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SEC 310
Final Project
October 2022

Agenda

Module 2	Security Awareness and Training Policy Contingency Planning Policy
Module 3	Risk Assessment Policy Access Control Policy
Module 4	Vulnerability Scanning Standard Encryption Standard
Module 5	Physical and Environmental Protection Policy Secure System Development Life Cycle Standard
Module 6	Cyber Incident Response Standard Personnel Security Policy

Introduction

The scope of this course is security management. We look at the principles and frameworks for recognizing security issues and solutions. Protecting people, information and physical assets, including loss prevention, are examined. Understanding the legal foundation, history, operations and tools of security management, as well as the role of security in today's businesses, government and public settings is vital.

What it the NIST Cybersecurity Framework and How Should My Business Use It?

NIST is the National Institute of Standards and Technology at the U.S. Department of Commerce. The NIST Cybersecurity Framework helps businesses of all sizes better understand, manage, and reduce their cybersecurity risk and protect their networks and data. The Framework is voluntary. It gives your business an outline of best practices to help you decide where to focus your time and money for cybersecurity protection.

You can put the NIST Cybersecurity Framework to work in your business in these five areas:
Identify, Protect, Detect, Respond, and Recover
(Office of Inspector General, n.d.)

https://www.ftc.gov/business-guidance/small-businesses/cybersecurity/nist-framework

Framework Core

Function	Category	ID
Identify	Asset Management	ID.AM
	Business Environment	ID.BE
	Governance	ID.GV
	Risk Assessment	ID.RA
	Risk Management Strategy	ID.RM
	Supply Chain Risk Management	ID.SC
Protect	Identity Management and Access Control	PR.AC
	Awareness and Training	PR.AT
	Data Security	PR.DS
	Information Protection Processes & Procedures	PR.IP
	Maintenance	PR.MA
	Protective Technology	PR.PT
Detect	Anomalies and Events	DE.AE
	Security Continuous Monitoring	DE.CM
	Detection Processes	DE.DP
Respond	Response Planning	RS.RP
	Communications	RS.CO
	Analysis	RS.AN
	Mitigation	RS.MI
	Improvements	RS.IM
Recover	Recovery Planning	RC.RP
	Improvements	RC.IM
	Communications	RC.CO

Subcategory	Informative References
ID.BE-1: The organization's role in the supply chain is identified and communicated	**COBIT 5** APO08.01, APO08.04, APO08.05, APO10.03, APO10.04, APO10.05 **ISO/IEC 27001:2013** A.15.1.1, A.15.1.2, A.15.1.3, A.15.2.1, A.15.2.2 **NIST SP 800-53 Rev. 4** CP-2, SA-12
ID.BE-2: The organization's place in critical infrastructure and its industry sector is identified and communicated	**COBIT 5** APO02.06, APO03.01 **ISO/IEC 27001:2013** Clause 4.1 **NIST SP 800-53 Rev. 4** PM-8
ID.BE-3: Priorities for organizational mission, objectives, and activities are established and communicated	**COBIT 5** APO02.01, APO02.06, APO03.01 **ISA 62443-2-1:2009** 4.2.2.1, 4.2.3.6 **NIST SP 800-53 Rev. 4** PM-11, SA-14
ID.BE-4: Dependencies and critical functions for delivery of critical services are established	**COBIT 5** APO10.01, BAI04.02, BAI09.02 **ISO/IEC 27001:2013** A.11.2.2, A.11.2.3, A.12.1.3 **NIST SP 800-53 Rev. 4** CP-8, PE-9, PE-11, PM-8, SA-14
ID.BE-5: Resilience requirements to support delivery of critical services are established for all operating states (e.g. under duress/attack, during recovery, normal operations)	**COBIT 5** DSS04.02 **ISO/IEC 27001:2013** A.11.1.4, A.17.1.1, A.17.1.2, A.17.2.1 **NIST SP 800-53 Rev. 4** CP-2, CP-11, SA-14

Function, Category, and Subcategory

https://www.nist.gov/cyberframework/online-learning/components-framework

Module 2

- Security Awareness and Training Policy
- Contingency Planning Policy

Security Awareness and Training Policy

Identify

Identify: Asset Management (ID.AM)

- ❑ ID.AM-1 Physical devices and systems within the organization are inventoried
- ❑ ID.AM-2 Software platforms and applications within the organization are inventoried
- ❑ ID.AM-6 Cybersecurity roles and responsibilities for the entire workforces and third-party stakeholders (e.g. suppliers, customers, partners) are established

Protect

Protect: Awareness and Training (PR.AT)

- ❑ PR.AT-1 All users are informed and trained

Security Awareness and Training Policy

IDENTIFY (ID)	**Asset Management (ID.AM):** The data, personnel, devices, systems, and facilities that enable the organization to achieve business purposes are identified and managed consistent with their relative importance to organizational objectives and the organization's risk strategy.	**ID.AM-1:** Physical devices and systems within the organization are inventoried	**CIS CSC** 1 **COBIT 5** BAI09.01, BAI09.02 **ISA 62443-2-1:2009** 4.2.3.4 **ISA 62443-3-3:2013** SR 7.8 **ISO/IEC 27001:2013** A.8.1.1, A.8.1.2 **NIST SP 800-53 Rev. 4** CM-8, PM-5
		ID.AM-2: Software platforms and applications within the organization are inventoried	**CIS CSC** 2 **COBIT 5** BAI09.01, BAI09.02, BAI09.05 **ISA 62443-2-1:2009** 4.2.3.4 **ISA 62443-3-3:2013** SR 7.8 **ISO/IEC 27001:2013** A.8.1.1, A.8.1.2, A.12.5.1 **NIST SP 800-53 Rev. 4** CM-8, PM-5
		ID.AM-6: Cybersecurity roles and responsibilities for the entire workforce and third-party stakeholders (e.g., suppliers, customers, partners) are established	**CIS CSC** 17, 19 **COBIT 5** APO01.02, APO07.06, APO13.01, DSS06.03 **ISA 62443-2-1:2009** 4.3.2.3.3 **ISO/IEC 27001:2013** A.6.1.1 **NIST SP 800-53 Rev. 4** CP-2, PS-7, PM-11
	Awareness and Training (PR.AT): The organization's personnel and partners are provided cybersecurity awareness education and are trained to perform their cybersecurity-related duties and responsibilities consistent with related policies, procedures, and agreements.	**PR.AT-1:** All users are informed and trained	**CIS CSC** 17, 18 **COBIT 5** APO07.03, BAI05.07 **ISA 62443-2-1:2009** 4.3.2.4.2 **ISO/IEC 27001:2013** A.7.2.2, A.12.2.1 **NIST SP 800-53 Rev. 4** AT-2, PM-13

