NIST Special Publication 800-53
Revision 2 Excerpt

Recommended Security Controls for Federal Information Systems

LOW-IMPACT BASELINE

INFORMATION SECURITY

ANNEX 1

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ANNEX ONE

BASELINE SECURITY CONTROLS

LOW-IMPACT INFORMATION SYSTEMS

Organizations are required to employ security controls to meet security requirements defined by applicable laws, Executive Orders, directives, policies, standards, or regulations (e.g., Federal Information Security Management Act, OMB Circular A-130, Appendix III). The challenge for organizations is to determine the appropriate set of security controls, which if implemented and determined to be effective in their application, would most cost-effectively comply with the stated security requirements. Selecting the appropriate set of security controls to meet the specific, and sometimes unique, security requirements of an organization is an important task—a task that demonstrates the organization's commitment to security and the due diligence exercised in protecting the confidentiality, integrity, and availability of its information and information systems. The ultimate objective is to implement information systems that are dependable in the face of threats.

To assist organizations in making the appropriate selection of security controls for their information systems, the concept of *baseline* controls is introduced. Baseline controls are the initial security controls recommended for an information system based on the system's security categorization in accordance with FIPS 199.[1] Table 1 provides a summary of the security controls and control enhancements in the low-impact baseline from Appendix D, NIST Special Publication 800-53. Part one follows, containing the full descriptions of the controls and associated enhancements listed in the table. Part two provides the minimum assurance requirements for low-impact information systems from Appendix E, NIST Special Publication 800-53.

Organizations are expected to apply the tailoring guidance described in Section 3.3 of NIST Special Publication 800-53 (as amended) to the initial low-impact baseline security controls—producing a tailored baseline. The tailored security control baseline serves as the starting point for organizations in determining the appropriate safeguards and countermeasures necessary to protect their information systems. Supplements to the tailored baseline (see Section 3.4 of NIST Special Publication 800-53) will likely be necessary in order to adequately mitigate risks to organizational operations (including mission, functions, image, and reputation), organizational assets, and individuals. The tailored baseline is supplemented based on an organizational assessment of risk with the supplemented baseline documented in the security plan for the information system. The supplemented security control baseline, along with any information system use restrictions required to achieve adequate risk mitigation, represents the organization's definition for information system security due diligence.

[1] FIPS 199 security categories are based on the potential impact on an organization or individuals should certain events occur which jeopardize the information and information systems needed by the organization to accomplish its assigned mission, protect its assets, fulfill its legal responsibilities, maintain its day-to-day functions, and protect individuals.

TABLE 1: SUMMARY OF BASELINE SECURITY CONTROLS

CNTL NO.	CONTROL NAME	CONTROL BASELINES		
		LOW	MOD	HIGH
Access Control				
AC-1	Access Control Policy and Procedures	AC-1	AC-1	AC-1
AC-2	Account Management	AC-2	AC-2 (1) (2) (3) (4)	AC-2 (1) (2) (3) (4)
AC-3	Access Enforcement	AC-3	AC-3 (1)	AC-3 (1)
AC-4	Information Flow Enforcement	Not Selected	AC-4	AC-4
AC-5	Separation of Duties	Not Selected	AC-5	AC-5
AC-6	Least Privilege	Not Selected	AC-6	AC-6
AC-7	Unsuccessful Login Attempts	AC-7	AC-7	AC-7
AC-8	System Use Notification	AC-8	AC-8	AC-8
AC-9	Previous Logon Notification	Not Selected	Not Selected	Not Selected
AC-10	Concurrent Session Control	Not Selected	Not Selected	AC-10
AC-11	Session Lock	Not Selected	AC-11	AC-11
AC-12	Session Termination	Not Selected	AC-12	AC-12 (1)
AC-13	Supervision and Review—Access Control	AC-13	AC-13 (1)	AC-13 (1)
AC-14	Permitted Actions without Identification or Authentication	AC-14	AC-14 (1)	AC-14 (1)
AC-15	Automated Marking	Not Selected	Not Selected	AC-15
AC-16	Automated Labeling	Not Selected	Not Selected	Not Selected
AC-17	Remote Access	AC-17	AC-17 (1) (2) (3) (4)	AC-17 (1) (2) (3) (4)
AC-18	Wireless Access Restrictions	AC-18	AC-18 (1)	AC-18 (1) (2)
AC-19	Access Control for Portable and Mobile Devices	Not Selected	AC-19	AC-19
AC-20	Use of External Information Systems	AC-20	AC-20 (1)	AC-20 (1)
Awareness and Training				
AT-1	Security Awareness and Training Policy and Procedures	AT-1	AT-1	AT-1
AT-2	Security Awareness	AT-2	AT-2	AT-2
AT-3	Security Training	AT-3	AT-3	AT-3
AT-4	Security Training Records	AT-4	AT-4	AT-4
AT-5	Contacts with Security Groups and Associations	Not Selected	Not Selected	Not Selected
Audit and Accountability				
AU-1	Audit and Accountability Policy and Procedures	AU-1	AU-1	AU-1
AU-2	Auditable Events	AU-2	AU-2 (3)	AU-2 (1) (2) (3)
AU-3	Content of Audit Records	AU-3	AU-3 (1)	AU-3 (1) (2)
AU-4	Audit Storage Capacity	AU-4	AU-4	AU-4
AU-5	Response to Audit Processing Failures	AU-5	AU-5	AU-5 (1) (2)
AU-6	Audit Monitoring, Analysis, and Reporting	Not Selected	AU-6 (2)	AU-6 (1) (2)

CNTL NO.	CONTROL NAME	CONTROL BASELINES		
		LOW	MOD	HIGH
AU-7	Audit Reduction and Report Generation	Not Selected	AU-7 (1)	AU-7 (1)
AU-8	Time Stamps	AU-8	AU-8 (1)	AU-8 (1)
AU-9	Protection of Audit Information	AU-9	AU-9	AU-9
AU-10	Non-repudiation	Not Selected	Not Selected	Not Selected
AU-11	Audit Record Retention	AU-11	AU-11	AU-11
Certification, Accreditation, and Security Assessments				
CA-1	Certification, Accreditation, and Security Assessment Policies and Procedures	CA-1	CA-1	CA-1
CA-2	Security Assessments	CA-2	CA-2	CA-2
CA-3	Information System Connections	CA-3	CA-3	CA-3
CA-4	Security Certification	CA-4	CA-4 (1)	CA-4 (1)
CA-5	Plan of Action and Milestones	CA-5	CA-5	CA-5
CA-6	Security Accreditation	CA-6	CA-6	CA-6
CA-7	Continuous Monitoring	CA-7	CA-7	CA-7
Configuration Management				
CM-1	Configuration Management Policy and Procedures	CM-1	CM-1	CM-1
CM-2	Baseline Configuration	CM-2	CM-2 (1)	CM-2 (1) (2)
CM-3	Configuration Change Control	Not Selected	CM-3	CM-3 (1)
CM-4	Monitoring Configuration Changes	Not Selected	CM-4	CM-4
CM-5	Access Restrictions for Change	Not Selected	CM-5	CM-5 (1)
CM-6	Configuration Settings	CM-6	CM-6	CM-6 (1)
CM-7	Least Functionality	Not Selected	CM-7	CM-7 (1)
CM-8	Information System Component Inventory	CM-8	CM-8 (1)	CM-8 (1) (2)
Contingency Planning				
CP-1	Contingency Planning Policy and Procedures	CP-1	CP-1	CP-1
CP-2	Contingency Plan	CP-2	CP-2 (1)	CP-2 (1) (2)
CP-3	Contingency Training	Not Selected	CP-3	CP-3 (1)
CP-4	Contingency Plan Testing and Exercises	CP-4	CP-4 (1)	CP-4 (1) (2)
CP-5	Contingency Plan Update	CP-5	CP-5	CP-5
CP-6	Alternate Storage Site	Not Selected	CP-6 (1) (3)	CP-6 (1) (2) (3)
CP-7	Alternate Processing Site	Not Selected	CP-7 (1) (2) (3)	CP-7 (1) (2) (3) (4)
CP-8	Telecommunications Services	Not Selected	CP-8 (1) (2)	CP-8 (1) (2) (3) (4)
CP-9	Information System Backup	CP-9	CP-9 (1) (4)	CP-9 (1) (2) (3) (4)
CP-10	Information System Recovery and Reconstitution	CP-10	CP-10	CP-10 (1)
Identification and Authentication				
IA-1	Identification and Authentication Policy and Procedures	IA-1	IA-1	IA-1
IA-2	User Identification and Authentication	IA-2	IA-2 (1)	IA-2 (2) (3)

CNTL NO.	CONTROL NAME	CONTROL BASELINES		
		LOW	MOD	HIGH
IA-3	Device Identification and Authentication	Not Selected	IA-3	IA-3
IA-4	Identifier Management	IA-4	IA-4	IA-4
IA-5	Authenticator Management	IA-5	IA-5	IA-5
IA-6	Authenticator Feedback	IA-6	IA-6	IA-6
IA-7	Cryptographic Module Authentication	IA-7	IA-7	IA-7
Incident Response				
IR-1	Incident Response Policy and Procedures	IR-1	IR-1	IR-1
IR-2	Incident Response Training	Not Selected	IR-2	IR-2 (1)
IR-3	Incident Response Testing and Exercises	Not Selected	IR-3	IR-3 (1)
IR-4	Incident Handling	IR-4	IR-4 (1)	IR-4 (1)
IR-5	Incident Monitoring	Not Selected	IR-5	IR-5 (1)
IR-6	Incident Reporting	IR-6	IR-6 (1)	IR-6 (1)
IR-7	Incident Response Assistance	IR-7	IR-7 (1)	IR-7 (1)
Maintenance				
MA-1	System Maintenance Policy and Procedures	MA-1	MA-1	MA-1
MA-2	Controlled Maintenance	MA-2	MA-2 (1)	MA-2 (1) (2)
MA-3	Maintenance Tools	Not Selected	MA-3	MA-3 (1) (2) (3)
MA-4	Remote Maintenance	MA-4	MA-4 (1) (2)	MA-4 (1) (2) (3)
MA-5	Maintenance Personnel	MA-5	MA-5	MA-5
MA-6	Timely Maintenance	Not Selected	MA-6	MA-6
Media Protection				
MP-1	Media Protection Policy and Procedures	MP-1	MP-1	MP-1
MP-2	Media Access	MP-2	MP-2 (1)	MP-2 (1)
MP-3	Media Labeling	Not Selected	Not Selected	MP-3
MP-4	Media Storage	Not Selected	MP-4	MP-4
MP-5	Media Transport	Not Selected	MP-5 (1) (2)	MP-5 (1) (2) (3)
MP-6	Media Sanitization and Disposal	MP-6	MP-6	MP-6 (1) (2)
Physical and Environmental Protection				
PE-1	Physical and Environmental Protection Policy and Procedures	PE-1	PE-1	PE-1
PE-2	Physical Access Authorizations	PE-2	PE-2	PE-2
PE-3	Physical Access Control	PE-3	PE-3	PE-3 (1)
PE-4	Access Control for Transmission Medium	Not Selected	Not Selected	PE-4
PE-5	Access Control for Display Medium	Not Selected	PE-5	PE-5
PE-6	Monitoring Physical Access	PE-6	PE-6 (1)	PE-6 (1) (2)
PE-7	Visitor Control	PE-7	PE-7 (1)	PE-7 (1)
PE-8	Access Records	PE-8	PE-8	PE-8 (1) (2)
PE-9	Power Equipment and Power Cabling	Not Selected	PE-9	PE-9
PE-10	Emergency Shutoff	Not Selected	PE-10	PE-10 (1)

