

Roles and Responsibilities of NSF Staff Involved in the Management and Oversight of Large Facilities



March 31, 2011

Overview

The Large Facilities Manual (LFM) describes the actions NSF takes to carry out its oversight and stewardship of a large facility project. This document defines the roles and responsibilities of the NSF participants who carry out those actions. The main participants are:

- **Program Officer (PO)** – a scientist or engineer having primary oversight responsibility within NSF for all aspects of the project.¹
- **Senior Management of the originating Division, Directorate, or Office** - utilizes community inputs, discipline-specific studies, advisory committee recommendations and internal NSF considerations to prioritize the opportunities represented by the candidate project relative to competing opportunities and demands for NSF resources.
- **Grants Officer (GO)** – NSF administrative staff from the Divisions of Grants and Agreements (DGA) or the Division of Cooperative Agreements and Contract Support (DACS), located within the Office of Budget, Finance, and Award Management (BFA)
- **Deputy Director for Large Facility Projects (DDLFP)** - NSF's DDLFP and supporting staff (the Large Facilities Office, or "LFO") are the NSF's primary resource for all policy or process issues related to the development, implementation, and oversight of MREFC projects, and are NSF-wide resource on project management. The DDLFP and staff² are administratively located in BFA

Within NSF, various bodies provide advice to the main participants:

- **Project Advisory Team (PAT)** - assists the PO in the planning, review and management of the MREFC project.
- **Business Oversight Team (BOT)** – a subset of the PAT that provide guidance to the PO and GO on business and administrative issues
- **Facilities Panel** - reviews and provides feedback to the PO on the NSF internal management plan (a document that describes NSF plans for conducting oversight, managing risk, and budgeting for the proposed project.
- **Advisory Committee of the originating Directorate or Office** – Comprised of researchers from outside NSF, it advises the originating Directorate or Office in a wide variety of programmatic areas, including large facilities.

There are also governing bodies that set NSF policy and allocate resources for the development, funding, and operation of large facility projects:

¹ The PO may have a title such as Program Manager or Program Director. The PO is administratively part of a Directorate or Office, comprised of Divisions, which serves a range of research disciplines. These are referred to as the "originating Division, Directorate or Office" in this document.

² The DDLFP and staff of the Large Facilities Office are collectively referred to as "LFO" in this document. References to the DDLFP describe specific responsibilities of that individual.

- **MREFC Panel** – Comprised of Senior Management representative from the Directorates and Offices of NSF, it provides governance of the overall MREFC process and reviews specific cases as presented by the Originating Organization(s).
- **Director’s Review Board** - reviews and approves the documentation associated with all projects proposed to the NSB for funding, including MREFC projects.
- **NSF Director** - has ultimate responsibility for the obligation of funds from the MREFC Account and for proposing new MREFC projects to the NSB, OMB and Congress.
- **National Science Board** - establishes policy, reviews and approves MREFC Account budgets, and reviews and approves specific MREFC projects for funding.

The PO, GO, and LFO are the individuals that interact most frequently to carry out NSF’s oversight of a large facility project. Their roles and responsibilities are summarized, by life-cycle stage, in Table 1. Fuller descriptions of their roles, and those of senior management in the originating Directorate or Office, and the Advisory and Governing Bodies, are provided in individual sections of this document that follow Table 1.

Table 1 - Summary of Principal Roles and Responsibilities of PO, GO and DDLFP by facility life cycle stage.

Program Officer (PO)	Grants Officer (GO)	LFO
Summary		
<ul style="list-style-type: none"> • Primary responsibility for all aspects of management and oversight of a MREFC project. • Experienced or trained in management of large projects. • Appointed by the Division Director (DD). • Must not be a temporary employee of the NSF. 	<ul style="list-style-type: none"> • Primary representative of the NSF in all business dealings with the Awardee. • Assigned to a project on a long term basis. • Familiar with unique requirements needed for adequate NSF oversight of large facility projects. 	<ul style="list-style-type: none"> • NSF’s primary resource for all policy or process issues related to the development, implementation, and oversight of MREFC projects. • Advises POs on project management issues during project development and oversight. • Responsible for updating all policies and procedures for MREFC projects as reflected in the Large Facilities Manual (LFM)
Conceptual design stage		
<ul style="list-style-type: none"> • Determines the importance and research priority to the affected research community of the science objectives motivating consideration of a future large facility. • Works with the research community to develop an overall scope for a large facility project. • Develops an Internal Management Plan • Organizes a PAT 	<ul style="list-style-type: none"> • Becomes acquainted with the anticipated scope of the proposed project. • Participates in planning meetings to work out details of partnerships, international or multi-agency agreements, property issues, etc. • Participates in the development of the IMP 	<ul style="list-style-type: none"> • Advises PO. • DDLFP chairs Facilities Panel. • In collaboration with PO, plans Conceptual Design Review (CDR); and independently assesses outcome and report this to NSF CFO.

