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Final Report of the Subcommittee on NAPA Implementation

Virtual Meeting – March 2017 Meeting

Michael Holland
March 13, 2017

Subcommittee Membership

Michael Holland	Executive Director, Center for Urban Science & Progress; New York University
Patrick Looney	Chair, Sustainable Energy Technologies Department; Brookhaven National Laboratory
Kevin Marvel	Executive Officer, American Astronomical Society
Katy Schmoll	Independent Consultant
Dick Seligman	Associate Vice President, Office of Research Administration; Caltech
Stephanie Short	Associate Deputy Director for Field Operations, DOE Office of Science
Dan Stanzione, Jr.	Executive Director, Texas Advanced Computing Center; The University of Texas at Austin
John Tao	President, O-Innovation Advisors LLC
David Trinkle	Director, Berkeley Research Development Office; University of California, Berkeley
Joseph Whittaker	Dean, School of Computer, Mathematical & Natural Sciences; Morgan State University

Subcommittee Charge

The Subcommittee has been charged with providing options for appropriate agency-wide oversight for the NSF Office of the Director (OD) for the following four tasks:

- Re-scope of the role, duties, and membership of the Major Research Equipment and Facilities Construction (MREFC) Panel to include status update reviews of projects in the development and construction phases focusing on cost, schedule, and performance. [NAPA Recommendation 6.2].
- Evaluate the potential value in extending the MREFC Panel’s role to operating facilities, including divestment (i.e. full life-cycle).
- Evaluate the potential value in creating an internal agency “senior official” position in OD charged with reporting to the Director and Deputy Director/Chief Operating Officer on large facilities;
- Evaluate the potential value in creating a new Federal Advisory Committee Act (FACA) committee to provide the NSF Director with a sounding board for objective insight on large research projects. [NAPA Recommendation 6.4]

Subcommittee Kick-Off Meeting

Overview/Context – NSF Perspective on the NAPA Report

Fae Korsmo, NSF Office of the Director

Current Process for Major Facilities at NSF

Matt Hawkins, NSF Large Facilities Office Head (LFO)

Recognized Challenges

Matt Hawkins, NSF Large Facilities Office Head

Brief Tutorial on the Cooperative Agreement Mechanism

Jeff Lupis, Division Director, NSF Acquisition & Cooperative Support

NSF Directorates' Viewpoint

James L. Olds, Assistant Director, BIO

James Kurose, Assistant Director, CISE

Grace Jinliu Wang, Deputy Assistant Director, ENG

Roger Wakimoto, Assistant Director, GEO

Rebecca L. Keiser, Head, International Science and Engineering

F. Fleming Crim, Assistant Director, MPS

External Oversight Viewpoint

Michael Sieverts, Division Director, NSF Budget Division

Julia Jester, Congressional Affairs Group Leader, NSF OLPA

Allison Lerner, NSF Inspector General and staff

NSB Oversight Viewpoint

A discussion to highlight the oversight viewpoint of the National Science Board.

Identification of Tasks/Potential Working Groups

Chair: Michael Holland

Potential Working Group Meetings

Identification of Areas Where More Information is needed from NSF

Agreement on Deliverables and Timeline

Information Gathering Calls

NSF Director France Cordova

- Briefed us on her experience with NEON, other NSF facilities, and the interim actions she had taken to date
- Touched on issues related to visibility into the facilities portfolio for the executive and leadership levels, approach to risk management at NSF, and NSF staffing culture

NSB Staff: Michael Van Woert, John Veysey, Elise Lipkowitz

- Discussed roles & responsibilities of NSB relative to NSF, roles of Committee on Programs and Plans and the Committee on Strategy and Budget's Subcommittee on Facilities, and typical materials presented to the Board for MREFC approvals

Lt. Gen James A. Abrahamson, USAF (Ret.)

- Director Cordova brought him in to do a root cause analysis of NEON.
- Discussed his observations about how NSF addresses risk factors

General Observations

On the basis of our briefings and review of materials NSF has provided to the Subcommittee, we have the following general observations:

- Limiting the role of the stage-gate process to one funding type (i.e., the MREFC budget account) does not support a systematic Foundation-wide approach to risk-management.
- NSF's current use of the MREFC Panel confounds approvals (for moving from one stage to the next in a stage-gate review process) and oversight of performance within a stage (conceptual design, preliminary design, construction, operations, etc.).
- Research infrastructure investments in the development stage (pre-conceptual design phase) are opaque to NSF leadership and oversight.
- Director Cordova's interim watch group that meets regularly to monitor progress on all research infrastructure projects and periodically take a deep dive into an individual project is a move in the right direction.

