

# Oversight at NSF's Operating Large Facilities

Christopher Weber, Kristen Koopman, Kristen  
Kulinowski, Stephanie Shipp

April 23, 2013

- Chartered by Congress in 1991 to provide rigorous objective advice and analysis to Office of Science and Technology Policy (OSTP) and other Executive Branch agencies, offices, and councils
- Provide analyses of national science and technology issues of interest to OSTP and other Executive Branch agencies
- IDA began operating the Science and Technology Policy Institute (STPI) in 2003



# Presentation Outline

- Project Background
- Study questions
- Approach/project schedule
- Findings by Study Question
- Recommendations
- Discussion/Questions

# Project Background

- NSF sponsored STPI to examine oversight issues related to operating large facilities
- First time such a study had been attempted
  - Challenge for NSF and STPI of identifying and gathering data for first time
- Facilities Working Group (POs) defined study questions November 2011 (next slide)
- Study completed June-August 2012

# Study Questions

- **Central Question: What steps can be taken to streamline NSF oversight review of operating facilities?**
- Sub-questions:
  - What are the different assessments (particularly including reviews but also including site visits and audits) that occur during the operational phase across NSF facilities, and by which NSF units?
  - What are the goals for these assessments (including: what decisions must be made on the basis of each), how do they sequence, and where are there overlaps in goals and timing?
  - On a representative case basis, what are the typical resource cost factors, particularly including person-time, associated with preparing for, executing, evaluating and acting on recommendations of reviews?
  - Are there important differences in review/oversight approaches that depend on the features/attributes of the facilities?

# Approach Summary

Study Questions	Interviews with Program Officers (Case Studies)	Interviews with Awardees (Case Studies)	Analysis of Cooperative Agreements (all operating facilities)
1. What are the different assessments (particularly including reviews but also including site visits and audits) that occur during the operational phase across NSF facilities, and by which NSF units?			✓
2. Are there important differences in review/oversight approaches that depend on the features/attributes of the facilities?			✓
3. What are the goals for these assessments (including what decisions must be made on the basis of each), how do they sequence, and where are there overlaps in goals and timing?	✓	✓	
4. On a representative case basis, what are the typical resource cost factors, particularly including person-time, associated with preparing for, executing, evaluating, and acting on recommendations of reviews?	✓	✓	
Central Question: What steps can be taken to streamline NSF oversight review of operating facilities?	✓	✓	✓
Note: Questions were reordered from the original list for ease of presentation.			

# Scope of Oversight Considered

- Clear interest in NSF reviews, including BSR
- PO interviews showed many using reports in oversight
- Guidance led to limiting to programmatic oversight (exclude audits) except BSR
- Internal governance vs. oversight? Oversight if:
  - Required by CA
  - PO participates or receives reports from body
  - Awardee considers it part of NSF oversight



# Facilities Chosen for Case Studies

Facility	Sites	Mobile	Yearly Operations Budget (FY12, \$M)	Directorate	Division	Partnerships
<b>Atacama Large Millimeter Array/National Radio Astronomy Observatory</b>	1/12	N/N	\$72 R&RA, \$3 MREFC	MPS	AST	IN
<b>EarthScope</b>	1600	N	\$26.2	GEO	EAR	IA
<b>Incorporated Research Institutions for Seismology</b>	150	N	\$11.3	GEO	EAR	IA
<b>Integrated Ocean Drilling Program</b>	1	Y	\$38.9	GEO	OCE	IN
<b>Laser Interferometer Gravitational-wave Observatory</b>	2	N	\$30.5 R&RA, \$21 MREFC	MPS	PHY	-
<b>National Optical Astronomy Observatory</b>	2	N	\$25.5	MPS	AST	IA
<b>National Solar Observatory</b>	8	N	\$8 R&RA , \$10M MREFC,	MPS	AST	IA
<b>Network for Earthquake Engineering Simulation</b>	14	N	\$20.5	ENG	CMMI	IAIN

Note: facilities anonymized in results slides



# FINDINGS

Q1: What are the different assessments (particularly including reviews but also including site visits and audits) that occur during the operational phase across NSF facilities, and by which NSF units?