Program Officer (PO)	Grants Officer (GO)	LFO
<ul style="list-style-type: none"> Formulates a plan for eventual termination or transfer of the facility Devises and carries out a renewal or termination strategy that implements re-competition of the operating award wherever feasible. 		
Preliminary Design Stage		
<ul style="list-style-type: none"> Works with the research community to develop a proposal that includes a preliminary Project Execution Plan (PEP) Arranges external peer review of the proposal. Presents the proposed project to the MREFC Panel Updates the IMP. Continues to meet with the PAT. Reports monthly to DDLFP on project's technical and financial status 	<ul style="list-style-type: none"> Creates solicitations for enabling research, workshops, summer studies, and other activities of the research community that will result in a proposal. (shared responsibility with PO) Participates in the business aspects of the proposal review and in surveillance or mentoring of the proposing institutions. Participates in preparation of the MREFC, DRB 	<ul style="list-style-type: none"> Advises PO. In collaboration with PO, plans PDR and independently assesses outcome. Chairs Facilities Panel. Receives monthly reports on project development from PO, and provides independent assessment to NSF OD. Determines that project plans are "construction ready" and construction and operations budgets are justified.
Final Design Stage		
<ul style="list-style-type: none"> Continues to monitor project in accordance with the IMP Provides monthly project status updates to the DDLFP Organizes periodic cost update reviews. Organizes the Final Design Review 	<ul style="list-style-type: none"> Instigates as required review or mentoring necessary to ensure that the Awardee. Participates in periodic cost update reviews. Reviews materials to be submitted to MREFC Panel. 	<ul style="list-style-type: none"> Continues to monitor project. Receives monthly project status updates from the PO, adds comments and evaluation and forwards them to the CFO and NSF Director. Aids the PO with the organization of the periodic cost update reviews in interval between PDR and FDR. In collaboration with PO, plans FDR and independently assesses outcome
Construction/Implementation		
<ul style="list-style-type: none"> Develops a Cooperative Agreement Approves the establishment of a project baseline scope, cost, and schedule and other updates to the PEP Approves significant changes to the project baseline. Receives monthly financial and technical status reports, quarterly and annual progress reports. Reports monthly to DDLFP on project's technical and financial 	<ul style="list-style-type: none"> Approves submittals from Awardee Reviews the scope of activities associated with each award to ensure that the financial and administrative framework aligns with NSF's expectations for stewardship and reporting. Receives and provides approval to the Awardee Participates in baseline review and subsequent periodic reviews as necessary to assure 	<ul style="list-style-type: none"> Advises PO. In collaboration with PO, plans construction reviews and independently assesses outcome Receives monthly project status reports from the PO. Visits the project site periodically in coordination with PO.