Contingency Planning Policy

Recover

Recover: Recovery Planning (RC.RP)

- ❑ RC.RP-1 Recovery plan is executed during or after a cybersecurity incident

Recover: Improvements (RC.IM)

- ❑ RC.IM-1 Recovery plans incorporate lessons learned
- ❑ RC.IM-2 Recovery strategies are updated

Contingency Planning Policy

RECOVER (RC)	**Recovery Planning (RC.RP):** Recovery processes and procedures are executed and maintained to ensure restoration of systems or assets affected by cybersecurity incidents.	**RC.RP-1:** Recovery plan is executed during or after a cybersecurity incident	**CIS CSC** 10 **COBIT 5** APO12.06, DSS02.05, DSS03.04 **ISO/IEC 27001:2013** A.16.1.5 **NIST SP 800-53 Rev. 4** CP-10, IR-4, IR-8
	Improvements (RC.IM): Recovery planning and processes are improved by incorporating lessons learned into future activities.	**RC.IM-1:** Recovery plans incorporate lessons learned	**COBIT 5** APO12.06, BAI05.07, DSS04.08 **ISA 62443-2-1:2009** 4.4.3.4 **ISO/IEC 27001:2013** A.16.1.6, Clause 10 **NIST SP 800-53 Rev. 4** CP-2, IR-4, IR-8
		RC.IM-2: Recovery strategies are updated	**COBIT 5** APO12.06, BAI07.08 **ISO/IEC 27001:2013** A.16.1.6, Clause 10 **NIST SP 800-53 Rev. 4** CP-2, IR-4, IR-8

Module 3

- Risk Assessment Policy
- Access Control Policy

Risk Assessment Policy

Identify

Identify: Risk Management Strategy (ID.RM)

- ID.RM-1 Risk management processes are established, managed, and agreed to by organizational stakeholders

Risk Assessment Policy

	Risk Management Strategy (ID.RM): The organization's priorities, constraints, risk tolerances, and assumptions are established and used to support operational risk decisions.	**ID.RM-1:** Risk management processes are established, managed, and agreed to by organizational stakeholders	**CIS CSC** 4 **COBIT 5** APO12.04, APO12.05, APO13.02, BAI02.03, BAI04.02 **ISA 62443-2-1:2009** 4.3.4.2 **ISO/IEC 27001:2013** Clause 6.1.3, Clause 8.3, Clause 9.3 **NIST SP 800-53 Rev. 4** PM-9

Access Control Policy

Protect

Protect: Identity Management and Access Control (PR.AC)

- PR.AC-1 Identities and credentials are issued, managed, verified, revoked, and audited for authorized devices, users and processes
- PR.AC-4 Access permissions and authorizations are managed, incorporating the principles of least privilege and separation of duties

Protect: Data Security (PR.DS)

- PR.DS-3 Assets are formally managed throughout removal, transfers, and disposition

Protect: Information Protection Processes and Procedures (PR.IP)

- PR.IP-1 A baseline configuration of information technology/industrial control systems is created and maintained incorporating security principles (e.g. concept of least functionality)

Protect: Protective Technology (PR.PT)

- PR.PT-1 Audit/log records are determined, documented, implemented, and reviewed in accordance with policy

Access Control Policy

IDENTIFY (ID)	**Asset Management (ID.AM):** The data, personnel, devices, systems, and facilities that enable the organization to achieve business purposes are identified and managed consistent with their relative importance to organizational objectives and the organization's risk strategy.	**ID.AM-1:** Physical devices and systems within the organization are inventoried	**CIS CSC** 1 **COBIT 5** BAI09.01, BAI09.02 **ISA 62443-2-1:2009** 4.2.3.4 **ISA 62443-3-3:2013** SR 7.8 **ISO/IEC 27001:2013** A.8.1.1, A.8.1.2 **NIST SP 800-53 Rev. 4** CM-8, PM-5
		ID.AM-2: Software platforms and applications within the organization are inventoried	**CIS CSC** 2 **COBIT 5** BAI09.01, BAI09.02, BAI09.05 **ISA 62443-2-1:2009** 4.2.3.4 **ISA 62443-3-3:2013** SR 7.8 **ISO/IEC 27001:2013** A.8.1.1, A.8.1.2, A.12.5.1 **NIST SP 800-53 Rev. 4** CM-8, PM-5

PROTECT (PR)	**Identity Management, Authentication and Access Control (PR.AC):** Access to physical and logical assets and associated facilities is limited to authorized users, processes, and devices, and is managed consistent with the assessed risk of unauthorized access to authorized activities and transactions.	**PR.AC-1:** Identities and credentials are issued, managed, verified, revoked, and audited for authorized devices, users and processes	**CIS CSC** 1, 5, 15, 16 **COBIT 5** DSS05.04, DSS06.03 **ISA 62443-2-1:2009** 4.3.3.5.1 **ISA 62443-3-3:2013** SR 1.1, SR 1.2, SR 1.3, SR 1.4, SR 1.5, SR 1.7, SR 1.8, SR 1.9 **ISO/IEC 27001:2013** A.9.2.1, A.9.2.2, A.9.2.3, A.9.2.4, A.9.2.6, A.9.3.1, A.9.4.2, A.9.4.3 **NIST SP 800-53 Rev. 4** AC-1, AC-2, IA-1, IA-2, IA-3, IA-4, IA-5, IA-6, IA-7, IA-8, IA-9, IA-10, IA-11
		PR.AC-4: Access permissions and authorizations are managed, incorporating the principles of least privilege and separation of duties	**CIS CSC** 3, 5, 12, 14, 15, 16, 18 **COBIT 5** DSS05.04 **ISA 62443-2-1:2009** 4.3.3.7.3 **ISA 62443-3-3:2013** SR 2.1 **ISO/IEC 27001:2013** A.6.1.2, A.9.1.2, A.9.2.3, A.9.4.1, A.9.4.4, A.9.4.5 **NIST SP 800-53 Rev. 4** AC-1, AC-2, AC-3, AC-5, AC-6, AC-14, AC-16, AC-24