CNTL NO.	CONTROL NAME	CONTROL BASELINES		
		LOW	MOD	HIGH
PE-11	Emergency Power	Not Selected	PE-11	PE-11 (1)
PE-12	Emergency Lighting	PE-12	PE-12	PE-12
PE-13	Fire Protection	PE-13	PE-13 (1) (2) (3)	PE-13 (1) (2) (3)
PE-14	Temperature and Humidity Controls	PE-14	PE-14	PE-14
PE-15	Water Damage Protection	PE-15	PE-15	PE-15 (1)
PE-16	Delivery and Removal	PE-16	PE-16	PE-16
PE-17	Alternate Work Site	Not Selected	PE-17	PE-17
PE-18	Location of Information System Components	Not Selected	PE-18	PE-18 (1)
PE-19	Information Leakage	Not Selected	Not Selected	Not Selected
Planning				
PL-1	Security Planning Policy and Procedures	PL-1	PL-1	PL-1
PL-2	System Security Plan	PL-2	PL-2	PL-2
PL-3	System Security Plan Update	PL-3	PL-3	PL-3
PL-4	Rules of Behavior	PL-4	PL-4	PL-4
PL-5	Privacy Impact Assessment	PL-5	PL-5	PL-5
PL-6	Security-Related Activity Planning	Not Selected	PL-6	PL-6
Personnel Security				
PS-1	Personnel Security Policy and Procedures	PS-1	PS-1	PS-1
PS-2	Position Categorization	PS-2	PS-2	PS-2
PS-3	Personnel Screening	PS-3	PS-3	PS-3
PS-4	Personnel Termination	PS-4	PS-4	PS-4
PS-5	Personnel Transfer	PS-5	PS-5	PS-5
PS-6	Access Agreements	PS-6	PS-6	PS-6
PS-7	Third-Party Personnel Security	PS-7	PS-7	PS-7
PS-8	Personnel Sanctions	PS-8	PS-8	PS-8
Risk Assessment				
RA-1	Risk Assessment Policy and Procedures	RA-1	RA-1	RA-1
RA-2	Security Categorization	RA-2	RA-2	RA-2
RA-3	Risk Assessment	RA-3	RA-3	RA-3
RA-4	Risk Assessment Update	RA-4	RA-4	RA-4
RA-5	Vulnerability Scanning	Not Selected	RA-5	RA-5 (1) (2)
System and Services Acquisition				
SA-1	System and Services Acquisition Policy and Procedures	SA-1	SA-1	SA-1
SA-2	Allocation of Resources	SA-2	SA-2	SA-2
SA-3	Life Cycle Support	SA-3	SA-3	SA-3
SA-4	Acquisitions	SA-4	SA-4 (1)	SA-4 (1)
SA-5	Information System Documentation	SA-5	SA-5 (1)	SA-5 (1) (2)
SA-6	Software Usage Restrictions	SA-6	SA-6	SA-6

CNTL NO.	CONTROL NAME	CONTROL BASELINES		
		LOW	MOD	HIGH
SA-7	User Installed Software	SA-7	SA-7	SA-7
SA-8	Security Engineering Principles	Not Selected	SA-8	SA-8
SA-9	External Information System Services	SA-9	SA-9	SA-9
SA-10	Developer Configuration Management	Not Selected	Not Selected	SA-10
SA-11	Developer Security Testing	Not Selected	SA-11	SA-11
System and Communications Protection				
SC-1	System and Communications Protection Policy and Procedures	SC-1	SC-1	SC-1
SC-2	Application Partitioning	Not Selected	SC-2	SC-2
SC-3	Security Function Isolation	Not Selected	Not Selected	SC-3
SC-4	Information Remnance	Not Selected	SC-4	SC-4
SC-5	Denial of Service Protection	SC-5	SC-5	SC-5
SC-6	Resource Priority	Not Selected	Not Selected	Not Selected
SC-7	Boundary Protection	SC-7	SC-7 (1) (2) (3) (4) (5)	SC-7 (1) (2) (3) (4) (5) (6)
SC-8	Transmission Integrity	Not Selected	SC-8	SC-8 (1)
SC-9	Transmission Confidentiality	Not Selected	SC-9	SC-9 (1)
SC-10	Network Disconnect	Not Selected	SC-10	SC-10
SC-11	Trusted Path	Not Selected	Not Selected	Not Selected
SC-12	Cryptographic Key Establishment and Management	Not Selected	SC-12	SC-12
SC-13	Use of Cryptography	SC-13	SC-13	SC-13
SC-14	Public Access Protections	SC-14	SC-14	SC-14
SC-15	Collaborative Computing	Not Selected	SC-15	SC-15
SC-16	Transmission of Security Parameters	Not Selected	Not Selected	Not Selected
SC-17	Public Key Infrastructure Certificates	Not Selected	SC-17	SC-17
SC-18	Mobile Code	Not Selected	SC-18	SC-18
SC-19	Voice Over Internet Protocol	Not Selected	SC-19	SC-19
SC-20	Secure Name /Address Resolution Service (Authoritative Source)	Not Selected	SC-20	SC-20
SC-21	Secure Name /Address Resolution Service (Recursive or Caching Resolver)	Not Selected	Not Selected	SC-21
SC-22	Architecture and Provisioning for Name/Address Resolution Service	Not Selected	SC-22	SC-22
SC-23	Session Authenticity	Not Selected	SC-23	SC-23
System and Information Integrity				
SI-1	System and Information Integrity Policy and Procedures	SI-1	SI-1	SI-1
SI-2	Flaw Remediation	SI-2	SI-2 (2)	SI-2 (1) (2)
SI-3	Malicious Code Protection	SI-3	SI-3 (1) (2)	SI-3 (1) (2)
SI-4	Information System Monitoring Tools and Techniques	Not Selected	SI-4 (4)	SI-4 (2) (4) (5)

CNTL NO.	CONTROL NAME	CONTROL BASELINES		
		LOW	MOD	HIGH
SI-5	Security Alerts and Advisories	SI-5	SI-5	SI-5 (1)
SI-6	Security Functionality Verification	Not Selected	Not Selected	SI-6
SI-7	Software and Information Integrity	Not Selected	Not Selected	SI-7 (1) (2)
SI-8	Spam Protection	Not Selected	SI-8	SI-8 (1)
SI-9	Information Input Restrictions	Not Selected	SI-9	SI-9
SI-10	Information Accuracy, Completeness, Validity, and Authenticity	Not Selected	SI-10	SI-10
SI-11	Error Handling	Not Selected	SI-11	SI-11
SI-12	Information Output Handling and Retention	Not Selected	SI-12	SI-12

Industrial Control System Supplements to the Security Control Baselines

The following table lists the recommended Industrial Control System supplements (highlighted in **bold** text) to the security controls baselines in Appendix D, NIST Special Publication 800-53.

CNTL NO.	CONTROL NAME	CONTROL BASELINES		
		LOW	MOD	HIGH
Access Control				
AC-3	Access Enforcement	AC-3	AC-3 (1) **(ICS-1)**	AC-3 (1) **(ICS-1)**
Configuration Management				
CM-3	Configuration Change Control	Not Selected	CM-3 **(ICS-1)**	CM-3 (1) **(ICS-1)**
Physical and Environmental Protection				
PE-9	Power Equipment and Power Cabling	Not Selected	PE-9 **(1)**	PE-9 **(1)**
PE-11	Emergency Power	**PE-11**	PE-11 **(1)**	PE-11 (1) **(2)**

PART ONE

SECURITY CONTROLS AND ENHANCEMENTS

LOW-IMPACT INFORMATION SYSTEMS

FAMILY: ACCESS CONTROL **CLASS:** TECHNICAL

AC-1 ACCESS CONTROL POLICY AND PROCEDURES

Control: The organization develops, disseminates, and periodically reviews/updates: (i) a formal, documented, access control policy that addresses purpose, scope, roles, responsibilities, management commitment, coordination among organizational entities, and compliance; and (ii) formal, documented procedures to facilitate the implementation of the access control policy and associated access controls.

Supplemental Guidance: The access control policy and procedures are consistent with applicable laws, Executive Orders, directives, policies, regulations, standards, and guidance. The access control policy can be included as part of the general information security policy for the organization. Access control procedures can be developed for the security program in general, and for a particular information system, when required. NIST Special Publication 800-12 provides guidance on security policies and procedures.

Control Enhancements: None.

AC-2 ACCOUNT MANAGEMENT

Control: The organization manages information system accounts, including establishing, activating, modifying, reviewing, disabling, and removing accounts. The organization reviews information system accounts [*Assignment: organization-defined frequency, at least annually*].

Supplemental Guidance: Account management includes the identification of account types (i.e., individual, group, and system), establishment of conditions for group membership, and assignment of associated authorizations. The organization identifies authorized users of the information system and specifies access rights/privileges. The organization grants access to the information system based on: (i) a valid need-to-know/need-to-share that is determined by assigned official duties and satisfying all personnel security criteria; and (ii) intended system usage. The organization requires proper identification for requests to establish information system accounts and approves all such requests. The organization specifically authorizes and monitors the use of guest/anonymous accounts and removes, disables, or otherwise secures unnecessary accounts. Account managers are notified when information system users are terminated or transferred and associated accounts are removed, disabled, or otherwise secured. Account managers are also notified when users' information system usage or need-to-know/need-to-share changes.

Control Enhancements: None.

AC-3 ACCESS ENFORCEMENT

Control: The information system enforces assigned authorizations for controlling access to the system in accordance with applicable policy.

Supplemental Guidance: Access control policies (e.g., identity-based policies, role-based policies, rule-based policies) and associated access enforcement mechanisms (e.g., access control lists, access control matrices, cryptography) are employed by organizations to control access between users (or processes acting on behalf of users) and objects (e.g., devices, files, records, processes, programs, domains) in the information system. In addition to controlling access at the information system level, access enforcement mechanisms are employed at the application level, when necessary, to provide increased information security for the organization. Consideration is given to the implementation of a controlled, audited, and manual override of automated mechanisms in the event of emergencies or other serious events. If encryption of stored information is employed as an access enforcement mechanism, the cryptography used is FIPS 140-2 (as amended) compliant. Related security control: SC-13.

Control Enhancements: None.

AC-7 UNSUCCESSFUL LOGIN ATTEMPTS

Control: The information system enforces a limit of [*Assignment: organization-defined number*] consecutive invalid access attempts by a user during a [*Assignment: organization-defined time period*] time period. The information system automatically [*Selection: locks the account/node for an* [*Assignment: organization-defined time period*], *delays next login prompt according to Assignment: organization-defined delay algorithm.*]] when the maximum number of unsuccessful attempts is exceeded.

Supplemental Guidance: Due to the potential for denial of service, automatic lockouts initiated by the information system are usually temporary and automatically release after a predetermined time period established by the organization.

Control Enhancements: None.

AC-8 SYSTEM USE NOTIFICATION

Control: The information system displays an approved, system use notification message before granting system access informing potential users: (i) that the user is accessing a U.S. Government information system; (ii) that system usage may be monitored, recorded, and subject to audit; (iii) that unauthorized use of the system is prohibited and subject to criminal and civil penalties; and (iv) that use of the system indicates consent to monitoring and recording. The system use notification message provides appropriate privacy and security notices (based on associated privacy and security policies or summaries) and remains on the screen until the user takes explicit actions to log on to the information system.

Supplemental Guidance: Privacy and security policies are consistent with applicable laws, Executive Orders, directives, policies, regulations, standards, and guidance. System use notification messages can be implemented in the form of warning banners displayed when individuals log in to the information system. For publicly accessible systems: (i) the system use information is available and when appropriate, is displayed before granting access; (ii) any references to monitoring, recording, or auditing are in keeping with privacy accommodations for such systems that generally prohibit those activities; and (iii) the notice given to public users of the information system includes a description of the authorized uses of the system.

Control Enhancements: None.

AC-13 SUPERVISION AND REVIEW — ACCESS CONTROL

Control: The organization supervises and reviews the activities of users with respect to the enforcement and usage of information system access controls.

