AGENDA

- About GAO
- GAO’s Cybersecurity Related Work
- New Cybersecurity Program Audit Guide
- Feedback
- Q & A
## FISCAL YEAR 2023 ACCOMPLISHMENTS

### By the Numbers: A look at our FY 2023 accomplishments

<table>
<thead>
<tr>
<th>Category</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial Benefits</td>
<td>$70.4 billion in financial benefits</td>
</tr>
<tr>
<td>Return for each $1 of budget</td>
<td>about $84 return for each $1 of our budget</td>
</tr>
<tr>
<td>Recommendations</td>
<td>1,345 new recommendations</td>
</tr>
<tr>
<td>Improvements in government</td>
<td>1,220 improvements in federal government operations</td>
</tr>
<tr>
<td>Total Products</td>
<td>671 total products</td>
</tr>
<tr>
<td>Testimonies</td>
<td>57 testimonies</td>
</tr>
<tr>
<td>Bid protests handled</td>
<td>about 2,000 bid protests handled</td>
</tr>
<tr>
<td>Legal decisions and opinions</td>
<td>over 700 legal decisions and opinions issued</td>
</tr>
</tbody>
</table>

Source: GAO. | GAO-24-900483
The vision of the ITC Team (approximately 200 people) is to provide Congress with nonpartisan and independent insight into federal efforts to
• effectively and securely manage information technology,
• ensure the cybersecurity of the nation, and
• effectively manage the collection, dissemination and quality of government information.
INFORMATION TECHNOLOGY & CYBERSECURITY (ITC)

The **ITC team oversees** federal efforts to

- improve IT management practices,
- ensure the efficiency of IT acquisitions and operations,
- adopt IT management best practices,
- protect information systems, and
- improve how the government protects individual privacy and sensitive data.
ITC’S PORTFOLIO

INFORMATION TECHNOLOGY & CYBERSECURITY

- Center for Enhanced Cybersecurity
- Federal Information Systems Cybersecurity
- USDA IT Systems
- STAA Technology Assessment Matrix Work
- VA IT Systems
- IT Supply Chain
- Electronic Health Records
- Telecommunications
- FITARA
- Agile Software Development
- DOD IT Systems
- CIO Authorities
- DHS IT Systems
- Legacy / IT Modernizations
- Satellite (Weather) and Space Technology
- COVID-19-Related Work
- HHS IT Systems
- Privacy and Data Protection
- Information Management
- Cybersecurity Strategy and Oversight
- Census IT Systems
- Critical Infrastructure Protection
- IRS IT Systems
- IT Workforce
- Cybersecurity Workforce
## CYBERSECURITY CHALLENGES

### Four major cybersecurity challenge areas

<table>
<thead>
<tr>
<th>Establishing a comprehensive cybersecurity strategy and performing effective oversight</th>
<th>Securing federal systems and information</th>
<th>Protecting cyber critical infrastructure</th>
<th>Protecting privacy and sensitive data</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Develop and execute a more comprehensive federal strategy for national cybersecurity and global cyberspace.</td>
<td>5. Improve implementation of government-wide cybersecurity initiatives.</td>
<td>8. Strengthen the federal role in protecting the cybersecurity of critical infrastructure (e.g., electricity grid and telecommunications networks).</td>
<td>9. Improve federal efforts to protect privacy and sensitive data.</td>
</tr>
<tr>
<td>2. Mitigate global supply chain risks (e.g., installation of malicious software or hardware).</td>
<td>6. Address weaknesses in federal agency information security programs.</td>
<td></td>
<td>10. Appropriately limit the collection and use of personal information and ensure that it is obtained with appropriate knowledge or consent.</td>
</tr>
<tr>
<td>3. Address cybersecurity workforce management challenges.</td>
<td>7. Enhance the federal response to cyber incidents.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Ensure the security of emerging technologies (e.g., artificial intelligence and Internet of Things).</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

GAO MEDIA MENTIONS

• Homeland Security Today: GAO Highly Critical of DHS’s New Biometric Program (September 26, 2023)

• MeriTalk: GAO Flags IRS Cybersecurity Improvement for Fifth Straight Year (August 8, 2023)

• Politico: Government Watchdog Finds U.S. Embassies Running Software Vulnerable to Attacks (August 4, 2023)

• MeriTalk: GAO Chides NNSA for Pace in Addressing Cyber Threats (June 13, 2023)

Improving Communication Could Strengthen Federal Efforts to Prevent the Next Major Cyberattack

SEPTEMBER 17, 2023

We’ve already seen what can happen when one of the nation’s critical services is disrupted by a ...