Program Officer (PO)	Grants Officer (GO)	LFO
<p>status</p> <ul style="list-style-type: none"> • Conducts periodic reviews of project progress using an external ad hoc panel. • Arranges internal review of Memorandums of Understanding (MOUs) • Regularly visits the project. • Continues to meet with the PAT. • Updates the IMP. • Ensures compliance with Government Performance and Results Act (GPRA) 	<p>the NSF that the Awardee</p> <ul style="list-style-type: none"> • Works with the BOT to expedite financial and administrative actions and decisions concerning the project. 	
Operations Stage		
<ul style="list-style-type: none"> • Prepares and participates in solicitation of award for Operations and Maintenance (O&M) CA • Ensures compliance with GPRA • Approves the Annual Work Plan (which includes high level performance goals) developed by the awardee. • Reviews and approves the Annual Report • Develops budgets that operate and maintain facilities. • Obtains Condition Assessment reports. • Monitors planning for information technology (IT) and property security, and validates through periodic review. • Organizes and participates in periodic reviews of the facility including annual operations reviews. • Formulates a plan for eventual termination or transfer of the facility. • Devises and carries out a renewal or termination strategy that implements re-competition of the operating award wherever feasible. 	<ul style="list-style-type: none"> • Prepares solicitation for O&M award. (Shared responsibility with PO). • Creates special terms and conditions in the CA to capture requirements for annual performance goals (shared responsibility with the PO) • Defines business practices for renewal, recompetition, or termination of Award. • Attends periodic reviews including operations and business system reviews as appropriate. • Helps to develop financial strategy, as appropriate, to budget for facility maintenance and replacement or refurbishment of long-lived capital assets.(shared responsibility with PO) 	<ul style="list-style-type: none"> • Advises PO and GO on effective operational oversight strategies, renewal and recompetition strategies, and termination. • Periodically visits operating facilities in coordination with PO. • In collaboration with PO and GO, insures implementation of performance measures within cooperative agreement for operation. • Assists with organizing and evaluating the results of operational reviews of large facilities. • Plans and executes BSRs • Advises PO and GO on project management issues related to recompetition of award for facility operation.

1. Main Participants

1.1. Program Officer (PO)

The Program Officer (PO) is the research community's primary interface to the NSF. The PO's responsibilities are substantial, and crucial to NSF's success. Examples of these responsibilities are listed below³:

- They are typically the main contact a principal investigator (PI) has with NSF.
- They are the link between what is happening in the research community and the appropriately responsive program solicitation from NSF.
- They are the catalysts for the increasing amount of research that crosses traditional single-discipline boundaries.
- They are the coaches and encouragers for proposals from less experienced researchers – particularly ones with innovative ideas – as well as those from underrepresented segments of the research community.
- They are the recruiters and managers of a peer review process that involves numerous experts from the research community to assess the intellectual merit and broader impacts of proposals from the community for new research
- They are the post-award managers and monitors for awarded research.

NSF's Authorization Act of 2002, 42 U.S.C.1862n-4(c), signed into law on December 19, 2002, restricts the choice of POs (also referred to within the NSF as Program Directors or Program Managers) to be regular employees of the NSF. The statutory language of the Act states:

“PROJECT MANAGEMENT. - No national research facility project funded under the major research equipment and facilities construction account shall be managed by an individual whose appointment to NSF is temporary.”

Administratively, the PO is part of a Directorate or Office that provides supervisory oversight and the budgetary authority to fund PO actions. Depending on the administrative structure of the originating or originating Directorate or Office, a Section Head, Division Director, Assistant Director, or Office Head may assign the PO to oversee a particular facility-related initiative and will directly or indirectly oversee and guide the activities of the PO. Actions of the PO described here implicitly recognize the authority of the individuals within this supervisory structure to appropriately guide, direct, and approve the actions of the PO.

The PO exercises primary responsibility within NSF for all aspects of a large facility project, including:

- Project planning, both internally and in coordination with the relevant research community;

³ Paraphrased from National Science Foundation: *Governance and Management for the Future*, a report by a panel of the National Academy of Public Administration, April 2004. pp 10-11.

- Serving as the NSF interface with the research community to nurture concepts for development and utilization by the community of a facility;
- Formulating an Internal Management Plan (IMP) that defines NSF strategy for conducting project oversight, managing NSF risk, and providing project funding;
- Coordinating contact between the project proponents and other NSF staff members that may need to have direct contact with the project or that the project may wish to contact.
- Conducting merit review of proposals for development, implementation, operation, and utilization of a facility (Conceptual Design Review, Preliminary Design Review, Final Design Review, construction and operational reviews);
- Preparing all required documentation for internal project review and approval within the NSF;
- Determining the estimated costs of planning, construction, operations, maintenance and related programmatic activities, and, under management direction of the originating Division, Directorate, or Office, assigns budgets to these tasks; and
- Overseeing implementation, operation, and eventual termination of NSF support for the project.

