



# Environmental Services

## ◆ ◆ Maturity Model ◆ ◆



December  
2020



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## Message from the chairman

It is vividly evident that the world witnessed the worst public health and economic crisis due to COVID-19 pandemic. This inevitably mobilized the international community to act seriously and swiftly. However, the mortalities and morbidities induced by healthcare-acquired infections (HAI) are equally fatal, but the international community did not act similarly. Consequently, we are continuously and chronically suffering from HAI.

The current intervention for HAI is merely based on passively-set standards and enforcing these standards via regulatory agencies such as the centre for disease control and prevention (CDC), joint commission international (JCI), ministries of health, and other regulatory agencies. To efficiently address HAI, we inevitably need to mobilize the international community because HAI traverses a multitude of epistemological dimensions, requiring multidisciplinary tacit knowledge, and mandates active international collaboration. Besides, we believe that we can efficiently traverse deeply into the root-causes and solution landscapes by automating the entire healthcare environmental services and infection control within healthcare institutions using the latest advancements in computational epistemology, computational infection control models, computational epidemiological models, artificial intelligence, machine learning, distributed ledger technology, collective intelligence, cognitive technologies, internet of things, ubiquitous technologies, intelligent micro-measurement frameworks, artificial life, evidence-based program implementation, patient-centric care, strategy anchored execution, and symbiotic healthcare ecosystem services. Consequently, we developed these open standards that were tailored from diverse international standards to promote the automation of healthcare environmental services and infection control processes and best practices.

The Healthcare Environmental Services Operational Map (HESOM) and other standards were developed to efficiently leverage multidisciplinary experts and practitioners to contribute towards the eradication of HAI-induced mortalities and morbidities. Using ReXcels research and innovation environment, we cultivate collective intelligence by bringing together these multidisciplinary experts to iteratively develop these standards and adaptively support the innovation of computational technology that automates the execution and enforcement of these standards. As such, we cordially invite you to use these documents and participate actively in the further development of these standards to significantly reduce HAI-induced mortalities, morbidities, and their enormous negative economic externalities.

**Hamid Adem**

Interim Chairman, and Chief R&D Officer

# Change Control

## Change Control

Version:	Date:	Changes:

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# Environmental Services Maturity Model

## Structure of the Document



# Structure of the Document

The ESMM document comprises the following chapters:

**Chapter–1: Overview:** This chapter provides an overview and introduces ESMM to the readers. This chapter establishes the scope, purpose and principles of ESMM and also identifies various references used for ESMM.

**Chapter–2: ESMM Concepts:** This chapter highlights fundamental concepts of ESMM, ESMM Design and Process Areas.

**Chapter–3: Maturity levels:** This chapter introduces each maturity level and highlights significant and prime characteristics of all the maturity levels. This chapter also associates process areas with their maturity levels in a tabular form.

**Chapter–4: Process Areas:** This chapter provides detailed explanation of all the process areas for each maturity level.

**Chapter–5: Process Areas: Maturity level 2:** This chapter identifies purpose, goals, practices and sub practices for each process area of the maturity level 2: Firefighting. This chapter also maps goals to specific practices for each process area.

**Chapter–6: Process Areas: Maturity level 3:** This chapter identifies purpose, goals, practices and sub practices for each process area of the maturity level 3: Planned. This chapter also maps goals to specific practices for each process area.

**Chapter–7: Process Areas: Maturity level 4:** This chapter identifies purpose, goals, practices and sub practices for each process area of the maturity level 4: Quantified. This chapter also maps goals to specific practices for each process area.

**Chapter–8: Process Areas: Maturity level 5:** This chapter identifies purpose, goals, practices and sub practices for each process area of the maturity level 5: Holistic Optimizing. This chapter also maps goals to specific practices for each process area.

**Chapter–9: Institutionalization:** This chapter provides an overview on the institutionalization goals, practices and sub practices for all the process areas.

**Chapter–10: References:** This chapter serves as a prime reference to Environmental services maturity model and presents the details supporting it.

## Overview



# 1 Overview

## 1.1 Introduction

Environmental Service Maturity Model (ESMM) is a well-established capability management framework with an objective to address current challenges faced by various organizations with regards to its environmental services.

ESMM describes an evolutionary improvement path that guides organizations as they move from immature, inconsistent environmental services management activities to mature and disciplined processes.

ESMM provides five systematic stages of improvement, whereby each stage provide a foundation on which to build improvements undertaken at the next stage. Thus ESMM provides a roadmap for continuous process improvement. ESMM is closely related to ESM (environmental Service map) and fully compatible to it. Reference Section depicts ESM.

## 1.2 Purpose

ESMM has been crafted to provide following benefits to any organization which implements it:

- ESMM will provide a sound evaluation framework based on an improvement roadmap for environmental services.
- ESMM will provide realistic maturity assessment of environmental services process, work flows and activities.
- ESMM would help to identify process deficiencies in the organization and guides the improvements in logical, incremental steps
- ESMM would enforce a standardization of environmental processes across different department and units.
- ESMM would align the environmental services goals with the business objectives of the organizations.
- ESMM would not only provide means to understand process risks, but to handle them properly.
- ESMM would provide proven methods for appraising the fidelity between how tasks are actually performed and how they should be performed.
- ESMM would provide guidance on how to implement the business process foundations required for organizational agility and lower operating costs.

# 1 Overview

## 1.3 Scope

The ESMM is intended for anyone interested or involved in improving an environmental services process related to their products and services - whether the products and services are for internal or external use.

ESMM can be used in various industries for example, hospitals and health care, environmental services, equipment manufacturing, and consulting services.

## 1.4 Principles

The foundation principles are:

- Attributes of an environmental process can be assessed to determine its current capability
- Environmental processes cannot survive unless the senior management provides ample support and maturity for its implementation.
- Optimized process improvement happens in successively more predictable stages (maturity level)
- Each stage or maturity level lays a required foundation on which future improvements can be built.

# 1 Overview

## 1.5 Maturity Levels (High Level)

Environmental Services Maturity Model, the ESMM is divided into five maturity levels that represent different states through which an organization is transformed as its environmental processes and capability are improved. Figure 1, below depicts the ESMM model

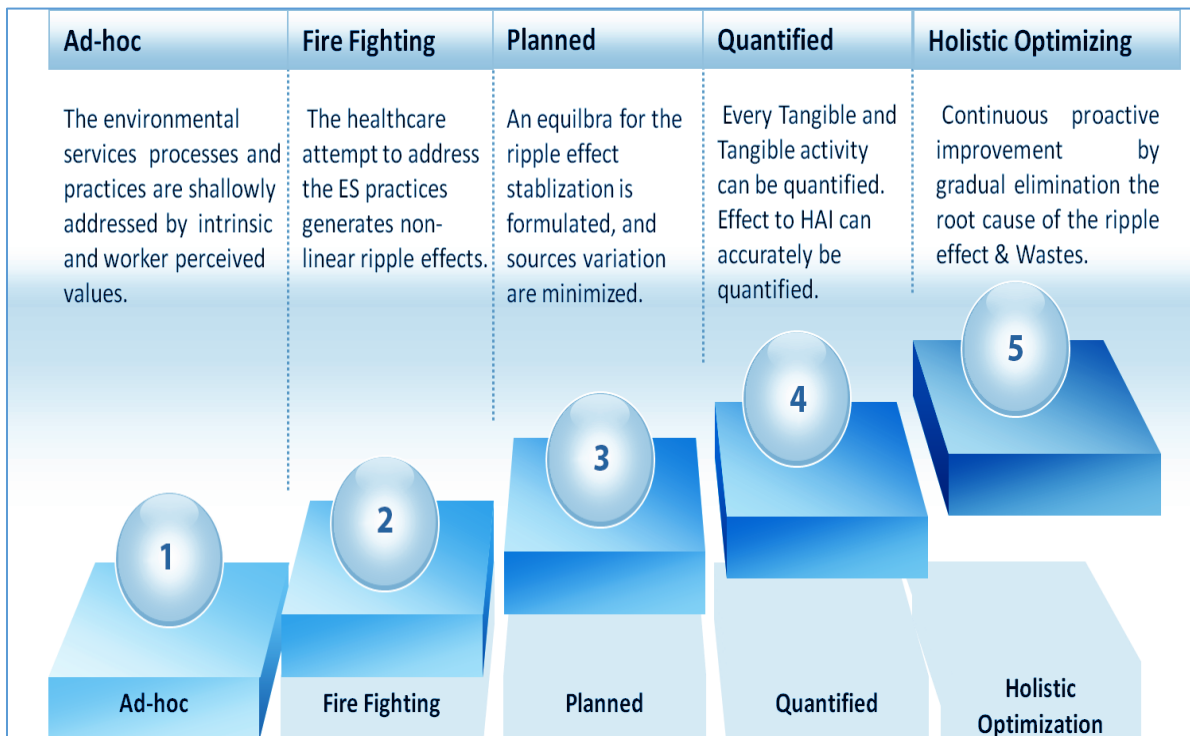


Figure 1: Environmental Service Maturity Model (high level)

The successive stages of environmental maturity model include:

- **Level 1: Adhoc** — at this level, environmental processes are performed in inconsistent sometimes ad hoc ways with results that are difficult to predict. The environmental services processes and practices are shallowly addressed by intrinsic and worker perceived values
- **Level 2: Firefighting** — At this level, work is stabilized to ensure that it can be performed in a repeatable way however, similar tasks may use different procedures. At this level, the healthcare attempt to address the ES practices generates non-linear ripple effects.

# 1 Overview

- **Level 3: Planned** — At this level environmental standard processes are synthesized from best practices and tailoring accordingly. Environmental standard processes provide an economy of scale and a foundation for learning from common measures and experience. An equilibra for the ripple effect stabilization is formulated, and sources variations are minimized.
- **Level 4: Quantified** — at this level Every Tangible and Tangible activity can be quantified. Effect to HAI can accurately be quantified.
- **Level 5: Holistic Optimizing** — This stage involves Continuous proactive improvement by gradual elimination of the root cause of the ripple effect & Wastes. This involves both proactive innovative and opportunistic improvement that can close gaps between the organization's current capability and the capability required to achieve its objectives.

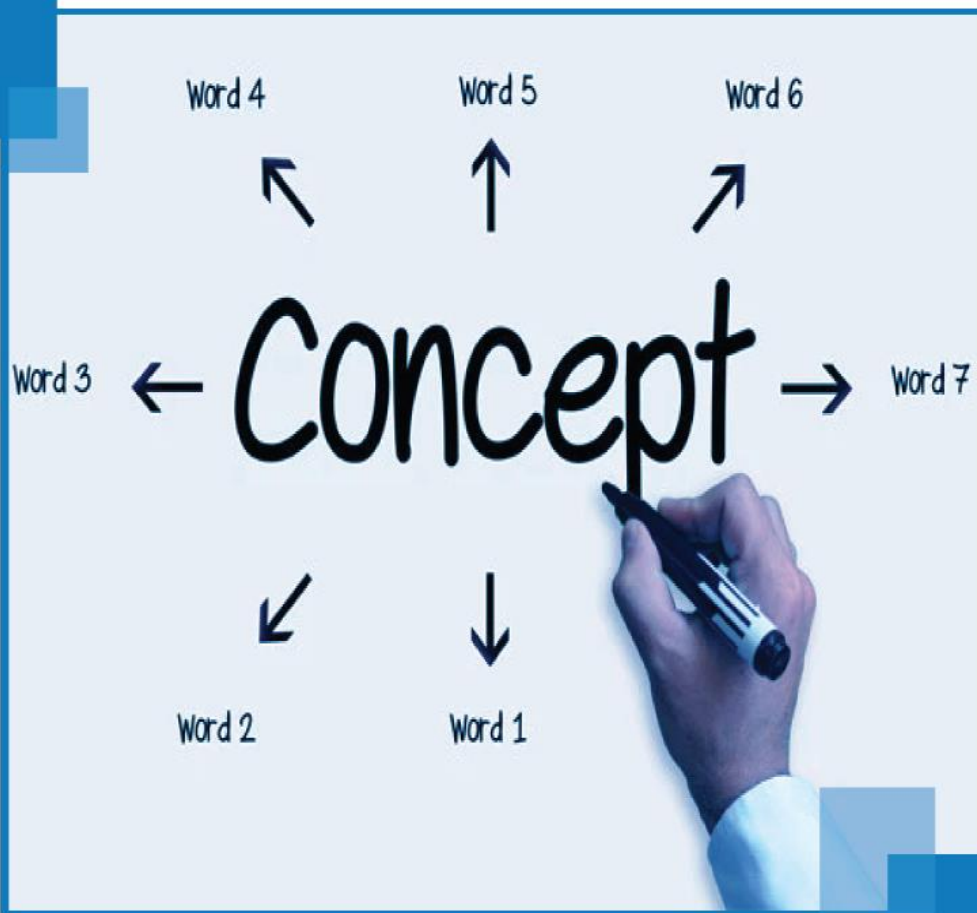
For more information on Ripple Effect refer to the References section Holistic ten Perspective.

## 1.6 Reference

The ESMM is a well-grounded to various international best practices standards, such as:

- NHS- National Health Services Standard
- OSHA- Occupational Safety and Health Administration standard
- CDC- Centers for Disease Control and Prevention standard
- Lean six sigma- Quality Standard
- JCI- Journal of Clinical Investigation standard
- JCAHO- Joint Commission on Accreditation of Healthcare Organizations (JCAHO)
- EPA- US Environmental Protection Agency
- HCAHPS - Hospital Consumer Assessment of Healthcare Providers and Systems
- HIPA- Health Information Privacy Act standard.
- Business Process Maturity Model (BPMM)
- ISO 4000 Environmental Management Standards

## ESSM Concepts





## 2.1 Fundamental Concepts

Following are Fundamental concepts of ESMM.

- **Maturity Model.** A maturity model is an evolutionary roadmap for implementing the vital practices of environmental services.
- **Maturity Level.** A maturity level is a well-defined evolutionary plateau that serves as a steppingstone for achieving an environmental mature process culture. Each environmental maturity level comprises a set of process goals that, when satisfied, stabilizes a critical set of practices that build on the preceding maturity level and form the foundation for continued improvements.
- **Process.** A process can be defined as a set of interrelated activities, methods, and practices that use a set of inputs to develop, deliver, and support a set of environmental services. As an organization matures, the processes become better defined and more consistently implemented throughout the organization.
- **Process Areas.** The process areas and maturity levels of the ESMM are indicators of process capability. Each process area consists of a collection of integrated best practices that indicate what should be done. Process areas identify the issues that must be addressed to achieve a maturity level. The process areas may be considered to be the requirements for achieving a maturity level. To achieve a maturity level, the process areas for that maturity level must be satisfied and the processes must be institutionalized.
- **Process Area Goals.** The process area goals summarize its practices and are used as a measure to determine whether an organization or unit has effectively implemented the environmental process area. The goals signify the scope, boundaries, and intent of each process area. Process Area goals comprise of two types:
  1. Specific goals
  2. Institutionalization goals
- **Process Capability.** Process capability describes the range of expected results that can be achieved by following an ESMM process. The process capability of an organization provides one means of predicting the most likely outcomes to be expected from the next effort the organization undertakes.
- **Sub practices.** Sub practices serve as guidance in interpreting an adequate implementation of the practice.
- **Process performance.** Process performance describes the actual results achieved by performing a process. Process performance focuses on the results achieved, while process capability focuses on results expected.
- **Process Maturity.** Process maturity is the extent to which processes are explicitly defined, managed, measured, controlled, and effective. Process maturation implies that process capability is improved over time.

## 2.2 ESSM Design

The Environmental services maturely model describes what is normally expected for organizations involved in environmental services, regardless of the services that are provided. Each ESMM Maturity level comprises of one or more process areas, which in turn comprises of following:

1. Process area purpose statement,
2. Process area introductory notes,
3. Process area specific goals,
4. Process area institutionalization goal,
5. Practice-to-goal relationship table,
6. Specific practices, and Institutionalization Practices.

This has been depicted in the Figure 2: Process Area Components



**Figure 2:** Process Area Component

The top-level components of the ESMM are the five maturity levels:

1. Maturity level 1 (Ad-hoc),
2. Maturity level 2 (Fire Fighting),
3. Maturity level 3(Planned),
4. Maturity level 4 (Quantified), and
5. Maturity level 5 (Holistic Optimizing).