	Data Security (PR.DS): Information and records (data) are managed consistent with the organization's risk strategy to protect the confidentiality, integrity, and availability of information.	**PR.DS-3:** Assets are formally managed throughout removal, transfers, and disposition	**CIS CSC** 1 **COBIT 5** BAI09.03 **ISA 62443-2-1:2009** 4.3.3.3.9, 4.3.4.4.1 **ISA 62443-3-3:2013** SR 4.2 **ISO/IEC 27001:2013** A.8.2.3, A.8.3.1, A.8.3.2, A.8.3.3, A.11.2.5, A.11.2.7 **NIST SP 800-53 Rev. 4** CM-8, MP-6, PE-16

	Information Protection Processes and Procedures (PR.IP): Security policies (that address purpose, scope, roles, responsibilities, management commitment, and coordination among organizational entities), processes, and procedures are maintained and used to manage protection of information systems and assets.	**PR.IP-1:** A baseline configuration of information technology/industrial control systems is created and maintained incorporating security principles (e.g. concept of least functionality)	**CIS CSC** 3, 9, 11 **COBIT 5** BAI10.01, BAI10.02, BAI10.03, BAI10.05 **ISA 62443-2-1:2009** 4.3.4.3.2, 4.3.4.3.3 **ISA 62443-3-3:2013** SR 7.6 **ISO/IEC 27001:2013** A.12.1.2, A.12.5.1, A.12.6.2, A.14.2.2, A.14.2.3, A.14.2.4 **NIST SP 800-53 Rev. 4** CM-2, CM-3, CM-4, CM-5, CM-6, CM-7, CM-9, SA-10

	Protective Technology (PR.PT): Technical security solutions are managed to ensure the security and resilience of systems and assets, consistent with related policies, procedures, and agreements.	**PR.PT-1:** Audit/log records are determined, documented, implemented, and reviewed in accordance with policy	**CIS CSC** 1, 3, 5, 6, 14, 15, 16 **COBIT 5** APO11.04, BAI03.05, DSS05.04, DSS05.07, MEA02.01 **ISA 62443-2-1:2009** 4.3.3.3.9, 4.3.3.5.8, 4.3.4.4.7, 4.4.2.1, 4.4.2.2, 4.4.2.4 **ISA 62443-3-3:2013** SR 2.8, SR 2.9, SR 2.10, SR 2.11, SR 2.12 **ISO/IEC 27001:2013** A.12.4.1, A.12.4.2, A.12.4.3, A.12.4.4, A.12.7.1 **NIST SP 800-53 Rev. 4** AU Family

Module 4

- Vulnerability Scanning Standard
- Encryption Standard

Vulnerability Scanning Standard

Detect

Detect: Anomalies and Events (DE.AE)

- DE.AE-3 Event data are collected and correlated from multiple sources and sensors

Detect: Security Continuous Monitoring (DE.CM)

- DE.CM-1 The network is monitored to detect potential cybersecurity events
- DE.CM-4 Malicious code is detected
- DE.CM-7 Monitoring for unauthorized personnel, connections, devices, and software is performed

Vulnerability Scanning Standard

DETECT (DE)	**Anomalies and Events (DE.AE):** Anomalous activity is detected and the potential impact of events is understood.	**DE.AE-3:** Event data are collected and correlated from multiple sources and sensors	**CIS CSC** 1, 3, 4, 5, 6, 7, 8, 11, 12, 13, 14, 15, 16 **COBIT 5** BAI08.02 **ISA 62443-3-3:2013** SR 6.1 **ISO/IEC 27001:2013** A.12.4.1, A.16.1.7 **NIST SP 800-53 Rev. 4** AU-6, CA-7, IR-4, IR-5, IR-8, SI-4
	Security Continuous Monitoring (DE.CM): The information system and assets are monitored to identify cybersecurity events and verify	**DE.CM-1:** The network is monitored to detect potential cybersecurity events	**CIS CSC** 1, 7, 8, 12, 13, 15, 16 **COBIT 5** DSS01.03, DSS03.05, DSS05.07 **ISA 62443-3-3:2013** SR 6.2 **NIST SP 800-53 Rev. 4** AC-2, AU-12, CA-7, CM-3, SC-5, SC-7, SI-4
		DE.CM-4: Malicious code is detected	**CIS CSC** 4, 7, 8, 12 **COBIT 5** DSS05.01 **ISA 62443-2-1:2009** 4.3.4.3.8 **ISA 62443-3-3:2013** SR 3.2 **ISO/IEC 27001:2013** A.12.2.1 **NIST SP 800-53 Rev. 4** SI-3, SI-8
		DE.CM-7: Monitoring for unauthorized personnel, connections, devices, and software is performed	**CIS CSC** 1, 2, 3, 5, 9, 12, 13, 15, 16 **COBIT 5** DSS05.02, DSS05.05 **ISO/IEC 27001:2013** A.12.4.1, A.14.2.7, A.15.2.1 **NIST SP 800-53 Rev. 4** AU-12, CA-7, CM-3, CM-8, PE-3, PE-6, PE-20, SI-4

Encryption Standard

Detect

Detect: Security Continuous Monitoring (DE.CM)

- DE.CM-1 The network is monitored to detect potential cybersecurity events

Protect

Protect: Data Security (PR.DS)

- PR.DS-1 Data-at-rest is protected
- PR.DS-2 Data-in-transit is protected

Protect: Information Protection Processes and Procedures (PR.IP)

- PR.IP-4 Backups of information are conducted, maintained, and tested
- PR.PT-4 Communications and control networks are protected

Encryption Standard

	Security Continuous Monitoring (DE.CM): The information system and assets are monitored to identify cybersecurity events and verify	**DE.CM-1:** The network is monitored to detect potential cybersecurity events	**CIS CSC** 1, 7, 8, 12, 13, 15, 16 **COBIT 5** DSS01.03, DSS03.05, DSS05.07 **ISA 62443-3-3:2013** SR 6.2 **NIST SP 800-53 Rev. 4** AC-2, AU-12, CA-7, CM-3, SC-5, SC-7, SI-4