1.2. Senior Management of the Originating Division, Directorate, or Office

1.2.1. Assistant Director or Office Head

Assistant Directors and Office Heads lead Directorates or Offices, and by extension their Divisions or Sections, which propose projects for funding through the MREFC Account or other funding source.

The Assistant Director (or Office Head) of the originating organization utilizes community inputs, discipline-specific studies, advisory committee recommendations and internal NSF considerations to prioritize the opportunities represented by the candidate project relative to competing opportunities and demands for NSF resources. The AD determines that the scientific merit and relative importance of the proposed facility are sufficiently strong to justify advancement of the project to Readiness Stage (i.e. ready to begin Preliminary Design activities), and authorizes the PO to proceed with organizing the development and external review of a Project Development Plan and with updating the IMP to explain how NSF will oversee and fund further development. The AD reviews and approves the IMP prior to its submission to the Facilities Panel. The AD determines whether to propose a project to the MREFC Panel as a candidate for future construction funding, based on the project's relative scientific importance and on the originating organization's commitment to pre- construction planning activities and eventual facility operation and use. The AD is regularly updated by the PO on the status of the project throughout the remainder of its life-cycle phases, and brings critical issues to the attention of the NSF OD and NSB as appropriate.

The AD has overall responsibility for advancing prospective projects for consideration of construction funding. In this capacity, the AD formulates strategic planning and budget development within the originating Directorate or Office. This strategic planning includes prioritizing across the research objectives of the range of disciplines served by the Directorate or Office. The AD oversees and monitors

development of NSF's project planning, with the assistance of supporting staff, advisory committees, and direct interactions with the broader community affected by the facility.

The AD oversees development of Memoranda of Understanding (MOUs) with other agencies, international partners, private foundations, and other entities and, with the approval of the NSF OD, enters into negotiations with those parties and signs these agreements on behalf of NSF when authority to do so is delegated by NSF OD.

Throughout a project's life, the AD has a primary responsibility to keep all major stakeholders in the project informed. Interested parties include policy stakeholders - the NSF, OD; funding stakeholders: - OMB, Congress; and community stakeholders – scientific organizations and the relevant research community.

At each stage of project development, the AD has the responsibility for making key decisions within the originating Directorate or Office that advance a project or remove it from consideration for further development.

Specific responsibilities include, but are not limited to:

- Approving the Internal Management Plan (IMP) at the Directorate level;
- Ensuring that the performance plans of the relevant Division Directors reflect the requirements and expectations of the LFM and other NSF policy statements, and the necessity to provide an environment of open communication and transparency in the management of MREFC projects;
- Assuring the evaluation and endorsement of a candidate MREFC project by the Directorate or Office advisory committee prior to submission of the project to the MREFC Panel for entry into the Readiness Stage;
- Overseeing the organization of all design reviews including appointment of review panels, charges to the panels, and Directorate responses to review panel recommendations;
- Reviewing and approving all Director's Review Board (DRB) packages and organizing representation of the project before NSF internal approval bodies, i.e. DRB, MREFC Panel, and the NSB;
- Representing the originating Directorate or Office in decisions to re-compete management of an operating facility, terminate support, admit new partners, and other major decisions affecting the facility;
- Assigning members of Directorate Office staff to serve as representatives on a PAT;
- Establishing appropriate Delegation of Authority for awards following NSB action.

1.2.2. Division Director

The Division Director, assisted by Divisional Staff, has primary responsibility for overseeing planning, review, oversight and funding of Large Facilities. This responsibility include coordination of planning; serving as the interface with relevant scientific and engineering communities; preparing all required documentation for project consideration and approval; conducting merit review of proposals; fully funding costs of operations, maintenance and relevant programmatic activities; and overseeing the project.

Administratively, a large facility in planning, construction, or operation, is under the purview of an originating⁴ Division or Office. The originating organization provides supervisory oversight and budgetary authority. Depending on the administrative structure of the originating organization, the cognizant PO is usually selected by the Divisional management (e.g. Section Head and DD collaborate in the selection) with concurrence of the AD. The PO's superiors directly or indirectly oversee and guide the activities of the PO.