Re-scope MREFC Panel

Charge

Re-scope of the role, duties, and membership of the MREFC Panel to include status update reviews of projects in the development and construction phases focusing on cost, schedule, and performance. [NAPA Recommendation 6.2].

Findings

- MREFC panel is appropriately focused on reviewing and recommending approval for projects, but its duties fall short by omitting review of project plans in the development, operations and divestment stages.
- The MREFC Panel is appropriately constituted and vested with sufficient authority to review and recommend ***as-needed approvals***. The more technically-oriented Integrated Project Teams and LFO-managed independent external reviews are the appropriate mechanism for the ***on-going oversight*** during the design and construction stages.
- Quarterly updates on status of projects under design or construction are not adequate to provide adequate continuous oversight should problems arise.
- There is a general lack of clarity about processes at the Directorate or Division level.

Re-scope MREFC Panel

Recommendations

- 3.1 Strengthen the role of the MREFC Panel during the project development stage by amending §2.2.1 of the LFM to require approval from the MREFC Panel prior to development activities. The focus of this approval should be on defining the capability gap and preliminary functional requirements needed by the Directorate.
- 3.2 Strengthen the role of the MREFC Panel during the operations stage by amending §2.4.2 of the LFM to require review and recommendation by the MREFC Panel of each project's Transition to Operations Plan as part of their review of final design and again at the completion of construction.
- 3.3 The MREFC Panel Charter should be brought into alignment with the LFM by specifically enumerating each of the stage-gates where MREFC Panel review and recommendation is required.
- 3.4 The Deputy Director/COO should meet at least monthly with the Head of the LFO and the chairs of all active IPTs to review progress, including all earned value management tracking, on projects under design and under construction.

Re-scope MREFC Panel

Recommendations (continued)

- 3.5 The LFM can be clearer in assigning responsibility for the composition of and the authorship of external review panel charges to the LFO to ensure that the NSF Director has direct access to independent project and cost estimating expertise during the pre-design and construction phases.
- 3.6 Directorates and Divisions should define their discipline-specific processes for the development stages of their large research infrastructure projects and for the general performance criteria against which facilities or suites of facilities will be evaluated during their operations phase.

Full Life-cycle Role

Charge

Evaluate the potential value in extending the MREFC Panel's role to operating facilities, including divestment (i.e. full life-cycle).

Finding

- Major research facilities require routine oversight throughout their full lifecycle, and the NSF needs a consistent framework for risk monitoring independent of the budget account funding any given project.
- The Subcommittee supports NSF exercising its managerial discretion to apply the LFM guidance and process requirements to projects below the legislatively mandated minimums in section 110(g)(2) of the recently enacted American Innovation and Competitiveness Act of 2017

Recommendation

4.1 Although the Subcommittee does not specify any particular threshold for inclusion in the MREFC account, all relevant thresholds should be clearly documented in §1.4 or §2.7 of the LFM. All research infrastructure investments above the MREFC threshold, regardless of the NSF budgetary source, should follow the NSF LFM guidance and process.

Full Life-cycle Role

- 4.2 The Large Facilities Office, working on behalf of the Deputy Director/COO, should work with Program Staff and NSF Management to assure that the skill sets included on IPTs are matched to the risk spectrum of the project being reviewed.
- 4.3 The NSF should develop a set of risk “tracks” that group projects not by size or funding source, but rather based on institutional risk. These tracks should consider the risk and the size of the project, and the risk monitoring and oversight should be suitably tailored. The requirements for these alternative tracks should be added to the LFM and clearly documented.
- 4.4 NSF should expand its enterprise risk management in research infrastructure investments to include monitoring facility operations and productivity, as well as progress on facility upgrade investments above the recommended threshold level.