Supplemental Guidance: The organization reviews audit records (e.g., user activity logs) for inappropriate activities in accordance with organizational procedures. The organization investigates any unusual information system-related activities and periodically reviews changes to access authorizations. The organization reviews more frequently the activities of users with significant information system roles and responsibilities. The extent of the audit record reviews is based on the FIPS 199 impact level of the information system. For example, for low-impact systems, it is not intended that security logs be reviewed frequently for every workstation, but rather at central points such as a web proxy or email servers and when specific circumstances warrant review of other audit records. NIST Special Publication 800-92 provides guidance on computer security log management.

Control Enhancements: None.

AC-14 PERMITTED ACTIONS WITHOUT IDENTIFICATION OR AUTHENTICATION

Control: The organization identifies and documents specific user actions that can be performed on the information system without identification or authentication.

Supplemental Guidance: The organization allows limited user activity without identification and authentication for public websites or other publicly available information systems (e.g., individuals accessing a federal information system at http://www.firstgov.gov). Related security control: IA-2.

Control Enhancements: None.

AC-17 REMOTE ACCESS

Control: The organization authorizes, monitors, and controls all methods of remote access to the information system.

Supplemental Guidance: Remote access is any access to an organizational information system by a user (or an information system) communicating through an external, non-organization-controlled network (e.g., the Internet). Examples of remote access methods include dial-up, broadband, and wireless. Remote access controls are applicable to information systems other than public web servers or systems specifically designed for public access. The organization restricts access achieved through dial-up connections (e.g., limiting dial-up access based upon source of request) or protects against unauthorized connections or subversion of authorized connections (e.g., using virtual private network technology). NIST Special Publication 800-63 provides guidance on remote electronic authentication. If the federal Personal Identity Verification (PIV) credential is used as an identification token where cryptographic token-based access control is employed, the access control system conforms to the requirements of FIPS 201 and NIST Special Publications 800-73 and 800-78. NIST Special Publication 800-77 provides guidance on IPsec-based virtual private networks. Related security control: IA-2.

Control Enhancements: None.

AC-18 WIRELESS ACCESS RESTRICTIONS

Control: The organization: (i) establishes usage restrictions and implementation guidance for wireless technologies; and (ii) authorizes, monitors, controls wireless access to the information system.

Supplemental Guidance: NIST Special Publications 800-48 and 800-97 provide guidance on wireless network security. NIST Special Publication 800-94 provides guidance on wireless intrusion detection and prevention.

Control Enhancements: None.

AC-20 USE OF EXTERNAL INFORMATION SYSTEMS

Control: The organization establishes terms and conditions for authorized individuals to: (i) access the information system from an external information system; and (ii) process, store, and/or transmit organization-controlled information using an external information system.

Supplemental Guidance: External information systems are information systems or components of information systems that are outside of the accreditation boundary established by the organization and for which the organization typically has no direct control over the application of required security controls or the assessment of security control effectiveness. External information systems include, but are not limited to, personally owned information systems (e.g., computers, cellular telephones, or personal digital assistants); privately owned computing and communications devices resident in commercial or public facilities (e.g., hotels, convention centers, or airports); information systems owned or controlled by nonfederal governmental organizations; and federal information systems that are not owned by, operated by, or under the direct control of the organization.

Authorized individuals include organizational personnel, contractors, or any other individuals with authorized access to the organizational information system. This control does not apply to the use of external information systems to access organizational information systems and information that are intended for public access (e.g., individuals accessing federal information through public interfaces to organizational information systems). The organization establishes terms and conditions for the use of external information systems in accordance with organizational security policies and procedures. The terms and conditions address as a minimum; (i) the types of applications that can be accessed on the organizational information system from the external information system; and (ii) the maximum FIPS 199 security category of information that can be processed, stored, and transmitted on the external information system.

Control Enhancements: None.

FAMILY: AWARENESS AND TRAINING **CLASS:** OPERATIONAL

AT-1 SECURITY AWARENESS AND TRAINING POLICY AND PROCEDURES

Control: The organization develops, disseminates, and periodically reviews/updates: (i) a formal, documented, security awareness and training policy that addresses purpose, scope, roles, responsibilities, management commitment, coordination among organizational entities, and compliance; and (ii) formal, documented procedures to facilitate the implementation of the security awareness and training policy and associated security awareness and training controls.

Supplemental Guidance: The security awareness and training policy and procedures are consistent with applicable laws, Executive Orders, directives, policies, regulations, standards, and guidance. The security awareness and training policy can be included as part of the general information security policy for the organization. Security awareness and training procedures can be developed for the security program in general, and for a particular information system, when required. NIST Special Publications 800-16 and 800-50 provide guidance on security awareness and training. NIST Special Publication 800-12 provides guidance on security policies and procedures.

Control Enhancements: None.

AT-2 SECURITY AWARENESS

Control: The organization provides basic security awareness training to all information system users (including managers and senior executives) before authorizing access to the system, when required by system changes, and [*Assignment: organization-defined frequency, at least annually*] thereafter.

Supplemental Guidance: The organization determines the appropriate content of security awareness training based on the specific requirements of the organization and the information systems to which personnel have authorized access. The organization's security awareness program is consistent with the requirements contained in C.F.R. Part 5 Subpart C (5 C.F.R 930.301) and with the guidance in NIST Special Publication 800-50.

Control Enhancements: None.

AT-3 SECURITY TRAINING

Control: The organization identifies personnel that have significant information system security roles and responsibilities during the system development life cycle, documents those roles and responsibilities, and provides appropriate information system security training: (i) before authorizing access to the system or performing assigned duties; (ii) when required by system changes; and (iii) [*Assignment: organization-defined frequency*] thereafter.

Supplemental Guidance: The organization determines the appropriate content of security training based on the specific requirements of the organization and the information systems to which personnel have authorized access. In addition, the organization provides system managers, system and network administrators, and other personnel having access to system-level software, adequate technical training to perform their assigned duties. The organization's security training program is consistent with the requirements contained in C.F.R. Part 5 Subpart C (5 C.F.R 930.301) and with the guidance in NIST Special Publication 800-50.

Control Enhancements: None.

AT-4 SECURITY TRAINING RECORDS

Control: The organization documents and monitors individual information system security training activities including basic security awareness training and specific information system security training.

Supplemental Guidance: None.

Control Enhancements: None.

FAMILY: AUDIT AND ACCOUNTABILITY **CLASS:** TECHNICAL

AU-1 AUDIT AND ACCOUNTABILITY POLICY AND PROCEDURES

Control: The organization develops, disseminates, and periodically reviews/updates: (i) a formal, documented, audit and accountability policy that addresses purpose, scope, roles, responsibilities, management commitment, coordination among organizational entities, and compliance; and (ii) formal, documented procedures to facilitate the implementation of the audit and accountability policy and associated audit and accountability controls.

Supplemental Guidance: The audit and accountability policy and procedures are consistent with applicable laws, Executive Orders, directives, policies, regulations, standards, and guidance. The audit and accountability policy can be included as part of the general information security policy for the organization. Audit and accountability procedures can be developed for the security program in general, and for a particular information system, when required. NIST Special Publication 800-12 provides guidance on security policies and procedures.

Control Enhancements: None.

AU-2 AUDITABLE EVENTS

Control: The information system generates audit records for the following events: [*Assignment: organization-defined auditable events*].

Supplemental Guidance: The purpose of this control is to identify important events which need to be audited as significant and relevant to the security of the information system. The organization specifies which information system components carry out auditing activities. Auditing activity can affect information system performance. Therefore, the organization decides, based upon a risk assessment, which events require auditing on a continuous basis and which events require auditing in response to specific situations. Audit records can be generated at various levels of abstraction, including at the packet level as information traverse the network. Selecting the right level of abstraction for audit record generation is a critical aspect of an audit capability and can facilitate the identification of root causes to problems. Additionally, the security audit function is coordinated with the network health and status monitoring function to enhance the mutual support between the two functions by the selection of information to be recorded by each function. The checklists and configuration guides at http://csrc.nist.gov/pcig/cig.html provide recommended lists of auditable events. The organization defines auditable events that are adequate to support after-the-fact investigations of security incidents. NIST Special Publication 800-92 provides guidance on computer security log management.

Control Enhancements: None.

AU-3 CONTENT OF AUDIT RECORDS

Control: The information system produces audit records that contain sufficient information to establish what events occurred, the sources of the events, and the outcomes of the events.

Supplemental Guidance: Audit record content includes, for most audit records: (i) date and time of the event; (ii) the component of the information system (e.g., software component, hardware component) where the event occurred; (iii) type of event; (iv) user/subject identity; and (v) the outcome (success or failure) of the event. NIST Special Publication 800-92 provides guidance on computer security log management.

Control Enhancements: None.

AU-4 AUDIT STORAGE CAPACITY

Control: The organization allocates sufficient audit record storage capacity and configures auditing to reduce the likelihood of such capacity being exceeded.

Supplemental Guidance: The organization provides sufficient audit storage capacity, taking into account the auditing to be performed and the online audit processing requirements. Related security controls: AU-2, AU-5, AU-6, AU-7, SI-4.

Control Enhancements: None.

AU-5 RESPONSE TO AUDIT PROCESSING FAILURES

Control: The information system alerts appropriate organizational officials in the event of an audit processing failure and takes the following additional actions: [*Assignment: organization-defined actions to be taken (e.g., shut down information system, overwrite oldest audit records, stop generating audit records)*].

Supplemental Guidance: Audit processing failures include, for example, software/hardware errors, failures in the audit capturing mechanisms, and audit storage capacity being reached or exceeded. Related security control: AU-4.

Control Enhancements: None.

AU-8 TIME STAMPS

Control: The information system provides time stamps for use in audit record generation.

Supplemental Guidance: Time stamps (including date and time) of audit records are generated using internal system clocks.

Control Enhancements: None.

AU-9 PROTECTION OF AUDIT INFORMATION

Control: The information system protects audit information and audit tools from unauthorized access, modification, and deletion.

Supplemental Guidance: Audit information includes all information (e.g., audit records, audit settings, and audit reports) needed to successfully audit information system activity.

Control Enhancements: None.

AU-11 AUDIT RECORD RETENTION

Control: The organization retains audit records for [*Assignment: organization-defined time period*] to provide support for after-the-fact investigations of security incidents and to meet regulatory and organizational information retention requirements.

Supplemental Guidance: The organization retains audit records until it is determined that they are no longer needed for administrative, legal, audit, or other operational purposes. This includes, for example, retention and availability of audit records relative to Freedom of Information Act (FOIA) requests, subpoena, and law enforcement actions. Standard categorizations of audit records relative to such types of actions and standard response processes for each type of action are developed and disseminated. NIST Special Publication 800-61 provides guidance on computer security incident handling and audit record retention.

Control Enhancements: None.

FAMILY: CERTIFICATION, ACCREDITATION, AND SECURITY ASSESSMENTS **CLASS:** MANAGEMENT

CA-1 CERTIFICATION, ACCREDITATION, AND SECURITY ASSESSMENT POLICIES AND PROCEDURES

Control: The organization develops, disseminates, and periodically reviews/updates: (i) formal, documented, security assessment and certification and accreditation policies that address purpose, scope, roles, responsibilities, management commitment, coordination among organizational entities, and compliance; and (ii) formal, documented procedures to facilitate the implementation of the security assessment and certification and accreditation policies and associated assessment, certification, and accreditation controls.

Supplemental Guidance: The security assessment and certification and accreditation policies and procedures are consistent with applicable laws, Executive Orders, directives, policies, regulations, standards, and guidance. The security assessment and certification and accreditation policies can be included as part of the general information security policy for the organization. Security assessment and certification and accreditation procedures can be developed for the security program in general, and for a particular information system, when required. The organization defines what constitutes a significant change to the information system to achieve consistent security reaccreditations. NIST Special Publication 800-53A provides guidance on security control assessments. NIST Special Publication 800-37 provides guidance on security certification and accreditation. NIST Special Publication 800-12 provides guidance on security policies and procedures.