The Division Director (DD) has overall responsibility for the conduct of programs in a related range of disciplines within NSF, and for the NSF interfaces between these programs and the scientific communities in these disciplines. For large facility projects, the DD:

- Evaluates and maintains, through appropriate mechanisms, the proper balance between the totality of life-cycle costs for MREFC facilities and the rest of the division's activity;
- Establishes and continually examines, through appropriate mechanisms and forums, the priorities among MREFC candidate projects within the discipline (those in development, under construction, and in operation);
- Appoints a cognizant PO for each project;
- Ensures that the program officer has the requisite experience and/or training to respond to the responsibilities of the position;
- Ensures that the cognizant PO follows appropriate best practices;
- Ensures that the PO is responding appropriately to the requirements of the Large Facilities Manual and other NSF policies and practices;
- Ensures that the PO is managing interfaces with other NSF units effectively and productively;
- Ensures that the performance plan of the program officer reflects the requirements and expectations of the LFM and other NSF policy statements;
- Facilitates the flow of information at an appropriate level of detail and timescale to keep all NSF stakeholders appropriately informed of project progress, status, and problems.

1.3. Grants Officer

The Grants Officer (GO) has authority, subject to statutory limitations, to award and administer cooperative agreements and/or contracts. As a member of the Project Advisory Team, this NSF officer participates in management reviews, risk assessment and issues management. The GO plans and coordinates development of award documents from early planning stages through award administration and closeout. The GO negotiates terms and conditions, interprets NSF policy, reviews business proposals and budgets, significant sub-awards, Memoranda of Understanding, and partnership agreements. The GO also monitors awards for compliance with the most current NSF financial and administrative policies and procedures.

⁴ This is the "lead organization" in the case where more than one Division participates in originating a project.

The GO is the point of contact at the NSF with the Awardee institution for all business and financial matters. The GO represents the NSF in conducting all of the financial and administrative business related oversight of the Awardee, including

- Providing approval or authorization for all financial transactions,
- Ensuring compliance with financial and administrative award conditions,
- Accepting submittals or reports from the Awardee, and
- Negotiating any specific terms and conditions which define the conduct and execution of a project, such as Cooperative Agreements (CAs) and subsequent amendments, memoranda of understanding, property leases, etc.

The Grants Officer (GO) is appointed by, and is administratively part of the Division of Agreements and Cooperative Support (DACS) within the Office of Business, Finance, and Award management (BFA). The timing of this assignment is at the discretion of the DACS Director in response to a request from the PO, but should be early enough in the planning stage of a large project to allow participation of the GO in the strategic planning and development of the IMP for a large project (i.e., during the Conceptual Design Stage when NSF begins to consider strategies for the business aspects of managing oversight of the proposed project).

The GO is responsible for oversight of the financial and administrative terms of the assistance agreement⁵, just as the PO is responsible for scientific and technical oversight. The GO and the PO jointly share the principal technical and financial responsibilities for the management and oversight of a large facility project. In this capacity, the GO is jointly responsible with the PO for the success of a project.

The GO may choose to organize and chair a Business Oversight Team⁶ (BOT) for a facility project in order to expedite NSF action on business and administrative issues related to the project

The GO confers with the PO and other relevant offices to insure that the NSF's technical and administrative oversight activities are well coordinated. The GO and PO collaborate on the preparation of solicitations and the proposal and award process. The GO has individual responsibility for developing and overseeing the implementation of financial and administrative aspects of the award process, and joint responsibility with the PO for recompetition planning and execution, and award termination and closeout.

The GO originates the Cooperative Agreements (CAs) or contracts that establish a business relationship between the NSF and an Awardee institution. Consequently, the GO necessarily has an oversight responsibility that extends to the business practices of that institution, in addition to the specific

⁵ An assistance agreement is a grant, cooperative agreement, or contract to an institution with fiduciary responsibility for the project or facility.

⁶ Refer to the section 2.5 on the BOT.

business operations and oversight practices of the particular project that may be based at that institution.⁷

The GO, with the assistance of BFA resources, establishes that the financial stewardship and reporting practices of the Awardee institution, as they pertain to NSF awards, are consistent with NSF requirements and OMB circulars. (Refer to the AMBAP and Business Systems Review guides for more details on the criteria and processes for this assessment.)