	Data Security (PR.DS): Information and records (data) are managed consistent with the organization's risk strategy to protect the confidentiality, integrity, and availability of information.	**PR.DS-1:** Data-at-rest is protected	**CIS CSC** 13, 14 **COBIT 5** APO01.06, BAI02.01, BAI06.01, DSS04.07, DSS05.03, DSS06.06 **ISA 62443-3-3:2013** SR 3.4, SR 4.1 **ISO/IEC 27001:2013** A.8.2.3 **NIST SP 800-53 Rev. 4** MP-8, SC-12, SC-28
		PR.DS-2: Data-in-transit is protected	**CIS CSC** 13, 14 **COBIT 5** APO01.06, DSS05.02, DSS06.06 **ISA 62443-3-3:2013** SR 3.1, SR 3.8, SR 4.1, SR 4.2 **ISO/IEC 27001:2013** A.8.2.3, A.13.1.1, A.13.2.1, A.13.2.3, A.14.1.2, A.14.1.3 **NIST SP 800-53 Rev. 4** SC-8, SC-11, SC-12

	Information Protection Processes and Procedures (PR.IP): Security policies (that address purpose, scope, roles, responsibilities, management commitment, and coordination among organizational entities), processes, and procedures are maintained and used to manage protection of information systems and assets.	**PR.IP-4:** Backups of information are conducted, maintained, and tested	**CIS CSC** 10 **COBIT 5** APO13.01, DSS01.01, DSS04.07 **ISA 62443-2-1:2009** 4.3.4.3.9 **ISA 62443-3-3:2013** SR 7.3, SR 7.4 **ISO/IEC 27001:2013** A.12.3.1, A.17.1.2, A.17.1.3, A.18.1.3 **NIST SP 800-53 Rev. 4** CP-4, CP-6, CP-9

	Protective Technology (PR.PT): Technical security solutions are managed to ensure the security and resilience of systems and assets, consistent with related policies, procedures, and agreements.	**PR.PT-4:** Communications and control networks are protected	**CIS CSC** 8, 12, 15 **COBIT 5** DSS05.02, APO13.01 **ISA 62443-3-3:2013** SR 3.1, SR 3.5, SR 3.8, SR 4.1, SR 4.3, SR 5.1, SR 5.2, SR 5.3, SR 7.1, SR 7.6 **ISO/IEC 27001:2013** A.13.1.1, A.13.2.1, A.14.1.3 **NIST SP 800-53 Rev. 4** AC-4, AC-17, AC-18, CP-8, SC-7, SC-19, SC-20, SC-21, SC-22, SC-23, SC-24, SC-25, SC-29, SC-32, SC-36, SC-37, SC-38, SC-39, SC-40, SC-41, SC-43

Module 5

- Physical and Environmental Protection Policy
- Secure System Development Life Cycle Standard

Physical and Environmental Protection Policy

Protect

Protect: Awareness and Training (PR.AT)

- PR.AT-1 All users are informed and trained

Physical and Environmental Protection Policy

	Awareness and Training (PR.AT): The organization's personnel and partners are provided cybersecurity awareness education and are trained to perform their cybersecurity-related duties and responsibilities consistent with related policies, procedures, and agreements.	**PR.AT-1:** All users are informed and trained	**CIS CSC** 17, 18 **COBIT 5** APO07.03, BAI05.07 **ISA 62443-2-1:2009** 4.3.2.4.2 **ISO/IEC 27001:2013** A.7.2.2, A.12.2.1 **NIST SP 800-53 Rev. 4** AT-2, PM-13

Secure System Development Life Cycle Standard

Protect

Protect: Identity Management and Access Control (PR.AC)

- PR.AC-1 Identities and credentials are issued, managed, verified, revoked, and audited for authorized devices, users and processes

- PR.AC-4 Access permissions and authorizations are managed, incorporating the principles of least privilege and separation of duties

Protect: Data Security (PR.DS)

- PR.DS-3 Assets are formally managed throughout removal, transfers, and disposition

Protect: Information Protection Processes and Procedures (PR.IP)

- PR.IP-1 A baseline configuration of information technology/industrial control systems is created and maintained incorporating security principles (e.g. concept of least functionality)

Protect: Protective Technology (PR.PT)

- PR.PT-1 Audit/log records are determined, documented, implemented, and reviewed in accordance with policy

Secure System Development Life Cycle Standard

PROTECT (PR)	**Identity Management, Authentication and Access Control (PR.AC):** Access to physical and logical assets and associated facilities is limited to authorized users, processes, and devices, and is managed consistent with the assessed risk of unauthorized access to authorized activities and transactions.	**PR.AC-1:** Identities and credentials are issued, managed, verified, revoked, and audited for authorized devices, users and processes	**CIS CSC** 1, 5, 15, 16 **COBIT 5** DSS05.04, DSS06.03 **ISA 62443-2-1:2009** 4.3.3.5.1 **ISA 62443-3-3:2013** SR 1.1, SR 1.2, SR 1.3, SR 1.4, SR 1.5, SR 1.7, SR 1.8, SR 1.9 **ISO/IEC 27001:2013** A.9.2.1, A.9.2.2, A.9.2.3, A.9.2.4, A.9.2.6, A.9.3.1, A.9.4.2, A.9.4.3 **NIST SP 800-53 Rev. 4** AC-1, AC-2, IA-1, IA-2, IA-3, IA-4, IA-5, IA-6, IA-7, IA-8, IA-9, IA-10, IA-11
		PR.AC-4: Access permissions and authorizations are managed, incorporating the principles of least privilege and separation of duties	**CIS CSC** 3, 5, 12, 14, 15, 16, 18 **COBIT 5** DSS05.04 **ISA 62443-2-1:2009** 4.3.3.7.3 **ISA 62443-3-3:2013** SR 2.1 **ISO/IEC 27001:2013** A.6.1.2, A.9.1.2, A.9.2.3, A.9.4.1, A.9.4.4, A.9.4.5 **NIST SP 800-53 Rev. 4** AC-1, AC-2, AC-3, AC-5, AC-6, AC-14, AC-16, AC-24