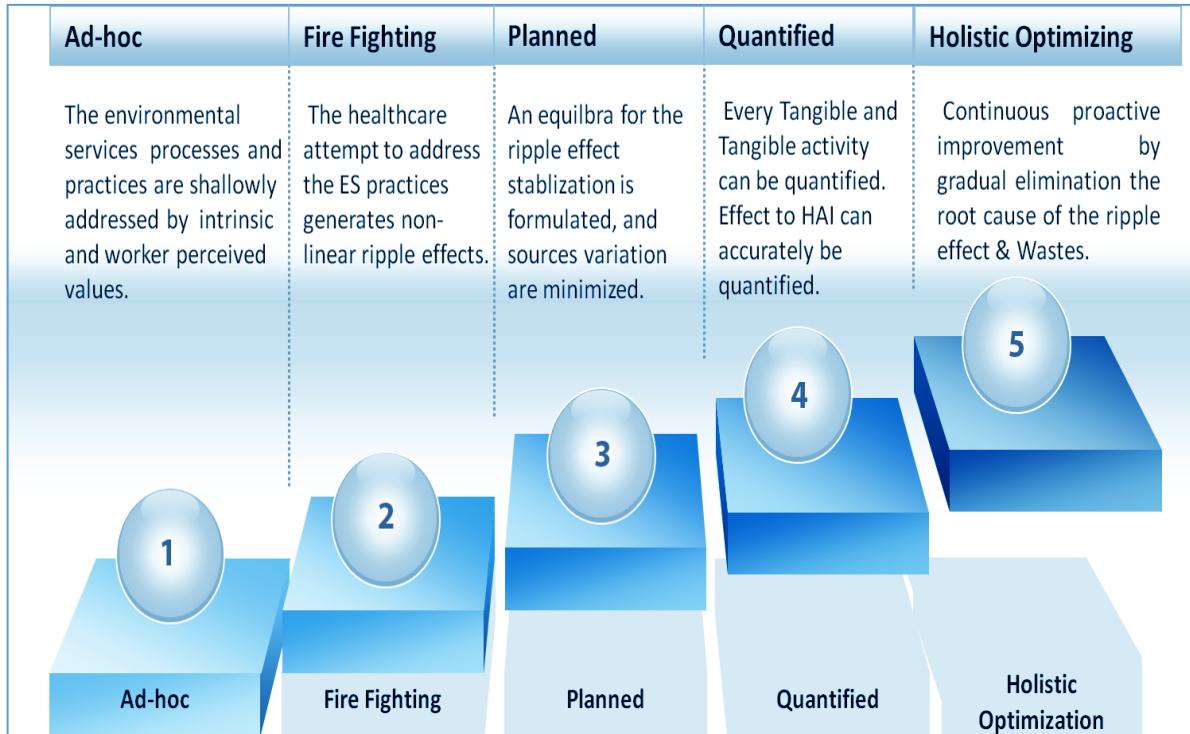
Maturity levels 2, 3, 4, and 5 each contain two or more process areas. Maturity level 1 does not contain any process areas.

## Maturity Levels



# 3

## Maturity Levels



### 3.1 Level 1: Adhoc

At this level, the environmental services processes and practices are shallowly addressed by intrinsic and worker perceived values.

#### Level Characteristics

At maturity level 1, the environmental processes are rarely defined or documented. Processes that are defined are rarely followed. The organization usually does not provide a stable environment for process implementation. Organizations frequently have difficulty establishing commitments. Success at this level depends on the competence of the people in the organization and not on the use of proven processes. Organizations at this level frequently exceed the budget and schedule or fall short of their throughput requirements. Maturity level 1 organizations encounter great difficulty in trying to adapt to changes in environmental services requirements or business environment.

## Process Areas

- Nil

## 3.2 Level 2: Fire Fighting

At this level, work is stabilized to ensure that it can be performed in a repeatable way however, similar tasks may use different procedures. At this level, the healthcare attempt to address the ES practices generates non-linear ripple effects.

### Level Characteristics

At maturity level 2, basic environmental planning, management and coordination processes, have been established. At this level responsibilities have been assigned to individual departments and units and dependencies among themselves is monitored.

Realistic commitments are made, which are based on the results observed on previous work. At this level costs, schedules, and throughput, as well as problems in meeting their requirements and commitments are well tracked.

At maturity level 2, the primary management concerns are cost, schedule, and throughput. There is an awareness of environmental quality concerns, but management of quality goals is not a primary management concern. Processes may differ among work units at this level.

Work units in maturity level 2 organizations generally deliver their environmental services within budget and on schedule and according to their throughput requirements.

## Process Areas

Following Process areas correspond to this maturity level:

- Environmental Process Leadership
- Environmental Organizational Business Governance
- Environmental Work Unit Requirements Management
- Environmental Work Unit Planning and Commitment
- Environmental Work Unit Monitoring and Control
- Environmental Work Unit Performance
- Environmental Work Unit Configuration Management Sourcing Management
- Environmental Process and Product Assurance

### 3.3 Level 3: Planned

At this level environmental standard processes are synthesized from best practices and tailoring accordingly. Environmental standard processes provide an economy of scale and a foundation for learning from common measures and experience. An equilibra for the ripple effect stabilization is formulated, and sources variations are minimized.

#### Level Characteristics

At maturity level 3, the organization's environmental standard processes for developing, preparing, deploying, operating, and supporting the environmental services are documented for use across the organization.

There is typically a unit or workgroup that is responsible for coordinating the environmental process activities. An organizational infrastructure is established to support organizational learning and knowledge Management.

Mechanisms are used to improve the organization's environmental standard processes. An organization-wide program is established to develop the skills and knowledge of the professional staff so that they can perform their assigned roles.

There is a shift of focus at maturity level 3 from the individual work units and workgroups to an integrated approach to developing, preparing, deploying, operating, and supporting complete set of environmental services.

#### Process Areas

Following Process areas correspond to this maturity level:

- Environmental Process Management
- Environmental Competency Development
- Environmental Resource Management
- Environmental Configuration Management
- Environmental Product and Service Business Management
- Environmental Product and Service Work Management
- Environmental Product and Service Preparation
- Environmental Product and Service Deployment
- Environmental Product and Service Operations
- Environmental Product and Service Support

### 3.4 Level 4: Quantified

At this level Every Tangible and Tangible activity can be quantified. Effect to HAI can accurately be quantified.

#### Level Characteristics

At maturity level 4, achievable quantitative environmental goals for performance and quality results are established for end-to-end work efforts, and are used as criteria in managing the work efforts. These quantitative goals are based on the needs of the customers, end users, and the organization.

Maturity level 4 is primarily concerned with

- Quantitatively understanding, reducing, and controlling the variation in how the work is performed;
- Statistically predicting the performance and quality results that will be achieved; and
- Performing in-process corrective actions to ultimately achieve the environmental performance and quality goals

#### Process Areas

Following Process areas correspond to this maturity level:

- Environmental Common Asset Management
- Environmental Capability and Performance
- Environmental Management Product and Service Process Integration
- Environmental Quantitative Product and Service Management
- Environmental Quantitative Process Management

### 3.5 Level 5: Holistic Optimizing

This stage involves Continuous proactive improvement by gradual elimination of the root cause of the ripple effect & Wastes. This involves both proactive innovative and opportunistic improvement that can close gaps between the organization's current capability and the capability required to achieve its objectives.

#### Level Characteristics

At maturity level 5, the organization understands its critical environmental issues or areas of concern and sets quantitative improvement goals to address these issues. The organization's environmental goals, and strategy determine the improvement goals. Improvements are pursued, identified, evaluated, piloted, and deployed to achieve the improvement goals.

At maturity level 4 the changes are made to the processes to reduce variation, produce stable performance, and achieve predictable results. At maturity level 5 process improvements are made to close the gap between current performance and results and desired performance and results. Maturity level 5 addresses improvements at all levels in the organization (the individual, work unit, workgroup, unit, and organization levels).

There are three broad categories of improvements addressed at maturity level 5:

- Defect and problem prevention improvements,
- Planned innovative improvements
- Continuous capability improvements

### Process Areas

Following Process areas correspond to this maturity level:

- Environmental Improvement Planning
- Environmental Performance Alignment
- Environmental Defect and Problem Prevention
- Environmental Continuous Capability Improvement
- Environmental Innovative Improvement
- Environmental Improvement Deployment

## 3.6 ESSM Process Areas

The following table highlights the focus of each maturity Level as well depicts process areas for each maturity level.

Maturity Level	Focus	Process Area
<b>Holistic Optimizing</b>	Organization's environmental processes are continually improved	<ul style="list-style-type: none"> <li>• Environmental Improvement Planning</li> <li>• Environmental Performance Alignment</li> <li>• Environmental Defect and Problem Prevention</li> </ul>



# 3

## Maturity Levels

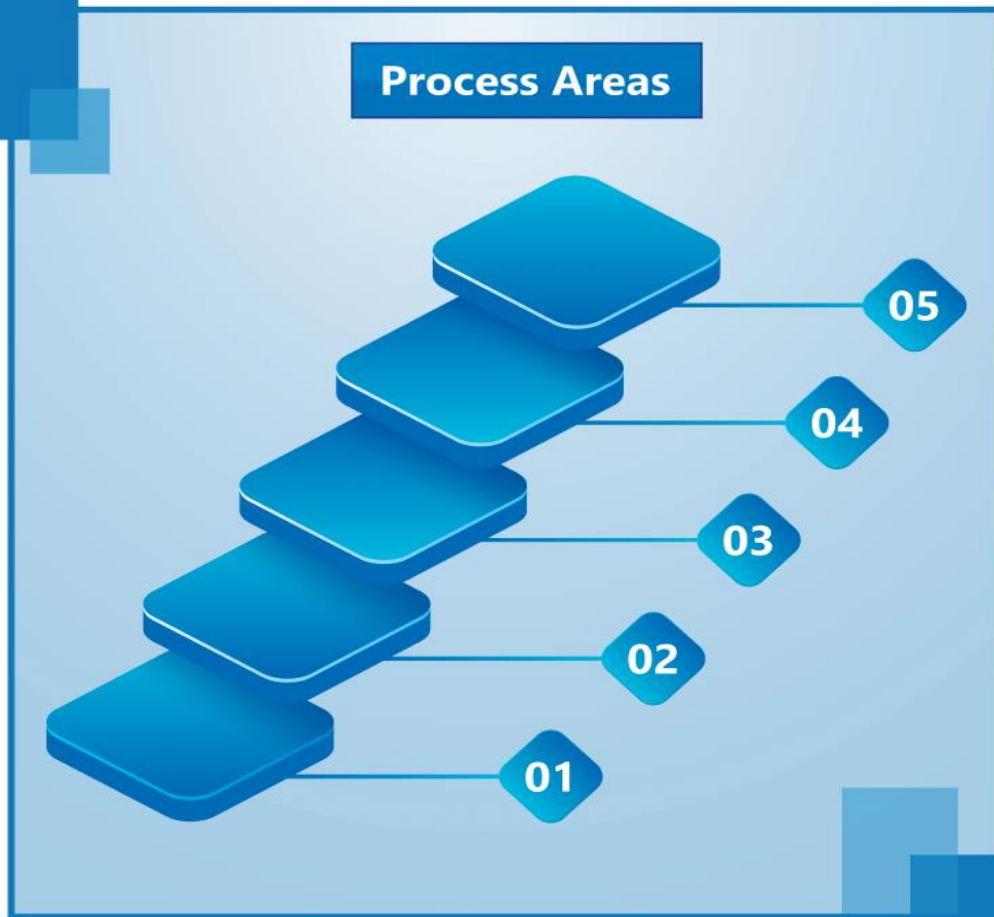
		<ul style="list-style-type: none"> <li>• Environmental Continuous Capability Improvement</li> <li>• Environmental Innovative Improvement</li> <li>• Environmental Improvement Deployment</li> </ul>
<b>Quantified</b>	Environmental Work processes are managed quantitatively to establish predictable results	<ul style="list-style-type: none"> <li>• Environmental Common Asset Management</li> <li>• Environmental Capability and Performance</li> <li>• Environmental Management Product and Service Process Integration</li> <li>• Environmental Quantitative Product and Service Management</li> <li>• Environmental Quantitative Process Management</li> </ul>
<b>Planned</b>	Organization establishes environmental standard processes and assets for performing the environmental service	<ul style="list-style-type: none"> <li>• Environmental Process Management</li> <li>• Environmental Competency Development</li> <li>• Environmental Resource Management</li> <li>• Environmental Configuration Management</li> <li>• Environmental Product and Service Business Management</li> <li>• Environmental Product and Service Work Management</li> </ul>

# 3

## Maturity Levels

		<ul style="list-style-type: none"> <li>• Environmental Product and Service Preparation</li> <li>• Environmental Product and Service Deployment</li> <li>• Environmental Product and Service Operations</li> <li>• Environmental Product and Service Support</li> </ul>
<b>Fire Fighting</b>	Managers establish a stable work environment in their work unit.	<ul style="list-style-type: none"> <li>• Environmental Process Leadership</li> <li>• Environmental Organizational Business Governance</li> <li>• Environmental Work Unit Requirements Management</li> <li>• Environmental Work Unit Planning and Commitment</li> <li>• Environmental Work Unit Monitoring and Control</li> <li>• Environmental Work Unit Performance</li> <li>• Environmental Work Unit Configuration Management</li> <li>• Environmental Sourcing Management</li> <li>• Environmental Process and Product Assurance</li> </ul>
<b>Ad-hoc</b>	Individual efforts with no explicit process or organizational support	

## Process Areas



# 4 Process Areas

## 4.1 Process Areas

There are 30 process areas in the ESMM:

- 9 at maturity level 2,
- 10 at maturity level 3,
- 5 at maturity level 4, and
- 6 at maturity level 5.

## 4.2 Maturity Level 2 Process Areas

The nine process areas that create Maturity Level 2 Process areas are as:

1. **Environmental Process Leadership.** Deals with establishing the executive sponsorship and the management accountability for the performance of the environmental process improvement activities.
2. **Environmental Organizational Business Governance.** Deals with establishing executive accountability for the management and performance of the environmental work and results
3. **Environmental Work Unit Requirements Management** deals with establishing and maintaining the documented and agreed-to requirements for the work that a work unit perform
4. **Environmental Work Unit Planning and Commitment** deals with establishing and the plans and commitments for performing and managing the work required of a work unit
5. **Environmental Work Unit Monitoring and Control** deals with regularly monitoring and adjusting the environmental processes related work assignments, resources, and other work factors for the individuals and workgroups in the work unit and keeping performance and results in line with the requirements and plans
6. **Environmental Work Unit Performance** deals with having the individuals and workgroups within the work unit perform their assigned environmental activities and produce the agreed-to results so that the aggregate efforts of individuals and workgroups satisfy the work unit's overall requirements and plans
7. **Environmental Work Unit Change Management** deals with managing and controlling the content and changes to services releases that are deployed for use internal and external to the organization
8. **Environmental Sourcing Management** deals with managing the acquisition of environmental products and services from suppliers external to the organization
9. **Environmental Process and Product Assurance** deals with providing appropriate conformance guidance and objectively reviewing the activities and work products of work efforts within the organization to ensure

they comply with applicable laws, regulations, standards, organizational policies, business rules, process descriptions, and work procedures



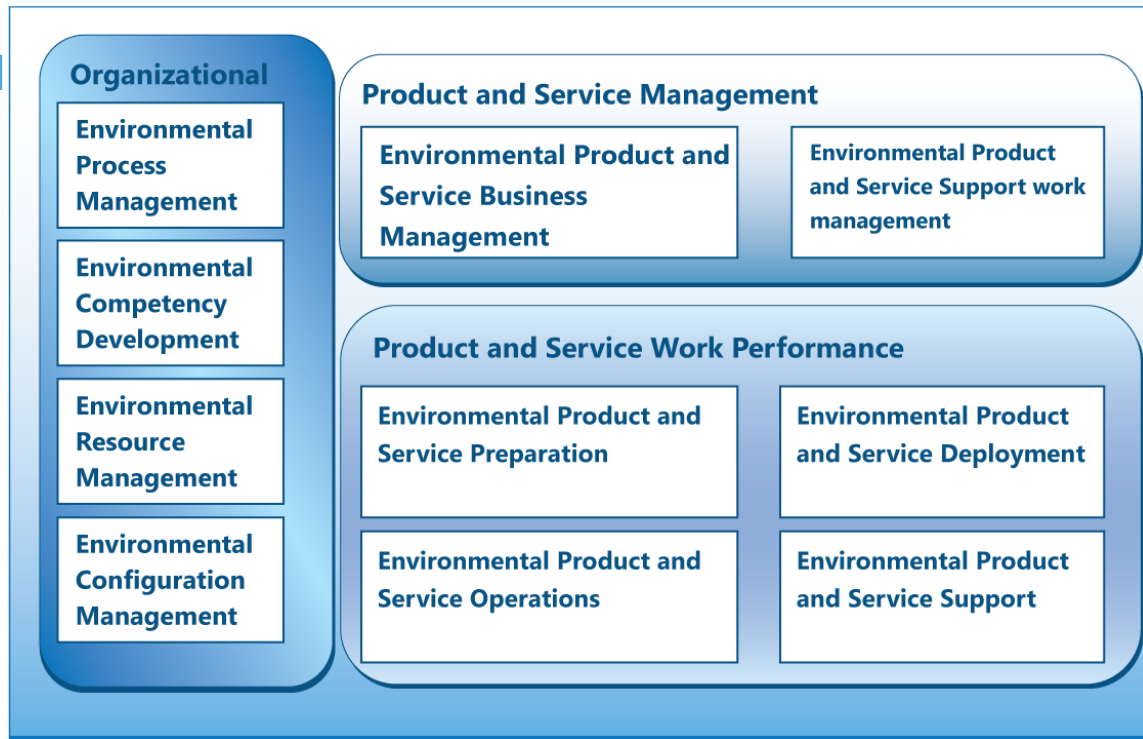
### 4.3 Maturity Level 3 Process Areas

The ten process areas that create Maturity Level 3 Process areas are as:

1. **Environmental Process Management** deals with developing usable environmental standard processes and related process assets for the organization, deploying them for use, and improving them based on understanding their strengths and weaknesses.
2. **Environmental Competency Development** deals with developing the competencies within the organization's environmental workforce that are needed to develop, prepare, deploy, operate, and support its products and services using the organization's environmental standard processes.
3. **Environmental Resource Management** deals with planning and managing the acquisition, allocation, and reassignment of people, equipment, computing and communication infrastructure, supplies, and other

resources, as needed, to develop, prepare, deploy, operate, and support the organization's environmental products and services

4. **Environmental Configuration Management** deals with identifying, managing, and controlling the content and changes to the configuration management (CM) product baselines that are released for external use and that are used in performing and managing the work efforts in the organization
5. **Environmental Product and Service Business Management** involves developing an understanding of the market for an environmental product and service offering, defining the capabilities and features of the offering, establishing the overall business plans for the offering, and managing the business and financial aspects of the offering
6. **Environmental Product and Service Work Management** involves planning and managing the work for an environmental product and service offering using the organization's process assets and defined processes that are tailored from the organization's environmental standard processes
7. **Environmental Product and Service Preparation** involves establishing the requirements for environmental product and service offering and developing and preparing the offering so that it is ready for deployment and use
8. **Environmental Product and Service Deployment** involves installing, modifying, replacing, or removing the people, equipment, computing and communication infrastructure, supplies, and other resources used in operating and supporting a product and service offering.
9. **Environmental Product and Service Operations** involves providing the customers of an environmental product and service offering with the capabilities and features of the offering
10. **Environmental Product and Service Support** involves maintaining the infrastructure, supplies, and other resources needed to sustain the operations and availability of a deployed product and service offering.