Control Enhancements: None.

CA-2 SECURITY ASSESSMENTS

Control: The organization conducts an assessment of the security controls in the information system [*Assignment: organization-defined frequency, at least annually*] to determine the extent to which the controls are implemented correctly, operating as intended, and producing the desired outcome with respect to meeting the security requirements for the system.

Supplemental Guidance: This control is intended to support the FISMA requirement that the management, operational, and technical controls in each information system contained in the inventory of major information systems be assessed with a frequency depending on risk, but no less than annually. The FISMA requirement for (at least) annual security control assessments should *not* be interpreted by organizations as adding additional assessment requirements to those requirements already in place in the security certification and accreditation process. To satisfy the annual FISMA assessment requirement, organizations can draw upon the security control assessment results from any of the following sources, including but not limited to: (i) security certifications conducted as part of an information system accreditation or reaccreditation process (see CA-4); (ii) continuous monitoring activities (see CA-7); or (iii) testing and evaluation of the information system as part of the ongoing system development life cycle process (provided that the testing and evaluation results are current and relevant to the determination of security control effectiveness). Existing security assessment results are reused to the extent that they are still valid and are supplemented with additional assessments as needed. Reuse of assessment information is critical in achieving a broad-based, cost-effective, and fully integrated security program capable of producing the needed evidence to determine the actual security status of the information system.

OMB does not require an annual assessment of *all* security controls employed in an organizational information system. In accordance with OMB policy, organizations must annually assess a subset of the security controls based on: (i) the FIPS 199 security categorization of the information system; (ii) the specific security controls selected and employed by the organization to protect the information system; and (iii) the level of assurance (or confidence) that the organization must have in determining the effectiveness of the security controls in the information system. It is expected that the organization will assess all of the security controls in the information system during the three-year accreditation cycle. The organization can use the current year's assessment results obtained during security certification to meet the annual FISMA assessment requirement (see CA-4). NIST Special Publication 800-53A provides guidance on security control assessments to include reuse of existing assessment results. Related security controls: CA-4, CA-6, CA-7, SA-11.

Control Enhancements: None.

CA-3 INFORMATION SYSTEM CONNECTIONS

Control: The organization authorizes all connections from the information system to other information systems outside of the accreditation boundary through the use of system connection agreements and monitors/controls the system connections on an ongoing basis.

Supplemental Guidance: Since FIPS 199 security categorizations apply to individual information systems, the organization carefully considers the risks that may be introduced when systems are connected to other information systems with different security requirements and security controls, both within the organization and external to the organization. Risk considerations also include information systems sharing the same networks. NIST Special Publication 800-47 provides guidance on connecting information systems. Related security controls: SC-7, SA-9.

Control Enhancements: None.

CA-4 SECURITY CERTIFICATION

Control: The organization conducts an assessment of the security controls in the information system to determine the extent to which the controls are implemented correctly, operating as intended, and producing the desired outcome with respect to meeting the security requirements for the system.

Supplemental Guidance: A security certification is conducted by the organization in support of the OMB Circular A-130, Appendix III requirement for accrediting the information system. The security certification is a key factor in all security accreditation (i.e., authorization) decisions and is integrated into and spans the system development life cycle. The organization assesses all security controls in an information system during the initial security accreditation. Subsequent to the initial accreditation and in accordance with OMB policy, the organization assesses a subset of the controls annually during continuous monitoring (see CA-7). The organization can use the current year's assessment results obtained during security certification to meet the annual FISMA assessment requirement (see CA-2). NIST Special Publication 800-53A provides guidance on security control assessments. NIST Special Publication 800-37 provides guidance on security certification and accreditation. Related security controls: CA-2, CA-6, SA-11.

Control Enhancements: None.

CA-5 PLAN OF ACTION AND MILESTONES

Control: The organization develops and updates [*Assignment: organization-defined frequency*], a plan of action and milestones for the information system that documents the organization's planned, implemented, and evaluated remedial actions to correct deficiencies noted during the assessment of the security controls and to reduce or eliminate known vulnerabilities in the system.

Supplemental Guidance: The plan of action and milestones is a key document in the security accreditation package developed for the authorizing official and is subject to federal reporting requirements established by OMB. The plan of action and milestones updates are based on the findings from security control assessments, security impact analyses, and continuous monitoring activities. OMB FISMA reporting guidance contains instructions regarding organizational plans of action and milestones. NIST Special Publication 800-37 provides guidance on the security certification and accreditation of information systems. NIST Special Publication 800-30 provides guidance on risk mitigation.

Control Enhancements: None.

CA-6 SECURITY ACCREDITATION

Control: The organization authorizes (i.e., accredits) the information system for processing before operations and updates the authorization [*Assignment: organization-defined frequency, at least every three years*] or when there is a significant change to the system. A senior organizational official signs and approves the security accreditation.

Supplemental Guidance: OMB Circular A-130, Appendix III, establishes policy for security accreditations of federal information systems. The organization assesses the security controls employed within the information system before and in support of the security accreditation. Security assessments conducted in support of security accreditations are called security certifications. The security accreditation of an information system is not a static process. Through the employment of a comprehensive continuous monitoring process (the fourth and final phase of the certification and accreditation process), the critical information contained in the accreditation package (i.e., the system security plan, the security assessment report, and the plan of action and milestones) is updated on an ongoing basis providing the authorizing official and the information system owner with an up-to-date status of the security state of the information system. To reduce the administrative burden of the three-year reaccreditation process, the authorizing official uses the results of the ongoing continuous monitoring process to the maximum extent possible as the basis for rendering a reaccreditation decision. NIST Special Publication 800-37 provides guidance on the security certification and accreditation of information systems. Related security controls: CA-2, CA-4, CA-7.

Control Enhancements: None.

CA-7 CONTINUOUS MONITORING

Control: The organization monitors the security controls in the information system on an ongoing basis.

Supplemental Guidance: Continuous monitoring activities include configuration management and control of information system components, security impact analyses of changes to the system, ongoing assessment of security controls, and status reporting. The organization assesses all security controls in an information system during the initial security accreditation. Subsequent to the initial accreditation and in accordance with OMB policy, the organization assesses a subset of the controls annually during continuous monitoring. The selection of an appropriate subset of security controls is based on: (i) the FIPS 199 security categorization of the information system; (ii) the specific security controls selected and employed by the organization to protect the information system; and (iii) the level of assurance (or grounds for confidence) that the organization must have in determining the effectiveness of the security controls in the information system. The organization establishes the selection criteria and subsequently selects a subset of the security controls employed within the information system for assessment. The organization also establishes the schedule for control monitoring to ensure adequate coverage is achieved. Those security controls that are volatile or critical to protecting the information system are assessed at least annually. All other controls are assessed at least once during the information system's three-year accreditation cycle. The organization can use the current year's assessment results obtained during continuous monitoring to meet the annual FISMA assessment requirement (see CA-2).

This control is closely related to and mutually supportive of the activities required in monitoring configuration changes to the information system. An effective continuous monitoring program results in ongoing updates to the information system security plan, the security assessment report, and the plan of action and milestones—the three principle documents in the security accreditation package. A rigorous and well executed continuous monitoring process significantly reduces the level of effort required for the reaccreditation of the information system. NIST Special Publication 800-37 provides guidance on the continuous monitoring process. NIST Special Publication 800-53A provides guidance on the assessment of security controls. Related security controls: CA-2, CA-4, CA-5, CA-6, CM-4.

Control Enhancements: None.

FAMILY: CONFIGURATION MANAGEMENT **CLASS:** OPERATIONAL

CM-1 CONFIGURATION MANAGEMENT POLICY AND PROCEDURES

Control: The organization develops, disseminates, and periodically reviews/updates: (i) a formal, documented, configuration management policy that addresses purpose, scope, roles, responsibilities, management commitment, coordination among organizational entities, and compliance; and (ii) formal, documented procedures to facilitate the implementation of the configuration management policy and associated configuration management controls.

Supplemental Guidance: The configuration management policy and procedures are consistent with applicable federal laws, directives, policies, regulations, standards, and guidance. The configuration management policy can be included as part of the general information security policy for the organization. Configuration management procedures can be developed for the security program in general, and for a particular information system, when required. NIST Special Publication 800-12 provides guidance on security policies and procedures.

Control Enhancements: None.

CM-2 BASELINE CONFIGURATION

Control: The organization develops, documents, and maintains a current baseline configuration of the information system.

Supplemental Guidance: This control establishes a baseline configuration for the information system. The baseline configuration provides information about a particular component's makeup (e.g., the standard software load for a workstation or notebook computer including updated patch information) and the component's logical placement within the information system architecture. The baseline configuration also provides the organization with a well-defined and documented specification to which the information system is built and deviations, if required, are documented in support of mission needs/objectives. The baseline configuration of the information system is consistent with the Federal Enterprise Architecture. Related security controls: CM-6, CM-8.

Control Enhancements: None.

CM-6 CONFIGURATION SETTINGS

Control: The organization: (i) establishes mandatory configuration settings for information technology products employed within the information system; (ii) configures the security settings of information technology products to the most restrictive mode consistent with operational requirements; (iii) documents the configuration settings; and (iv) enforces the configuration settings in all components of the information system.

Supplemental Guidance: Configuration settings are the configurable parameters of the information technology products that compose the information system. Organizations monitor and control changes to the configuration settings in accordance with organizational policies and procedures. OMB FISMA reporting instructions provide guidance on configuration requirements for federal information systems. NIST Special Publication 800-70 provides guidance on producing and using configuration settings for information technology products employed in organizational information systems. Related security controls: CM-2, CM-3, SI-4.

Control Enhancements: None.

CM-8 INFORMATION SYSTEM COMPONENT INVENTORY

Control: The organization develops, documents, and maintains a current inventory of the components of the information system and relevant ownership information.

Supplemental Guidance: The organization determines the appropriate level of granularity for the information system components included in the inventory that are subject to management control (i.e., tracking, and reporting). The inventory of information system components includes any information determined to be necessary by the organization to achieve effective property accountability (e.g., manufacturer, model number, serial number, software license information, system/component owner). The component inventory is consistent with the accreditation boundary of the information system. Related security controls: CM-2, CM-6.

Control Enhancements: None.

FAMILY: CONTINGENCY PLANNING **CLASS:** OPERATIONAL

CP-1 CONTINGENCY PLANNING POLICY AND PROCEDURES

Control: The organization develops, disseminates, and periodically reviews/updates: (i) a formal, documented, contingency planning policy that addresses purpose, scope, roles, responsibilities, management commitment, coordination among organizational entities, and compliance; and (ii) formal, documented procedures to facilitate the implementation of the contingency planning policy and associated contingency planning controls.

Supplemental Guidance: The contingency planning policy and procedures are consistent with applicable federal laws, directives, policies, regulations, standards, and guidance. The contingency planning policy can be included as part of the general information security policy for the organization. Contingency planning procedures can be developed for the security program in general, and for a particular information system, when required. NIST Special Publication 800-34 provides guidance on contingency planning. NIST Special Publication 800-12 provides guidance on security policies and procedures.

Control Enhancements: None.

CP-2 CONTINGENCY PLAN

Control: The organization develops and implements a contingency plan for the information system addressing contingency roles, responsibilities, assigned individuals with contact information, and activities associated with restoring the system after a disruption or failure. Designated officials within the organization review and approve the contingency plan and distribute copies of the plan to key contingency personnel.

Supplemental Guidance: None.

Control Enhancements: None.

CP-4 CONTINGENCY PLAN TESTING AND EXERCISES

Control: The organization: (i) tests and/or exercises the contingency plan for the information system [*Assignment: organization-defined frequency, at least annually*] using [*Assignment: organization-defined tests and/or exercises*] to determine the plan's effectiveness and the organization's readiness to execute the plan; and (ii) reviews the contingency plan test/exercise results and initiates corrective actions.