	Data Security (PR.DS): Information and records (data) are managed consistent with the organization's risk strategy to protect the confidentiality, integrity, and availability of information.	**PR.DS-3:** Assets are formally managed throughout removal, transfers, and disposition	**CIS CSC** 1 **COBIT 5** BAI09.03 **ISA 62443-2-1:2009** 4.3.3.3.9, 4.3.4.4.1 **ISA 62443-3-3:2013** SR 4.2 **ISO/IEC 27001:2013** A.8.2.3, A.8.3.1, A.8.3.2, A.8.3.3, A.11.2.5, A.11.2.7 **NIST SP 800-53 Rev. 4** CM-8, MP-6, PE-16

	Information Protection Processes and Procedures (PR.IP): Security policies (that address purpose, scope, roles, responsibilities, management commitment, and coordination among organizational entities), processes, and procedures are maintained and used to manage protection of information systems and assets.	**PR.IP-1:** A baseline configuration of information technology/industrial control systems is created and maintained incorporating security principles (e.g. concept of least functionality)	**CIS CSC** 3, 9, 11 **COBIT 5** BAI10.01, BAI10.02, BAI10.03, BAI10.05 **ISA 62443-2-1:2009** 4.3.4.3.2, 4.3.4.3.3 **ISA 62443-3-3:2013** SR 7.6 **ISO/IEC 27001:2013** A.12.1.2, A.12.5.1, A.12.6.2, A.14.2.2, A.14.2.3, A.14.2.4 **NIST SP 800-53 Rev. 4** CM-2, CM-3, CM-4, CM-5, CM-6, CM-7, CM-9, SA-10

	Protective Technology (PR.PT): Technical security solutions are managed to ensure the security and resilience of systems and assets, consistent with related policies, procedures, and agreements.	**PR.PT-1:** Audit/log records are determined, documented, implemented, and reviewed in accordance with policy	**CIS CSC** 1, 3, 5, 6, 14, 15, 16 **COBIT 5** APO11.04, BAI03.05, DSS05.04, DSS05.07, MEA02.01 **ISA 62443-2-1:2009** 4.3.3.3.9, 4.3.3.5.8, 4.3.4.4.7, 4.4.2.1, 4.4.2.2, 4.4.2.4 **ISA 62443-3-3:2013** SR 2.8, SR 2.9, SR 2.10, SR 2.11, SR 2.12 **ISO/IEC 27001:2013** A.12.4.1, A.12.4.2, A.12.4.3, A.12.4.4, A.12.7.1 **NIST SP 800-53 Rev. 4** AU Family

Module 6

- Cyber Incident Response Standard
- Personnel Security Policy

Cyber Incident Response Standard

Identify

Identify: Supply Chain Risk Management (ID.SC)

- ID.SC-5 Response and recovery planning and testing are conducted with suppliers and third-party providers

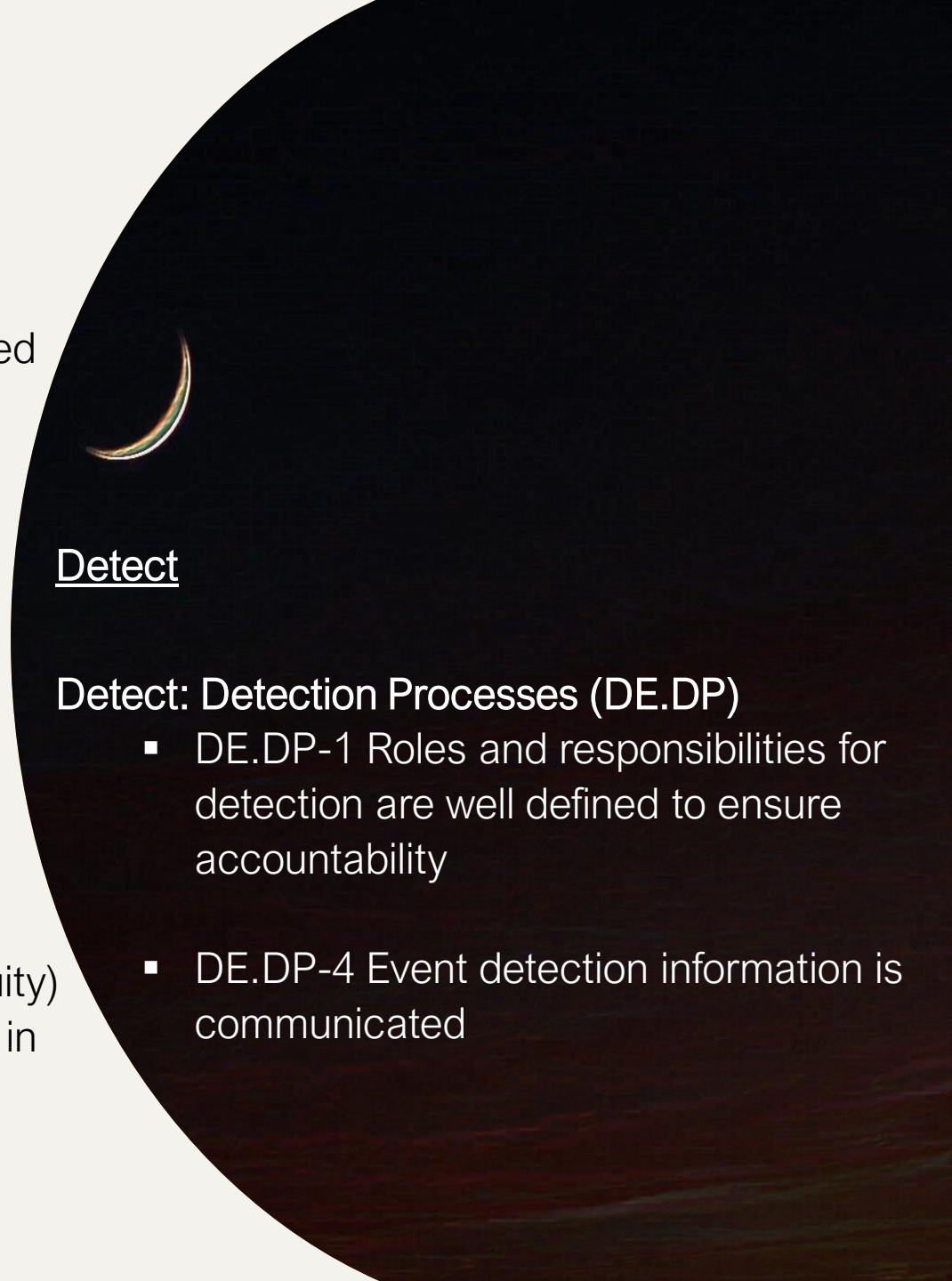
Protect

Protect: Data Security (PR.DS)