The GO develops the grants or CAs that create the business framework for funding, reporting, and oversight of the project, including special terms and conditions tailored to the specific circumstances of the project. (Refer to “Reporting Requirements” in Chapter 5 of the LFM.)

1.4. Deputy Director for Large Facility Projects and BFA’s Large Facilities Office

The NSF’s Deputy Director for Large Facilities Projects (DDLFP) and supporting staff (the Large Facilities Office, or “LFO”) are the NSF’s primary resource for all policy or process issues related to the development, implementation, and oversight of MREFC projects, and are NSF-wide resource on project management. The DDLFP has the institutional authority and resources to effectively develop mandatory policies, which are approved by Senior Management, for all phases of large facility construction and retirement. The DDLFP is consulted on all policy issues relating to large facility development. The DDLFP works closely with the PO and the GO, providing expert assistance on non-scientific and non-technical aspects of project planning, budgeting, implementation, and management to further strengthen the oversight capabilities of NSF. The DDLFP also facilitates the use of best management practices by fostering coordination and collaboration throughout NSF to share application of lessons learned from prior projects.

The LFO develops and implements processes for insuring implementation of the overarching policy and procedures that require, either directly in the award notice or by reference through other documents, that all current and future facility agreements include, at a minimum, four performance evaluation and measurement components:

1. Clear and agreed-upon goals and objectives;
2. Performance measures and, where appropriate, performance targets;
3. Periodic reporting; and
4. Evaluation and feedback to assess progress.

Prior to NSF requesting NSB approval to include a proposed project in a future construction budget request, the DDLFP makes a determination that the project plans are construction ready, and assists the

⁷ Refer to the Business Systems Review (BSR) Guide for discussion on this point. When NSF is not the cognizant audit agency for the Awardee institution, its oversight of Awardee business practices is narrowly defined.

Chief Financial Officer in determining that the construction and operations budgets are satisfactorily justified.⁸

The DDLFP prepares a monthly status report on all ongoing MREFC projects, candidate MREFC projects in planning, and other large facility projects designated by the originating Directorate or Office. Inputs to the monthly report are provided by each cognizant PO. The PO's reports summarize the technical and financial status of the project and inform NSF of pending near-term milestones and any other issues that should be brought to the attention of senior NSF management. The DDLFP combines all these inputs into a single report, summarizes the key technical and financial status information into an executive summary, and provides an independent commentary on project management issues.

Under the direction of the NSF Deputy Director, the DDLFP prepares an annual NSF Facilities Plan and presents it to the National Science Board, usually at the NSB's February meeting. The Facilities Plan describes the status and plans for the portfolio of major multi-user facility projects that are either receiving or are candidates for receiving MREFC funds. The Facility Plan supplements information contained in the NSF's annual Budget Request to Congress.

For each large facility project, the DDLFP designates an LFO representative to work closely with the PO and the GO, providing expert assistance on non-scientific and non-technical aspects of project planning, budgeting, implementation, and management to further strengthen the oversight capabilities of NSF. The LFO representative participates in each project PAT and also advises the cognizant PO of mitigating steps when project management challenges arise.

The LFO representatives collaborate with POs and GOs to plan and carry out key project reviews: CDR, PDR, FDR, Operations Reviews, and other *ad hoc* project reviews in all life-cycle phases as appropriate⁹, and independently analyzes and reports on the outcome of these reviews to the CFO. While the PO is responsible for planning, carrying out, and assessing the full range of topics addressed in the review, LFO representatives focus on project management, business, and administrative issues, and assist the PO and GO in these areas. The DDLFP independently assesses and reports to the BFA OD on the outcome of these reviews with respect to project management issues.

LFO representatives visit sites and interact with Awardees, in coordination with the PO and originating organization, to strengthen project management aspects of NSF's oversight. In these Awardee interactions, the PO is the unique point of contact with the project for all programmatic issues, and the GO is the point of contact with the awardee institution for administrative issues. Project-specific communications between LFO staff and projects are coordinated through the respective PO and GO.

