National Science Foundation
Office of Inspector General
Audit Overview

ASSOCIATION OF COLLEGE AND UNIVERSITY AUDITORS
ANNUAL CONFERENCE
September 2012

Outline

• Federal Offices of Inspector General
• National Science Foundation OIG Audit Overview
• Overview of Financial Assistance in the U.S.
• Framework for Grant Oversight
• Federal Initiatives

The Inspectors General

• 73 Federal Inspectors General (IGs)
• To promote economy, efficiency, effective and integrity in agency programs
• Established by Federal law:
  • 1978: The IG Act
  • 1988: The IG Act Amendments
  • 2008: The IG Reform Act
• IG staff sizes vary
Inspector General Responsibilities

- Audit and evaluate agency programs and activities
- Investigate allegations of wrongdoing
- Review agency compliance with legislation and regulations
- Advise agency head and Congress
- Operate a hotline to receive information

Inspectors General Do Not....

- Operate programs or decide funding
- Perform management functions
- Make agency employment decisions
- Enforce implementation of OIG recommendations
- Suspend or debar recipients

Council of Inspectors General for Integrity and Efficiency (CIGIE)

- Mission
  - Address integrity, economy, effectiveness of Federal agencies
  - Establish policies, standards to increase effectiveness of OIG offices
- Members: Inspectors Generals (per IG Act)
  - Executive Chair: OMB Deputy Director (Management)
  - Council Chair: Member-elected IG (serves for 2 years)
  - Standing committees:
    - Audit, Investigations, Legislative, Professional Development
    - Inspections/Evaluation, Integrity, Information Technology
- CIGIE facilitates Inspector General collaboration
**NSF OIG: Who We Are**

- **Office of Audit**
  - We conduct internal/external audits:
    - Financial
    - Performance

- **Outreach**
  - We invest in outreach:
    - Presentations
    - Briefings
    - Publications and Brochures

**NSF OIG: What We Do**

- **Office of Investigations**
  - We investigate allegations of:
    - Fraud, waste, and abuse
    - Research misconduct
    - Violations of law, regulation, directive, or policy

- **Office of Audit**
  - We conduct internal/external audits:
    - Financial
    - Performance

**NSF OIG: Office of Audit**

- Audits NSF-funded grants, contracts, and cooperative agreements
- Determines whether costs claimed by awardees are allowable, reasonable and allocated properly
- Oversees annual audit of NSF’s financial statement
- Promotes economy and efficiency in NSF’s financial, administrative, and programmatic operations
Development of Audit Workplan

- Work Required by Law
  - Agency Financial Statement Audit (CFO Act)
  - Federal Information Security Management Act (FISMA)
  - Improper Payment Elimination and Recovery Act (IPERA)
  - American Recovery and Reinvestment Act of 2009 (ARRA)
- National Science Board and NSF Suggestions
- Congressional Requests
- Referrals from Investigations
- OIG Risk-based Assessments
  - NSF Management Challenges
  - Data analytics

Distribution of Audit Work, 2011

Audit Process < 7 months

Internal Meetings

Documents

Entrance Conference
Status Updates
Exit Conference
Survey/Planning
Fieldwork
Draft Report
Final Report

1 Month
2 – 4 Months
2 Months
Audits of NSF Awards

- Financial Assistance Overview
- Award Administration
- Cost Compliance

U.S. Financial Assistance Overview

- $550 billion in awards
  - 88,000 awardees and 26 Federal grant making agencies
  - Project and research, block, and formula
- Outcomes are designed to promote public good
- Challenges
  - Limited visibility of how Federal funds are spent by awardees
  - Support for funding requests much less than for contracts
  - $840 billion of assistance to stimulate the economy
  - Greater accountability and transparency over spending than ever
- Opportunities to enhance oversight with less
  - Automated oversight

Audit Capacity to Award Universe

88,000 Recipients of Grant Funding

40,000 are subject to A-133 Single Audit

200 OIG Audits

Framework for Grant Oversight
focuses limited resources on highest risk activities
Grants Differ From Contracts

**Grants**
- Promote services for the Public Good
- Merit review (competitive)
- Multiple awardees
- Award budget
- No government ownership
- Grant payments
  - Summary drawdowns
  - No invoices for claims
  - Expenditures not easily visible
- Salary percentages

**Contracts**
- Specified deliverables (Goods and Services)
- Competitive process
- One awardee
- Contract price
- Government ownership
- Contract payments
  - Itemized payment requests
  - Invoices to support claims
  - Detailed costs
- Salary hourly rates