- PR.DS-1 Data-at-rest is protected
- PR.DS-2 Data-in-transit is protected

Protect: Information Protection Processes and Procedures (PR.IP)

- PR.IP-4 Backups of information are conducted, maintained, and tested
- PR.IP-9 Response plans (Incident Response and Business Continuity) and recovery plans (Incident Recovery and Disaster Recovery) are in place and managed
- PR.IP-10 Response and recovery plans are tested



Detect

Detect: Detection Processes (DE.DP)

- DE.DP-1 Roles and responsibilities for detection are well defined to ensure accountability
- DE.DP-4 Event detection information is communicated

Cyber Incident Response Standard (cont.)

Respond

Respond: Response Planning (RS.RP)

- RS.RP-1 Response plan is executed during or after an event

Respond: Communications (RS.CO)

- RS.CO-1 Personnel know their roles and order of operations when a response is needed
- RS.CO-2 Incidents are reported consistent with established criteria
- RS.CO-3 Information is shared consistent with response plans
- RS.CO-4 Coordination with stakeholders occurs consistent with response plans
- RS.CO-5 Voluntary information sharing occurs with external stakeholders to achieve broader cybersecurity situational awareness

Respond: Analysis (RS.AN)

- RS.AN-4 Incidents are categorized consistent with response plans

Cyber Incident Response Standard (cont.)

Respond (cont.)

Respond: Improvements (RS.IM)

- RS.IM-1 Response plans incorporate lessons learned
- RS.IM-2 Response strategies are updated

Recover: Recovery Planning (RC.RP)

- RC.RP-1 Recovery plan is executed during or after a cybersecurity incident

Recover: Improvements (RC.IM)

- RC.IM-1 Recovery plans incorporate lessons learned
- RC.IM-2 Recovery strategies are updated

Recover: Communications (RC.CO)

- RC.CO-1 Public relations are managed
- RC.CO-2 Reputation is repaired after an incident
- RC.CO-3 Recovery activities are communicated to internal and external stakeholders as well as executive and management teams

Cyber Incident Response Standard

	Supply Chain Risk Management (ID.SC): The organization's priorities, constraints, risk tolerances, and assumptions are established and used to support risk decisions associated with managing supply chain risk. The organization has established and implemented the processes to identify, assess and manage supply chain risks.	**ID.SC-5:** Response and recovery planning and testing are conducted with suppliers and third-party providers	**CIS CSC** 19, 20 **COBIT 5** DSS04.04 **ISA 62443-2-1:2009** 4.3.2.5.7, 4.3.4.5.11 **ISA 62443-3-3:2013** SR 2.8, SR 3.3, SR.6.1, SR 7.3, SR 7.4 **ISO/IEC 27001:2013** A.17.1.3 **NIST SP 800-53 Rev. 4** CP-2, CP-4, IR-3, IR-4, IR-6, IR-8, IR-9

	Data Security (PR.DS): Information and records (data) are managed consistent with the organization's risk strategy to protect the confidentiality, integrity, and availability of information.	**PR.DS-1:** Data-at-rest is protected	**CIS CSC** 13, 14 **COBIT 5** APO01.06, BAI02.01, BAI06.01, DSS04.07, DSS05.03, DSS06.06 **ISA 62443-3-3:2013** SR 3.4, SR 4.1 **ISO/IEC 27001:2013** A.8.2.3 **NIST SP 800-53 Rev. 4** MP-8, SC-12, SC-28
		PR.DS-2: Data-in-transit is protected	**CIS CSC** 13, 14 **COBIT 5** APO01.06, DSS05.02, DSS06.06 **ISA 62443-3-3:2013** SR 3.1, SR 3.8, SR 4.1, SR 4.2 **ISO/IEC 27001:2013** A.8.2.3, A.13.1.1, A.13.2.1, A.13.2.3, A.14.1.2, A.14.1.3 **NIST SP 800-53 Rev. 4** SC-8, SC-11, SC-12

	Information Protection Processes and Procedures (PR.IP): Security policies (that address purpose, scope, roles, responsibilities, management commitment, and coordination among organizational entities), processes, and procedures are maintained and used to manage protection of information systems and assets.	**PR.IP-4:** Backups of information are conducted, maintained, and tested	**CIS CSC** 10 **COBIT 5** APO13.01, DSS01.01, DSS04.07 **ISA 62443-2-1:2009** 4.3.4.3.9 **ISA 62443-3-3:2013** SR 7.3, SR 7.4 **ISO/IEC 27001:2013** A.12.3.1, A.17.1.2, A.17.1.3, A.18.1.3 **NIST SP 800-53 Rev. 4** CP-4, CP-6, CP-9

	Information Protection Processes and Procedures (PR.IP): Security policies (that address purpose, scope, roles, responsibilities, management commitment, and coordination among organizational entities), processes, and procedures are maintained and used to manage protection of information systems and assets.	**PR.IP-9:** Response plans (Incident Response and Business Continuity) and recovery plans (Incident Recovery and Disaster Recovery) are in place and managed	**CIS CSC** 19 **COBIT 5** APO12.06, DSS04.03 **ISA 62443-2-1:2009** 4.3.2.5.3, 4.3.4.5.1 **ISO/IEC 27001:2013** A.16.1.1, A.17.1.1, A.17.1.2, A.17.1.3 **NIST SP 800-53 Rev. 4** CP-2, CP-7, CP-12, CP-13, IR-7, IR-8, IR-9, PE-17
		PR.IP-10: Response and recovery plans are tested	**CIS CSC** 19, 20 **COBIT 5** DSS04.04 **ISA 62443-2-1:2009** 4.3.2.5.7, 4.3.4.5.11 **ISA 62443-3-3:2013** SR 3.3 **ISO/IEC 27001:2013** A.17.1.3 **NIST SP 800-53 Rev. 4** CP-4, IR-3, PM-14

Cyber Incident Response Standard (cont.)

