%, this is balanced overall by facilities that operate more reliably. We expect that the vast majority of facilities will keep operating time lost due to unscheduled downtime to less than 10% of the total operating time. We do not believe the agency should be considered unsuccessful if a small percentage of the facilities are, at times, unable to meet this goal. Therefore, to provide the flexibility necessary for NSF to report realistic goals, we reestablished the level deemed "successful" at 90% of the facilities. This change will be evaluated over time to determine if 90% is the appropriate level for this goal.

RESULTS: We were not successful in achieving this goal. Of the 29 reporting facilities, 25 (86%) met the goal of keeping unscheduled downtime to below 10% of the total scheduled operating time. Four reported unscheduled downtime greater than 10%.

OPERATING TIME				
	FY 1999	**FY 2000**	**FY 2001**	**FY 2002**
Goal	Keep operating time lost due to unscheduled downtime to less than 10% of the total scheduled operating time.	Keep operating time lost due to unscheduled downtime to less than 10% of the total scheduled operating time.	For 90% of facilities, keep operating time lost due to unscheduled downtime to less than 10% of the total scheduled operating time.	For 90% of facilities, keep operating time lost due to unscheduled downtime to less than 10% of the total scheduled operating time.
Actual	Majority of facilities successful.	22 of 26 (85%) reporting facilities met goal.	**✕25 of 29 (86%) reporting facilities met goal**[36]**.**	

WHY WE DID NOT ACHIEVE THIS GOAL: Some causes of unscheduled downtime in excess of 10% of total scheduled operating time were outside the control of the facility manager, such as electric power supply interruption and equipment failure. Other causes ranged from sub-par

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performance of new instruments early in their commissioning to unanticipated failure and downtime for repair.

STEPS WE WILL TAKE IN FY 2002 TO ACHIEVE THIS GOAL: NSF program staff will continue to work with project managers to identify obstacles to successful performance and to ensure that progress will be made toward the achievement of this goal in FY 2002.

IMPLICATIONS FOR THE FY 2002 PERFORMANCE PLAN: This goal will be maintained in FY 2002. We have established a new position – Deputy, Large Facility Projects – to enable the efficient and effective evolution of our large facility projects from their pre-formulation through operations.