

## **VII. ASSESSMENT AND EVALUATION PROCESS**

We employ a mix of both qualitative and quantitative goals, and make use of both qualitative information and quantitative data in determining annual progress towards achieving goals. Our outcome goals are generally expressed in a qualitative form, and most management goals and investment process goals are quantitative.

### **MANAGEMENT AND INVESTMENT PROCESS GOALS**

We make use of internal data systems to monitor and report progress in achieving the quantitative management goals and investment process goals. For these goals, performance results are assessed and reviewed by our administrative staff and managers, with selected goals audited by external third parties. The two qualitative investment process goals (Goals V-2 and V-3) are addressed by external experts who participate in COV and AC reviews. Selected results are verified and validated by a third party.

The assessment process for the quantitative goals is straightforward. We collect relevant data using internal corporate data systems and compare the result with the performance level targeted for the fiscal year. Progress towards achievement of most quantitative goals is reviewed by senior management on a quarterly basis. In FY 2000, an agency-wide GPRA module that collects data relevant to the quantitative goals was created to allow staff to track progress throughout the year.

### **OUTCOME GOALS**

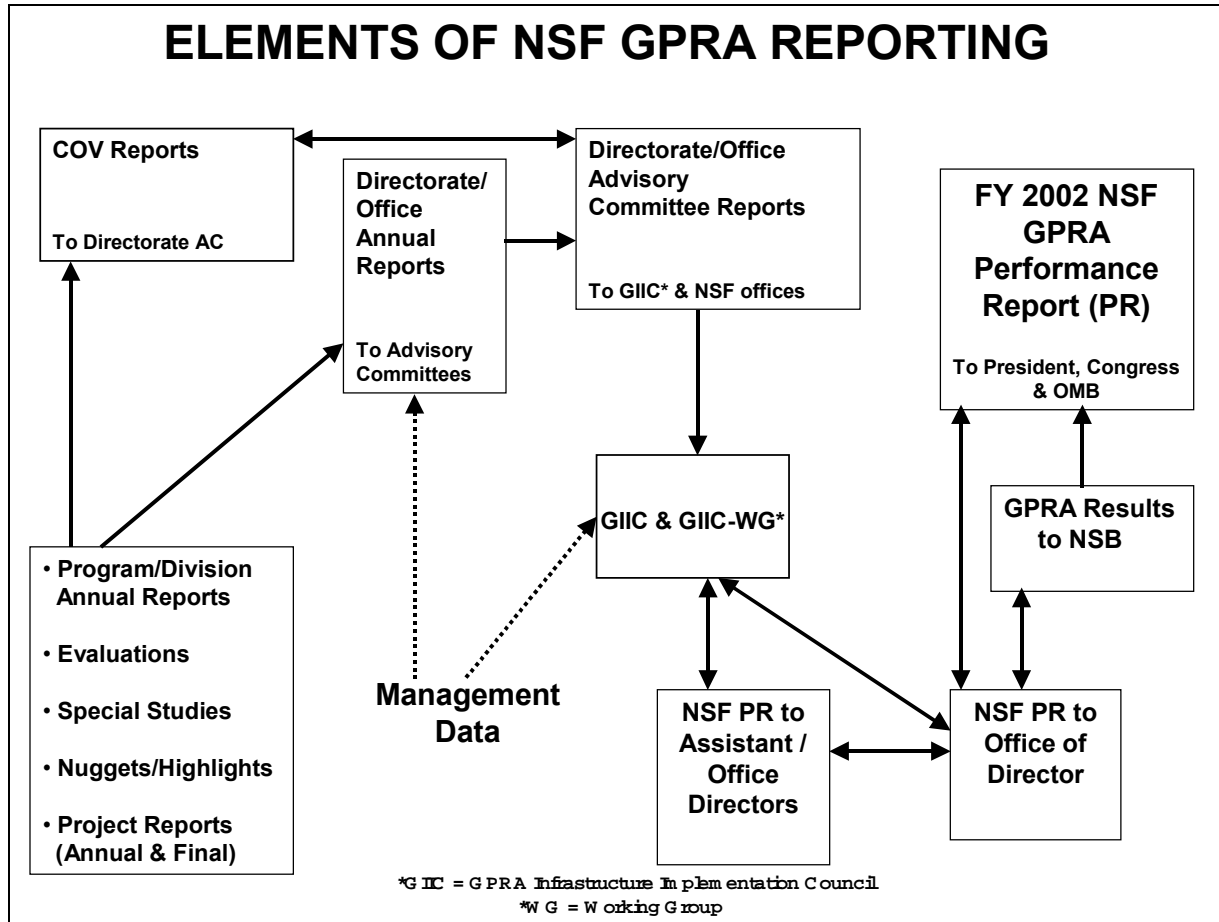
We have traditionally made use of various types of assessments and evaluations to monitor non-quantitative research and education outcomes, the quality of our investments, and the processes we use. Formalized examination takes place during merit review of proposals, COV and AC assessments, and GPRA reporting. Additionally, programs and plans are assessed and evaluated throughout the year on a continuing basis by NSF staff. Elements of GPRA reporting are highlighted in the figure below.