## 4.4 Maturity Level 4 Process Areas

The five process areas that create a Maturity Level 4 capability are

1. **Environmental Common Asset Management** deals with determining the common characteristics of the organization's current and future environmental products and services and exploiting this commonality to improve the performance, quality, cycle time, throughput, and predictability of the organization's environmental processes.
2. **Environmental Capability and Performance** deals with quantitatively characterizing the capability of the organization's environmental standard processes, and developing and providing the capability data, baselines, and models to quantitatively manage the organization's environmental products and services and associated work efforts
3. **Environmental Management Product and Service Process Integration** deals with improving the efficiency and effectiveness of interdependent work processes by integrating the processes of the different disciplines and functions involved in the work

# 4 Process Areas

4. **Environmental Quantitative Product and Service Management** deals with planning and managing the work involved in an environmental product or service so that the product or service achieves its quantitative performance and quality goals.
5. **Environmental Quantitative Process Management** deals with statistically managing the performance of a work effort that performs work for developing, preparing, deploying, operating or supporting an environmental product or service so that the performance and quality goals assigned to that work effort are achieved



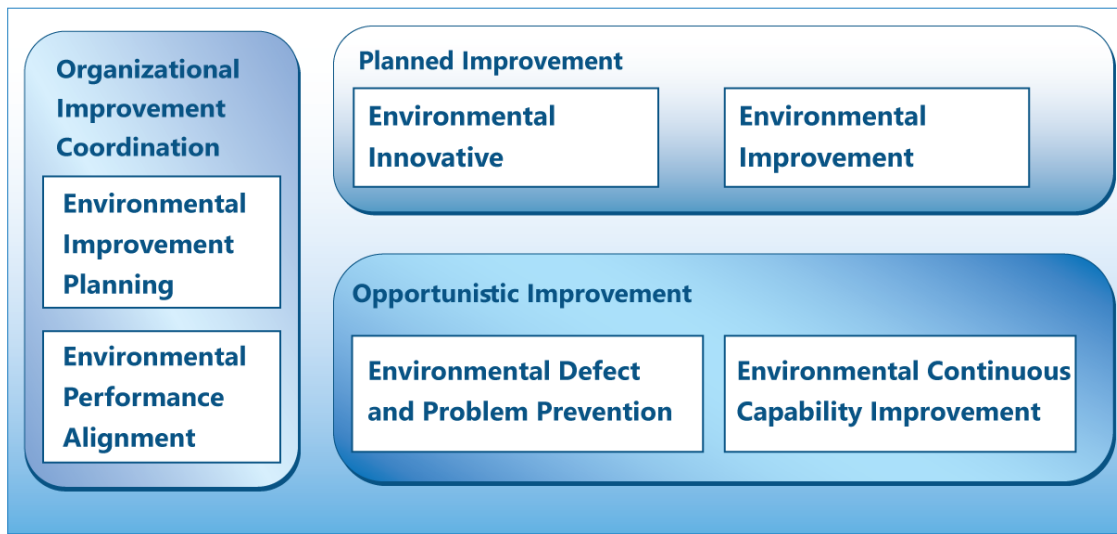
## 4.5 Maturity Level 5 Process Areas

The six process areas that create a Maturity Level 4 capability are

1. **Environmental Improvement Planning** deals with establishing the organization's quantitative improvement goals (based on the organization's business issues, goals, and strategies), establishing the infrastructure for systematically pursuing improvements, and defining the strategy for achieving the goals
2. **Environmental Performance Alignment** deals with maintaining proper alignment of the quantitative improvement goals and the improvement strategies up and down the organizational levels and across the organization's products and services.
3. **Environmental Defect and Problem Prevention** deals with identifying and addressing the causes of defects and other problems that are the primary obstacles to achieving a work unit's or workgroup's plans and quantitative improvement goals so that they do not recur

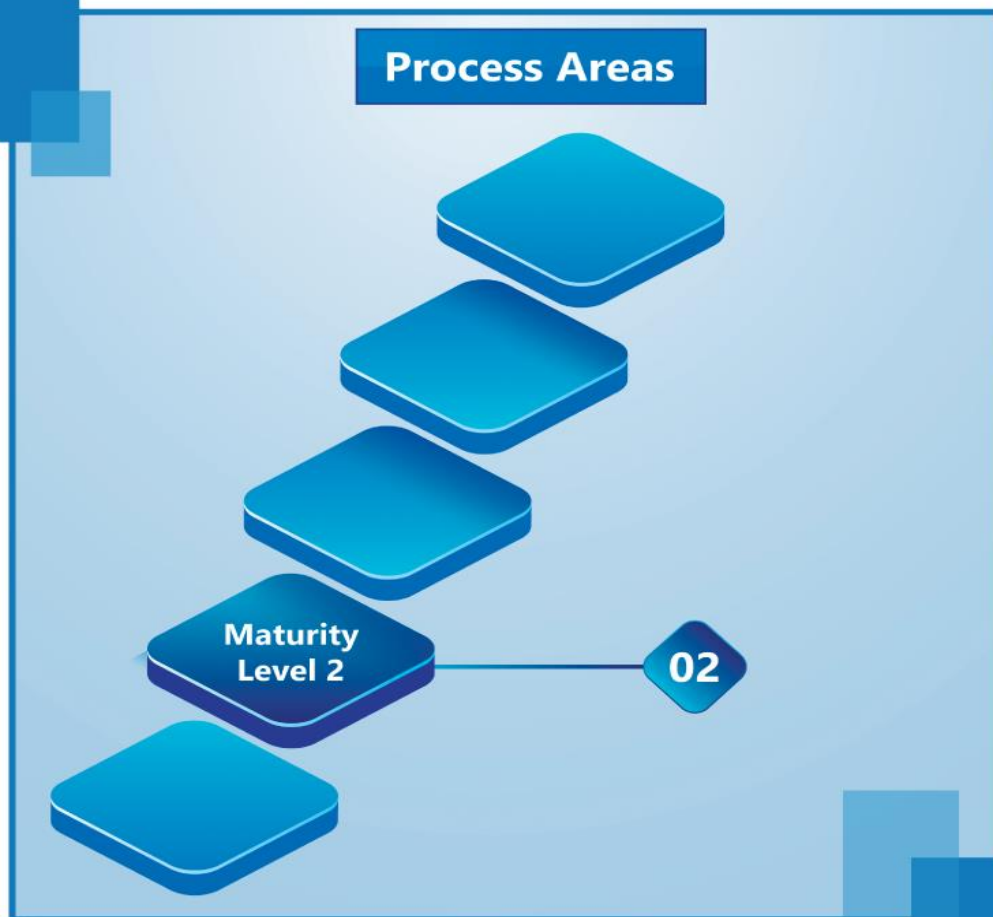


4. **Environmental Continuous Capability Improvement** deals with continually and measurably improving the performance of the organization's processes by identifying and deploying incremental improvements



5. **Environmental Innovative Improvement** deals with formulating a complete improvement solution that, when deployed, will achieve specific quantitative improvement goals assigned to a planned improvement effort
6. **Environmental Improvement Deployment** deals with continually and measurably improving the organization's performance and quality by transitioning improvements into use in a systematic manner

## Process Areas: Maturity Level 2



The following section describes the process areas that belong to maturity level 2: Firefighting of ESMM.

## 5.1 Environmental Process Leadership

### Purpose

Environmental Process Leadership establishes the executive sponsorship and accountability for the management and performance of the organization's process improvement activities

### Goals

#### 1. Specific Goals

- **Goal 1: Process Improvement Is Sponsored.** The organization's environmental process improvement activities are sponsored by executive management.
- **Goal 2: Management Systems and Improvements Are Aligned.** The organization's environmental management systems and activities are aligned with the organization's process improvement goals and strategies.

#### 2. Institutional Goals

- **Goal 1: Practices Are Institutionalized.** The practices for Environmental Process Leadership are institutionalized.

### Practice to Goal Relationship table

Goal	Practice
Specific Goal 1	Specific Practice 1,2,3,4, 5,6
Specific Goal 2	Specific Practice 7,8,9,10,11
Institutional Goal 1	Institutional Practice 1,2,3,4,5

### Practices

- **Specific Practice**

- 1. Maintain Justification for Process Improvement**

Business reasons justifying the organization's investment in environmental process improvement are established and maintained by executive management. This practice ensures that the organization's process improvement strategies and activities are directly tied to the business goals.

#### **Sub practices**

- Identify performance-related issues that inhibit achievement of the organization's environmental services goals and strategies.
- Identify and prioritize the performance contributions needed from each major business unit to help the organization achieve its environmental goals and strategies.
- Identify the environmental problems, challenges, and issues that must be addressed to improve performance against the improvement-related goals.
- Estimate the financial or other benefits that can be achieved through the improvements and compare these estimates to the estimates of the costs and other impacts of the improvement activities.
- Establish and maintain the business reasons that justify investments in improving the environmental services processes in the organization.
- Establish and maintain environmental measures that will provide near-term and long-term criteria for evaluating the success of environmental process improvement activities against the business goals.
- Revise the business reasons for environmental process improvement as necessary to reflect changing business conditions or goals.
- Communicate the business reasons justifying the investment in environmental process improvement throughout the organization.

- 2. Maintain Justification for Process Improvement**

The description of the environmental process improvement goals and strategies for the organization are established and maintained by executive management.

#### **Sub practices**

- Identify and prioritize the environmental process-related issues that, if improved, would enhance the organization's ability to achieve its business goals and strategies.

- Solicit, collect, and analyze inputs regarding environmental process issues and improvement goals and strategies from the managers and staff in the organization.
- Identify the critical issues that affect the selection of environmental process improvement goals and strategies.
- Identify, prioritize, and document the organization's environmental process improvement goals.
- Review the environmental process improvement goals and strategies with the managers and staff that are responsible for coordinating the organization's process improvement activities, and obtain their agreement.
- Revise the organization's environmental services improvement goals and strategies as needed.

### 3. Communicate Executive Process Expectations

Executive management's expectations for environmental process improvement are communicated to the organization by process improvement goals and strategies.

#### Sub practices

- Communicate the environmental process improvement strategies and the business rationale for selecting them to the managers and staff in the organization.
- Provide regular restatement and updates, as appropriate, on the environmental process improvement goals and priorities to the managers and staff in the organization
- Communicate expectations regarding the management of the environmental process improvement activities to the managers and staff in the organization.

### 4. Provide Environmental Process Improvement Resources

Funding and other resources needed to implement the organization's environmental services improvement strategies are provided. This ensures that the organization commits adequate funding and other resources to environmental services improvement plans

#### Sub practices

- Determine the funding and other resources to be committed to environmental process improvement based on the process improvement goals and strategies
- Review the committed and planned environmental process improvement funding and other resources with the staff that are responsible for coordinating the process improvement activities, and obtain their agreement.

- Provide the funding and other resources needed to implement the environmental process improvement strategies and achieve the process improvement goals
- Establish provisions for future funding and other resources to sustain the environmental process improvement and related activities over the long term.

### 5. Review Process Improvement Plans

Executive management reviews and approves the plans for implementing the environmental services improvement strategies. This practice ensures that environmental process improvement activities are planned and managed as a project and that they address the process improvement goals and strategies.

#### Sub practices

- Provide guidelines for how environmental process improvement activities are to be planned and how these plans will be reviewed and approved.
- Establish environmental accountability for process improvement planning and management
- Review and approve environmental process improvement plans.
- Require corrective planning when process improvement plans fail to meet management expectations or guidelines
- Provide authority to implement the environmental services plans

### 6. Coordinate Improvement Activities With External Stakeholders

Executive management coordinates with external customers and other relevant stakeholders to address the effects environmental process improvement activities have on them. This practice ensures that external customers and other relevant stakeholders are appropriately informed and involved, and are aligned with the organization's environmental process improvement activities.

#### Sub Practice

- Identify the external customers and other external organizations that may be affected by changes in practices and behaviors that result from the environmental process improvement activities.
- Maintain regular communications with external customers and other external organizations regarding changes in practices or behaviors that may affect interfaces, other interactions, or results.
- Identify and resolve issues resulting from changes in environmental practices or behaviors that affect the external customers and other external organizations.

- Involve external customers and other external organizations, as appropriate, in the process improvement activities.

### 7. Maintain Definition of Improvement Measures

Definitions of the measures used to plan, manage, and evaluate results of the organization's environmental services improvement program are established and maintained. This practice ensures that the management of the organization's environmental services improvement program is based on quantitative information and data.

#### Sub practices

- Identify the measurement information needs for the environmental process improvement program
- Select and define measures to address the measurement information needs.
- Define the procedures for collecting and storing the environmental measures.
- Specify how the environmental measures will be analyzed and reported.
- Review the environmental measurement information needs, plans, and definitions of the measures with those affected, and obtain their agreement
- Place the definitions of environmental measures under version control.
- Revise the measurement information needs, plans, and definitions of the measures as needed

### 8. Align Work and Process Improvement Responsibilities

The responsibilities and commitments of the staff are kept consistent with the environmental process improvement goals and strategies. This practice ensures that all the organizational units are properly aligned with and support the organization's environmental services improvement goals and activities so that the organization can successfully implement its improvement strategies and achieve its goals.

#### Sub practices

- Allocate and translate the organization's environmental process improvement goals into improvement goals for each unit at each level of management.
- Incorporate environmental process improvement activities into the departmental units' plans as needed to address the organization's process improvement strategies and plans.
- Identify conflicts between the organization's environmental process improvement goals, strategies, and plans with the plans and commitments made for each unit at each level of management.

- Resolve conflicts between the organization's process improvement goals, strategies, and plans and commitments made for each unit at each level of management.
- Coordinate environmental process improvement activities among the units, as appropriate.
- Reinforce management accountability at all levels for accomplishing their agreed-to process improvement goals.
- Perform corrective actions when the environmental process improvement plans, actions, and results of the units are misaligned with the planned process improvement goals, strategies, and plans.

### 9. Adjust Management Systems

This practice ensures that the environmental concerns and priorities of executive management regarding business performance and process improvement are reflected as tangible factors in the career opportunities and monetary rewards for the managers and staff in the organization.

#### Sub practices

- Establish appropriate environmental role descriptions and performance goals for managers and staff whose primary role includes the coordination and deployment of process improvements.
- Adjust the environmental performance planning and review process for the managers and staff whose primary role includes the coordination and deployment of environmental process improvements appropriately
- Adjust the performance feedback and review process to ensure appropriate corrective actions are performed
- Adjust the merit compensation and incentive awards processes, as appropriate.
- Adjust the criteria for selecting among candidates for assignments or promotions to include an appropriate emphasis on both accomplishments in process improvement and accomplishments in business performance.

### 10. Review Process Improvement Results

This practice ensures that executive management has visibility into progress against environmental process improvement goals and plans, and ensures that corrective actions are performed when appropriate.



### Sub practice

- Periodically collect the status of the environmental process improvement activities in the organization.
- Periodically collect and analyze measures of the environmental process improvement activities and results to provide insights into progress and benefits
- Monitor the use of funds and other resources committed to environmental process improvement.
- Review the status, issues, measures, other results, outlook, and risks for the environmental process improvement activities with relevant stakeholders, including executive management.
- Identify corrective actions, as needed, to address issues in the environmental process improvement activities.
- Perform or assign the identified corrective actions and track to closure.

### 11. Communicate Process Improvement Information

This practice ensures that the managers and staff in the organization receive the information needed to perform their roles and sustain the momentum for environmental process improvement.

#### Sub practices

- Provide the organization's managers and staff with ready access to the descriptions of the organization's environmental improvement goals and strategies.
- Provide periodic executive reinforcement and updates concerning the environmental process improvement goals and strategies to the managers and staff in the organization.
- Communicate the status and results of environmental process improvement activities to the managers and staff in the organization on a periodic and event driven basis.