Supplemental Guidance: There are several methods for testing and/or exercising contingency plans to identify potential weaknesses (e.g., full-scale contingency plan testing, functional/tabletop exercises). The depth and rigor of contingency plan testing and/or exercises increases with the FIPS 199 impact level of the information system. Contingency plan testing and/or exercises also include a determination of the effects on organizational operations and assets (e.g., reduction in mission capability) and individuals arising due to contingency operations in accordance with the plan. NIST Special Publication 800-84 provides guidance on test, training, and exercise programs for information technology plans and capabilities.

Control Enhancements: None.

CP-5 CONTINGENCY PLAN UPDATE

Control: The organization reviews the contingency plan for the information system [*Assignment: organization-defined frequency, at least annually*] and revises the plan to address system/organizational changes or problems encountered during plan implementation, execution, or testing.

Supplemental Guidance: Organizational changes include changes in mission, functions, or business processes supported by the information system. The organization communicates changes to appropriate organizational elements responsible for related plans (e.g., Business Continuity Plan, Disaster Recovery Plan, Continuity of Operations Plan, Business Recovery Plan, Incident Response Plan, Emergency Action Plan).

Control Enhancements: None.

CP-9 INFORMATION SYSTEM BACKUP

Control: The organization conducts backups of user-level and system-level information (including system state information) contained in the information system [*Assignment: organization-defined frequency*] and protects backup information at the storage location.

Supplemental Guidance: The frequency of information system backups and the transfer rate of backup information to alternate storage sites (if so designated) are consistent with the organization's recovery time objectives and recovery point objectives. While integrity and availability are the primary concerns for system backup information, protecting backup information from unauthorized disclosure is also an important consideration depending on the type of information residing on the backup media and the FIPS 199 impact level. An organizational assessment of risk guides the use of encryption for backup information. The protection of system backup information while in transit is beyond the scope of this control. Related security controls: MP-4, MP-5.

Control Enhancements: None.

CP-10 INFORMATION SYSTEM RECOVERY AND RECONSTITUTION

Control: The organization employs mechanisms with supporting procedures to allow the information system to be recovered and reconstituted to a known secure state after a disruption or failure.

Supplemental Guidance: Information system recovery and reconstitution to a known secure state means that all system parameters (either default or organization-established) are set to secure values, security-critical patches are reinstalled, security-related configuration settings are reestablished, system documentation and operating procedures are available, application and system software is reinstalled and configured with secure settings, information from the most recent, known secure backups is loaded, and the system is fully tested.

Control Enhancements: None.

FAMILY: IDENTIFICATION AND AUTHENTICATION **CLASS:** TECHNICAL

IA-1 IDENTIFICATION AND AUTHENTICATION POLICY AND PROCEDURES

Control: The organization develops, disseminates, and periodically reviews/updates: (i) a formal, documented, identification and authentication policy that addresses purpose, scope, roles, responsibilities, management commitment, coordination among organizational entities, and compliance; and (ii) formal, documented procedures to facilitate the implementation of the identification and authentication policy and associated identification and authentication controls.

Supplemental Guidance: The identification and authentication policy and procedures are consistent with: (i) FIPS 201 and Special Publications 800-73, 800-76, and 800-78; and (ii) other applicable federal laws, directives, policies, regulations, standards, and guidance. The identification and authentication policy can be included as part of the general information security policy for the organization. Identification and authentication procedures can be developed for the security program in general, and for a particular information system, when required. NIST Special Publication 800-12 provides guidance on security policies and procedures. NIST Special Publication 800-63 provides guidance on remote electronic authentication.

Control Enhancements: None.

IA-2 USER IDENTIFICATION AND AUTHENTICATION

Control: The information system uniquely identifies and authenticates users (or processes acting on behalf of users).

Supplemental Guidance: Users are uniquely identified and authenticated for all accesses other than those accesses explicitly identified and documented by the organization in accordance security control AC-14. Authentication of user identities is accomplished through the use of passwords, tokens, biometrics, or in the case of multifactor authentication, some combination thereof. NIST Special Publication 800-63 provides guidance on remote electronic authentication including strength of authentication mechanisms. For purposes of this control, the guidance provided in Special Publication 800-63 is applied to both local and remote access to information systems. Remote access is any access to an organizational information system by a user (or an information system) communicating through an external, non-organization-controlled network (e.g., the Internet). Local access is any access to an organizational information system by a user (or an information system) communicating through an internal organization-controlled network (e.g., local area network) or directly to a device without the use of a network. Unless a more stringent control enhancement is specified, authentication for both local and remote information system access is NIST Special Publication 800-63 level 1 compliant. FIPS 201 and Special Publications 800-73, 800-76, and 800-78 specify a personal identity verification (PIV) credential for use in the unique identification and authentication of federal employees and contractors. In addition to identifying and authenticating users at the information system level (i.e., at system logon), identification and authentication mechanisms are employed at the application level, when necessary, to provide increased information security for the organization.

In accordance with OMB policy and E-Authentication E-Government initiative, authentication of public users accessing federal information systems may also be required to protect nonpublic or privacy-related information. The e-authentication risk assessment conducted in accordance with OMB Memorandum 04-04 is used in determining the NIST Special Publication 800-63 compliance requirements for such accesses with regard to the IA-2 control and its enhancements. Scalability, practicality, and security issues are simultaneously considered in balancing the need to ensure ease of use for public access to such information and information systems with the need to protect organizational operations, organizational assets, and individuals. Related security controls: AC-14, AC-17.

Control Enhancements: None.

IA-4 IDENTIFIER MANAGEMENT

Control: The organization manages user identifiers by: (i) uniquely identifying each user; (ii) verifying the identity of each user; (iii) receiving authorization to issue a user identifier from an appropriate organization official; (iv) issuing the user identifier to the intended party; (v) disabling the user identifier after [*Assignment: organization-defined time period*] of inactivity; and (vi) archiving user identifiers.

Supplemental Guidance: Identifier management is not applicable to shared information system accounts (e.g., guest and anonymous accounts). FIPS 201 and Special Publications 800-73, 800-76, and 800-78 specify a personal identity verification (PIV) credential for use in the unique identification and authentication of federal employees and contractors.

Control Enhancements: None.

IA-5 AUTHENTICATOR MANAGEMENT

Control: The organization manages information system authenticators by: (i) defining initial authenticator content; (ii) establishing administrative procedures for initial authenticator distribution, for lost/compromised, or damaged authenticators, and for revoking authenticators; (iii) changing default authenticators upon information system installation; and (iv) changing/refreshing authenticators periodically.

Supplemental Guidance: Information system authenticators include, for example, tokens, PKI certificates, biometrics, passwords, and key cards. Users take reasonable measures to safeguard authenticators including maintaining possession of their individual authenticators, not loaning or sharing authenticators with others, and reporting lost or compromised authenticators immediately. For password-based authentication, the information system: (i) protects passwords from unauthorized disclosure and modification when stored and transmitted; (ii) prohibits passwords from being displayed when entered; (iii) enforces password minimum and maximum lifetime restrictions; and (iv) prohibits password reuse for a specified number of generations. For PKI-based authentication, the information system: (i) validates certificates by constructing a certification path to an accepted trust anchor; (ii) establishes user control of the corresponding private key; and (iii) maps the authenticated identity to the user account. In accordance with OMB policy and related E-authentication initiatives, authentication of public users accessing federal information systems (and associated authenticator management) may also be required to protect nonpublic or privacy-related information. FIPS 201 and Special Publications 800-73, 800-76, and 800-78 specify a personal identity verification (PIV) credential for use in the unique identification and authentication of federal employees and contractors. NIST Special Publication 800-63 provides guidance on remote electronic authentication.

Control Enhancements: None.

IA-6 AUTHENTICATOR FEEDBACK

Control: The information system obscures feedback of authentication information during the authentication process to protect the information from possible exploitation/use by unauthorized individuals.

Supplemental Guidance: The feedback from the information system does not provide information that would allow an unauthorized user to compromise the authentication mechanism. Displaying asterisks when a user types in a password is an example of obscuring feedback of authentication information.

Control Enhancements: None.

IA-7 CRYPTOGRAPHIC MODULE AUTHENTICATION

Control: The information system employs authentication methods that meet the requirements of applicable laws, Executive Orders, directives, policies, regulations, standards, and guidance for authentication to a cryptographic module.

Supplemental Guidance: The applicable federal standard for authentication to a cryptographic module is FIPS 140-2 (as amended). Validation certificates issued by the NIST Cryptographic Module Validation Program (including FIPS 140-1, FIPS 140-2, and future amendments) remain in effect, and the modules remain available for continued use and purchase until a validation certificate is specifically revoked. Additional information on the use of validated cryptography is available at http://csrc.nist.gov/cryptval.

Control Enhancements: None.

FAMILY: INCIDENT RESPONSE **CLASS:** OPERATIONAL

IR-1 INCIDENT RESPONSE POLICY AND PROCEDURES

Control: The organization develops, disseminates, and periodically reviews/updates: (i) a formal, documented, incident response policy that addresses purpose, scope, roles, responsibilities, management commitment, coordination among organizational entities, and compliance; and (ii) formal, documented procedures to facilitate the implementation of the incident response policy and associated incident response controls.

Supplemental Guidance: The incident response policy and procedures are consistent with applicable federal laws, directives, policies, regulations, standards, and guidance. The incident response policy can be included as part of the general information security policy for the organization. Incident response procedures can be developed for the security program in general, and for a particular information system, when required. NIST Special Publication 800-12 provides guidance on security policies and procedures. NIST Special Publication 800-61 provides guidance on incident handling and reporting. NIST Special Publication 800-83 provides guidance on malware incident handling and prevention.

Control Enhancements: None.

IR-4 INCIDENT HANDLING

Control: The organization implements an incident handling capability for security incidents that includes preparation, detection and analysis, containment, eradication, and recovery.

Supplemental Guidance: Incident-related information can be obtained from a variety of sources including, but not limited to, audit monitoring, network monitoring, physical access monitoring, and user/administrator reports. The organization incorporates the lessons learned from ongoing incident handling activities into the incident response procedures and implements the procedures accordingly. Related security controls: AU-6, PE-6.

Control Enhancements: None.

IR-6 INCIDENT REPORTING

Control: The organization promptly reports incident information to appropriate authorities.

Supplemental Guidance: The types of incident information reported, the content and timeliness of the reports, and the list of designated reporting authorities or organizations are consistent with applicable federal laws, directives, policies, regulations, standards, and guidance. Organizational officials report cyber security incidents to the United States Computer Emergency Readiness Team (US-CERT) at http://www.us-cert.gov within the specified timeframe designated in the US-CERT Concept of Operations for Federal Cyber Security Incident Handling. In addition to incident information, weaknesses and vulnerabilities in the information system are reported to appropriate organizational officials in a timely manner to prevent security incidents. NIST Special Publication 800-61 provides guidance on incident reporting.

Control Enhancements: None.

IR-7 INCIDENT RESPONSE ASSISTANCE

Control: The organization provides an incident response support resource that offers advice and assistance to users of the information system for the handling and reporting of security incidents. The support resource is an integral part of the organization's incident response capability.

Supplemental Guidance: Possible implementations of incident response support resources in an organization include a help desk or an assistance group and access to forensics services, when required.

Control Enhancements: None.

FAMILY: MAINTENANCE **CLASS:** OPERATIONAL

MA-1 SYSTEM MAINTENANCE POLICY AND PROCEDURES

Control: The organization develops, disseminates, and periodically reviews/updates: (i) a formal, documented, information system maintenance policy that addresses purpose, scope, roles, responsibilities, management commitment, coordination among organizational entities, and compliance; and (ii) formal, documented procedures to facilitate the implementation of the information system maintenance policy and associated system maintenance controls.

Supplemental Guidance: The information system maintenance policy and procedures are consistent with applicable federal laws, directives, policies, regulations, standards, and guidance. The information system maintenance policy can be included as part of the general information security policy for the organization. System maintenance procedures can be developed for the security program in general, and for a particular information system, when required. NIST Special Publication 800-12 provides guidance on security policies and procedures.