Q2: Are there important differences in review/oversight approaches that depend on the features/attributes of the facilities?

# What are the different assessments across facilities?

- Documents examined:
  - Cooperative Agreements and Contracts
  - Programmatic Terms and Conditions
  - General Financial and Administrative Terms and Conditions
    - Supplemental FATC for Managers of Large Facilities and FFRDCs
  - Project Solicitations
  - Governance documents (for international collaborations)
  - Input from case studies

# Facilities use different language to describe oversight

- Generally three kinds of oversight:
  - NSF-organized reviews
  - Reports submitted to the NSF
  - Internal governance conducted by the awardee
- Within these categories, oversight procedures covering similar content still had different names
  - Necessitated creation of a taxonomy

# Creation of a Taxonomy for Oversight

- Example taxonomy for NSF-organized reviews:

Review Category	Description	Terms found in CAs
<b>Program</b>	A comprehensive review including science, often reviewing project planning documents.	Program review panel, review of science and facility programs, site visits
<b>Operations</b>	A review focused on facility operation or technical operation.	Operations merit review, merit review site visit of facility operations, operations and maintenance review, maintenance and operations review
<b>Management</b>	A review focused on the overall management of the facility and the performance of the management organization.	Management performance review, interim management review, review of management and operations, in-depth review of management, review of management performance
<b>Transition</b>	A review covering the transition between awardees or stages of the project.	Transition Review
<b>BSR</b>	An NSF Business Systems Review.	Business Systems Review
<b>Proposal</b>	A proposal review in preparation for a renewal.	(Not included in CAs)
<b>Other</b>	Other reviews; largely those without enough detail provided to categorize properly.	On-site review, annual review, review

# Some CAs provide flexibility in oversight requirements

- Frequency requirements are not always absolute: 10 of 18 facilities use “at least” to specify frequency
- Five facilities require the BSR “as deemed necessary”
- Some facilities have other language for flexibility (allowing content and scheduling of review to be determined during the award, combining a quarterly report with an annual report, allowing the final report to take the place of the annual report for the final year, etc)

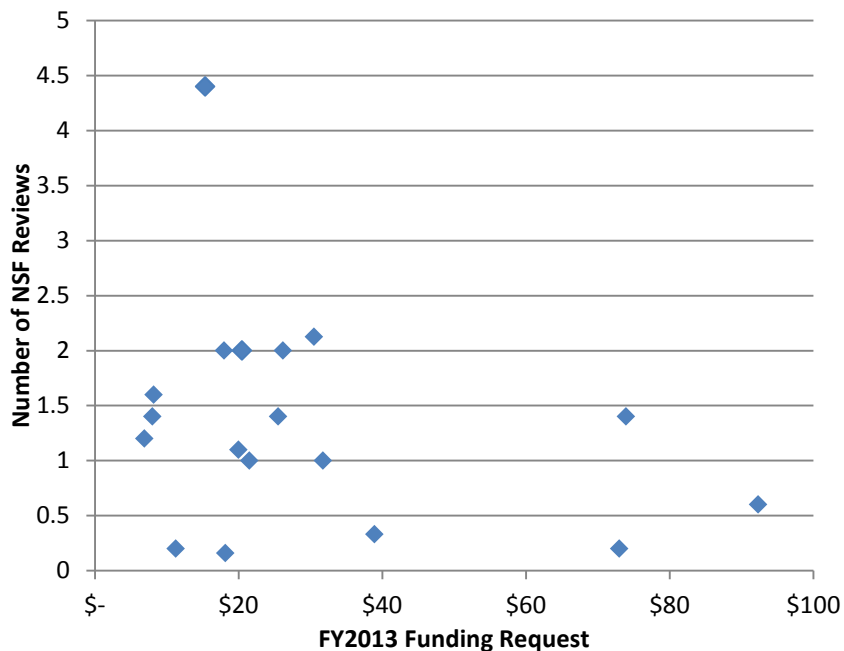
# NSF's oversight is unique to each facility