## 5.2 Environmental Organizational Business Governance

### Purpose

Environmental Organizational Business Governance establishes executive accountability for the management and performance of the organization's environmental work and results.

### Goals

#### 1. Specific Goals

- **Goal 1: Business Activities Are Aligned.** Executive management aligns the business activities involved in the organization's environmental product and service work with the organization's business goals.
- **Goal 2: Business Workflows Are Managed.** Executive management approves, measures, and manages the environmental service management activities of the organization's units.

#### 2. Institutional Goals

- **Goal 1: Practices Are Institutionalized.** The practices for Environmental organizational business governance are institutionalized.

### Practice to Goal Relationship table

Goal	Practice
Specific Goal 1	Specific Practice 1,2,3,4, 5
Specific Goal 2	Specific Practice 7,8,9
Institutional Goal 1	Institutional Practice 1,2,3,4,5

### Practices

- **Specific Practice**

- 1. Establish Environmental Business Objectives**

This practice establishes the business context for performing the organization's environmental processes.

#### Sub practices

- Obtain and review the organization's environmental business strategy.
- Establish and maintain near-term and long-term business goals derived from the organization's business strategy.
- Identify how near-term and long-term business goals serve to achieve the organization's environmental strategy.
- Periodically review the organization's near-term and long-term business goals and make adjustments as needed.
- Communicate the organization's environmental business strategy and goals throughout the organization.

- 2. Define Business Measures**

This practice establishes business measures that help clarify the criteria for evaluating environmental business processes.

#### Sub practices

- Identify the primary business criteria by which the organization's accomplishment of its environmental business goals will be measured
- Define business measures for quantifying the primary business criteria
- Clarify how these business measures relate to business activities and processes
- Define methods for storing, analyzing, and reporting business measures.
- Periodically review business measures to ensure they are supporting their intended purposes and take corrective actions as needed.

- 3. Maintain Descriptions of Business Workflows**

This practice ensures that all the business activities needed to prepare, deploy, operate, and support the organization's environmental services are known so that their performance can be supported, evaluated, and improved.

### Sub practices

- Identify and document a list of the organization's environmental services.
- Identify and document the critical business activities that must be performed to develop, prepare, deploy, operate, and support each of the products and services.
- Establish and maintain a business process that defines the phases or sequencing of business activities required to prepare, deploy, operate, and support the organization's products and services
- Establish and maintain a structure of units whose collective responsibilities are sufficient to prepare, deploy, operate, and support the organization's products and services.
- Assign appropriate responsibility and authority to the units to clarify their roles in the environmental business process, the business activities they are expected to perform, and their accountability for developing, preparing, deploying, operating, and supporting the organization's products and service
- Identify the work dependencies among business units based on the workflows in the business process and ensure they are appropriately addressed in the plans of the affected units.

#### 4. Define Work Performance Objectives

This practice ensures that all of the organization's environmental work activities ultimately contribute to achieving the organization's environmental business strategy

### Sub practices

- Evaluate the business strategy to determine the results that must be obtained from business processes to meet strategic goals.
- Prioritize and document the process goals believed to be most important for achieving strategic goals

#### 5. Maintain Organizational environmental Policies

This practice ensures that environmental work is performed in ways that are consistent across the organization and acceptable to executive management.

### Sub practices

- Define the organizational requirements and expectations governing the behavior and constraints to be applied in performing the organization's environmental business activities
- Define and document organizational environmental policies that define the requirements and expectations for the organization's business activities.

- Define and document other organizational environmental policies as necessary to meet the governance responsibilities of executive management
- Review the organizational environmental policies with the executives and middle managers and obtain their agreement
- Distribute the organizational environmental policies through media and vehicles that make them readily available to the managers and staff
- Regularly communicate to the managers and staff the organizational expectations documented in the environmental policies.
- Establish appropriate means for executive management to maintain awareness of conformance with the organizational policies
- Revise the organizational environmental policies as needed.

### 6. Approve work Commitments

This practice ensures that the environmental work commitments the units make to external stakeholders are reasonable and consistent with the plans of the units.

#### Sub practices

- Identify the external work commitments for each unit at each organizational level.
- Determine whether the plans and resources for the units are sufficient to satisfy the external work commitments.
- Negotiate changes to the external work commitments and the plans and resources for the units so that the external work commitments can be satisfied

### 7. Allocate Resources for units

This practice ensures that the resources that each unit is allocated is consistent with the work they have to do.

#### Sub practices

- Review the resource estimates and plans of each unit against the work assigned to the unit and the available resources.
- Negotiate a balance of the resources and assigned work with each unit and obtain their agreement.
- Establish the plans and commitments to provide the resources each unit needs.

### 8. Maintain Definition of Workflow Measures

This practice ensures that the executive and middle managers have the data and quantitative information to monitor the performance of the business units, workflows among these units, and business activities for developing, preparing, deploying, operating, and supporting the organization's environmental services

#### Sub practices

- Identify the workflow information needs of the executive and middle manager for monitoring the performance of the units and the workflow among units.
- Select and define measures to address the environmental information needs.
- Define the plans and procedures for collecting and storing the measures.
- Specify how the measures will be analyzed and reported.
- Review the workflow information needs, measurement plans and procedures, and definitions of the measures with those affected, and obtain their agreement.
- Place the definitions of measures under version control.
- Revise the workflow information needs, measurement plans and procedures, and definitions of the measures as needed.

### 9. Maintain Definition of Workflow Measures

This practice ensures that the executive and middle managers maintain appropriate visibility into the performance of environmental activities in order to manage the interactions and aggregate result of the units that report to them.

#### Sub practices

- Periodically collect and analyze measures of the environmental performance and results for the units and the workflow among units.
- Periodically collect, summarize, and review the activities, status, and results of the units relative to their plans, internal and external commitments, and other performance criteria.
- Periodically review the resources consumed by each unit and take corrective actions or reallocate resources to address imbalances.
- Conduct business reviews of each environmental service at important milestones or other logical times.
- Identify corrective actions, as needed, to address issues in the environmental performance and results of the units and the workflow among units.

- Perform or assign responsibility for the identified corrective actions, and track the corrective actions to closure.
- Periodically summarize and report the status, issues, measures, other results, outlook, and risks for the critical environmental business activities to provide appropriate insight to higher levels of management.

## 5.3 Environmental Work Unit Requirements Management

### Purpose

Work Unit Requirements Management establishes and maintains the documented and agreed-requirements for the environmental work that a work unit or project performs.

### Goals

#### 1. Specific Goals

- **Goal 1: Requirements Are Identified and Evaluated.** The requirements and requirements changes for a work unit and the impact of these requirements on the work unit are identified and evaluated.
- **Goal 2: Requirements Baseline Is Maintained.** The requirements baseline for an environmental work unit is documented, maintained, and agreed to by the work unit.

#### 2. Institutional Goals

- **Goal 1: Practices Are Institutionalized.** The practices for environmental Work Unit Requirement Management are institutionalized.

### Practice to Goal Relationship table

Goal	Practice
Specific Goal 1	Specific Practice 1,2,3
Specific Goal 2	Specific Practice 4,5,6
Institutional Goal 1	Institutional Practice 1,2,3,4,5



### Practices

- **Specific Practice**

1. **Identify proposed requirements**

This practice ensures that the full set of environmental proposed requirements and requirements changes that the work unit is expected to satisfy is explicitly identified and documented.

#### **Sub practices**

- Identify all legitimate sources of requirements, the scope of requirements they are authorized to provide, and the responsible workgroup or individual for each requirements source.
- Establish mechanisms for accepting proposed requirements and requirements changes from the legitimate sources.
- Document the proposed requirements and requirements changes and the supporting rationale.
- Review the proposed requirements and requirements changes with the requirements providers to ensure a common understanding.
- Revise the documentation of the proposed environmental work requirements and requirements changes and the supporting rationale, as needed, to reflect clarifications.

2. **Clarify Requirements**

This practice ensures that the environmental work unit adequately understands each proposed requirement and requirements change in sufficient detail so that the work unit can determine whether they can be implemented by the work unit.

#### **Sub Practices**

- Review each proposed requirement and requirements change to ensure it is understood.
- Identify issues in understanding the proposed requirements and requirements changes.
- Resolve issues in understanding the proposed requirements and requirements changes with the requirements providers.
- Determine the priorities of the proposed requirements and requirements changes.
- Revise the documentation of the proposed requirements and requirements changes, as needed, to reflect clarifications and resolutions of issues.

### 3. Evaluate Requirements for Implementation

This practice ensures that the proposed environmental requirements and requirements changes can be implemented within the scope of responsibility, capability, and capacity of the work unit.

#### Sub Practice

- Review each proposed environmental requirement and requirements change to ensure they are valid, implementable requirements.
- Identify and document inconsistencies between the proposed requirements and requirements changes and the scope of responsibility and capability of the work unit.
- Identify and document environmental changes needed in the plans, activities, and work products to make them consistent with the proposed requirements and requirements changes.
- Derive and document quantitative estimates of the effort, schedule, and other planning parameters for incorporating the proposed requirements and requirements changes into the plans and activities.
- Determine if the scope of responsibilities and capabilities of the environmental work unit can be adjusted to accommodate the needs of the proposed requirements and requirements changes.
- Resolve issues with the requirements providers and others, as appropriate, so that the requirements and requirements changes can be implemented within the scope of responsibility, capability, and capacity of the work unit.
- Revise the documentation of the proposed requirements and requirements changes, as needed, to reflect clarifications and resolutions of issues

### 4. Negotiate Requirement

This practice ensures that the work unit can perform the work that is needed to satisfy the proposed environmental requirements and requirements changes.

#### Sub Practice

- Determine and document the impact of the proposed environmental requirements and requirements changes on existing plans and commitments.
- Negotiate changes to the work unit plans and commitments with relevant stakeholders so that the plans and commitments are consistent with the proposed requirements and requirements changes.

- Negotiate changes to the proposed environmental requirements and requirements changes with the requirements providers, to reconcile them with the plans and commitments.
- Review the proposed environmental requirements and requirements changes and the changes to the plans and commitments with relevant stakeholders, and obtain their agreement.
- Document the agreed-to changes to the proposed requirements and requirements changes.
- Document the agreed-to changes to the plans and commitments

### 5. Maintain Agreed to Requirements

This practice ensures that a single source of agreed-to environmental baseline requirements for the work unit is documented, is kept up to date, and is available to relevant stakeholders.

#### Sub practices

- Inform relevant stakeholders on a regular basis about the status and disposition of the proposed and agreed-to environmental requirements and requirements changes.
- Integrate all agreed-to requirements and requirements changes into a documented requirements specification for the work unit.
- Document the source of each requirement and requirements change.
- Identify and document the methods that will be used to verify each requirement.
- Review the requirements specification with relevant stakeholders, and obtain their agreement.
- Make the environmental requirements specification available to relevant stakeholders.
- Revise the requirements specification as necessary.

### 6. Conduct Regular Requirements Review

This practice ensures that environmental work unit's requirements can be changed to adjust for changing business circumstances

#### Sub practices

- Review the agreed-to requirements against the business needs of the organization and work unit.
- Identify environmental work unit requirements that are inconsistent with the business needs of the organization and work unit.
- Identify and document proposed changes to the requirements.
- Define and document the rationale for each proposed requirements change.

- Review the proposed requirements changes with the requirements providers and other relevant stakeholders, and obtain their agreement.
- Evaluate, negotiate, and document, as appropriate, the proposed requirements changes.
- Document and archive the results and other relevant records of the requirements review.

## 5.4 Environmental Work Unit Planning and Commitment

### Purpose

Environmental Work Unit Planning and Commitment establishes and maintains the plans and commitments for performing and managing the work required of a work unit or project.

### Goals

#### 1. Specific Goals

- **Goal 1: Work is estimated.** Quantitative estimates of the planning parameters are derived and documented to describe the magnitude of the work to be done by a work unit.
- **Goal 2: Commitments and agreements are approved.** The commitments environmental work unit needs to perform its work are identified, planned, documented, and agreed to by relevant stakeholders.
- **Goal3: Plans Are Documented and Consistent.** Plans that describe how environmental work unit will perform its work are documented and kept consistent with its requirements, its commitments, and related plans.

#### 2. Institutional Goals

- **Goal 1: Practices Are Institutionalized.** The practices for Environmental work unit planning and commitment.

### Practice to Goal Relationship table

Goal	Practice
Specific Goal 1	Specific Practice 1,2,3,4,5,6,7,8
Specific Goal 2	Specific Practice 9,10,11,12,17
Specific Goal 3	Specific Practice 13,14,15,16,18,19

Institutional Goal 1	Institutional Practice 1,2,3,4,5
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### Practices

- **Specific Practice**

1. **Involve Staff in Planning**

This practice ensures that the experiential knowledge of the people doing the environmental work is gathered and used in the estimating and planning, and a sense of ownership and commitment to the plans are instilled in the people.

2. **Apply Lessons Learned**

This practice ensures that environmental work unit learns from experience so that estimating and planning improves.

#### **Sub practices**

- Make lessons learned available to the environmental work unit staff and managers.
- Review and incorporate the documented lessons learned into the estimating and planning activities and artifacts.

3. **Maintain Workflow Description**

This practice ensures that there is a common understanding within the environmental work unit and with other stakeholders of how the work will flow into, within, and out of the work unit so that the work can be effectively managed.

#### **Sub practices**

- Identify and document a list of the critical environmental work activities that must be performed to accomplish the work unit's work
- Identify and document the critical inputs, outputs, interface, and dependencies among the work activities.
- Identify and document the critical external inputs, outputs, interface, and dependencies for the work activities.
- Define and document a description of the workflow for the work unit's work.
- Review the description of the workflow for the work unit with relevant stakeholders, and obtain their agreement.
- Place the description of the workflow for the work unit under version control.

- Revise the description of the workflow for the work unit as needed

#### 4. Maintain Work Breakdown Structure

This practice ensures that there is a complete documented list of the environmental work activities and work products as a basis for estimating, planning, and managing

##### Sub practices

- Partition and decompose the environmental work activities, work products, and services in sufficient detail to estimate, plan, and manage the work.
- Identify the environmental services that will be acquired from other internal and external sources.
- Define and document the approach to doing the environmental work.
- Document environmental work activities, work products, and services in a work breakdown structure.
- Review the work breakdown structure with relevant stakeholders, and obtain their agreement.
- Place the work breakdown structure under version control.
- Revise the work breakdown structure as needed.

#### 5. Maintain Definitions of Measures

This practice ensures that the quantitative information and data needed to effectively plan and manage environmental work unit's work are designed based on the work unit's requirements, work efforts, goals, and other needs

##### Sub practices

- Identify the measurement information needs for the environmental work unit.
- Select and define measures to address the measurement information needs.
- Define the procedures for collecting and storing the measures.
- Specify how the measures will be analyzed and reported.
- Review the measurement information needs, plans, and definitions of the measures with relevant stakeholders, and obtain their agreement.
- Place the definitions of measures under version control.
- Revise the measurement information needs, plans, and definitions of the measures as needed

### 6. Maintain Definitions of Measures

The purpose of this practice is to estimate the base attributes of environmental work that a work unit needs to perform so that there is a basis for planning this work and similar work in the future.

#### Sub practice

- Identify the base attributes for the environmental work activities.
- Define the environmental work activities to the granularity needed to achieve the needed estimating accuracy.
- Estimate the identified base attributes of the environmental work activities and work products.
- Review the estimates of the identified base attributes with relevant stakeholders, and obtain their agreement.
- Document and archive the results and other relevant records of the work attribute estimation activities.
- Revise the estimates or the identified base attributes as needed.

### 7. Maintain Estimates of Demand/Production Schedule

This practice determines how the demand profile for environmental work unit is affected by outside factors and events (for example, different needs on different days of the week) so that resources can be appropriately planned to fit the varying needs.

#### Sub practices

- Identify the requirements and goals that define the overall demand profile for the work unit's primary activities.
- Obtain forecasts that define how the overall demand profile for the environmental work unit's primary activities will change in the future.
- Identify the factors and events that influence the demand for the environmental work unit's primary activities.
- Estimate the demand profile as determined by the influencing factors and events.
- Define the demand/production schedule to address the estimated demand volume
- Review the estimated demand profile and demand/production schedule with relevant stakeholders, and obtain their agreement.
- Place the estimated demand profile and demand/production schedule under version control.
- Revise the estimated demand profile and demand/production schedule as needed



### 8. Maintain Estimates of Needed Resources

This practice ensures that the estimated attributes of the work that needs to be performed are appropriately translated into measures of effort, budget, and other resources, so that a reasonable plan can be established

#### Sub practices

- Identify the categories of resources that need to be estimated to effectively plan the work.
- Determine the quantitative relationships of the base attributes of the environmental work activities and work products to the effort, cost, and other resources, as well as the quantitative relationships among these parameters
- Obtain and analyze available historical data and other inputs that are needed to derive estimates of effort, cost, and other resources.
- Derive and document estimates of the overall effort and specific skills required to perform the environmental work.
- Derive and document estimates of the non-people resources required to perform the environmental work.
- Derive estimates of the overall cost required to perform the work.
- Develop the capacity plans for cost, effort, and other resources to support the demand/production schedule.
- Review the capacity plans and estimates of cost, effort, and other resources with relevant stakeholders, and obtain their agreement.
- Document and archive the results and other relevant records of the resource estimation activities.
- Revise, as needed, the capacity plans and estimates of cost, effort, and other resources

### 9. Maintain Commitment Agreements

This practice ensures that the critical dependencies an environmental work unit has on other work efforts and the dependencies other work efforts have on environmental work unit will be satisfied, so that the work can be performed according to the plans.