#### **Project Assessment During NSF Merit Review**

Applicants and grantees provide results from previous NSF support, information about existing facilities and equipment available to conduct the proposed activity, biographical information on the Principal Investigators, other sources of support, federally required certifications and certifications specific to NSF. Such information is required at the time of application, at the time of an award, and in annual and final project reports. It is reviewed by NSF staff, is utilized during merit review, and is available to external committees (COVs and ACs) conducting performance assessment. The merit review process provides a rigorous, first phase of assessment of NSF's research and education portfolio. Thus, at the onset, this process selects for support only the most competitive one-third of proposals submitted for consideration.

Program Officers review the annual progress of awards. The progress report includes information on significant accomplishments, progress achieved in the prior year, plans for the next year, and points out issues that may impact progress or completion of the project on schedule and within budget. On approval of this report by the Program Officer, NSF releases funds for the ensuing year.

All materials associated with the review of a proposal as well as subsequent annual reports are available to Committees of Visitors. Our staff also prepare materials (reports, evaluations, highlights) for use by COVs and ACs in developing their reports and making their assessments.



### Program Assessment by Committees of Visitors (COVs)

NSF's Committees of Visitors provide program assessments that are used both in program management and in our annual GPRA reporting. Included are assessments for outcome goals and for the two qualitative investment process goals dealing with the implementation of the merit review criteria. In the past, COVs have traditionally assessed the integrity and efficiency of the processes for proposal review. With the full implementation of GPRA in FY 1999, we added a retrospective GPRA assessment component (both outputs and outcomes) to their responsibilities.

Each COV typically consists of five to twenty external experts who review one or more programs over a two or three day period. These experts are selected to ensure independence, programmatic coverage, and balanced representation. They typically represent academia, industry, government, and the public sector.

## VII. – Assessment and Evaluation Process

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Each year, COVs assess approximately one-third of our programs, and review their performance over the previous three years. In FY 2001, about 32% of NSF's portfolio of 220 programs was evaluated by COVs for quality of process and progress made in achieving NSF's FY 2001 goals. In FY 2000, about 37% of NSF's portfolio was evaluated by COVs. The remaining portion of NSF's portfolio will be evaluated by COVs in FY 2002 to complete the full three-year cycle of assessment of NSF programs.

In FY 2001, approximately 250 COV members participated in program review and performance assessment. The 19 COV reports generated covered 70 of our approximately 220 programs (see Appendix II for a schedule of program evaluations). Typically, there are fewer COV reports than programs because some reports evaluate multiple programs.

All COVs are asked to complete a report template with questions addressing how programs contribute to NSF's goals. Committees of Visitors are asked to address (A) the integrity and efficiency of the *processes* involved in proposal review; and (B) the results, including quality and other factors, of NSF's investments. In determining whether there has been significant achievement with respect to the prescribed performance indicators, COV members use their collective experienced-based norms.