Business Systems Reviews (BSRs): LFO also carries out reviews of Awardee business systems for large facilities in construction or operation (or in late stage planning when expenditure rates are significantly large to indicate that conducting a BSR would result in risk reduction). BSRs may also be conducted at

⁸ See Attachment 5 to NSB-04-92 NSB-04-97 May 4, 2004, http://www.nsf.gov/nsb/meetings/2004/may_srprt.pdf

smaller scale facilities at the request of the CFO or the originating organization. (BSR objectives and processes are described in detail in NSF's *Business Systems Review Guide*.)

2. Advisory Bodies

2.1. Project Advisory Team

The Project Advisory Team (PAT) assists the PO in the planning, review and management of the MREFC project. The PAT advises and assists the PO in creating and updating the IMP, planning and assessing internal reviews, and providing counsel on all aspects of the project as requested. The team is administrative issues associated with various types of infrastructure projects. The PAT is convened and chaired by the PO. It meets periodically, at intervals adapted to the needs of the project and the PO.

The role of the PAT is purely advisory to the PO. When unresolved concerns exist, PAT members should raise these concerns to their respective supervisors for resolution or for communication to the PO's Division or Directorate.

2.2. Business Oversight Team (BOT)

The BOT is the subset of the PAT whose primary interests and responsibility pertain to the business and administrative aspects of the project. The BOT addresses key issues such as the development and revision of special terms and conditions of Cooperative Agreements, development of strategy for making an award, plans for evaluating administrative and business aspects of an MREFC proposal, and establishing an oversight process for the business plans and activities associated with execution of the award.

2.3. Facilities Panel

The Facilities Panel is an advisory body that reviews and provides feedback on the initial IMP for each MREFC project or large facility project, as well as subsequent IMP revisions (as requested). The panel provides written comments to the originating organization and may share these comments with the MREFC Panel and/or the Office of the Director. The Facilities Panel is chaired by the DDLFP. The other members of the panel are experienced business operations personnel and experienced programmatic personnel, all of whom have prior experience in the technical and administrative aspects of large project oversight. The Facilities Panel may also provide preliminary review of the materials submitted to the MREFC Panel, DRB and NSB when requested.

Members of the Facilities Panel are invited to participate by the Director of BFA, upon the recommendation of the DDLFP.

The Facilities Panel reviews and approves the initial Internal Management Plan (IMP)¹⁰ for each project near the beginning of the Readiness Stage of a project. They may also approve any subsequent revisions, at the request of PO, with particular consideration of the adequacy of the oversight plan and agency risk management plan for the candidate project.

2.4. Advisory Committee to the Originating Directorate or Office

The Advisory Committee of the originating organization provides input to the NSF AD, or Office Head of the originating organization concerning priorities among and between projects and other activities sponsored by the Directorate. The NSF Director requires the endorsement of the Advisory Committee of the originating organization prior to requesting NSF action approving a project's inclusion (at the Director's discretion) in a future NSF budget request to Congress.

3. Governing Bodies

3.1. MREFC Panel

The MREFC Panel provides governance of the overall MREFC process and reviews specific cases as presented by the originating organization(s). The Panel consists of the NSF Deputy Director (Chair), the ADs, Program Office Heads, the Chief Financial Officer, the other Senior Management of NSF, and (in non-voting capacity) the DDLFP.

The MREFC Panel defines the specific implementation processes utilized by NSF to oversee, assess, prioritize, and fund major research infrastructure projects funded through the MREFC account¹¹. The MREFC panel reviews specific on-going and candidate projects as presented by the originating organization and makes recommendations to the NSF Director. In particular, because the Panel is composed of administrators with responsibility for every area of science and engineering supported by NSF, it applies the third NSF ranking criteria¹² for prioritization, which pertain to overall NSF priorities:

- Which projects are in new and emerging fields that have the most potential to be transformative? Which projects have the most potential to change how research is conducted or to expand fundamental science and engineering frontiers?
- Which projects have the greatest potential for maintaining U.S. leadership in key science and engineering fields?

¹⁰ IMP's describe the NSF's strategy funding, oversight, and agency-specific risk management during the course of planning and construction of the proposed facility.

¹¹ For example, the MREFC Panel reviews the Large Facilities Manual and supporting information such as this document. The Large Facilities Manual and its supporting materials are "living materials" that periodically to reflect additional requirements and/or policy changes as they are reviewed by the MREFC Panel, NSF Director and the National Science Board.