#### Sub practices

- Identify and document the critical dependencies on other work units, workgroups, customers, and suppliers
- Identify and document the critical dependencies that other work units, workgroups, customers, and suppliers have on this work unit

- Negotiate and document commitments with those responsible for satisfying each critical dependency for the work unit.
- Negotiate and document commitments with those who have critical dependencies on this work unit.
- Review the descriptions of the critical dependencies and the documented commitments with those making the commitments and obtain their agreement.
- Place the descriptions of the critical dependencies and the agreed-to commitments under version control.
- Revise the descriptions of the work unit's critical dependencies and commitments as needed

### 10. Review Commitments with Staff

This practice ensures that the people doing the work agree that the environmental work unit's commitments are reasonable so that they assume an appropriate share of owning the commitments and the plans built around these commitments

#### Sub practice

- Review the environmental work unit's commitments with the individuals and workgroups within the work unit.
- Identify and resolve any significant issues with the commitments
- Document any unresolved significant commitment issues as risks.

### 11. Maintain Schedule of Work

This practice ensures that the management and staff of an environmental work unit know what future work has to be performed and when it will be performed so they can adequately prepare and coordinate with others to do this work.

#### Sub practice

- Obtain and verify the inputs needed to establish the schedule.
- Identify and document the constraints, assumptions, and other factors that affect the schedule.
- Define and document the schedule of activities and milestones to support accuracy in progress measurement and meeting commitments.
- Review the schedule and associated constraints, assumptions, and other factors with relevant stakeholders, and obtain their agreement.

- Place the schedule and descriptions of the associated constraints, assumptions, and other factors under version control.
- Revise the schedule as needed

### 12. Resolve Requirements and Estimates Conflicts

This practice ensures that the plans for environmental work unit represent a reasonable approach for performing the work and delivering its products and services.

#### Sub practices

- Identify inconsistencies among the requirements, planning constraints, estimates, and available levels of resources, schedule, and budget.
- Determine the relative priorities and amount of flexibility for the requirements, planning constraints, and available levels of resources, schedule, and budget.
- Negotiate and document descriptions of the changes to the requirements needed to resolve inconsistencies.
- Negotiate and document descriptions of the changes to the planning constraints needed to resolve inconsistencies
- Negotiate and document changes to the quantity of resources, budget, and schedule needed to resolve inconsistencies.
- Review the changes to the requirements, planning constraints, and available levels of resources, schedule, and budget with relevant stakeholders, and obtain their agreement.
- Revise the specification of the requirements, as appropriate, to reflect the results of the estimate reconciliation
- Revise the estimates and plans, as appropriate, to reflect the results of the estimate reconciliation.
- Document and archive the results and other relevant records of the estimate reconciliation activities.

### 13. Maintain Staff Plans

This practice ensures that the people who are assigned and available to do the work assigned to a work unit, at any point in time, match the work that needs to be done.

#### Sub practice

- Identify the number of people needed to perform the environmental work, when they are needed, and the skills they must possess.

- Assess the skills and available capacity of the people currently assigned, if any, against the needs.
- Define and document the plan for obtaining the appropriate staff that is needed
- Define and document the plan for how the environmental skills gap will be addressed.
- Review the environmental staffing plans with relevant stakeholders, and obtain their agreement.
- Place the environmental staff assignment plans under version control.
- Revise the staffing plans as needed

### 14. Maintain Non-People Resource Plans

This practice ensures that the types and quantity of non-people resources that a work unit has in place, at any point in time, match what is needed to do the work.

#### Sub practice

- Identify the quantity of each of the non-people resources needed and when they are needed.
- Assess the non-people resources currently available, if any, against the needs.
- Define and document the plan for how the non-people resources gap will be addressed.
- Review the non-people resource plans with relevant stakeholders, and obtain their agreement.
- Place the non-people resource deployment plans under version control.
- Revise the plan for non-people resources as needed.

### 15. Maintain Data Management Plans

This practice ensures that the work unit is aware of its critical environmental data and information and that plans are in place to collect, store, manage, and dispose the data and information in a manner that satisfies the applicable laws, regulations, organizational policies, and other operational needs.

#### Sub practices

- Identify and document the environmental data and information that needs to be collected, stored, and distributed, along with the applicable data management requirements for each type of data and information
- Define and document the standards that apply to the management of the data and information.

- Define and document the mechanisms and procedures used to collect, store, access, distribute, and dispose each type of environmental data and information.
- Review the data management plans with relevant stakeholders, and obtain their agreement.
- Place the data management plans under version control.
- Revise the data management plans as needed.

### 16. Maintain Risk Management Plans

This practice ensures that the environmental work unit maintains an awareness of risks so that these risks are appropriately considered in the environmental work unit's planning and management activities

#### Sub practice

- Obtain and verify the inputs needed to identify and analyze the risks.
- Identify risks along with associated contextual information.
- Analyze the risks to determine potential impact, likelihood of occurrence, and the likely timeframe of occurrence.
- Prioritize the risks.
- Document the risks and the associated analysis, priorities, and contextual information.
- Review the documented risks with relevant stakeholders, and obtain their agreement.
- Place the documented risks under version control.
- Revise the documented risks as needed.

### 17. Maintain Work Monitoring Mechanisms

This practice ensures that the environmental Services manager is able to effectively manage the work activities

### 18. Resolve Conflicts with Related Plans

This practice ensures that no significant conflicts, inefficiencies, unresolved dependencies, or missing responsibilities exist among the plans and commitments of the related work units and workgroups.

#### Sub practices

- Review plans and commitments of the environmental work unit against those of the related work units and workgroups to identify areas that are in conflict or disagreement.

- Identify and document significant conflicts, inefficiencies, unresolved dependencies, or missing responsibilities in plans and commitments of the environmental work unit and the related work units and workgroups.
- Negotiate with those responsible for the reviewed plans and document the changes that are needed in the plans and commitments to resolve any significant issues.
- Review the plan and commitment changes with relevant stakeholders, and obtain their agreement.
- Revise the work unit's plans and commitments to reflect the agreed-to changes.
- Document and archive the results and other relevant records of the plan and commitment reconciliation activities

### 19. Establish Consistent work unit plans

This practice ensures that all aspects of the plans for an environmental work unit are consistent and aligned with each other so that there is a common understanding and that the set of plans provide a course of action to perform the work and deliver the products and services

#### Sub practices

- Obtain and verify the component plans and other inputs needed to integrate the work unit's plans.
- Review the component plans to identify areas that are in conflict or disagreement.
- Identify and document significant conflicts, inefficiencies, unresolved dependencies, or missing responsibilities in the plans.
- Identify changes to the plans to resolve any significant issues.
- Review the plan changes with relevant stakeholders, and obtain their agreement.
- Incorporate the plan changes into the component plans and integrate the plans.
- Document and archive the results and other relevant records of the plan integration activities.

## 5.5 Environmental Work Unit Monitoring and Control

### Purpose

Environmental Work Unit Monitoring and Control measures, monitors, and adjusts the environmental assignments, resources, and other work factors for the individuals and workgroups in the environmental work unit or project and keeps performance and results in line with the requirements and plans.

### Goals

#### 1. Specific Goals

- **Goal 1: Environmental Work Assignments Are Managed.** Work assignments and environmental work activities for environmental work unit are managed against its requirements, estimates, plans, and commitments.
- **Goal 2: Performance and Results Are Tracked.** The actual performance and results of environmental work unit are monitored against its requirements, estimates, plans, and commitments.
- **Goal 3: Corrective Actions Are Performed.** Corrective actions are performed when the performance or results of a work unit deviate significantly from its requirements, plans, or commitments

#### 2. Institutional Goals

- **Goal 1: Practices Are Institutionalized.** The practices for Environmental Work Unit Monitoring and Control are institutionalized.

### Practice to Goal Relationship table

Goal	Practice
Specific Goal 1	Specific Practice 1,2,3,4
Specific Goal 2	Specific Practice 5,6,7,8,9,10
Specific Goal 3	Specific Practice 11,12,13,14,15

Institutional Goal 1	Institutional Practice 1,2,3,4,5
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### Practices

- **Specific Practice**

1. **Process Incoming Work Requests**

Environmental Work requests received by an environment work unit are analyzed, prioritized, and planned into the work unit's activities.

#### Sub practices

- Receive, acknowledge, and document each work request received by the environment work unit.
- Obtain and verify the inputs needed to analyze, prioritize, and plan each work request.
- Analyze each environmental work request to understand the requirements for the work to be performed and the outputs that will satisfy the work request.
- Evaluate the capability and capacity of the environment work unit to address each work request, and identify any capability and capacity issues.
- Resolve any issues with the submitter of the work unit work requests and other relevant stakeholders regarding the environment work unit's capability and capacity to address each work request.
- Document the disposition and supporting rationale for each environmental work request and communicate it to the submitter and other relevant stakeholders.
- Plan each approved work request into the ongoing environmental work activities of the environment work unit.

2. **Prepare Staff for Assignments**

This practice ensures that the quantity and capability of the environment work unit's staff are adequate to perform the work.

#### Sub practices

- Compare the quantity and capabilities of the people currently assigned and available for environmental assignment against the plans and needs.
- Arrange for the appropriate addition or reassignment of people based on the plans and needs.



- Arrange for appropriate skills development activities for the assigned people.

### 3. Prepare Staff for Assignments

This practice ensures that the quantity and capability of the environment work unit's non-people resources are adequate to perform the work.

#### Sub practices

- Determine the non-people resources and the quantity of each needed to perform the work as planned and satisfy the other needs of the environment work unit.
- Compare the quantity of each of the non-people resources current assigned and available for assignment against the plans and needs.
- Arrange for the appropriate addition or reallocation of the non-people resources based on the plans and needs.

### 4. Assign Work.

This practice ensures that all environmental work activities needed to satisfy work requirements or complete work requests are assigned, that workloads are balanced among the members of a environment work unit, and that members of the environment work unit are accountable for their assignments.

#### Sub practices

- Organize the environment work activities into roles and assignments according to a environment work unit's defined workflow
- Organize the environment work activities into roles and assignments as needed to satisfy a environment work unit's requirements and to complete the work requests
- Evaluate the competency and capacity of individuals and workgroups to perform the various work activities.
- Assign responsibility for the environment work activities to individuals and workgroups according to their competencies and availability.
- Review the assigned environment work activities with the responsible individuals and work groups to ensure they understand and can perform the assignments.
- Establish commitments for performing the environment work activities with the responsible individuals and workgroups.
- Incorporate assigned environmental work activities into the performance goals of the individuals or workgroup, as appropriate.

- Document and archive the results and other relevant records of the assignment of work.
- Revise the work assignments as needed.

### 5. Monitor Workflow

This practice ensures that the individual work activities, in aggregate, achieve the overall results expected of an environment work unit.

#### Sub practices

- Monitor the critical inputs and dependencies for the environmental work activities to determine whether they are timely and satisfy the needs of the work activities.
- Monitor the critical outputs of the environmental work activities to determine whether they are timely and satisfy the needs of the environmental work activities that use them.
- Identify problems with the critical inputs and critical outputs.
- Evaluate the actual or potential impact of the input and output issues.

### 6. Monitor and Adjust Work Assignments

This practice ensures that the day-to-day work performance and results are understood and adjustments are made to keep the environment work unit's work on track and to ensure that the staff and other resources are used effectively and efficiently

#### Sub practices

- Obtain and verify the work status, measures, and other inputs needed to monitor the work assigned to the individuals and workgroups.
- Identify any workload imbalance and other issues in how the work is being performed and in the work results.
- Determine and make adjustments in the work assignments, resources, and other factors to address any workload imbalance and other issues.

### 7. Analyze Measures

This practice ensures that objective, quantitative information is used to guide management decisions.

#### Sub practices

- Collect the base measures as specified in the plans.
- Derive the measures needed for analysis as specified in the plans.
- Review the measures to ensure data integrity
- Analyze the measures to obtain the desired information as specified in the plans.

- Review the measures and analysis results with relevant stakeholders, and obtain their agreement on the results and interpretations.
- Store the measures and analysis results and make available, with appropriate restrictions, to relevant stakeholders.
- Report the measures and analysis results as specified in the plans

### 8. Review Performance and Status

This practice ensures that the manager of a environment work unit understands whether any problems exist relative to satisfying the environment work unit's requirements, plans, and commitments.

#### Sub practices

- Obtain and verify the work status, measures, and other inputs needed to analyze the environment work unit's performance and the status
- Review, on a regular basis, the actual status, performance, and results against the requirements, plans, and commitments
- Identify requirements that are not being satisfied or that are at risk of not being satisfied.
- Identify plans that are not being satisfied or that are at risk of not being satisfied.
- Review the environment work unit's commitments made to other work units, workgroups, and external organizations with them and identify any that are not being satisfied or that are at risk of not being satisfied.
- Review the commitments to this environment work unit made by other work units, workgroups, and external organizations with them and identify any that are not being satisfied or that are at risk of not being satisfied.
- Document and archive the results and other relevant records of the status review activities.

### 9. Manage Data and Information

This practice ensures that the environment work unit and others have appropriate access to the environment work unit's critical data and information.

### 10. Manage Risks

This practice ensures that appropriate actions are taken for the environment work unit's risks to prevent a risk from becoming a problem or minimize the effects of the problem if it does occur.

#### Sub practices

- Obtain and verify the inputs needed to monitor the environment work unit's risks.

- Review the identified risks on a periodic basis
- Review the environment work unit's requirements, plans, commitments, and activities to identify new risks, risks information that should be revised, and risks that can be removed from the actively-managed list. Identify each risk that is likely to become a serious problem.
- Identify preventive or mitigation actions to address each risk that is likely to become a serious problem.
- Perform the identified preventive or mitigation actions, as appropriate, and track to closure.
- Revise the documentation of the risks including description, status, evaluation, and priority, as needed

### 11. Address Significant Deviations

This practice ensures that significant deviations are recognized and addressed so that environments work unit's requirements, estimates, plans, and commitments can be adjusted to reflect a reasonable plan forward.

#### Sub practices

- Analyze identified issues and risks to determine the actual or likely deviations from the environment work unit's requirements, estimates, plans, and commitments
- Perform corrective actions to fix any existing critical problems caused by the deviation, where appropriate
- Document issues and risks which result or are likely to result in significant deviations and designate them for analysis and corrective action.
- Determine and document corrective actions needed to address the identified deviations from the environment work unit's requirements, estimates, plans, and commitments
- Review the planned corrective actions with relevant stakeholders, and obtain their agreement.
- Perform the agreed-to corrective actions and track to completion
- Document and archive the results and other relevant records of addressing the significant deviations

### 12. Address Deviation Causes

This practice ensures that, where possible, significant deviations from an environment work unit's requirements, estimates, plans, and commitments of the type that occurred in the past do not recur.

### Sub practice

- Review significant deviations and other issues to determine which of these are likely to recur.
- Analyze the significant deviations and other issues to determine their likely causes.
- Document the likely causes of each identified significant deviation and issue so that corrective actions can be performed.
- Determine and document preventive actions that are expected to prevent the future occurrence of identified problems and similar problems.
- Review the proposed preventive actions with relevant stakeholders, and obtain their agreement.
- Perform the agreed preventive actions and track to completion.
- Document as risks any significant recurring problems that are not addressed with the preventive actions
- Document and archive the results and other relevant records of the analysis and preventive actions performed to address likely causes of problems.

### 13. Communicate Progress

This practice ensures that relevant stakeholders by the environment work unit's activities have a common, correct, and current understanding of the progress, accomplishments, issues, and risks so there are no surprises.

#### Sub practices

- Obtain and verify the inputs needed to present the progress, accomplishments, issues, and risks with relevant stakeholders.
- Conduct reviews at points in time that are meaningful to the environment work unit and the reviewers
- Identify and document action items and track them to closure.
- Document issues and risks identified in the review.

### 14. Revise Plans

This practice ensures that the environment work unit's plans reflect an accurate description of the current situation and what is planned for the future.

#### Sub practices

- Obtain and verify the inputs needed to revise the plans.
- Review the plans.
- Adjust the planning parameters and estimates

- Revise the plans to reflect accomplishments, progress, changes, corrective actions, and other changes as appropriate.
- Document and archive the results and other relevant records of the plan revision activities

### 15. Apply Lessons Learned

This practice ensures that the environment work unit learns from its experiences, and these lessons are applied.

#### Sub practices

- Review the environment work unit's requirements, estimates, plans, commitments, and environmental work activities periodically to identify lessons learned.
- Review the analyses performed on significant deviations and actions performed to identify lessons learned.
- Document and store the derived lessons learned.
- Review the documented lessons learned with those who are relevant stakeholders and others who are knowledgeable.
- Incorporate the documented lessons learned into the environment work unit's plans, processes, and procedures.
- Make lessons learned available to the environment work unit staff and managers.