The U.S. Is Less Prepared to Fight Cybercrime Than It Could Be

AUGUST 29, 2023

Cybercrimes in the United States have resulted in hundreds of billions of dollars in losses, and ...

After a Recent Hacking — What are the Risks and Rewards of Cloud Computing Use by the Federal Government?

AUGUST 16, 2023

Cloud computing offers significant opportunities to increase government efficiency, as well as ...

Source: https://www.gao.gov/blog
GAO CYBERSECURITY WORK

Cybersecurity:
State Needs to Expeditiously Implement Risk Management and Other Key Practices.
**GAO-23-107012**
Published: Sept. 28, 2023

Personnel Vetting:
DOD Needs a Reliable Schedule and Cost Estimate for the National Background Investigation Services Program.
**GAO-23-105670**
Published: Aug. 17, 2023

Cybersecurity Workforce:
**GAO-23-105945**
Published: July 27, 2023
POLL QUESTION

How much experience do you have in conducting cybersecurity audits?

a) none
b) 1-5 years
c) 5-10 years
d) 10+ years
GAO issued a new cybersecurity program audit guide for conducting cybersecurity performance audits.

(GAO-23-104705)
OVERVIEW OF THE CYBERSECURITY PROGRAM AUDIT GUIDE (CPAG)

• Provides a set of methodologies, and audit procedures to evaluate components of agency cybersecurity programs and systems.

• Relies on practices covered by the National Institute of Standards and Technology (NIST) guidance; Office of Management and Budget (OMB); and industry leading practices.
CPAG FEATURES

<table>
<thead>
<tr>
<th>Feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Points to many different criteria in the NIST Cybersecurity Framework and NIST 800-53 Rev. 5 controls, as well as others.</td>
</tr>
<tr>
<td>Provides information on how to conduct a cybersecurity audit.</td>
</tr>
<tr>
<td>Provides suggested audit steps.</td>
</tr>
</tbody>
</table>
DIFFERENCES WITH THE FEDERAL INFORMATION SYSTEM CONTROLS AUDIT MANUAL (FISCAM)

- FISCAM provides a methodology for assessing information system controls related to financial audits or attestation engagements.

- FISCAM was issued in 1999 and updated in 2009. Recently, an exposure draft of FISCAM was issued in June 2023 (GAO-23-104975).

- This revision reorders FISCAM to follow GAO’s Financial Audit Manual as many of the reviewed controls remain relevant to financial audits.
DEVELOPMENT OF CPAG

• Issued an initial questionnaire to the existing FISCAAM users and asked for input on possible improvements. The users included federal Office of Inspectors General, independent public accounting firms, and state auditors.

• Held 10 focus groups with internal and external stakeholders. The focus groups included senior GAO executives, IT managers, and analysts across GAO; federal Office of Inspectors General; Independent Public Accounting representatives; and state auditors.

• Interviewed officials from NIST, the Center for Internet Security, and ISACA, among others for their input and comments.

• Performed content analysis on focus groups to identify most frequently suggested changes.
CPAG STRUCTURE

• Organized into seven chapters with accompanying supplements.

• Not intended to list every possible control objective and audit procedure.
POLL QUESTION

Which high-risk area is most needed to be in a Cybersecurity Audit Guide, according to your own experience?

a) Risk management
b) Safeguarding of sensitive data
c) Protection of critical infrastructure
d) Incident response
e) Something else
CPAG STRUCTURE

Chapter 1: general guide to the audit process

Chapters 2-7: details on the main components of a comprehensive cybersecurity audit

Appendixes: glossary and a suggested list of criteria to use

Supplement attachment: Suggested audit procedure steps (Excel spreadsheets)
CHAPTER 1: CYBERSECURITY PROGRAM AUDIT PROCESS

- CPAG is based on generally accepted government auditing standards and systemic processes that GAO uses for performance audits.