OMB Circular A-133 Single Audit Act

- Annual audits of grantees with expenditures of $500,000+
  - Compliance and financial testing
  - Internal controls evaluated
  - Sample of award costs tested
  - Institution arranges for CPA firm to conduct audit
- A-133 reports are submitted annually
  - Federal Audit Clearinghouse
  - Copy of the report and electronic report data (NSF OIG uses for risk assessments)
- Not an Office of Inspector General (OIG) audit, but OIGs have oversight of the audit firm’s quality
- A-133 is primarily a management oversight tool
- 40,000 of 88,000 award institutions subject to A-133

Award Administration

Grant Recipient Responsibilities

We Look At
- Financial management system and expenditures
- Accuracy and timeliness of reporting, notifications
- Participant support, sub-award monitoring
- Effort reporting

Common Findings
- No approvals, no procedures for determining allowable costs
- Effort reporting not timely, not approved by appropriate official
- Budget not compared to actual expenditures
- Participant support reallocated without prior NSF-approval
- Inadequate sub-award monitoring

OMB Circulars A-110, A-133
**Cost Compliance**

Costs must be allowable, reasonable, allocable, documented, and consistent in treatment

- We Look At
  - Salaries & wages, equipment, travel, subawards, participant support, consultants, cost sharing, indirect costs

**Common Findings**

- **Unsupported expenditures**
  - Reimbursements not documented (invoices, etc.)
  - Time and effort not timely, not signed/certified

- **Unallowable expenditures**
  - Direct charges for costs in the indirect pool
  - Overload salary (unless NSF-approved)
  - Meals, non-related travel, alcohol
  - Unapproved changes in participant support

OMB Circulars A-21, A-87, A-122

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**Framework for Grant Oversight**

- Data analytics-driven, risk-based methodology for improving oversight
  - Identify institutions that may not use Federal funds properly
  - Techniques to surface questionable expenditures

- Life cycle approach to oversight
  - Mapping of end-to-end process to identify controls
  - 100% review of key financial and program information
  - Statistical sampling is limited
  - Focus attention on award and expenditure anomalies

- Complements traditional oversight approaches
  - Techniques to review process and transactions are similar
  - Transactions are targeted on questionable activities

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**End to End Process for Grant Oversight**

- Pre-Award Risks
  - Funding Over Time
  - Conflict of Interest
  - False Statements
  - False Certifications
  - Duplicate Funding
  - Inflated Budgets
  - Candidate
  - Suspended/Denaturalized

- Active Award Risks
  - Unallowable, Unreasonable, Unallocable Costs
  - Inadequate Documentation
  - General Ledger Differences From Draw Amount
  - Shortage
  - No/Late/Inadequate Reports
  - Unrelated Liquidity
  - Sub-Awards
  - Consultant
  - Consultants, Contracts
  - Duplicate Payments
  - New Costs in Hand/Cost transfers
  - Unreported Program Income
  - Excess Cash on Hand/Cost transfers

- Award End Risks
  - Unreported Program Income
  - Extensive Final Reports
  - Cost Transfer
  - General Ledger
  - Financial Adjustments
  - Unmet Cost Sharing
Data Sources

- **Internal**
  - Proposals: budgets, panel scores
  - Agency award systems, recipient reporting

- **External**
  - Excluded Parties List System (EPLS)
  - System for Award Management (SAM), formerly CCR
  - Dun and Bradstreet risk scores
  - Tax filings and public records
  - OMB A-133 Single Audit Act

- Recipient financial system records
  - General ledger and subsidiary ledger
  - Property
  - Travel and purchase card

Risk Assessment and Identification of Questionable Transactions

- **Phase I**
  - Identify High Risk Institutions
  - Agency Award Data
  - Quarterly expense reports
  - Cash draw downs

- **Data Analytics**
  - Continuous monitoring of grant awards and recipients

- **Phase II**
  - Identify Questionable Expenditures
  - Review Questionable Transactions
  - A-133 audits (FAC)
  - D&B, Recovery Board
  - SAM, and EPLS

Data Analytics Help to....