- Different CAs require different types of reviews at different frequencies
- All facilities require a retrospective annual report
- Most (but not all) CAs require a forward-looking annual program plan
- Internal governance very facility-specific

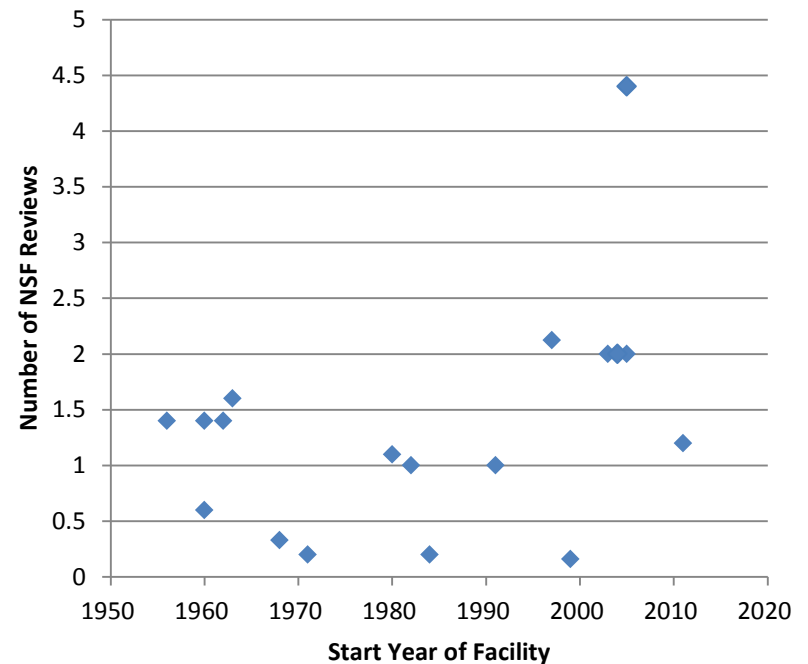


# No trends based on size or age

Weak correlation between facility size (as measured by funding request) and annualized number of reviews



Weak correlation between facility age and annualized number of reviews



# Directorates/Divisions can have similar requirements

- Only trends at Division and Directorate level
  - Networked facilities in ENG facilities tend to have multiple reviews per year due to structure
  - AST facilities tend to have common annual program review, 5-year management review, and internal governance similarities
- Many potential reasons for differences:
  - tradition, facility structure, awardee preferences, PO preferences
  - Determining actual reasons requires further study

Q3: What are the goals for these assessments (including: what decisions must be made on the basis of each), how do they sequence, and where are there overlaps in goals and timing?

1 Scope

2 Timing

# Findings: Goals of Oversight

- NSF oversight includes different activities to different parties
  - Awardees often considered governance bodies to be oversight
  - Not consistent across facilities even within Divisions/Directorates
  - More study needed across more facilities

# Are There Overlaps in Scope?

- Perceptions highly varied between POs and awardees; roughly half said no overlap
- BSRs and renewal proposals seen as highly burdensome (even though less time invested than in other types)

Facility	PO	Awardee
1	Yes, BSR/Mgmt	Yes, Internal/Mgmt
2	Yes, BSR/Mgmt, Mgmt/Renew	Yes BSR/Mgmt
3	No overlap	No overlap
4	No overlap	Yes, Ops/Internal
5	Yes, BSR/Mgmt	Yes, Program/Internal
6	No overlap	Yes, BSR/A133 Audits
7	No overlap	No overlap
8	Yes, BSR/Mgmt	Yes, Program/Internal