- This chapter is a general guide to the audit process and the main phases of a cybersecurity performance audit:
  1.1 Planning and designing
  1.2 Performing
  1.3 Reporting
CHAPTERS 2 TO 7: COMPONENTS

• Chapters 2 to 7 of CPAG

- Security management practices of reviewing policies and procedures are embedded in each of the six main components.
- Each chapter contains key practices and criteria covered by NIST guidance, OMB policies and guidance, as well as industry leading practices, plus a corresponding supplement Excel sheet attachment with illustrative examples of controls, audit procedures, and criteria.
### Example Controls and Audit Procedures for Asset and Risk Management

#### 2.1 Assess IT Governance

<table>
<thead>
<tr>
<th>Control Objectives</th>
<th>Audit Procedures</th>
<th>Examples of Control Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2.1.1 Determine if the security control policies and procedures</strong></td>
<td>1. Review security policies and procedures and compare their content to NIST guidance and other applicable criteria. See if policies and procedures are implemented as intended.</td>
<td>National Institute of Standards and Technology (NIST) SP 800-53 Revision 5: Risk Assessment (RA)</td>
</tr>
<tr>
<td>- are documented and appropriately consider risk;</td>
<td>• consider risk;</td>
<td>RA-1 Policy and Procedures</td>
</tr>
<tr>
<td>- address purpose, scope, roles, responsibilities, and compliance;</td>
<td>• address purpose, scope, roles, responsibilities, and compliance;</td>
<td>Assessment, Authorization and Monitoring (CA)</td>
</tr>
<tr>
<td>- ensure that users can be held accountable for their actions;</td>
<td>• discuss that users are accountable for their actions;</td>
<td>CA-3 Information Exchange</td>
</tr>
<tr>
<td>- appropriately consider general and application controls;</td>
<td>• appropriately consider general and application controls;</td>
<td>NIST Cybersecurity Framework Version 1.1:</td>
</tr>
<tr>
<td>- are approved by management;</td>
<td>• are approved by management;</td>
<td>ID.GV-1 (Identify Governance): Organizational cybersecurity policy is established and communicated.</td>
</tr>
<tr>
<td>- are periodically reviewed and updated.</td>
<td>• are periodically reviewed and updated.</td>
<td>ID.RA-1 (Identify Risk Assessment): Asset vulnerabilities are identified and documented.</td>
</tr>
<tr>
<td><strong>2.1.2 Determine whether policies and procedures are implemented as intended.</strong></td>
<td>2. Review to see if security roles and responsibilities are defined. Roles and responsibilities may be defined in policies, job descriptions, agreements, hierarchy charts, and/or contracts. Analyze the contracts and service level agreements with critical vendors to determine if cybersecurity controls and incident notifications are addressed appropriately.</td>
<td>NIST SP 800-30 Revision 1</td>
</tr>
</tbody>
</table>

**Note:** The use of “should” statements within key practices does explicitly state in criteria. Auditors using this guide should apply determining which key practices and audit steps to implement.
CHAPTER 2: ASSET AND RISK MANAGEMENT

• Involves developing an organizational understanding of the risks to assets, systems, information, and operational capabilities.

• Key practices:
  2.1 Assess IT governance
  2.2 Assess management of assets
  2.3 Assess risk management strategy
  2.4 Review risk assessment
  2.5 Review plans of actions and milestones
  2.6 Assess management of supply chain risk
  2.7 Evaluate security awareness and training program
CHAPTER 3: CONFIGURATION MANAGEMENT

• Involves the identification and management of security features for an information system's hardware, software, and firmware; and systematically controlling changes to its configuration.