The FY 2001 COVs were asked to judge whether our programs were successful or not in achieving Outcome Goals III-1a, III-2, and III-3, and in implementing the merit review criteria (Investment Process Goals V-2 and V-3). COVs are asked to justify their judgements and provide supporting examples or statements illustrating success and progress toward GPRA goals.

COVs are generally subcommittees of NSF Directorate Advisory Committees. As such, their reports, along with responses from the responsible Directorate addressing recommendations made by the COVs, are submitted to the parent Advisory Committee. The reports are also reviewed by NSF staff.

### **Advisory Committee (AC) Reporting on Directorate/Office Performance**

Advisory Committees advise the seven directorates and the Office of Polar Programs. They are typically composed of 18-25 external experts who have broad experience in academia, industry, and government. Advisory Committees are chartered and hence are subject to Federal Advisory Committee Act (FACA) rules. The role of the ACs is to provide advice on priorities, address program effectiveness, review COV reports and directorate responses to COV recommendations, and assess directorate progress in achieving NSF-wide GPRA goals.

The ACs have full access to all available data sources to carry out their assessments. Their review and assessment process culminates with an AC report that incorporates the results of all external COV and directorate reporting and highlights the annual progress of the directorate toward achieving NSF's qualitative goals.

At the close of the fiscal year, each directorate submits all GPRA-related materials (COV and AC reports, directorate annual reports, and responses to recommendations made by COVs) to agency senior management, including the Office of the Director. Simultaneously, quantitative data relevant to the management goals and investment process goals are finalized by our staff and submitted to senior management, including the Office of the Director.

### Agency GPRA Reporting

The COV and AC reports prepared by external experts address a broad set of issues ranging from staffing and quality of merit review to specifics of a scientific project. The GPRA components of these reports are used in assessing NSF's progress toward achieving its People, Ideas, and Tools outcome goals (Goals III-1a, III-2 and III-3.) These reports also contain discussions of investment process goals related to use of merit review criteria by reviewers (Goal V-2) and Program Officers (Goal V-3). Both are stated in the alternative form. Two quantitative goals (Goals III-1b and III-1c) associated with the People outcome goal are evaluated using relevant quantitative data.

The criterion for success for each of the People, Ideas, and Tools outcome goals can be stated:

*“NSF is successful when, in the aggregate, results reported in the period demonstrate significant achievement in one of more of the [associated indicators].”*

This criterion is utilized for judgements about both program and agency success for GPRA P-I-T outcome goals. For program assessment, only relevant goals and indicators are used. For agency assessment, all goals and indicators are relevant and all are used in determining agency success. The agency decision for NSF is based on analysis of the successful/not successful judgements contained within the AC and COV reports. Each successful rating requires supporting evidence or retrospective examples supporting such a judgement.

NSF staff examine individual ratings (Successful or Not Successful) included in COV and AC reports to ensure that ratings for the qualitative outcome goals and indicators are justified. Each rating assigned by the committees is evaluated by NSF staff utilizing well-defined, internally developed criteria. In order to verify and validate staff judgements regarding AC or COV ratings, an external firm, PricewaterhouseCoopers LLP (PwC), was engaged to review the COV and AC reports using the same criteria as NSF staff. PwC was asked to independently assess ratings and justifications contained within the COV and AC reports. NSF staff and PwC then met to compare and reconcile their conclusions. In almost all cases there was consensus. The differences were minor and had no impact on the final results.

Principal factors contributing to NSF's decision that the agency is successful for our outcome goals related to People, Ideas, and Tools include:

- the consistently high ratings for each of the eight directorates and offices, as contained in Advisory Committee reports – the external experts on the eight advisory committees judged all relevant outcome goals and indicators as successful.
- the lack of significant numbers of “not successful” assessments (in both COV and AC reports).
- the extensive number and quality of retrospective examples demonstrating significant achievement for the 11 indicators associated with the three outcome goals.

For agency GPRA reporting, we generally placed more emphasis on results contained in the AC reports because these reports are more complete and comprehensive compared to the COV reports, which cover only a third of our programs. The AC reports took into account all of the material provided by the COVs and Directorates/Office staff