# Other Scope Findings

- Link between programmatic reviews and recompetition decision is unclear
- Review charges show considerable variation in types of questions and level of detail
  - Level of detail probably a function of history, previous review results
  - Is more detail helpful?
- Most POs would welcome guidance from LFO to reduce overlap
  - Particularly related to overlap with BSR
  - Guidance needed on point of management reviews

# Timing: Findings

- Considerable temporal overlap between multiple reviews and between reviews, reports, and internal oversight
  - All case studies showed some overlap
  - Most often with BSR and renewal process
  - Burden different at different times of process
- POs try to avoid such timing issues but not always possible
  - Combining reviews/reports
  - Postponing reviews



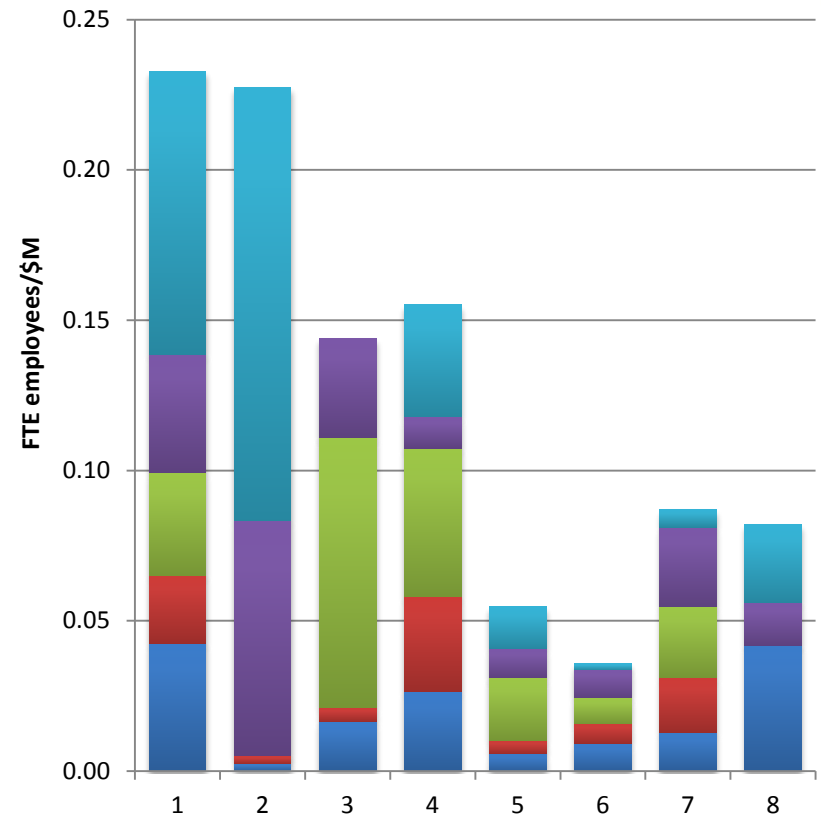
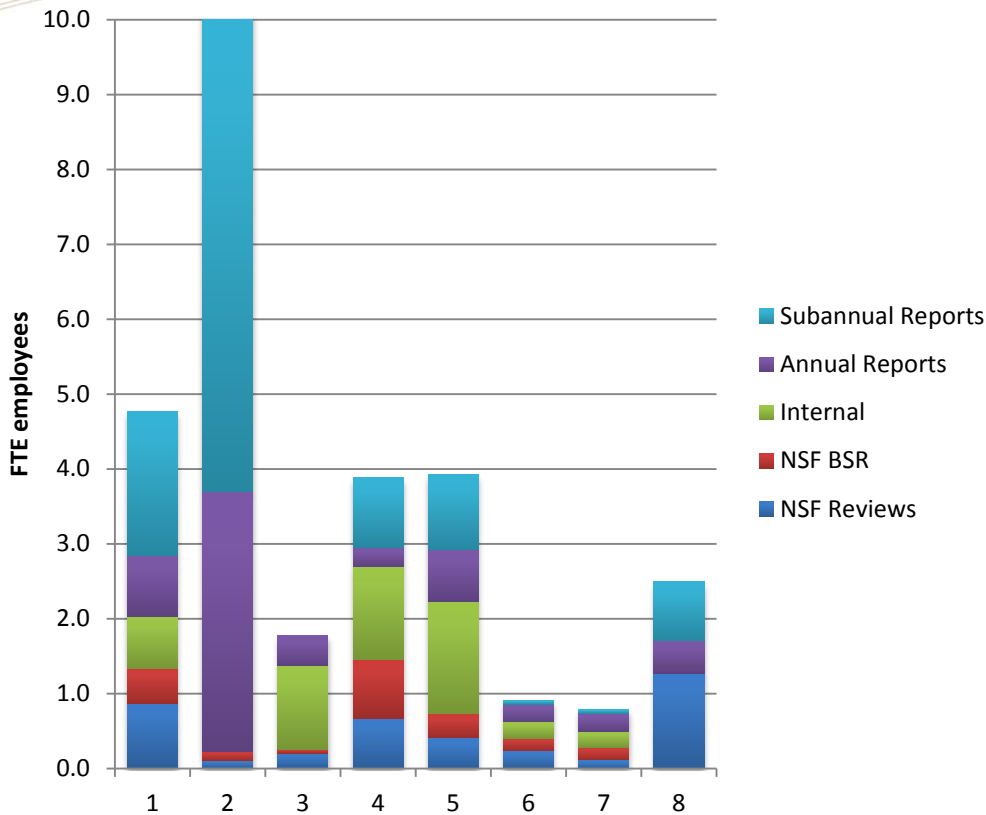
# Timing: Examples