• Key practices:
  3.1 Review configuration management policies, plans, and procedures
  3.2 Review current configuration identification information
  3.3 Assess management of configuration changes
  3.4 Assess configuration monitoring activities
  3.5 Assess software update process
  3.6 Review documentation of emergency configuration changes
CHAPTER 4: IDENTITY & ACCESS MANAGEMENT

- Involves limiting or detecting inappropriate access to computer resources (data, equipment, and facilities), thereby protecting them from unauthorized modification, loss & disclosure

- Key practices:
  4.1 Evaluate system boundary protection
  4.2 Assess identification and authentication mechanisms
    - 4.2.1 Assess logical access controls
    - 4.2.2 Assess physical access controls
  4.3 Assess data protection and privacy activities
  4.4 Review the security policies on hiring, transfer, termination, and performance
POLL QUESTION

Where have you seen the greatest vulnerabilities in physical security controls used to restrict access and protect resources from loss or impairment?

a) Access control cards
b) Fire warning & suppression
c) Closed circuit cameras
d) Security guards
e) Something else
CHAPTER 5: CONTINUOUS MONITORING & LOGGING

• Involves maintaining ongoing awareness of cybersecurity, vulnerabilities, and threats occurring within an organization’s systems and networks

• Discusses **5 key practices** for reviewing this component
CHAPTER 5: KEY PRACTICES

Key practices

5.1 Assess Continuous Monitoring

5.2 Review the Continuous Monitoring Strategy and Implementation

5.3 Review Security Control Assessments and Assessor Independence

5.4 Review Automated Monitoring Results

5.5 Assess Security Event Identification, Logging, and Retention
CHAPTER 6: INCIDENT RESPONSE

• Actions to take when actual or potential jeopardy to the confidentiality, integrity, or availability of systems or the information is identified.

• Key practices:
  6.1 Assess incident response policies, plans, and procedures
  6.2 Assess incident response capabilities
  6.3 Assess incident response training and testing capabilities
  6.4 Assess incident monitoring capabilities
CHAPTER 6: INCIDENT RESPONSE PROCESS

START → Declare incident → Determine investigation scope → Share CTI → Adjust detection tools → Inform process improvement

- Instrumentation: Agency user reporting → Contractor reporting → Cyber threat intelligence (CTI)
- Collect and preserve data → Perform technical analysis → New signs of compromise?
  - YES: Contain activity
  - NO: Execute eradication plan
- 3rd party analysis support (if needed)
- Recover system(s) and services → Post-incident activities
- Activity detected?
  - YES: Contain activity
  - NO: Execute eradication plan

Legend:
- Preparation
- Detection and analysis
- Containment
- Eradication and recovery
- Coordination

A file that contains critical password information has been leaked at an information security organization. What is the best type of contingency plan for this situation, based on your past experience?

a) Incident response plan  
b) Disaster recovery plan  
c) Continuity of operations plan  
d) Business continuity plan
CHAPTER 7: CONTINGENCY PLANNING AND RECOVERY

• Involves developing and maintaining a contingency plan; assigning and training individuals for recovery operations; and executing the successful restoration of systems, assets, and capabilities.

• Key practices:
  7.1 Review contingency plans
  7.2 Assess steps taken to prevent and minimize potential damage and interruptions
  7.3 Assess testing of contingency plans
  7.4 Review the documented lessons learned
CHAPTER 7: CONTINGENCY PLANNING AND RECOVERY PROCESS

Contingency planning and recovery

Update contingency plan
Test or implement contingency plan
Document lessons learned
Implement lessons learned

Update the plan annually to account for lessons learned and changes to the information system.
Test the plan or conduct table top exercises at a frequency determined by organizational requirements.
Document the contingency plan test results and lessons learned in an after-action report.
Implement changes, such as improved training, based on lessons learned.

POLL QUESTION

What kind of additional training regarding CPAG would you prefer?

a) Live training
b) Self-paced individual classes
c) Real-world case studies that show implementation
d) A mixture of all of the above
HAVE FEEDBACK?

• We plan to have revisions and updates for CPAG when the new NIST Cybersecurity Framework version 2.0 is published.

• Do you have any ideas on what else we should include?

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