Control Enhancements: None.

MA-2 CONTROLLED MAINTENANCE

Control: The organization schedules, performs, documents, and reviews records of routine preventative and regular maintenance (including repairs) on the components of the information system in accordance with manufacturer or vendor specifications and/or organizational requirements.

Supplemental Guidance: All maintenance activities to include routine, scheduled maintenance and repairs are controlled; whether performed on site or remotely and whether the equipment is serviced on site or removed to another location. Organizational officials approve the removal of the information system or information system components from the facility when repairs are necessary. If the information system or component of the system requires off-site repair, the organization removes all information from associated media using approved procedures. After maintenance is performed on the information system, the organization checks all potentially impacted security controls to verify that the controls are still functioning properly.

Control Enhancements: None.

MA-4 REMOTE MAINTENANCE

Control: The organization authorizes, monitors, and controls any remotely executed maintenance and diagnostic activities, if employed.

Supplemental Guidance: Remote maintenance and diagnostic activities are conducted by individuals communicating through an external, non-organization-controlled network (e.g., the Internet). The use of remote maintenance and diagnostic tools is consistent with organizational policy and documented in the security plan for the information system. The organization maintains records for all remote maintenance and diagnostic activities. Other techniques and/or controls to consider for improving the security of remote maintenance include: (i) encryption and decryption of communications; (ii) strong identification and authentication techniques, such as Level 3 or 4 tokens as described in NIST Special Publication 800-63; and (iii) remote disconnect verification. When remote maintenance is completed, the organization (or information system in certain cases) terminates all sessions and remote connections invoked in the performance of that activity. If password-based authentication is used to accomplish remote maintenance, the organization changes the passwords following each remote maintenance service. NIST Special Publication 800-88 provides guidance on media sanitization. The National Security Agency provides a listing of approved media sanitization products at http://www.nsa.gov/ia/government/mdg.cfm. Related security controls: IA-2, MP-6.

Control Enhancements: None.

MA-5 MAINTENANCE PERSONNEL

Control: The organization allows only authorized personnel to perform maintenance on the information system.

Supplemental Guidance: Maintenance personnel (whether performing maintenance locally or remotely) have appropriate access authorizations to the information system when maintenance activities allow access to organizational information or could result in a future compromise of confidentiality, integrity, or availability. When maintenance personnel do not have needed access authorizations, organizational personnel with appropriate access authorizations supervise maintenance personnel during the performance of maintenance activities on the information system.

Control Enhancements: None.

FAMILY: MEDIA PROTECTION **CLASS:** OPERATIONAL

MP-1 MEDIA PROTECTION POLICY AND PROCEDURES

Control: The organization develops, disseminates, and periodically reviews/updates: (i) a formal, documented, media protection policy that addresses purpose, scope, roles, responsibilities, management commitment, coordination among organizational entities, and compliance; and (ii) formal, documented procedures to facilitate the implementation of the media protection policy and associated media protection controls.

Supplemental Guidance: The media protection policy and procedures are consistent with applicable federal laws, directives, policies, regulations, standards, and guidance. The media protection policy can be included as part of the general information security policy for the organization. Media protection procedures can be developed for the security program in general, and for a particular information system, when required. NIST Special Publication 800-12 provides guidance on security policies and procedures.

Control Enhancements: None.

MP-2 MEDIA ACCESS

Control: The organization restricts access to information system media to authorized individuals.

Supplemental Guidance: Information system media includes both digital media (e.g., diskettes, magnetic tapes, external/removable hard drives, flash/thumb drives, compact disks, digital video disks) and non-digital media (e.g., paper, microfilm). This control also applies to portable and mobile computing and communications devices with information storage capability (e.g., notebook computers, personal digital assistants, cellular telephones).

An organizational assessment of risk guides the selection of media and associated information contained on that media requiring restricted access. Organizations document in policy and procedures, the media requiring restricted access, individuals authorized to access the media, and the specific measures taken to restrict access. The rigor with which this control is applied is commensurate with the FIPS 199 security categorization of the information contained on the media. For example, fewer protection measures are needed for media containing information determined by the organization to be in the public domain, to be publicly releasable, or to have limited or no adverse impact on the organization or individuals if accessed by other than authorized personnel. In these situations, it is assumed that the physical access controls where the media resides provide adequate protection.

Control Enhancements: None.

MP-6 MEDIA SANITIZATION AND DISPOSAL

Control: The organization sanitizes information system media, both digital and non-digital, prior to disposal or release for reuse.

Supplemental Guidance: Sanitization is the process used to remove information from information system media such that there is reasonable assurance, in proportion to the confidentiality of the information, that the information cannot be retrieved or reconstructed. Sanitization techniques, including clearing, purging, and destroying media information, prevent the disclosure of organizational information to unauthorized individuals when such media is reused or disposed. The organization uses its discretion on sanitization techniques and procedures for media containing information deemed to be in the public domain or publicly releasable, or deemed to have no adverse impact on the organization or individuals if released for reuse or disposed. NIST Special Publication 800-88 provides guidance on media sanitization. The National Security Agency also provides media sanitization guidance and maintains a listing of approved sanitization products at http://www.nsa.gov/ia/government/mdg.cfm.

Control Enhancements: None.

FAMILY: PHYSICAL AND ENVIRONMENTAL PROTECTION **CLASS:** OPERATIONAL

PE-1 PHYSICAL AND ENVIRONMENTAL PROTECTION POLICY AND PROCEDURES

Control: The organization develops, disseminates, and periodically reviews/updates: (i) a formal, documented, physical and environmental protection policy that addresses purpose, scope, roles, responsibilities, management commitment, coordination among organizational entities, and compliance; and (ii) formal, documented procedures to facilitate the implementation of the physical and environmental protection policy and associated physical and environmental protection controls.

Supplemental Guidance: The physical and environmental protection policy and procedures are consistent with applicable federal laws, directives, policies, regulations, standards, and guidance. The physical and environmental protection policy can be included as part of the general information security policy for the organization. Physical and environmental protection procedures can be developed for the security program in general, and for a particular information system, when required. NIST Special Publication 800-12 provides guidance on security policies and procedures.

Control Enhancements: None.

PE-2 PHYSICAL ACCESS AUTHORIZATIONS

Control: The organization develops and keeps current a list of personnel with authorized access to the facility where the information system resides (except for those areas within the facility officially designated as publicly accessible) and issues appropriate authorization credentials. Designated officials within the organization review and approve the access list and authorization credentials [*Assignment: organization-defined frequency, at least annually*].

Supplemental Guidance: Appropriate authorization credentials include, for example, badges, identification cards, and smart cards. The organization promptly removes from the access list personnel no longer requiring access to the facility where the information system resides.

Control Enhancements: None.

PE-3 PHYSICAL ACCESS CONTROL

Control: The organization controls all physical access points (including designated entry/exit points) to the facility where the information system resides (except for those areas within the facility officially designated as publicly accessible) and verifies individual access authorizations before granting access to the facility. The organization controls access to areas officially designated as publicly accessible, as appropriate, in accordance with the organization's assessment of risk.

Supplemental Guidance: The organization uses physical access devices (e.g., keys, locks, combinations, card readers) and/or guards to control entry to facilities containing information systems. The organization secures keys, combinations, and other access devices and inventories those devices regularly. The organization changes combinations and keys: (i) periodically; and (ii) when keys are lost, combinations are compromised, or individuals are transferred or terminated. Workstations and associated peripherals connected to (and part of) an organizational information system may be located in areas designated as publicly accessible with access to such devices being appropriately controlled. Where federal Personal Identity Verification (PIV) credential is used as an identification token and token-based access control is employed, the access control system conforms to the requirements of FIPS 201 and NIST Special Publication 800-73. If the token-based access control function employs cryptographic verification, the access control system conforms to the requirements of NIST Special Publication 800-78. If the token-based access control function employs biometric verification, the access control system conforms to the requirements of NIST Special Publication 800-76.

Control Enhancements: None.

PE-6 MONITORING PHYSICAL ACCESS

Control: The organization monitors physical access to the information system to detect and respond to physical security incidents.

Supplemental Guidance: The organization reviews physical access logs periodically and investigates apparent security violations or suspicious physical access activities. Response to detected physical security incidents is part of the organization's incident response capability.

Control Enhancements: None.

PE-7 VISITOR CONTROL

Control: The organization controls physical access to the information system by authenticating visitors before authorizing access to the facility where the information system resides other than areas designated as publicly accessible.

Supplemental Guidance: Government contractors and others with permanent authorization credentials are not considered visitors. Personal Identity Verification (PIV) credentials for federal employees and contractors conform to FIPS 201, and the issuing organizations for the PIV credentials are accredited in accordance with the provisions of NIST Special Publication 800-79.

Control Enhancements: None.

PE-8 ACCESS RECORDS

Control: The organization maintains visitor access records to the facility where the information system resides (except for those areas within the facility officially designated as publicly accessible) that includes: (i) name and organization of the person visiting; (ii) signature of the visitor; (iii) form of identification; (iv) date of access; (v) time of entry and departure; (vi) purpose of visit; and (vii) name and organization of person visited. Designated officials within the organization review the visitor access records [*Assignment: organization-defined frequency*].

Supplemental Guidance: None.

Control Enhancements: None.

PE-12 EMERGENCY LIGHTING

Control: The organization employs and maintains automatic emergency lighting that activates in the event of a power outage or disruption and that covers emergency exits and evacuation routes.

Supplemental Guidance: None.

Control Enhancements: None.

PE-13 FIRE PROTECTION

Control: The organization employs and maintains fire suppression and detection devices/systems that can be activated in the event of a fire.

Supplemental Guidance: Fire suppression and detection devices/systems include, but are not limited to, sprinkler systems, handheld fire extinguishers, fixed fire hoses, and smoke detectors.

Control Enhancements: None.

PE-14 TEMPERATURE AND HUMIDITY CONTROLS

Control: The organization regularly maintains, within acceptable levels, and monitors the temperature and humidity within the facility where the information system resides.

Supplemental Guidance: None.

Control Enhancements: None.

PE-15 WATER DAMAGE PROTECTION

Control: The organization protects the information system from water damage resulting from broken plumbing lines or other sources of water leakage by providing master shutoff valves that are accessible, working properly, and known to key personnel.

Supplemental Guidance: None.

Control Enhancements: None.

PE-16 DELIVERY AND REMOVAL

Control: The organization authorizes and controls information system-related items entering and exiting the facility and maintains appropriate records of those items.

Supplemental Guidance: The organization controls delivery areas and, if possible, isolates the areas from the information system and media libraries to avoid unauthorized physical access.

Control Enhancements: None.

FAMILY: PLANNING **CLASS:** MANAGEMENT

PL-1 SECURITY PLANNING POLICY AND PROCEDURES

Control: The organization develops, disseminates, and periodically reviews/updates: (i) a formal, documented, security planning policy that addresses purpose, scope, roles, responsibilities, management commitment, coordination among organizational entities, and compliance; and (ii) formal, documented procedures to facilitate the implementation of the security planning policy and associated security planning controls.

Supplemental Guidance: The security planning policy and procedures are consistent with applicable federal laws, directives, policies, regulations, standards, and guidance. The security planning policy addresses the overall policy requirements for confidentiality, integrity, and availability and can be included as part of the general information security policy for the organization. Security planning procedures can be developed for the security program in general, and for a particular information system, when required. NIST Special Publication 800-18 provides guidance on security planning. NIST Special Publication 800-12 provides guidance on security policies and procedures.

Control Enhancements: None.

PL-2 SYSTEM SECURITY PLAN

Control: The organization develops and implements a security plan for the information system that provides an overview of the security requirements for the system and a description of the security controls in place or planned for meeting those requirements. Designated officials within the organization review and approve the plan.