## 5.6 Environmental Work Unit Performance

### Purpose

Environment work unit Performance establishes work agreements for the individuals and workgroups with the environment work unit manager and performs the work to produce the agreed-to results.

### Goals

#### 1. Specific Goals

- **Goal 1: Work Assignments Are Accepted.** Individuals and workgroups within an environment work unit understand their work assignments and are provided with the resources needed to perform the work.
- **Goal 2: Work Is Performed and Delivered.** The work performed and work products and services delivered by the individuals and workgroups within an environment work unit satisfy their plans and commitments.
- **Goal3: Work Is Measured and Improved.** Individuals and workgroups within an environment work unit measure and improve the performance of their work activities.

#### 2. Institutional Goals

- **Goal 1: Practices Are Institutionalized.** The practices for Environment work unit are institutionalized.

### Practice to Goal Relationship table

Goal	Practice
Specific Goal 1	Specific Practice 1,2,3,4
Specific Goal 2	Specific Practice 5,6,7
Specific Goal 3	Specific Practice 8,9
Institutional Goal 1	Institutional Practice 1,2,3,4,5

### Practices

- **Specific Practice**

- 1. Receive and Plan Work Assignments**

This practice ensures that responsibility for the environment work unit's work is accepted by the individuals and workgroups as assigned by the manager

#### Sub practice

- Receive and acknowledge the work assignments from the environment work unit manager.
- Analyze work assignments to understand the needed inputs, the work to be performed, the overall workflow, and the required outputs.
- Evaluate the capability and capacity of the individuals and workgroups against what is needed for the work assignments.
- Identify any issues with the understanding of the work assignment and with the capability and capacity to perform the work.
- Resolve any understanding, capability, or capacity issues with the environment work unit manager.
- Determine if the work assignment, as defined, can be performed by the individuals and workgroups, and resolve the assignment with the environment work unit manager.
- Plan the agreed-to work assignments into the individual's and workgroup's ongoing environmental work activities as appropriate.

- 2. Establish Work Commitments**

This practice ensures that individuals and workgroups establish the coordination necessary to complete their assigned work as agreed

#### Sub practice

- Analyze the assigned environmental work activities to identify dependencies these activities have with the environmental work activities assigned to other individuals and workgroups.
- Identify and analyze the interactions needed with other individuals and workgroups to identify dependencies with their work activities.
- Negotiate and document commitments with affected individuals and workgroups to ensure the dependencies are addressed.
- Establish communication mechanisms to coordinate commitments with affected individuals and workgroups.



- Review the work dependencies and commitments with affected individuals and workgroups periodically or as needed to identify issues.
- Perform corrective actions as needed to ensure that commitments are in place and are satisfied, or are likely to be satisfied as planned.

### 3. Obtain Work Information and Resources

This practice ensures that individuals and workgroups are fully enabled to perform their assigned environmental work activities and that they avoid delays caused by insufficient resources or incomplete information.

#### Sub practice

- Identify the information and resources needed to perform the work steps for the assigned work.
- Obtain and allocate the needed resources to the work steps and the people performing the work steps.
- Obtain appropriate access to the information needed to perform the work steps.
- Identify issues with the availability of the information and resources needed to perform the work steps.
- Perform corrective actions to resolve issues with the availability of the information and resources needed to perform the work steps

### 4. Prepare For Work Assignments

This practice helps reduce errors and rework by ensuring that individuals and workgroups are fully prepared when initiating their work assignments

#### Sub practice

- Review the work steps constituting the work assignments and the process descriptions or work procedures that are to be followed and identify any issues.
- Review the inputs for the work assignment to ensure that the inputs are available, complete, and correct, and identify any issues.
- Review the resources provided and planned for the work assignment to ensure that they are adequate and available when needed, and identify any issues.
- Perform corrective actions as needed to address any identified preparation issues.
- Review any revised process descriptions or work procedures, provided and planned resources, and inputs to ensure they are sufficient to support performance of the work step.

- Identify and document recurring problems with the process descriptions or work procedures, provided and planned resources, and inputs to work steps for local action, where possible, or communicate them to the environment work unit manager for action.

### 5. Perform Assigned Work

This practice ensures that work steps for the environmental work assignments are performed in a consistent and correct manner and that relevant stakeholders can expect consistent and correct results.

#### Sub practice

- Review identified work dependencies and work agreements to ensure they will be satisfied as needed.
- Communicate and coordinate to ensure that interdependent environmental work activities are performed in a way that satisfies the work requirements, work procedures, and work agreements.
- Review the actions that will be taken in performing each work step to ensure they comply with the defined workflow, work agreements and work procedures before initiating the work step.
- Review the inputs needed for each work to ensure they are available and in a state sufficient to support performance of the work step.
- Identify any issues regarding the ability to perform the assigned work.
- Perform corrective action, as appropriate, to address the issues regarding the ability to perform the assigned work.
- Perform the work steps for the environmental work assignment in accordance with the work agreements and work procedures.
- Identify exceptional conditions encountered in performing the work steps.
- Define, obtain approval, and perform the actions that are appropriate for handling the identified exceptional conditions.
- Store and provide to the relevant stakeholders the outputs of the work step as specified in the work requirements, work procedures, and work agreements

### 6. Maintain Authenticity and Integrity of Data and Information

This practice ensures that the users and recipients of the data and information associated with the environmental work can be assured of its authenticity and integrity as the work is performed and the data and information are manipulated.

### Sub practices

- Identify the critical data and information whose authenticity and integrity must be protected.
- Define and document the rules and procedure for obtaining, accessing, manipulating, creating, storing, distributing, and revising the critical data and information in a manner that maintains their authenticity and integrity
- Implement automated support, as appropriate, to enforce the rules and procedures for handling the critical data and information.
- Handle the critical data and information according to established rules and procedures.
- Trace the change activities for the critical data and information to the individual work steps.
- Verify the work steps performed and work products produced for completeness and accuracy before submitting the results to subsequent work steps, and identify problems.
- Conduct regular objective reviews of the critical data and information to ensure their authenticity and integrity, and identify problems.
- Perform corrective actions to address identified problems and track to closure.
- Identify and document recurring problems encountered in maintaining the authenticity and integrity of the data and information for local action, where possible, or communicate them to the environment work unit manager for action.

### 7. Provide Work Status Reports

This practice ensures that the environment work unit manager and other relevant stakeholders have continuing awareness of the status of the assigned work so that the work can be managed.

#### Sub Practices

- Determine the need for work status information and frequency of reporting for the environment work unit manager and other relevant stakeholders.
- Collect and provide the agreed status information to the environment work unit manager and other relevant stakeholders

### 8. Measure Work Performance

This practice ensures that the individuals and work groups within an environment work unit develop a quantitative understanding of their work that they can use to manage their work and identify and evaluate local improvements

### Sub practice

- Identify measures needed by the individuals and workgroups to understand and improve the performance and results of the work performed.
- Define the plan for collecting, storing, and analyzing each identified measure.
- Collect the identified measures and store them appropriately.
- Derive the measures needed to analyze the work performed.
- Periodically and as needed, analyze the identified measures of environmental work activities to understand the quantitative aspects of performing the work.
- Periodically and as needed, analyze measures of work products to understand the quality and other attributes of these work products.
- Report the measures, as appropriate to the environment work unit manager.

### 9. Improve Work Performance

This practice initiates simple opportunistic improvements to environmental work activities or work products within the environment work unit and provides a foundation for systematic improvement at higher maturity levels.

### Sub practice

- Periodically or as needed, analyze status information, measures, and other inputs to identify opportunities for the improvement
- Review proposed improvements to environmental work activities to ensure they comply with work procedures, commitments for coordinating work dependencies, and environment work unit requirements.
- Implement selected improvements to work activities.
- Evaluate the results of improvements to environmental work activities using status information, work measures, and other inputs.
- Perform corrective actions when improvements to environmental work activities fail to achieve their intended results.
- Record the results of improvements to environmental work activities and share them with other individuals, workgroups, or environment work units that might benefit from these improvements

## 5.7 Environmental Work Unit Configuration Management

### Purpose

Environment work unit Configuration Management identifies, manages, and controls the content and changes to a environment work unit's configuration management (CM) product baselines.

### Goals

#### 1. Specific Goals

- **Goal 1: Configurations Are Identified.** A environment work unit's CM product baselines and their configuration items are identified.
- **Goal 2: Contents of Configurations Are Controlled.** The content of an environment work unit's CM product baselines and their configuration items are managed and controlled
- **Goal3: Configuration Management Information Is Reported** Information that describes the content and status of an environment work unit's CM product baselines and their configuration items is maintained and reported to relevant stakeholders.

#### 2. Institutional Goals

- **Goal 1: Practices Are Institutionalized.** The practices for Environment work unit configuration management are institutionalized.

### Practice to Goal Relationship table

Goal	Practice
Specific Goal 1	Specific Practice 1,2,3
Specific Goal 2	Specific Practice 4,5,6
Specific Goal 3	Specific Practice 7,8,9
Institutional Goal 1	Institutional Practice 1,2,3,4,5

### Practices

- **Specific Practice**

- 1. Maintain Configuration Management Repositories**

This practice ensures that the repositories needed to store and manage the environment work unit's configuration items, CM product baselines, and associated data and records are adequate and appropriate.

#### **Sub practices**

- Select and install configuration management repositories for storing the environment work unit's configuration items, CM product baselines, and associated records.
- Select and install configuration management repositories for documenting, storing, and tracking problem reports and change requests against the environment work unit's configuration items and CM product baselines.
- Establish the mechanisms and procedures to store, retrieve, and update the contents of the environment work unit's configuration management repositories.
- Establish the mechanisms and procedures to appropriately control access to the contents of the environment work unit's configuration management repositories.
- Establish the mechanisms and procedures to appropriately move the environment work unit's configuration items and CM product baselines between configuration management control levels.
- Revise the environment work unit's configuration management repositories as necessary

- 2. Identify Configuration Items**

This practice ensures that there is a shared understanding among relevant stakeholders as to which of the environment work unit's work products are maintained under configuration management, specific characteristics of these work products, and when each of these work products will be placed under configuration management

#### **Sub practice**

- Identify the configuration items for the environment work unit based on documented criteria.
- Assign unique identifiers to each configuration item.
- Describe the important characteristics of each configuration item.
- Define when each configuration item will be placed under configuration management.
- Review the list of configuration items with relevant stakeholders, and obtain their agreement.

- Place the list of configuration items under version control
- Revise the list of configuration items as necessary

### 3. Specify CM Product Baselines

This practice ensures that there is a shared understanding among relevant stakeholders as to when the environment work unit's CM product baselines will be created, the configuration items that compose each CM product baseline, and how the CM product baselines will be used.

#### Sub practices

- Identify the environment work unit's CM product baselines that are essential for performing and managing the work efforts in the organization and that will be delivered to customers
- Specify the configuration items that comprise each CM product baseline.
- Assign unique identifiers to each CM product baseline.
- Specify the build and release procedures for each CM product baseline.
- Specify the intended users and uses of each CM product baseline.
- Describe the important characteristics of each CM product baseline and each configuration item.
- Review the specifications of the CM product baselines with relevant stakeholders, and obtain their agreement.
- Place the specifications of the CM product baselines under configuration management.
- Revise the specifications of the CM product baselines as necessary.

### 4. Manage Changes to Configurations

This practice ensures that the environment work unit's configuration items are updated in a controlled manner so that their contents remain in a known authorized state.

#### Sub practice

- Store the environment work unit's configuration items and the associated records in the configuration management repositories.
- Record the problem reports and change requests that are written against the environment work unit's configuration items.
- Identify changes to be made to the configuration items.
- Obtain appropriate authorization for each revision to configuration items before the changes are made.

- Control the check in and check out of configuration items in a manner that maintains the correctness and integrity of the configuration management repositories and their contents.
- Track the status of problem reports and change requests to closure.
- Review and approve changes made to the configuration items prior to incorporating the configuration items in the configuration management repositories.
- Report the results of change activities for the configuration items to relevant stakeholders

### 5. Build CM Product Baselines

This practice ensures that the environment work unit's CM product baselines or controlled service packs, as appropriate, contain the correct versions of the correct configuration items and that they are constructed as required.

#### Sub practice

- Obtained appropriate authorization before building a CM product baseline or service pack.
- Obtain and verify the inputs needed to create each CM product baseline.
- Build each CM product baseline or service pack from the designated configuration items according to documented and approved build procedures.
- Verify each CM product baseline or service pack build.
- Document each build of a CM product baseline or service pack.
- Place the documentation of each CM product baseline and service pack under version control.
- Store each build of a CM product baseline or service pack that will be delivered in a controlled product release repository.
- Report the results of the CM product baseline or service pack build to relevant stakeholders.

### 6. Deliver CM Product Baselines

This practice ensures that customers and internal users of a environment work unit's CM product baselines receive the appropriate baselines and updates to them.

#### Sub practices

- Identify and document the environment work unit's CM product baselines and delta releases that will be delivered
- Identify and document the recipients and methods and channels for delivery of the CM product baselines and delta releases.



- Review the list of CM product baselines and delta releases what will be delivered, the recipients, and the methods and channels for delivery with relevant stakeholders, and obtain their agreement.
- Deliver the CM product baselines and delta releases.
- Report the results of the CM product baseline and delta release activities to relevant stakeholder

### 7. Maintain Configuration Management Records

This practice ensures that records are maintained and available those accurately describe the environment work unit's configuration management activities and the version and content of the environment work unit's configuration items and CM product baselines

#### Sub practices

- Record the configuration management actions so that the content, status, and revision of each of the environment work unit's configuration items and CM product baselines are known and previous versions can be recovered.
- Document the differences between successive versions of each configuration items and successive versions of each CM product baseline.
- Revise the environment work unit's configuration management records as needed.

### 8. Audit CM Product Baselines

This practice ensures that the environment work unit's configuration management activities and results are complete, correct, and usable for their purposes

#### Sub practices

- Review the contents of the configuration management repositories for correctness and completeness.
- Compare the environment work unit's CM product baselines and their configuration items to ensure that they are correct and consistent with the configuration management records
- Review the environment work unit's configuration management activities for conformance with applicable standards and work procedures.
- Identify and document problems and issues with the configuration management repositories, the CM product baselines, their configuration items, and the associated records.
- Define corrective actions for the identified problems and issues, review them with relevant stakeholders, and obtain their agreement.

- Perform corrective actions and track to closure.
- Report the results of the CM product baseline audits to relevant stakeholders.

### 9. Provide Configuration Management Reports

This practice ensures that relevant stakeholders for the environment work unit's configuration management activities are kept informed of the relevant configuration management information so they can fulfill the configuration management roles and responsibilities or appropriately use the CM product baselines.

## 5.8 Environmental Sourcing Management

### Purpose

Sourcing Management manages the acquisition of Environmental products and services from suppliers external to the organization.

### Goals

#### 1. Specific Goals

- **Goal 1: Sourcing Agreements Are Approved.** Commitments with a qualified supplier to provide selected Environmental products and services for an environment work unit are agreed to by relevant stakeholders
- **Goal 2: Sourcing Agreements Are satisfied.** The sourcing agreements and work agreements between a environment work unit and supplier are satisfied by the supplier and environment work unit.
- **Goal3: Acquired Products and Services Are Incorporated** The acquired products and services are accepted and incorporated into an environment work unit's infrastructure, processes, products, and services.

#### 2. Institutional Goals

- **Goal 1: Practices Are Institutionalized.** The practices for sourcing management are institutionalized.

### Practice to Goal Relationship table

Goal	Practice
Specific Goal 1	Specific Practice 1,2,3,4,5,6,7
Specific Goal 2	Specific Practice 8,9,10,11,12,18
Specific Goal 3	Specific Practice 12,13,14,15,16,17

Institutional Goal 1

Institutional Practice 1,2,3,4,5

## Practices

- **Specific Practice**

1. **Maintain Descriptions of Sourcing Needs**

This practice helps identify the most appropriate products and services for an environment work unit to acquire from external sources.

### Sub practices

- Analyze the environment work unit's plans and requirements to identify products and services that will be acquired.
- Document the description of each environmental product and service that will be acquired.
- Select the acquisition option for each environmental product and services.
- Review the descriptions of each environmental product and service to be acquired and the selected acquisition option with relevant stakeholders, and obtain their agreement.
- Revise the descriptions of each environmental product and service to be acquired and the selected acquisition option as needed

2. **Maintain Sourcing Requirements**

This practice establishes the basis for potential suppliers to propose and provide products and services that satisfy the environment work unit's needs and for evaluating and verifying acquired products and services.

### Sub practices

- Identify and document the requirements for each environmental product and service to be acquired.
- Define and document the organization's requirements for each environmental product and service to be acquired.
- Define and document the support needed for the life of for each acquired product and service.
- Identify potential suppliers for each environmental product and service and the selection approach.
- Review the requirements for each environmental product and service and the list of potential suppliers with relevant stakeholders, and obtain their agreement.

- Place the requirements for each environmental product and service under configuration management.
- Revise the requirements for each environmental product and service as necessary.

### 3. Select Off-the-Shelf Products

This practice ensures that off-the-shelf products are used where it is advantageous and where these off-the-shelf products fit the needs of the environment work unit.