	Detection Processes (DE.DP): Detection processes and procedures are maintained and tested to ensure awareness of anomalous events.	**DE.DP-1:** Roles and responsibilities for detection are well defined to ensure accountability	**CIS CSC** 19 **COBIT 5** APO01.02, DSS05.01, DSS06.03 **ISA 62443-2-1:2009** 4.4.3.1 **ISO/IEC 27001:2013** A.6.1.1, A.7.2.2 **NIST SP 800-53 Rev. 4** CA-2, CA-7, PM-14
		DE.DP-4: Event detection information is communicated	**CIS CSC** 19 **COBIT 5** APO08.04, APO12.06, DSS02.05 **ISA 62443-2-1:2009** 4.3.4.5.9 **ISA 62443-3-3:2013** SR 6.1 **ISO/IEC 27001:2013** A.16.1.2, A.16.1.3 **NIST SP 800-53 Rev. 4** AU-6, CA-2, CA-7, RA-5, SI-4

RESPOND (RS)	**Response Planning (RS.RP):** Response processes and procedures are executed and maintained, to ensure response to detected cybersecurity incidents.	**RS.RP-1:** Response plan is executed during or after an incident	**CIS CSC** 19 **COBIT 5** APO12.06, BAI01.10 **ISA 62443-2-1:2009** 4.3.4.5.1 **ISO/IEC 27001:2013** A.16.1.5 **NIST SP 800-53 Rev. 4** CP-2, CP-10, IR-4, IR-8
	Communications (RS.CO): Response activities are coordinated with internal and external stakeholders (e.g. external support from law enforcement agencies).	**RS.CO-1:** Personnel know their roles and order of operations when a response is needed	**CIS CSC** 19 **COBIT 5** EDM03.02, APO01.02, APO12.03 **ISA 62443-2-1:2009** 4.3.4.5.2, 4.3.4.5.3, 4.3.4.5.4 **ISO/IEC 27001:2013** A.6.1.1, A.7.2.2, A.16.1.1 **NIST SP 800-53 Rev. 4** CP-2, CP-3, IR-3, IR-8
		RS.CO-2: Incidents are reported consistent with established criteria	**CIS CSC** 19 **COBIT 5** DSS01.03 **ISA 62443-2-1:2009** 4.3.4.5.5 **ISO/IEC 27001:2013** A.6.1.3, A.16.1.2 **NIST SP 800-53 Rev. 4** AU-6, IR-6, IR-8
		RS.CO-3: Information is shared consistent with response plans	**CIS CSC** 19 **COBIT 5** DSS03.04 **ISA 62443-2-1:2009** 4.3.4.5.2 **ISO/IEC 27001:2013** A.16.1.2, Clause 7.4, Clause 16.1.2 **NIST SP 800-53 Rev. 4** CA-2, CA-7, CP-2, IR-4, IR-8, PE-6, RA-5, SI-4
		RS.CO-4: Coordination with stakeholders occurs consistent with response plans	**CIS CSC** 19 **COBIT 5** DSS03.04 **ISA 62443-2-1:2009** 4.3.4.5.5 **ISO/IEC 27001:2013** Clause 7.4 **NIST SP 800-53 Rev. 4** CP-2, IR-4, IR-8
		RS.CO-5: Voluntary information sharing occurs with external stakeholders to achieve broader cybersecurity situational awareness	**CIS CSC** 19 **COBIT 5** BAI08.04 **ISO/IEC 27001:2013** A.6.1.4 **NIST SP 800-53 Rev. 4** SI-5, PM-15

Cyber Incident Response Standard (cont.)

	Analysis (RS.AN): Analysis is conducted to ensure effective response and support recovery activities.	**RS.AN-4:** Incidents are categorized consistent with response plans	**CIS CSC** 19 **COBIT 5** DSS02.02 **ISA 62443-2-1:2009** 4.3.4.5.6 **ISO/IEC 27001:2013** A.16.1.4 **NIST SP 800-53 Rev. 4** CP-2, IR-4, IR-5, IR-8

	Improvements (RS.IM): Organizational response activities are improved by incorporating lessons learned from current and previous detection/response activities.	**RS.IM-1:** Response plans incorporate lessons learned	**COBIT 5** BAI01.13 **ISA 62443-2-1:2009** 4.3.4.5.10, 4.4.3.4 **ISO/IEC 27001:2013** A.16.1.6, Clause 10 **NIST SP 800-53 Rev. 4** CP-2, IR-4, IR-8
		RS.IM-2: Response strategies are updated	**COBIT 5** BAI01.13, DSS04.08 **ISO/IEC 27001:2013** A.16.1.6, Clause 10 **NIST SP 800-53 Rev. 4** CP-2, IR-4, IR-8

RECOVER (RC)	**Recovery Planning (RC.RP):** Recovery processes and procedures are executed and maintained to ensure restoration of systems or assets affected by cybersecurity incidents.	**RC.RP-1:** Recovery plan is executed during or after a cybersecurity incident	**CIS CSC** 10 **COBIT 5** APO12.06, DSS02.05, DSS03.04 **ISO/IEC 27001:2013** A.16.1.5 **NIST SP 800-53 Rev. 4** CP-10, IR-4, IR-8

	Improvements (RC.IM): Recovery planning and processes are improved by incorporating lessons learned into future activities.	**RC.IM-1:** Recovery plans incorporate lessons learned	**COBIT 5** APO12.06, BAI05.07, DSS04.08 **ISA 62443-2-1:2009** 4.4.3.4 **ISO/IEC 27001:2013** A.16.1.6, Clause 10 **NIST SP 800-53 Rev. 4** CP-2, IR-4, IR-8
		RC.IM-2: Recovery strategies are updated	**COBIT 5** APO12.06, BAI07.08 **ISO/IEC 27001:2013** A.16.1.6, Clause 10 **NIST SP 800-53 Rev. 4** CP-2, IR-4, IR-8