Supplemental Guidance: The security plan is aligned with the organization's information system architecture and information security architecture. NIST Special Publication 800-18 provides guidance on security planning.

Control Enhancements: None.

PL-3 SYSTEM SECURITY PLAN UPDATE

Control: The organization reviews the security plan for the information system [*Assignment: organization-defined frequency, at least annually*] and revises the plan to address system/organizational changes or problems identified during plan implementation or security control assessments.

Supplemental Guidance: Significant changes are defined in advance by the organization and identified in the configuration management process. NIST Special Publication 800-18 provides guidance on security plan updates.

Control Enhancements: None.

PL-4 RULES OF BEHAVIOR

Control: The organization establishes and makes readily available to all information system users a set of rules that describes their responsibilities and expected behavior with regard to information and information system usage. The organization receives signed acknowledgement from users indicating that they have read, understand, and agree to abide by the rules of behavior, before authorizing access to the information system and its resident information.

Supplemental Guidance: Electronic signatures are acceptable for use in acknowledging rules of behavior unless specifically prohibited by organizational policy. NIST Special Publication 800-18 provides guidance on preparing rules of behavior.

Control Enhancements: None.

PL-5 PRIVACY IMPACT ASSESSMENT

Control: The organization conducts a privacy impact assessment on the information system in accordance with OMB policy.

Supplemental Guidance: OMB Memorandum 03-22 provides guidance for implementing the privacy provisions of the E-Government Act of 2002.

Control Enhancements: None.

FAMILY: PERSONNEL SECURITY **CLASS:** OPERATIONAL

PS-1 PERSONNEL SECURITY POLICY AND PROCEDURES

Control: The organization develops, disseminates, and periodically reviews/updates: (i) a formal, documented, personnel security policy that addresses purpose, scope, roles, responsibilities, management commitment, coordination among organizational entities, and compliance; and (ii) formal, documented procedures to facilitate the implementation of the personnel security policy and associated personnel security controls.

Supplemental Guidance: The personnel security policy and procedures are consistent with applicable federal laws, directives, policies, regulations, standards, and guidance. The personnel security policy can be included as part of the general information security policy for the organization. Personnel security procedures can be developed for the security program in general, and for a particular information system, when required. NIST Special Publication 800-12 provides guidance on security policies and procedures.

Control Enhancements: None.

PS-2 POSITION CATEGORIZATION

Control: The organization assigns a risk designation to all positions and establishes screening criteria for individuals filling those positions. The organization reviews and revises position risk designations [*Assignment: organization-defined frequency*].

Supplemental Guidance: Position risk designations are consistent with 5 CFR 731.106(a) and Office of Personnel Management policy and guidance.

Control Enhancements: None.

PS-3 PERSONNEL SCREENING

Control: The organization screens individuals requiring access to organizational information and information systems before authorizing access.

Supplemental Guidance: Screening is consistent with: (i) 5 CFR 731.106; (ii) Office of Personnel Management policy, regulations, and guidance; (iii) organizational policy, regulations, and guidance; (iv) FIPS 201 and Special Publications 800-73, 800-76, and 800-78; and (v) the criteria established for the risk designation of the assigned position.

Control Enhancements: None.

PS-4 PERSONNEL TERMINATION

Control: The organization, upon termination of individual employment, terminates information system access, conducts exit interviews, retrieves all organizational information system-related property, and provides appropriate personnel with access to official records created by the terminated employee that are stored on organizational information systems.

Supplemental Guidance: Information system-related property includes, for example, keys, identification cards, and building passes. Timely execution of this control is particularly essential for employees or contractors terminated for cause.

Control Enhancements: None.

PS-5 PERSONNEL TRANSFER

Control: The organization reviews information systems/facilities access authorizations when personnel are reassigned or transferred to other positions within the organization and initiates appropriate actions.

Supplemental Guidance: Appropriate actions that may be required include: (i) returning old and issuing new keys, identification cards, building passes; (ii) closing old accounts and establishing new accounts; (iii) changing system access authorizations; and (iv) providing for access to official records created or controlled by the employee at the old work location and in the old accounts.

Control Enhancements: None.

PS-6 ACCESS AGREEMENTS

Control: The organization completes appropriate signed access agreements for individuals requiring access to organizational information and information systems before authorizing access and reviews/updates the agreements [*Assignment: organization-defined frequency*].

Supplemental Guidance: Access agreements include, for example, nondisclosure agreements, acceptable use agreements, rules of behavior, and conflict-of-interest agreements. Electronic signatures are acceptable for use in acknowledging access agreements unless specifically prohibited by organizational policy.

Control Enhancements: None.

PS-7 THIRD-PARTY PERSONNEL SECURITY

Control: The organization establishes personnel security requirements including security roles and responsibilities for third-party providers and monitors provider compliance.

Supplemental Guidance: Third-party providers include, for example, service bureaus, contractors, and other organizations providing information system development, information technology services, outsourced applications, and network and security management. The organization explicitly includes personnel security requirements in acquisition-related documents. NIST Special Publication 800-35 provides guidance on information technology security services.

Control Enhancements: None.

PS-8 PERSONNEL SANCTIONS

Control: The organization employs a formal sanctions process for personnel failing to comply with established information security policies and procedures.

Supplemental Guidance: The sanctions process is consistent with applicable federal laws, directives, policies, regulations, standards, and guidance. The sanctions process can be included as part of the general personnel policies and procedures for the organization.

Control Enhancements: None.

FAMILY: RISK ASSESSMENT **CLASS:** MANAGEMENT

RA-1 RISK ASSESSMENT POLICY AND PROCEDURES

Control: The organization develops, disseminates, and periodically reviews/updates: (i) a formal, documented risk assessment policy that addresses purpose, scope, roles, responsibilities, management commitment, coordination among organizational entities, and compliance; and (ii) formal, documented procedures to facilitate the implementation of the risk assessment policy and associated risk assessment controls.

Supplemental Guidance: The risk assessment policy and procedures are consistent with applicable federal laws, directives, policies, regulations, standards, and guidance. The risk assessment policy can be included as part of the general information security policy for the organization. Risk assessment procedures can be developed for the security program in general, and for a particular information system, when required. NIST Special Publications 800-30 provides guidance on the assessment of risk. NIST Special Publication 800-12 provides guidance on security policies and procedures.

Control Enhancements: None.

RA-2 SECURITY CATEGORIZATION

Control: The organization categorizes the information system and the information processed, stored, or transmitted by the system in accordance with applicable federal laws, Executive Orders, directives, policies, regulations, standards, and guidance and documents the results (including supporting rationale) in the system security plan. Designated senior-level officials within the organization review and approve the security categorizations.

Supplemental Guidance: The applicable federal policy for security categorization of nonnational security information and information systems is FIPS 199. The organization conducts FIPS 199 security categorizations as an organization-wide activity with the involvement of the chief information officer, senior agency information security officer, information system owners, and information owners. The organization also considers potential impacts to other organizations and, in accordance with the USA PATRIOT Act of 2001 and Homeland Security Presidential Directives, potential national-level impacts in categorizing the information system. As part of a defense-in-depth protection strategy, the organization considers partitioning higher-impact information systems into separate physical domains (or environments) and restricting or prohibiting network access in accordance with an organizational assessment of risk. NIST Special Publication 800-60 provides guidance on determining the security categories of the information types resident on the information system. Related security controls: MP-4, SC-7.

Control Enhancements: None.

RA-3 RISK ASSESSMENT

Control: The organization conducts assessments of the risk and magnitude of harm that could result from the unauthorized access, use, disclosure, disruption, modification, or destruction of information and information systems that support the operations and assets of the agency (including information and information systems managed/operated by external parties).

Supplemental Guidance: Risk assessments take into account vulnerabilities, threat sources, and security controls planned or in place to determine the resulting level of residual risk posed to organizational operations, organizational assets, or individuals based on the operation of the information system. The organization also considers potential impacts to other organizations and, in accordance with the USA PATRIOT Act and Homeland Security Presidential Directives, potential national-level impacts in categorizing the information system. Risk assessments also take into account risk posed to organizational operations, organizational assets, or individuals from external parties (e.g., service providers, contractors operating information systems on behalf of the organization, individuals accessing organizational information systems, outsourcing entities). In accordance with OMB policy and related E-authentication initiatives, authentication of public users accessing federal information systems may also be required to protect nonpublic or privacy-related information. As such, organizational assessments of risk also address public access to federal information systems. The General Services Administration provides tools supporting that portion of the risk assessment dealing with public access to federal information systems. NIST Special Publication 800-30 provides guidance on conducting risk assessments including threat, vulnerability, and impact assessments.

Control Enhancements: None.

RA-4 RISK ASSESSMENT UPDATE

Control: The organization updates the risk assessment [*Assignment: organization-defined frequency*] or whenever there are significant changes to the information system, the facilities where the system resides, or other conditions that may impact the security or accreditation status of the system.

Supplemental Guidance: The organization develops and documents specific criteria for what is considered significant change to the information system. NIST Special Publication 800-30 provides guidance on conducting risk assessment updates.

Control Enhancements: None.

FAMILY: SYSTEM AND SERVICES ACQUISITION **CLASS:** MANAGEMENT

SA-1 SYSTEM AND SERVICES ACQUISITION POLICY AND PROCEDURES

Control: The organization develops, disseminates, and periodically reviews/updates: (i) a formal, documented, system and services acquisition policy that includes information security considerations and that addresses purpose, scope, roles, responsibilities, management commitment, coordination among organizational entities, and compliance; and (ii) formal, documented procedures to facilitate the implementation of the system and services acquisition policy and associated system and services acquisition controls.

Supplemental Guidance: The system and services acquisition policy and procedures are consistent with applicable federal laws, directives, policies, regulations, standards, and guidance. The system and services acquisition policy can be included as part of the general information security policy for the organization. System and services acquisition procedures can be developed for the security program in general, and for a particular information system, when required. NIST Special Publication 800-12 provides guidance on security policies and procedures.

Control Enhancements: None.

SA-2 ALLOCATION OF RESOURCES

Control: The organization determines, documents, and allocates as part of its capital planning and investment control process, the resources required to adequately protect the information system.

Supplemental Guidance: The organization includes the determination of security requirements for the information system in mission/business case planning and establishes a discrete line item for information system security in the organization's programming and budgeting documentation. NIST Special Publication 800-65 provides guidance on integrating security into the capital planning and investment control process.

Control Enhancements: None.

SA-3 LIFE CYCLE SUPPORT

Control: The organization manages the information system using a system development life cycle methodology that includes information security considerations.

Supplemental Guidance: NIST Special Publication 800-64 provides guidance on security considerations in the system development life cycle.

Control Enhancements: None.

SA-4 ACQUISITIONS

Control: The organization includes security requirements and/or security specifications, either explicitly or by reference, in information system acquisition contracts based on an assessment of risk and in accordance with applicable federal laws, Executive Orders, directives, policies, regulations, and standards.

Supplemental Guidance:

Solicitation Documents
The solicitation documents (e.g., Requests for Proposals) for information systems and services include, either explicitly or by reference, security requirements that describe: (i) required security capabilities (security needs and, as necessary, specific security controls and other specific FISMA requirements); (ii) required design and development processes; (iii) required test and evaluation procedures; and (iv) required documentation. The requirements in the solicitation documents permit updating security controls as new threats/vulnerabilities are identified and as new technologies are implemented. NIST Special Publication 800-36 provides guidance on the selection of information security products. NIST Special Publication 800-35 provides guidance on information technology security services. NIST Special Publication 800-64 provides guidance on security considerations in the system development life cycle.

Information System Documentation
The solicitation documents include requirements for appropriate information system documentation. The documentation addresses user and systems administrator guidance and information regarding the implementation of the security controls in the information system. The level of detail required in the documentation is based on the FIPS 199 security category for the information system.

Use of Tested, Evaluated, and Validated Products
NIST Special Publication 800-23 provides guidance on the acquisition and use of tested/evaluated information technology products.