#### Sub practice

- Develop criteria for evaluating off-the-shelf products.
- Identify candidate off-the-shelf products to be evaluated.
- Evaluate candidate off-the-shelf products against the associated requirements and criteria.
- Select the off-the-shelf products to be acquired.
- Review the evaluation of the candidates and the selected off-the shelf products with relevant stakeholders, and obtain their agreement
- Revise the requirements for the acquired product as necessary to accommodate the selected off-the-shelf products.
- Revise the environment work unit's plans and commitments as necessary to accommodate the selected off-the-shelf products.
- Identify risks associated with the selected off-the shelf product.

### 4. Select Supplier

This practice ensures that the selected supplier is the best fit for the needs of the environment work unit and organization.

#### Sub practice

- Establish and document criteria that will be used to evaluate potential suppliers.
- Distribute the proposal solicitation material and requirements to the potential suppliers.
- Evaluate the proposals submitted by the potential suppliers against applicable laws and regulations.
- Evaluate the proposals submitted by the potential suppliers against the evaluation criteria.
- Select the supplier.
- Identify risks associated with the selected supplier
- Review the selected supplier and the associated risks with relevant stakeholders, and obtain their agreement.

- Document and archive the results and other relevant records of the supplier selection.

### 5. Maintain Sourcing Agreement

This practice ensures that the supplier and acquirer share a common understanding of the legal requirements and responsibilities related to the products and services so that the sourcing agreement can be managed.

#### Sub practice

- Revise the sourcing requirements for the supplier to reflect negotiations.
- Define and document what the environment work unit and organization will provide to the supplier in support of the sourcing agreement.
- Define and document the procedures, measures, and criteria used in monitoring the supplier.
- Define and document the sourcing agreement terms and conditions.
- Document the sourcing agreement.
- Review the sourcing agreement with relevant stakeholders, including the supplier, and obtain their agreement.
- Obtain the appropriate approval signatures on the sourcing agreement from the organization and supplier.
- Revise the environment work unit's processes, work procedures, plans, and commitments as necessary to reflect the sourcing agreement.
- Place the sourcing agreement under version control.
- Revise the sourcing as necessary.

### 6. Select Supplier to Perform Work Orders

This practice ensures that the selected supplier is the best fit to perform the work specified in work orders.

#### Sub practices

- Establish and document criteria that will be used to evaluate potential suppliers for each work order
- Identify potential suppliers for each environmental work order.
- Distribute the proposal solicitation material and work order requirements to the potential suppliers.
- Evaluate the proposals submitted by the potential suppliers against the work order requirements and evaluation criteria.

- Select the supplier to perform each work order.
- Identify risks associated with the selected supplier for each work order.
- Review the selected supplier for each work order with relevant stakeholders, and obtain their agreement
- Document and archive the results and other relevant records of the selection of the supplier to perform each work order.

### 7. Maintain Supplier Work Orders

This practice provides a common understanding of the products and services the supplier will provide and the responsibilities of the supplier and acquirer so that the sourcing agreement can be managed.

#### Sub practices

- Revise the requirements for each environmental product and service to reflect negotiations with the supplier for each work order.
- Define and document what the environment work unit and organization will provide to the supplier in support of each work order.
- Define and document the procedures, measures, and criteria used in monitoring the supplier's performance and results for each work order.
- Document each work order.
- Review the environmental product and service requirements and work orders with relevant stakeholders, including the supplier, and obtain their agreement.
- Obtain the appropriate approvals for the work orders from the organization and supplier.
- Revise the environment work unit's processes, work procedures, plans, and commitments as necessary to reflect the work orders.
- Place the work orders under version control.
- Revise the work orders as necessary.

### 8. Resolve Planning Conflicts

This practice ensures that the supplier's products, services, and associated activities are consistent with the environment work unit's needs.

#### Sub practices

- Review and compare the supplier's plans and commitments with the relevant work orders and the environment work unit's plans and commitments.

- Identify measures and analyses that need to be included in the supplier's plans to support the environment work unit's plans, commitments, and management activities
- Identify areas in the supplier's plans and commitments that are in conflict or disagreement with the relevant work orders and the environment work unit's plans and commitments.
- Negotiate changes to the supplier's plans and commitments and the environment work unit's plans and commitments.
- Arrange for revisions to the supplier's plans and commitments as necessary to reflect negotiated changes.
- Revise the environment work unit's plans and commitments as necessary to reflect negotiated changes.
- Review the changes to the supplier's and the environment work unit's plan and commitment with relevant stakeholders, and obtain their agreement.

### 9. Satisfy Acquirer Responsibilities

This practice ensures that the supplier is provided with the facilities, access, and other support it needs from the environment work unit and other involved workgroups so that the supplier can perform its work and satisfy its requirements and commitments.

#### Sub practices

- Provide the supplier with the facilities, equipment, documentation, supplies, access, and other support, as specified in the sourcing agreement and work orders, so the supplier can appropriately interact with the environment work unit and organization.
- Review the status and outlook for the commitments to the supplier with the supplier.
- Identify the commitments to the supplier that are not being satisfied or that are at risk of not being satisfied.
- Identify corrective actions needed to satisfy the specified responsibilities of the environment work units and other involved workgroups.
- Perform the corrective actions and track to closure.

### 10. Monitor Supplier

This practice ensures that the supplier performs its work as planned and agreed to, and that the needs of the environment work unit are satisfied.



### Sub practices

- Review the accomplishments, status, issues, results, and outlook of the supplier against the sourcing agreement, work orders, plans, commitments, and the needs of the environment work unit.
- Review the supplier's conformance to standards and processes.
- Conduct regular management and performance reviews with the supplier.
- Identify and document action items based on monitoring the supplier.
- Track the identified action items to closure.
- Prepare regular reports summarizing the supplier's status, performance, issues, results, and outlook, and distribute to relevant stakeholders.
- Develop and document regular evaluations of the supplier's performance along with recommendations.
- Review the evaluations and recommendations with the supplier.
- Use the results of the supplier evaluations to provide awards or impose penalties as specified in the sourcing agreements.

### 11. Manage Supplier Relationship

This practice ensures that the business and working relationships with a supplier support the effective performance of the agreed-to work and, as appropriate, longer-term relationships

### Sub practices

- Regularly evaluate the role, capabilities, and importance of the supplier relative to the needs and goals of the environment work unit and organization.
- Determine the role of the supplier relative to the roles of other suppliers and potential future sourcing opportunities.
- Communicate and collaborate with the supplier on a regular basis to improve the supplier relationship and effectively manage the development, preparation and delivery of the products and services.
- Jointly with the supplier, determine ways to simplify and improve operations, reduce costs, and improve quality of the combined work of the supplier and acquirer.
- Determine the strategy for continuing the sourcing relationship with the supplier.
- Document and archive the results and other relevant records of the supplier relationship management activities.

- Review the results of the supplier relationship management activities with relevant stakeholders, and obtain their agreement.
- Make adjustments to the sourcing agreements for the supplier, as appropriate, to reflect the results of the supplier relationship management activities.

### 12. Evaluate Acquired Products and Services

This practice ensures that the supplier's products and services satisfy their requirements and the needs of the environment work unit

#### Sub practices

- Define the evaluation criteria and procedures for the products and services received from the supplier.
- Review the applicable evaluation criteria and procedures with the supplier and other relevant stakeholders, and obtain their agreement.
- Evaluate the products and services received from the supplier against their requirements using the defined criteria and procedures.
- Identify problems and defects in the environmental product and service received from the supplier.
- Document the results of the product and service evaluations.

### 13. Prepare to Transition Acquired Products

This practice ensures that the environment work unit and organization can assume ownership and responsibility for the acquired products when they are delivered by the supplier.

#### Sub practices

- Identify and document the facilities, the people, and the non-people resources needed to receive, store, maintain, and support the acquired products.
- Identify and document the administrative and business issues that need to be addressed to receive, store, maintain, and support the acquired products
- Review the documentation of the facilities, people, and non-people resources, and the administrative and business issues for the acquired products with relevant stakeholders, and obtain their agreement.
- Define and document the plans and procedures for receiving, storing, supporting, maintaining, and making available the acquired products.

- Plan and obtain, construct, or procure the appropriate facilities and non-people resources to receive, store, support and maintain the acquired products.
- Plan, obtain, assign, and prepare the people who are needed to receive, store, maintain, and support the acquired products
- Identify and perform the actions to address the administrative and business issues related to receiving, storing, supporting, and maintaining the acquired products.
- Revise the documentation of the facilities, the people, the non-people resources, and the administrative and business issues for the acquired products as needed.
- Adjust, as needed, the facilities, the people, the non-people resources, and other factors that are in place to receive, store, maintain, and support the acquired products.

### 14. Transition Acquired Products

This practice ensures that the acquired products are available to the environment work unit and are usable for their intended purposes.

#### Sub practices

- Receive and store the acquired products according to the established plans and procedures.
- Receive and store the operating and support documentation for the acquired products according to the established plans and procedures.
- Place the acquired products and operating and support documentation under configuration management
- Maintain the acquired products according to the established plans and procedures.
- Make the acquired products available according to the established plans and procedures

### 15. Address Significant Deviations

This practice ensures that significant deviations from the sourcing agreement, work orders, environmental product and service requirements, plans, and commitments are recognized and addressed appropriately.

#### Sub practices

- Analyze identified issues and problems in the supplier's status, performance, and results to determine the actual or likely deviations from the sourcing agreement, work orders, product and service requirements, plans, and commitments.

- Analyze identified issues and problems in the environment work unit's status and results that affect the supplier to determine the actual or likely deviations from the sourcing agreement, work orders, product and service requirements, plans, and commitments.
- Review the identified issues, problems, and defects to determine which ones result, or are likely to result, in significant deviations from the sourcing agreement, work orders, product and service requirements, plans, and commitments.
- Jointly with the supplier, perform corrective actions to fix any immediate critical problems caused by the significant deviations, where appropriate.
- Define, document, and obtain agreement with the supplier on corrective actions that will be performed to address the significant deviations
- Perform the agreed-to corrective actions that are the responsibility of the environment work unit or organization and track to closure
- Monitor the supplier's performance of the agreed-to corrective actions that are their responsibility and track to closure

### 16. Address Deviation Causes

This practice ensures that, where possible, significant deviations from a sourcing requirements, plans, and commitments of the type that occurred in the past do not recur.

#### Sub practices

- Review significant deviations and other issues to determine which of these are likely to recur.
- Analyze the significant deviations and other issues to determine the likely causes of the issue and significant deviation.
- Document the likely causes of each identified significant deviation and issue so that corrective actions can be performed.
- Determine and document preventive actions that are expected to prevent the future occurrence of identified problems and similar problems.
- Review the proposed preventive actions with relevant stakeholders, and obtain their agreement.
- Perform the agreed-to preventive actions and track to completion
- Document significant recurring problems that are not addressed with the preventive actions as risks
- Document and archive the results and other relevant records of the analysis and preventive actions performed to address likely causes of problems

### 17. Close Out Supplier Work Orders

This practice ensures that the conditions specified for a work order have been satisfied, that both the supplier and acquirer agree these conditions are satisfied, and that both the supplier and acquirer agree the work order is completed.

#### Sub practices

- Determine whether the products and services specified for delivery in the work order have been delivered and accepted.
- Identify corrective actions needed to resolve issues to do with delivery and acceptance of the products and services.
- Review the identified corrective actions with relevant stakeholders, including the supplier, and obtain their agreement.
- Perform the agreed-to corrective actions that are the responsibility of the environment work unit or organization and track to closure.
- Monitor the supplier's performance of the agreed-to corrective actions that are their responsibility and track to closure.
- Prepare final documentation for the work order certifying the delivery and acceptance of products and services.
- Review the final documentation for the work order with relevant stakeholders, including the supplier, obtain their agreement, and obtain the appropriate approvals from the organization and supplier.
- Provide the supplier with formal closeout notification for the work order

### 18. Close Out Sourcing Agreements

This practice ensures that the conditions specified for an environmental sourcing agreement have been satisfied, that both the supplier and acquirer agree these conditions are satisfied, and that both the supplier and acquirer agree the sourcing relationship is ended

#### Sub practices

- Determine whether all the work orders in the sourcing agreement have been completed and closed
- Determine whether administrative actions specified in the sourcing agreement have been performed.
- Determine whether payments specified in the sourcing agreement have been made and all other claims relative to the sourcing agreement have been resolved.

- Identify corrective actions needed to resolve issues to do with administrative actions, payments, and claims.
- Review the identified corrective actions with relevant stakeholders, including the supplier, and obtain their agreement.
- Perform the agreed-to corrective actions that are the responsibility of the environment work unit or organization and track to closure.
- Monitor the supplier's performance of the agreed-to corrective actions that are their responsibility and track to closure.
- Prepare final documentation for the sourcing relationship certifying the delivery and acceptance of products and services, completion of administrative actions, final and complete payments, and resolution of claims.
- Review the final documentation for the sourcing relationship with relevant stakeholders, including the supplier, obtain their agreement, and obtain the appropriate approvals of the organization's and supplier's business functions.
- Provide the supplier with formal closeout notification for the sourcing agreement.

## 5.9 Environmental Process and Product Assurance

### Purpose

This process provides appropriate conformance guidance and objectively reviews the activities and work products of work efforts within the organization to ensure they conform with applicable laws, regulations, standards, environmental policies, business rules, process descriptions, and work procedures.

### Goals

#### 1. Specific Goals

- **Goal 1: Activities and Results Are Objectively Evaluated** Environmental activities and work products are objectively evaluated for conformance to the applicable laws, regulations, standards, organizational policies, business rules, process descriptions, and work procedures.
- **Goal 2: Non-Conformance Issues Are Resolved** Non-conformance issues are tracked, communicated, and resolved.

#### 2. Institutional Goals

- **Goal 1: Practices Are Institutionalized.** The practices for Environment process and product assurance.

### Practice to Goal Relationship table

Goal	Practice
Specific Goal 1	Specific Practice 1,2,3,4,5
Specific Goal 2	Specific Practice 6,7,8,9,10
Specific Goal 3	Specific Practice 13,14,15,16,18,19
Institutional Goal 1	Institutional Practice 1,2,3,4,5

### Practices

- **Specific Practice**

1. **Provide Conformance Assistance**

This practice consolidates the investigation of the potentially complex and large volume of applicable laws, regulations, organizational policies, business rules, and standards, so that each individual, work unit, and workgroup does not have to separately determine the applicable clauses and provisions with which they must comply.

#### **Sub practices**

- Identify all legitimate sources of laws, regulations, organizational policies, business rules, and environmental standards that apply to the work.
- Establish mechanisms for obtaining the laws, regulations, organizational policies, business rules, and environmental standards, and revisions to them, that apply to the work.
- Determine and document which clauses and provisions of the laws, regulations, organizational policies, business rules, and environmental standards apply to the various processes and how they apply.
- Provide the information from the laws, regulations, organizational policies, business rules, and environmental standards that the people doing the work need to understand.
- Review the applicable clauses and provisions of the laws, regulations, organizational policies, business rules, and environmental standards with relevant stakeholders to ensure they understand how they apply to their work

2. **Facilitate Learning Across Work Efforts**

This practice ensures that information and assets uncovered in performing the environmental process and product assurance reviews within the organization are propagated to add value to the ongoing work efforts.

#### **Sub practices**

- Identify information and assets that could be useful to the organization's work efforts as part of the assurance reviews.
- Review the results of past assurance activities for information and assets that could be useful to the organization's work efforts.



- Review the plans, process descriptions, standards, work procedures, and work activities for the organization's work efforts and provide recommendations on how they could be improved.
- Provide guidance to facilitate and improve the overall cross work flow between work units
- Provide objective guidance on managing and performing the work.

### 3. Evaluate Process Descriptions

This practice ensures that the applicable laws, regulations, standards, organizational policies, and business rules are reflected in the process descriptions and work procedures, so that in following the process descriptions and work procedures the people have confidence they are in conformance.

#### Sub practices

- Periodically and as needed review, filter, and provide interpretation to relevant stakeholders of the applicable laws, regulations, standards, organizational policies, and business rules.
- Provide guidance and review of the process descriptions and work procedures as they are developed and revised to ensure they reflect the applicable laws, regulations, standards, organizational policies, and business rules.
- Verify that process descriptions and work procedures are in place and are usable as a basis to objectively evaluate the work activities and work products.
- Evaluate the environmental process descriptions and work procedures against the applicable laws, regulations, standards, organizational policies, and business rules.
- Identify and document non-conformance issues for the process descriptions and work procedures.
- Identify lessons learned that could improve the future development and maintenance of process descriptions and work procedures within the organization

### 4. Evaluate Work Activities

This practice objectively evaluates the performance of work activities, and identifies work activities that are not in conformance with the applicable laws, regulations, standards, organizational policies, business rules, process descriptions, and work procedures, so that corrective actions can be taken.

#### Sub practices

- Select the work activities to be evaluated.
- Obtain and verify the inputs needed to evaluate the selected work activities.