- **Determine reliability data fields**
  - Shape of the data (statistics)
  - Completeness of transactions and fields

- **Show anomalies**
  - Within a database
  - Between databases
  - Changes in behavior over time

- **Develop risk profiles for comparisons**
  - Awardee profiles
  - Award-type profiles
  - Program profiles
Common Data Analytics Tests

- Join
- Summarization
- Corrupt data
- Blank fields (noteworthy if field is mandatory)
- Invalid dates
- Bounds testing
- Completeness
- Invalid codes
- Unreliable computed fields
- Illogical field relationships
- Trend analysis
- Duplicates

Control Charts

Normal Distribution

Normal Activity

Anomalous Activity
Comparing Data Files
(Three Bucket Theory)

Vendor Table

Vendors Not Paid Yet

Vendors Paid but not In Vendor Table

Vendors Paid and In Vendor Table

Disbursing Transactions

Hardware and Software

- Hardware
  - SQL servers
  - Mainframe (QM)
  - Docking stations
  - Terminal server
- Software Applications*
  - Data mining and predictive analytics, e.g., SAS Enterprise Miner
  - Data interrogation – e.g., ACL, IDEA, MS Access, Excel
  - Statistical analysis – e.g., SPSS and SAS
  - Link analysis – e.g., I2, Plantir
  - Lexis-Nexis
  - Data conversion utilities (Monarch)
  - Internet, open-source research
  - Access to system query tools

* NSF OIG DOES NOT ENDORSE COMMERCIAL PRODUCTS

Forensic Audit Approach

- Audit objectives and audit universe
- Work with investigations
- Structured brainstorming
  - Consider a Subject Matter Expert (SME) conference
  - Identify indicators of potential fraud and ways to find in data
  - Process to identify financial risks
- Map out the end-to-end process
  - Identify systems and key processes
  - Identify key controls
- Identify and obtain transaction-level data
  - Record layout
  - 1000 record dump
  - ACL, IDEA, and Monarch can read virtually any data format (examples)*
- Build targeted business rules and run against data
- Examine anomalies

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Methods of Data Mining

- **Supervised Modeling**
  - Predict patterns in data based on patterns of known information
  - Decision Trees
  - Neural Networks

- **Unsupervised Modeling**
  - Identify anomalies or outliers based on grouping like transactions
  - Kohonen Networks
  - K-Means Clusters

Building a Forensic Capability

- **Develop Organizational Capability**
  - All audit staff should have basic skill with data analysis tools
  - Forensic audit units perform more sophisticated analyses
  - Targeted audits are more efficient in time and cost

- **Phased Development**
  - Hardware and software
  - Access to internal and external data
  - Staff: system savvy, analytical, business process knowledge
  - Training, then immediate application to work

- Very important component is the tone at the top

Future Opportunities For Automated Oversight

- Electronic invoices and receipts

- **Debit Cards**
  - Funding agency can access transaction charges
  - OIGs can run analytics on the digital data

- **Continuous Monitoring and Auditing**
  - Grantee performs
  - Agency performs
  - Government-wide efforts
Federal Initiatives

- Recovery Accountability and Transparency Board (RATB)
- Government Accountability and Transparency Board (GATB)
- OMB Grant Reform

Recovery Accountability and Transparency Board (RATB)

- American Recovery and Reinvestment Act 2009
  - To provide transparency of Recovery-related funds
  - To detect and prevent fraud, waste, and mismanagement
  - 11 Inspectors General on the Board

- Maintains websites for public information
  - Recovery.gov
  - Federal Transparency.gov
  - EducationJobsFund.gov

- Sunsets on September 30, 2013

Government Accountability and Transparency Board (GATB)

- Apply lessons from Recovery Act oversight
  - Support collection and display of government spending data
    - Build upon RATB capabilities and techniques
    - Identify implementation guidelines for integrating systems
    - Ensure the reliability of data
    - Broaden fraud detection technologies

- Members
  - 5 Inspectors General:
    - Education, NSF, HHS, Transportation, USPS
  - 5 Agency representatives:
    - OMB, HHS, Treasury, Defense, VA
  - Richard Ginman, Chair
    (Defense Procurement and Acquisition Policy)
OMB Grant Reform

- OMB effort to streamline the OMB circulars for financial assistance oversight
  - Cost compliance
  - Administrative principles
  - Audit monitoring and follow-up
- Federal Register Notice
  - First posting/comments closed April 30
  - Second posting/comments later in 2012
- Areas under discussion
  - Single Audit threshold and testing
  - Annual time and effort reporting
  - Cost accounting requirements

When should you contact OIG?

- Report significant administrative or financial problems
- Report allegations of wrongdoing
  - Research misconduct
  - Fraud / theft involving NSF funds
  - Violation of regulation, directive, or policy
- 1-800-428-2189 (anonymous hotline) or regular contact if anonymity not needed

OIG Outreach

- Presentations at conferences and seminars
  - For students, PIs, and administrators
  - OIG outreach visit can be requested
- Fact sheets and brochures, briefings, conference presentations [www.nsf.gov/oig/outreach_all.jsp](http://www.nsf.gov/oig/outreach_all.jsp)
- OIG Semiannual Report
- Requests: oig@nsf.gov
Questions?

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