Configuration Settings and Implementation Guidance
The information system required documentation includes security configuration settings and security implementation guidance. OMB FISMA reporting instructions provide guidance on configuration requirements for federal information systems. NIST Special Publication 800-70 provides guidance on configuration settings for information technology products.

Control Enhancements: None.

SA-5 INFORMATION SYSTEM DOCUMENTATION

Control: The organization obtains, protects as required, and makes available to authorized personnel, adequate documentation for the information system.

Supplemental Guidance: Documentation includes administrator and user guides with information on: (i) configuring, installing, and operating the information system; and (ii) effectively using the system's security features. When adequate information system documentation is either unavailable or non existent (e.g., due to the age of the system or lack of support from the vendor/manufacturer), the organization documents attempts to obtain such documentation and provides compensating security controls, if needed.

Control Enhancements: None.

SA-6 SOFTWARE USAGE RESTRICTIONS

Control: The organization complies with software usage restrictions.

Supplemental Guidance: Software and associated documentation are used in accordance with contract agreements and copyright laws. For software and associated documentation protected by quantity licenses, the organization employs tracking systems to control copying and distribution. The organization controls and documents the use of publicly accessible peer-to-peer file sharing technology to ensure that this capability is not used for the unauthorized distribution, display, performance, or reproduction of copyrighted work.

Control Enhancements: None.

SA-7 USER INSTALLED SOFTWARE

Control: The organization enforces explicit rules governing the installation of software by users.

Supplemental Guidance: If provided the necessary privileges, users have the ability to install software. The organization identifies what types of software installations are permitted (e.g., updates and security patches to existing software) and what types of installations are prohibited (e.g., software that is free only for personal, not government use, and software whose pedigree with regard to being potentially malicious is unknown or suspect).

Control Enhancements: None.

SA-9 EXTERNAL INFORMATION SYSTEM SERVICES

Control: The organization: (i) requires that providers of external information system services employ adequate security controls in accordance with applicable laws, Executive Orders, directives, policies, regulations, standards, guidance, and established service-level agreements; and (ii) monitors security control compliance.

Supplemental Guidance: An external information system service is a service that is implemented outside of the accreditation boundary of the organizational information system (i.e., a service that is used by, but not a part of, the organizational information system). Relationships with external service providers are established in a variety of ways, for example, through joint ventures, business partnerships, outsourcing arrangements (i.e., through contracts, interagency agreements, lines of business arrangements), licensing agreements, and/or supply chain exchanges. Ultimately, the responsibility for adequately mitigating risks to the organization's operations and assets, and to individuals, arising from the use of external information system services remains with the authorizing official. Authorizing officials must require that an appropriate chain of trust be established with external service providers when dealing with the many issues associated with information system security. For services external to the organization, a chain of trust requires that the organization establish and retain a level of confidence that each participating service provider in the potentially complex consumer-provider relationship provides adequate protection for the services rendered to the organization. Where a sufficient level of trust cannot be established in the external services and/or service providers, the organization employs compensating security controls or accepts the greater degree of risk to its operations and assets, or to individuals. The external information system services documentation includes government, service provider, and end user security roles and responsibilities, and any service-level agreements. Service-level agreements define the expectations of performance for each required security control, describe measurable outcomes, and identify remedies and response requirements for any identified instance of non-compliance. NIST Special Publication 800-35 provides guidance on information technology security services. NIST Special Publication 800-64 provides guidance on the security considerations in the system development life cycle.

Control Enhancements: None.

FAMILY: SYSTEM AND COMMUNICATIONS PROTECTION **CLASS:** TECHNICAL

SC-1 SYSTEM AND COMMUNICATIONS PROTECTION POLICY AND PROCEDURES

Control: The organization develops, disseminates, and periodically reviews/updates: (i) a formal, documented, system and communications protection policy that addresses purpose, scope, roles, responsibilities, management commitment, coordination among organizational entities, and compliance; and (ii) formal, documented procedures to facilitate the implementation of the system and communications protection policy and associated system and communications protection controls.

Supplemental Guidance: The system and communications protection policy and procedures are consistent with applicable federal laws, directives, policies, regulations, standards, and guidance. The system and communications protection policy can be included as part of the general information security policy for the organization. System and communications protection procedures can be developed for the security program in general, and for a particular information system, when required. NIST Special Publication 800-12 provides guidance on security policies and procedures.

Control Enhancements: None.

SC-5 DENIAL OF SERVICE PROTECTION

Control: The information system protects against or limits the effects of the following types of denial of service attacks: [*Assignment: organization-defined list of types of denial of service attacks or reference to source for current list*].

Supplemental Guidance: A variety of technologies exist to limit, or in some cases, eliminate the effects of denial of service attacks. For example, boundary protection devices can filter certain types of packets to protect devices on an organization's internal network from being directly affected by denial of service attacks. Information systems that are publicly accessible can be protected by employing increased capacity and bandwidth combined with service redundancy.

Control Enhancements: None.

SC-7 BOUNDARY PROTECTION

Control: The information system monitors and controls communications at the external boundary of the information system and at key internal boundaries within the system.

Supplemental Guidance: Any connections to the Internet, or other external networks or information systems, occur through managed interfaces consisting of appropriate boundary protection devices (e.g., proxies, gateways, routers, firewalls, guards, encrypted tunnels) arranged in an effective architecture (e.g., routers protecting firewalls and application gateways residing on a protected subnetwork commonly referred to as a demilitarized zone or DMZ). Information system boundary protections at any designated alternate processing sites provide the same levels of protection as that of the primary site.

As part of a defense-in-depth protection strategy, the organization considers partitioning higher-impact information systems into separate physical domains (or environments) and applying the concepts of managed interfaces described above to restrict or prohibit network access in accordance with an organizational assessment of risk. FIPS 199 security categorization guides the selection of appropriate candidates for domain partitioning.

The organization carefully considers the intrinsically shared nature of commercial telecommunications services in the implementation of security controls associated with the use of such services. Commercial telecommunications services are commonly based on network components and consolidated management systems shared by all attached commercial customers, and may include third party provided access lines and other service elements. Consequently, such interconnecting transmission services may represent sources of increased risk despite contract security provisions. Therefore, when this situation occurs, the organization either implements appropriate compensating security controls or explicitly accepts the additional risk. NIST Special Publication 800-77 provides guidance on virtual private networks. Related security controls: MP-4, RA-2.

Control Enhancements: None.

SC-13 USE OF CRYPTOGRAPHY

Control: For information requiring cryptographic protection, the information system implements cryptographic mechanisms that comply with applicable federal laws, Executive Orders, directives, policies, regulations, standards, and guidance.

Supplemental Guidance: The applicable federal standard for employing cryptography in nonnational security information systems is FIPS 140-2 (as amended). Validation certificates issued by the NIST Cryptographic Module Validation Program (including FIPS 140-1, FIPS 140-2, and future amendments) remain in effect and the modules remain available for continued use and purchase until a validation certificate is specifically revoked. NIST Special Publications 800-56 and 800-57 provide guidance on cryptographic key establishment and cryptographic key management. Additional information on the use of validated cryptography is available at http://csrc.nist.gov/cryptval.

Control Enhancements: None.

SC-14 PUBLIC ACCESS PROTECTIONS

Control: The information system protects the integrity and availability of publicly available information and applications.

Supplemental Guidance: None.

Control Enhancements: None.

FAMILY: SYSTEM AND INFORMATION INTEGRITY **CLASS:** OPERATIONAL

SI-1 SYSTEM AND INFORMATION INTEGRITY POLICY AND PROCEDURES

Control: The organization develops, disseminates, and periodically reviews/updates: (i) a formal, documented, system and information integrity policy that addresses purpose, scope, roles, responsibilities, management commitment, coordination among organizational entities, and compliance; and (ii) formal, documented procedures to facilitate the implementation of the system and information integrity policy and associated system and information integrity controls.

Supplemental Guidance: The system and information integrity policy and procedures are consistent with applicable federal laws, directives, policies, regulations, standards, and guidance. The system and information integrity policy can be included as part of the general information security policy for the organization. System and information integrity procedures can be developed for the security program in general, and for a particular information system, when required. NIST Special Publication 800-12 provides guidance on security policies and procedures.

Control Enhancements: None.

SI-2 FLAW REMEDIATION

Control: The organization identifies, reports, and corrects information system flaws.

Supplemental Guidance: The organization identifies information systems containing software affected by recently announced software flaws (and potential vulnerabilities resulting from those flaws). The organization (or the software developer/vendor in the case of software developed and maintained by a vendor/contractor) promptly installs newly released security relevant patches, service packs, and hot fixes, and tests patches, service packs, and hot fixes for effectiveness and potential side effects on the organization's information systems before installation. Flaws discovered during security assessments, continuous monitoring, incident response activities, or information system error handling are also addressed expeditiously. Flaw remediation is incorporated into configuration management as an emergency change. NIST Special Publication 800-40, provides guidance on security patch installation and patch management. Related security controls: CA-2, CA-4, CA-7, CM-3, IR-4, SI-11.

Control Enhancements: None.

SI-3 MALICIOUS CODE PROTECTION

Control: The information system implements malicious code protection.

Supplemental Guidance: The organization employs malicious code protection mechanisms at critical information system entry and exit points (e.g., firewalls, electronic mail servers, web servers, proxy servers, remote-access servers) and at workstations, servers, or mobile computing devices on the network. The organization uses the malicious code protection mechanisms to detect and eradicate malicious code (e.g., viruses, worms, Trojan horses, spyware) transported: (i) by electronic mail, electronic mail attachments, Internet accesses, removable media (e.g., USB devices, diskettes or compact disks), or other common means; or (ii) by exploiting information system vulnerabilities. The organization updates malicious code protection mechanisms (including the latest virus definitions) whenever new releases are available in accordance with organizational configuration management policy and procedures. The organization considers using malicious code protection software products from multiple vendors (e.g., using one vendor for boundary devices and servers and another vendor for workstations). The organization also considers the receipt of false positives during malicious code detection and eradication and the resulting potential impact on the availability of the information system. NIST Special Publication 800-83 provides guidance on implementing malicious code protection.

Control Enhancements: None.

SI-5 SECURITY ALERTS AND ADVISORIES

Control: The organization receives information system security alerts/advisories on a regular basis, issues alerts/advisories to appropriate personnel, and takes appropriate actions in response.

Supplemental Guidance: The organization documents the types of actions to be taken in response to security alerts/advisories. The organization also maintains contact with special interest groups (e.g., information security forums) that: (i) facilitate sharing of security-related information (e.g., threats, vulnerabilities, and latest security technologies); (ii) provide access to advice from security professionals; and (iii) improve knowledge of security best practices. NIST Special Publication 800-40 provides guidance on monitoring and distributing security alerts and advisories.

Control Enhancements: None.

PART TWO

MINIMUM ASSURANCE REQUIREMENTS

LOW-IMPACT INFORMATION SYSTEMS

The minimum assurance requirements for security controls described in the security control catalog are listed below. The assurance requirements are directed at the activities and actions that security control developers and implementers[2] define and apply to increase the level of confidence that the controls are implemented correctly, operating as intended, and producing the desired outcome with respect to meeting the security requirements for the information system. The assurance requirements are applied on a control-by-control basis. Using a format similar to security controls, assurance requirements are followed by supplemental guidance that provides additional detail and explanation of how the requirements are to be applied.

Assurance Requirement: The security control is in effect and meets explicitly identified functional requirements in the control statement.

Supplemental Guidance: For security controls in the low baseline, the focus is on the controls being in place with the expectation that no obvious errors exist and that, as flaws are discovered, they are addressed in a timely manner.

[2] In this context, a developer/implementer is an individual or group of individuals responsible for the development or implementation of security controls for an information system. This may include, for example, hardware and software vendors providing the controls, contractors implementing the controls, or organizational personnel such as information system owners, information system security officers, system and network administrators, or other individuals with security responsibility for the information system.