	Communications (RC.CO): Restoration activities are coordinated with internal and external parties (e.g. coordinating centers, Internet Service Providers, owners of attacking systems, victims, other CSIRTs, and vendors).	**RC.CO-1:** Public relations are managed	**COBIT 5** EDM03.02 **ISO/IEC 27001:2013** A.6.1.4, Clause 7.4
		RC.CO-2: Reputation is repaired after an incident	**COBIT 5** MEA03.02 **ISO/IEC 27001:2013** Clause 7.4
		RC.CO-3: Recovery activities are communicated to internal and external stakeholders as well as executive and management teams	**COBIT 5** APO12.06 **ISO/IEC 27001:2013** Clause 7.4 **NIST SP 800-53 Rev. 4** CP-2, IR-4

Personnel Security Policy

Protect

Protect: Awareness and Training (PR.AT)

- PR.AT-1 All users are informed and trained

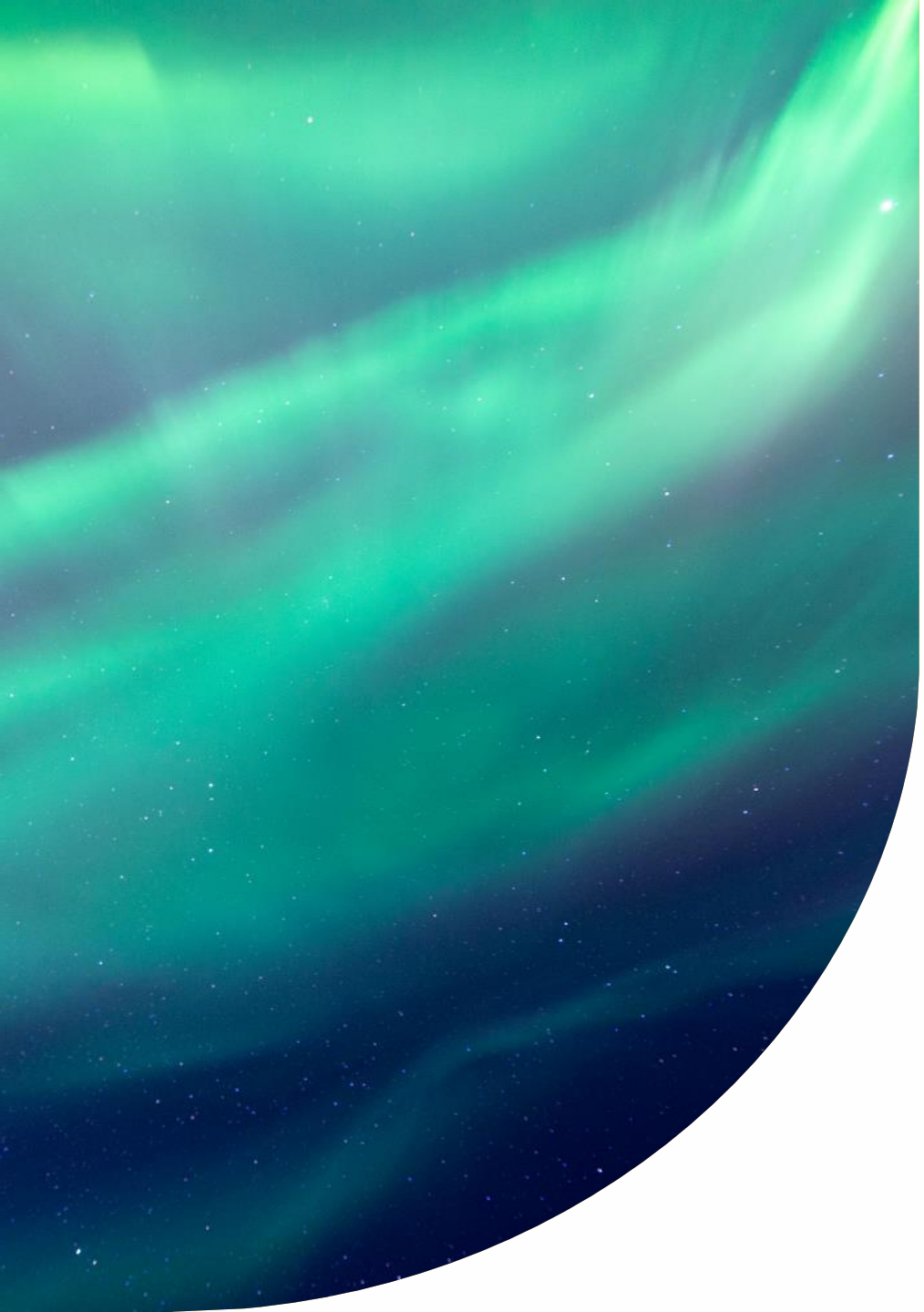
Personnel Security Policy

	Awareness and Training (PR.AT): The organization's personnel and partners are provided cybersecurity awareness education and are trained to perform their cybersecurity-related duties and responsibilities consistent with related policies, procedures, and agreements.	**PR.AT-1:** All users are informed and trained	**CIS CSC** 17, 18 **COBIT 5** APO07.03, BAI05.07 **ISA 62443-2-1:2009** 4.3.2.4.2 **ISO/IEC 27001:2013** A.7.2.2, A.12.2.1 **NIST SP 800-53 Rev. 4** AT-2, PM-13

Challenges

Challenges

- ✓ Finding suitable companies to use for policy comparison was a little difficult at times
- ✓ Understanding the NIST framework was interesting
- ✓ Since our class didn't have live lectures or visual aids for our project, it presented a challenge on what was expected of us



Career Skills

Career Skills

- ✓ Research
- ✓ Patience
- ✓ Problem Solving
- ✓ Overcoming Obstacles
- ✓ Flexibility
- ✓ Persistence
- ✓ Analytical Thinking
- ✓ Attention to Detail
- ✓ Resourcefulness

Conclusion

We learned the importance of NIST Cybersecurity Framework and how companies can benefit from its flexibility in planning policies and standards. I've worked with policies and standards in the past, but I'd never thought about how the templates came about or whether there were any standards to follow.

Having polices and standards for cybersecurity makes it easier for IT departments to know what is being done and when and implement security measures for vital information in the company.

REFERENCES

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National Institute of Standards and Technology. (2018, February 6). An Introduction to the Components of the Framework. NIST. Retrieved October 22, 2022, from https://www.nist.gov/cyberframework/online-learning/components-framework