CY	2008			2009					2010					2011					2012					2013																								
FY	2009			2010					2011					2012					2013																													
Type	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9
Board	IN				IN				IN				IN				IN				IN				IN				IN				IN				IN				IN				IN			
IntAdv	IC	IC	IC	IC	IC	IC	IC	IC	IC	IC	IC	IC	IC	IC	IC	IC	IC	IC	IC	IC	IC	IC	IC	IC	IC	IC	IC	IC	IC	IC	IC	IC	IC	IC	IC	IC	IC	IC	IC	IC	IC	IC	IC	IC				
Mgmt SV									NM	NM						NM	NM										NM	NM															NM	NM				
Mgmt Ext													NM	NM	NM										NM	NM	NM																					
Renew																																																
BSR									NB	NB	NB		NB	NB		NB	NB	NB		NB	NB	NB		NB	NB		NB	NB		NB	NB	NB		NB	NB	NB		NB	NB	NB		NB	NB	NB				
Ann Rept									AR	AR						AR	AR										AR	AR															AR	AR				
Qsci	QR	QR			QR	QR			QR	QR			QR	QR		QR	QR			QR	QR			QR	QR		QR	QR		QR	QR			QR	QR			QR	QR			QR	QR					

CY	2009			2010					2011					2012					2013					2014																			
FY	2010			2011					2012					2013					2014																								
Type	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	
Int Prog	IC					IC								IC														IC															IC
Int Mgmt																																											
Program		NS					NS							NS														NS												NS			
Mgmt																																											
Portfolio																																											
Renew																																											
BSR																																											
Ann Rept																																											
Ann Plan																																											
LR Plan																																											
Qsci					QR		QR							QR		QR												QR		QR									QR				
Qfin		QR			QR		QR		QR		QR		QR			QR		QR		QR		QR		QR			QR			QR		QR		QR		QR		QR		QR			

Q4: On a representative case basis, what are the typical resource cost factors, particularly including person-time, associated with preparing for, executing, evaluating, and acting on recommendations of reviews?