Full Life-cycle Role

- 4.4.1 The Deputy Director/COO should meet at least every six months with the Head of the LFO and the chairs of all IPTs to review performance metrics of operating large-scale research facilities. These metrics, which should be developed in consultation with the relevant research community, must reflect both the scientific productivity of the facility (e.g. number of user proposals, number of users served, publications, high-impact research results) as well its operational efficiency (e.g. beam-up time, number of operating hours vs. scheduled, etc.) for all operating large facilities.
- 4.4.2 Each Large Facility should report on facility performance annually to NSF. NSF should report large facility performance to the NSB in summary form. Results from facility operational reviews should also be reported in summary form to NSF leadership and the NSB.
- 4.4.3 The IPT's purview and lifespan should be extended to the operational phase of the project with a mandate to regularly review operational performance of NSF large facilities; and the membership of the ITP should include members who have experience operating large facilities.

Full Life-cycle Role

- 4.4.4 At least once every five years after the initial ten years of operations, the annual review should evaluate whether divestment should be considered for the facility. Any resulting plan developed by a Directorate or Division that proposes significantly repurposing and redirecting a facility or its decommissioning, disassembly, and disposal – any of which can involve significant expenditures of resources – to go through the MREFC Panel for review and recommendation to the Director
- 4.5 NSF should work with the research communities, including consultation with the Directorate advisory committee, to explore and document approaches and best practices for managing facility end of life and divestment from large research facilities. NSF should develop policy and guidance for programs to support divestment consideration and decision making.

Senior Official

Charge

Evaluate the potential value in creating an internal agency “senior official” position in OD charged with reporting to the Director and Deputy Director/Chief Operating Officer on large facilities.

Finding

- The Senior Official and the NAPA call for a for a Facilities FACA are tightly linked. We see value in OD have a clearly articulated responsibility with respect to facilities and research infrastructure, which may include more than the MREFC budget account.

Recommendation

- 5.1 The Subcommittee believes that there should be a clearly-designated senior official in the Office of the Director with direct visibility into and accountability for the Foundation’s facilities and research infrastructure – which would encompass significant projects in the directorates as well as in the MREFC account. This official would serve a role analogous to the Acquisition Executive role in DOE and NASA

Facilities FACA

Charge

Evaluate the potential value in creating a new Federal Advisory Committee Act (FACA) committee to provide the NSF Director with a sounding board for objective insight on large research projects. [NAPA Recommendation 6.4]

Finding

- The Subcommittee does not believe an additional external review of individual projects by a Large Facilities FACA would improve performance. Independent project management and cost estimating reviews of individual research infrastructure projects must be designed into processes codified in the LFM.
- The Subcommittee notes that the charter of the BOAC is not in compliance with the General Services Administration's Committee Management Secretariat guidance document, Preparing Federal Advisory Committee Charters, that states the agency "identify the agency or official (by title or position) to whom the advisory committee provides its advice. Normally, this is the agency head."

Facilities FACA

Recommendation

- 6.1 Instead of creating a new Large Facilities FACA, NSF should utilize BOAC subcommittees as needed to periodically review the rigor of NSF's large facilities oversight processes in a manner analogous to the role a Committee of Visitors has in providing external expert assessment of the quality and integrity of program operations and program-level technical and managerial matters pertaining to proposal decisions. BOAC, like other FACA committees, has a mechanism for creating subcommittees as necessary.
- 6.2 To ensure that the NSF Director has full awareness of all such BOAC subcommittee assessments, NSF should re-charter BOAC so that the NSF Director, through the BFA and OIRM Heads, becomes the official to whom the committee reports as recommended by the General Services Administration's Committee Management Secretariat guidance

Additional Considerations

MREFC Review Packages

The Subcommittee recommends that LFM §2.3.2.6 be revised to make more explicit the responsibility of the Director's Review Board to prepare cover memos for packages advancing to the Director and NSB that focus executive attention on cost, scope and schedule risks, mitigation options analyzed, and remediation actions taken to manage those risks.

MREFC Ranking Criteria

The Subcommittee recommends that the international leadership question be considered as one criterion for approval to enter the Conceptual Design Phase.

FACA Committees

Consistent with recommendation 6.2 that NSF re-charter BOAC so that the NSF Director be the official to whom the committee reports in compliance with the General Services Administration's Committee Management Secretariat guidance, the Subcommittee recommends that NSF consider re-chartering the advisory committees reporting to the Associate Directors as well as the two joint NSF/DOE FACAs



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THANK YOU