¹² See Appendix 2 of the Large Facilities Manual – Ranking Criteria for Prioritizing MREFC Projects.

- Which projects produce the greatest benefits in numbers of researchers, educators and students enabled?
- Which projects most need to be undertaken in the near term? Which ones have the most current windows of opportunity, pressing needs and international or interagency commitments that should be met?
- Which projects have the greatest degree of community support?
- Which projects will have the greatest impact on scientific advances across fields taking into account the importance of balance among fields for NSF's portfolio management in the nation's interest?

Under the guidance of the NSF Director and Deputy Director, the MREFC Panel reviews the current status, planning and implementation, challenges and concerns, and any policy issues concerning MREFC projects throughout the year. The MREFC Panel recommends advancement of projects into successive stages of development, and may provide other review and assessment as directed by the Deputy Director.

3.2. Director's Review Board

The Director's Review Board (DRB) reviews and approves the documentation associated with all projects proposed to the NSB for funding or other actions, including MREFC projects. The DRB is composed of the NSF Deputy Director, three Assistant Directors/Office Heads serving on a rotating basis, the Chief Financial Officer, a representative from the Office of General Counsel, a staff advisor from the Office of the Director, and a DRB Executive Secretary.

Actions requiring review by the DRB and the National Science Board are defined in NSF O/D 01- 02. A preparation guide is available in NSF O/D 97-07. The timeline for submission of materials is defined in NSB/PPP-07-30.

3.3. NSF Director

The NSF Director has ultimate responsibility for the obligation of funds from the MREFC Account and for proposing new MREFC projects to the NSB, OMB and Congress. The Director approves all IMPs, as well as all materials submitted to the NSB, OMB or Congress.

3.4. National Science Board

The National Science Board (NSB) establishes policy, reviews and approves MREFC Account budgets, and reviews and approves specific MREFC projects for funding. NSB is an independent body established by Congress in 1950 to set policies for NSF. Within NSB, the Committee on Programs and Plans (CPP)

oversees NSF program initiatives and major new projects and facilities. The NSB sets the priority order of projects recommended for construction.

The NSB oversees NSF and establishes NSF policies within the framework of applicable national policies set forth by the President and the Congress. In this capacity, the NSB identifies issues that are critical to NSF's future, approves NSF's strategic directions, annual budget requests, new major programs and awards, and provides guidance on the balance between initiatives, infrastructure investments and core programs¹³.

The NSB has established a process for reviewing and approving recommended actions and funding requests from NSF regarding large facility projects during facility development¹⁴. The NSB performs such reviews and approvals after CDR, PDR and FDR, and performs an annual review of facilities as well as prioritization of projects as necessary. NSB involvement at each life-cycle stage of development includes:

- Sets policies of NSF that determine the administrative framework for overseeing all life-cycle phases of NSF's large facilities.
- Is kept apprised of the status of all large facilities funded by NSF.
- Approves the release of NSF's annual Facility Plan.
- Reviews projects that have recently completed CDR, and assigns relative priorities for further development.
- May provide guidance or expectations for pursuing further development of a project, which, if not realized, could result in terminating further NSF support; and concurs in any recommendation to terminate support.
- May recommend augmentation of the budget of the Division originating a candidate new facility, to partially offset the impact on other programs resulting from the need to fully support pre-construction planning.
- Recommends inclusion of a candidate project in a future NSF Budget Request to Congress, after a Preliminary Design Review (PDR) and NSF Director approval.
- Prioritizes the order of construction start among projects similarly approved for inclusion and not yet started.
- Authorizes the obligation of appropriated MREFC construction funding to the awardee.
- Is regularly apprised of the status of facilities under construction.
- Reviews all recommendations for awarding funds to operate large facilities.
- Approves recompetition strategies for operations awards.

¹³ More about the NSB is available on-line at: <http://www.nsf.gov/nsb/about/index.jsp>.

¹⁴ National Science Board MREFC Process (graphic, NSB-10-65, approved August 2010). See also NSB's most recent Annual Timeline for Integration of Board MREFC Process with NSF Budget Process (NSB-10-66, approved August 2010).