# Substantial awardee time involved with NSF oversight, 1 to 10 FTEs

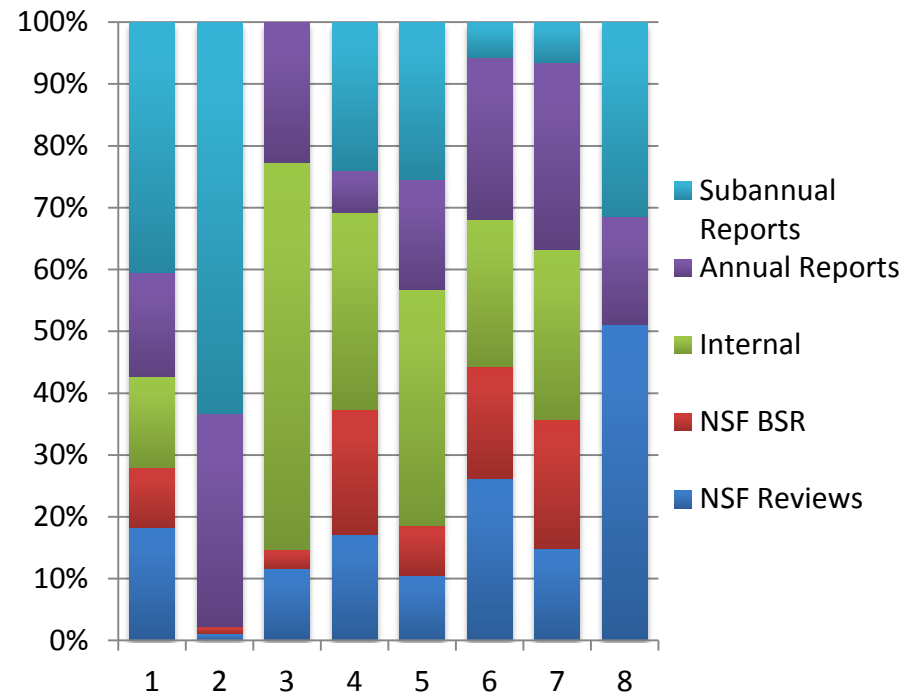


# Person-time Between Facilities

- Some variability based on facility age
  - Could account for trends within Directorates
  - Number of required reviews not correlated to age, but older facilities tended to have lower estimated burden
- Caveat: small sample size and mostly estimates

# Awardee Person-time Between Categories

- Reporting largest time sink (51% average)
  - Compare 14% NSF reviews, 11% internal
  - Some facilities consider subannual reports essential for management
- Large variation between facilities
  - Reporting 20%-95%
  - Reviews <5%-50%
  - Internal 0%-60%
- Most awardee comments on BSR/renewal
  - Different staff involved (director less involved in subannual reporting)
  - More pressure (renewal/recompetition)



# RECOMMENDATIONS

# Study Recommendations (1)

- Standardize oversight terminology and scopes
  - LFO working with Directorates and Divisions
  - Will help share best practices
- Clearly communicate oversight requirements to facilities during the development of CAs
  - Insert language for flexibility where appropriate
- To the extent possible, schedule oversight upfront (during CA development) to avoid overlap



# Study Recommendations (2)

- Consider internal oversight in total oversight burden
  - POs, Directorates, and LFO should include these activities in scheduling and designing oversight
- Conduct further study to understand how internal governance activities could contribute to NSF oversight goals
- Clarify the role of management reviews in the context of recompetition decisions
  - Discuss need and purpose of management reviews if recompetition decision made prior to or apart from review

# Acknowledgements

- Funding provided by NSF Large Facilities Office
- Thanks to:
  - Bill Miller, LFO for direction
  - Other LFO staff for feedback and information
  - POs and Awardees for speaking with us!
- Co-authors: Stephanie Shipp, Kristen Kulinowski

# Questions

- ?