- Provide consultation and guidance to the people doing the work to help ensure they comply with the applicable laws, regulations, standards, and environmental policies, business rules, process descriptions, and work procedures.
- Evaluate the work activities for conformance to the applicable laws, regulations, standards, organizational policies, business rules, process descriptions, and work procedures.
- Identify and document non-conformance issues for the work activities
- Document and archive the results and other relevant records of the work activity evaluations.
- Identify lessons learned that could improve how work activities are performed in the organization

### 5. Evaluate Process Results

This practice identifies work products and services that are not in conformance with the applicable laws, regulations, environmental standards, environmental policies, and business rules, so that corrective actions can be taken.

#### Sub practices

- Select the work products and services that are outputs of the process for evaluation.
- Obtain and verify the inputs needed to evaluate the selected work products and services.
- Provide consultation and guidance to the people responsible for developing, preparing and delivering the work products and services to help ensure they comply with the applicable laws, regulations, standards, organizational policies, and business rules.
- Evaluate the work products and services for conformance to the applicable laws, regulations, standards, organizational policies, and business rules.
- Identify and document non-conformance issues for the work products and services.
- Document and archive the results and other relevant records of the work environmental product and service evaluations.
- Identify lessons learned that could improve how work products and services are developed and delivered by the organization.

### 6. Review Evaluation Results Locally

This practice ensures that the individuals, work units, workgroups, and managers who are responsible for the work are kept informed of the results of the assurance evaluations so they understand all non-conformance issues and, where appropriate, they can take corrective actions and make appropriate adjustments in their future work.

### Sub practices

- Provide information to the responsible work units and workgroups on the assurance evaluations that have been performed as compared to the plan.
- Describe the important results of the assurance evaluations.
- Provide recommendations to the responsible work units and workgroups for changes to process descriptions, work procedures, and future work activities.
- Describe changes to the assurance plans for the work unit or workgroup.

### 7. Resolve Non-Conformances at Local Level

This practice ensures that the individuals, work units, workgroups, and managers who are responsible for the work have the opportunity to correct non-conformance issues before higher level management is involved.

### Sub practices

- Document potential and actual non-conformance issues to be addressed.
- Review and discuss the documented issues with the responsible individuals, work units, workgroups, and managers.
- Define, document, and agree on actions to resolve the issue or escalation actions.
- Periodically review the status of agreed-to actions with the work unit or workgroup manager.
- Track issues to resolution. 6. Document and archive the results and other relevant records of the non-conformance discussions and actions.

### 8. Resolve Non-Conformances at Local Level

This practice ensures that non-conformance issues that require arbitration or that are beyond the responsibility and authority of the work unit or workgroup are resolved by the appropriate level of management in the organization.

### Sub practices

- Document non-conformance issues that are not resolved within the workgroup.
- Escalate non-conformance issues that are not resolved within the work unit or workgroup to the appropriate level of management, up to and including the executive manager designated as the final conformance authority.
- Periodically review each open non-conformance issue with the manager responsible for acting on that issue.
- Track non-conformance issues to resolution.

- Provide regular updates to relevant stakeholders on the status of the open non-conformance issues and the resolution. 6. Document and archive the results and other relevant records of the non-conformance escalation activities.

### 9. Address Non-Conformance Causes

This practice ensures that, where possible, significant non-conformance issues that occurred in the past do not recur.

#### Sub practices

- Review significant non-conformance issues to determine which of these are likely to recur.
- Analyze the significant non-conformance issues to determine the likely causes.
- Document the likely causes of each identified significant non-conformance issue so that corrective actions can be performed.
- Determine and document preventive actions that are expected to prevent the future occurrence of identified non-conformance issue.
- Review the proposed preventive actions with relevant stakeholders, and obtain their agreement.
- Perform the agreed-to preventive actions and track to completion.
- Document as risks any significant non-conformance issues that are not addressed with the preventive actions.

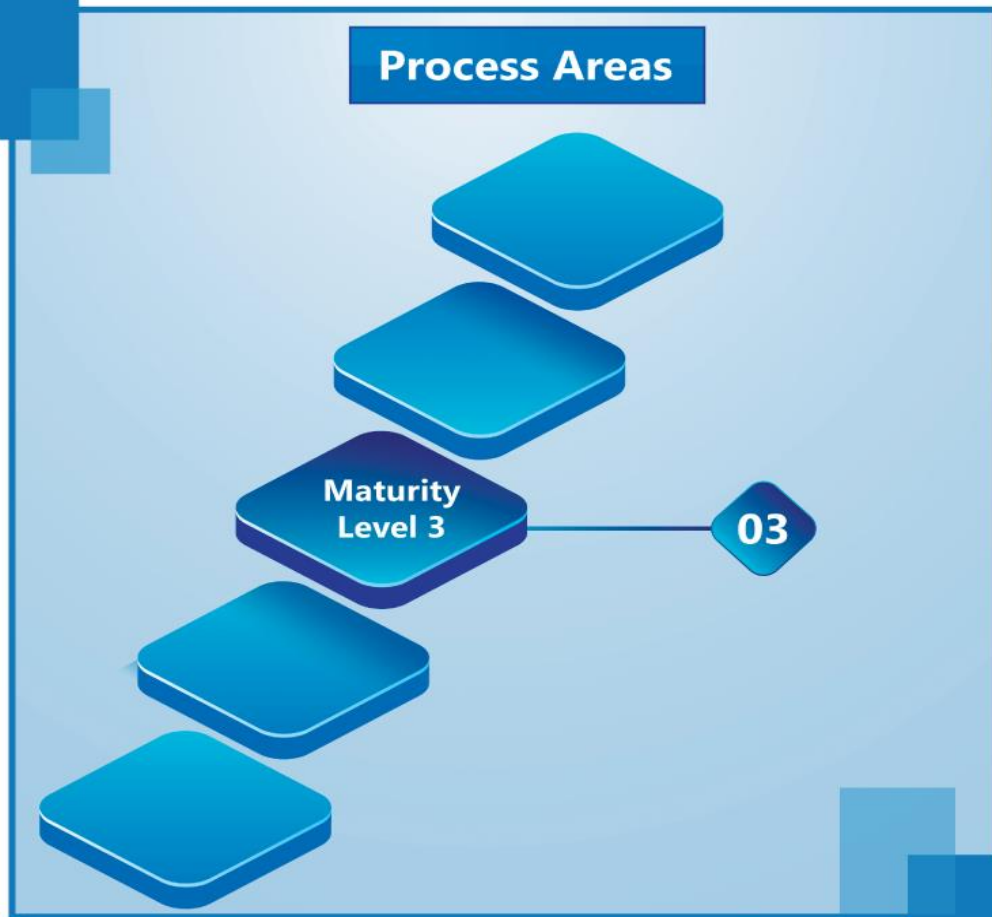
### 10. Maintain Assurance Records

This practice ensures that process and product assurance records needed to satisfy statutory and organizational requirements, to perform future assurance work, and to learn from past experiences are available for future reference.

#### Sub practices

- Record the status and results of the assurance evaluations.
- Analyze the non-conformance issues to determine quality trends and other relevant information that may require action.
- Provide records on the status and results of the assurance evaluations and related analysis results to relevant stakeholders.
- Revise the process and product assurance records as necessary.

## Process Areas: Maturity Level 3



The following section describes the process areas that belong to maturity level 3: Planning.

## 6.1 Environmental Process Management

### Purpose

Organizational Process Management develops usable environmental standard processes and related process assets for the organization, deploys them for use, and improves them based on understanding their strengths and weaknesses.

### Goals

#### 1. Specific Goals

- **Goal 1: Appraisal-Based Improvements Are Incorporated.** The strengths and weaknesses of the organization's environmental processes and process assets are understood and improvements are made.
- **Goal 2: Process Assets Are Created and Deployed.** The organization's environmental standard processes and environmental process assets are established and made available for developing, preparing, deploying, operating, and supporting the organization's environmental products and services.
- **Goal 3: Experience Based improvements are incorporated.** The organization's environmental processes and process assets are analyzed and improved based on developing and using them.

#### 2. Institutional Goals

- **Goal 1: Practices Are Institutionalized.** The practices for Environmental Process Management are established.

### Practice to Goal Relationship table

Goal	Practice
Specific Goal 1	Specific Practice 1,2,3,4,5
Specific Goal 2	Specific Practice 6,7,8,9,10

Specific Goal 3	Specific Practice 11,12,13
Institutional Goal 1	Institutional Practice 1,2,3,4,5

## Practices

- **Specific Practice**

- 1. Maintain Descriptions of Process Needs**

This practice ensures that the organization's environmental process needs, goals, and standards are understood and documented so the organization's processes and process assets are properly aligned with the needs of the organization and the work that will be performed.

### Sub Practices

- Review the laws, regulations, standards, organizational policies, and business rules that are applicable to the organization's work.
- Identify and document the process needs of the organization.
- Identify and document the organization's process performance and quality goals.
- Identify, define, and document the organization's process standards.
- Review the organization's process needs, goals, and standards with relevant stakeholders, and obtain their agreement.
- Revise the organization's process needs, goals, and standards as needed.

- 2. Appraise Processes**

This practice develops an objective understanding of the strengths and weaknesses of the environmental processes and process assets that are used in the organization, and provides a basis for identifying improvements.

### Sub practices

- Define the scope of the process appraisals.
- Obtain executive management sponsorship for the process appraisals and follow-on improvement activities.
- Plan the process appraisals.
- Prepare for the process appraisals
- Perform the process appraisals.

- Document the findings and results of the process appraisals.
- Review the findings and results of the process appraisals with the appraisal sponsors and others designated by the sponsors.

### 3. Identify Process Improvements

This practice ensures that the improvements that are to be implemented are those that provide the most business value to the organization.

#### Sub practices

- Determine candidate process improvements.
- Prioritize the candidate process improvements.
- Identify and document the process improvements that will be implemented.
- Review and obtain agreement on the process improvements that will be implemented with relevant stakeholders.
- Revise the list of candidate and selected process improvements as necessary

### 4. Maintain Process Action Plans

This practice ensures that the process improvements that the organization selects are thoroughly planned so they can be implemented in a controlled manner to achieve the expected results.

#### Sub practices

- Identify actions to address the identified process improvements.
- Assign responsibility and authority to implement the actions.
- Review and obtain agreement on the process action plans with relevant stakeholders.
- Place the process action plans under version control.
- Revise the process action plans as necessary

### 5. Implement Process Action Plans

This practice ensures that the process improvements selected and defined by the organization are implemented and coordinated according to the plans and that relevant stakeholders are appropriately aware of and involved in the implementation activities.

#### Sub practices

- Review the process action plans with the individuals and workgroups responsible for implementing the process action plans and obtain their agreement.
- Negotiate and document commitments among the process action teams and other relevant stakeholders.



- Obtain the information and resources required to perform the work associated with implementing the process action plans.
- Implement the process improvements according to the process action plans.
- Conduct regular reviews of the progress of the process actions with relevant stakeholders.
- Evaluate the results of the implemented process improvements.
- Identify significant deviations from the process action plans and other issues related to the implementation and results of the process improvements, and perform appropriate corrective actions.
- Measure and analyze the process improvement work activities and results.
- Inform relevant stakeholders of the plans, status, activities, and results related to the implementation of the process action plans.

### 6. Maintain Descriptions of Environmental standard processes

This practice makes available a set of organization environmental standard processes to guide the establishment and implementation of appropriately consistent defined processes across the organization.

#### Sub practices

- Identify the process-related standards, requirements, organizational policies, and goals for the organization.
- Specify the life cycle models for the organization's environmental standard processes.
- Identify the constituent standard process elements that make up the environmental standard processes.
- Specify the critical properties of each standard process element
- Specify the relationships among process elements of each standard process and the relationship to related environmental standard processes.
- Verify the descriptions of the organization's environmental standard processes against the applicable standards, requirements, organizational policies, and goals.
- Conduct work product inspections of the descriptions of the organization's environmental standard processes.
- Place the descriptions of the organization's environmental standard processes under configuration management.
- Revise the descriptions of the organization's environmental standard processes as necessary.

### 7. Maintain Definitions of Organizational Measures

This practice ensures that measures are available to understand the performance and other characteristics of the organization's environmental processes and plan and measure improvements.

#### Sub practices

- Identify and prioritize the organization's measurement information needs and goals.
- Identify the organization's environmental standard measures associated with the organization's environmental standard processes
- Identify additional measures needed to characterize the organization's environmental standard processes and process assets.
- Define and document the base measures and derived measures to address the measurement information needs and goals.
- Define and document how the measures will be obtained, collected, and stored. 6. Define and document how the measures will be analyzed, reported, and used.
- Conduct work product inspections of the measurement specifications
- Review the measurement specifications with relevant stakeholders, and obtain their agreement
- Place the measurement specifications under configuration management.
- Revise the measurement specifications as necessary.

### 8. Maintain Tailoring Guidelines

This practice ensures that the tailored defined processes are appropriately consistent across the organization and also fit the specific needs of the work to be performed.

#### Sub practices

- Define and document the guidelines, criteria, and procedures for tailoring the organization's environmental standard processes.
- Define and document the standards for documenting the defined processes.
- Define and document the procedures for submitting and obtaining approval of waivers from the requirements of the organization's environmental standard processes and tailoring guidelines and criteria.
- Conduct work product inspections of the organization's tailoring guidelines, criteria, and procedures.
- Place the organization's tailoring guidelines, criteria, and procedures under configuration management.

- Revise the organization's tailoring guidelines, criteria, and procedures as necessary.

### 9. Maintain Process Repositories

This practice ensures that the organization's environmental process assets and other useful information are stored and made available to support the planning, management, and performance of the organization's work efforts.

#### Sub practices

- Determine the organization's needs for storing and retrieving process assets and process-related information.
- Design the organization's repositories for storing and retrieving process assets and process-related information, including the repository structure, support environment, and procedures.
- Construct or acquire and deploy the organization's repositories for storing and retrieving process assets and process related information, including the repository structure, support environment, and procedures.
- Conduct work product inspections of the design and established organization's process repositories.
- Plan the environmental repositories under configuration management.

### 10. Deploy Process Assets

This practice ensures that the deployment of process assets and asset changes into the organization is performed, managed, and coordinated so that they are deployed appropriately; in an orderly manner and that they achieve the expected results.

#### Sub practices

- Determine which process assets and process asset changes are appropriate for each area of the organization and the timeframe for deploying them.
- Plan the deployment of each process asset and process asset change.
- Review the plans for the deployments with relevant stakeholders, and obtain their agreement.
- Arrange for the associated support needed to successfully transition the organizational process assets, associated methods and tools, and changes to them.
- Deploy the organizational process assets and associated methods and tools according to the deployment plans.
- Provide guidance and consultation on the use of the deployed organizational process assets.
- Evaluate the results of each deployment.

- Identify significant deviations from the deployment plans and other issues related to the implementation and results of the deployments.
- Identify and perform appropriate corrective actions to address identified significant deviations from the deployment plans and other issues.

### 11. Collect Process Assets

This practice ensures that the best of the organization's process artifacts are captured and readily available to current and future work units and workgroups to support their environmental earning and improvement.

#### Sub practices

- Establish and maintain the criteria and procedures for obtaining, storing, and retrieving process assets and process-related information.
- Obtain candidate process assets and process-related information from the units in the organization.
- Evaluate and select the process assets and process-related information that will be incorporated into the organizational repositories.
- Enter, update, and replace, as appropriate, the selected process assets and process-related information in the repositories for easy reference and retrieval.
- Maintain the process assets and process-related information under version control.
- Periodically review the process assets and process-related information entered into the repositories to ensure the completeness, integrity, accuracy, currency, and usefulness of the items.
- Revise the process assets and process-related information as necessary, including adding or deleting assets

### 12. Analyze Process information

This practice maintains an understanding of the use and value of the organization's process assets so that this information can be used to support organizational process improvement.

#### Sub practices

- Obtain feedback on the use of the organization's environmental standard processes and related process assets from relevant stakeholders.
- Collect and analyze the organizational measures.

- Conduct periodic reviews of the effectiveness and suitability of the organization's environmental standard processes and related process assets relative to the organization's business needs and goals.
- Conduct periodic reviews of the effectiveness, suitability, and usability of the organization's environmental standard processes and related process assets relative to the needs and goals of those who tailor and implement the tailored processes.
- Determine the extent of conformance with the requirements of the organization's environmental standard processes and the tailoring guidelines and criteria.
- Evaluate the processes, methods, and tools in limited use in the organization for use in other areas of the organization and coordinate the migration to these new areas.
- Define and document improvement recommendations for problem areas and improvement opportunities in the organization's environmental standard processes and related process assets.
- Handle improvement proposals for the organization's environmental standard processes and related process assets.
- Derive and make available lessons learned from defining, piloting, implementing, and deploying the organization's environmental standard processes and related process assets.

### 13. Provide Information on Environmental Process Management

This practice ensures that the people in the organization have an appropriate understanding of the organization's process management activities and process artifacts to help them in developing, preparing, deploying, operating, supporting, and improving the organization's environmental products and services.

#### Sub practices

- Maintain records of the organization's process management activities and process assets.
- Provide feedback to the people in the organization on the status and results of the process management activities.

## 6.2 Environmental Competency Development

### Purpose

Environmental Competency Development develops the competencies within the organization's workforce that are needed to perform the organization's work using the organization's environmental standard processes.

### Goals

#### 1. Specific Goals

- **Goal 1: Environmental Competency Development Is Planned.** The development of the workforce competencies needed to perform the organization's environmental standard processes and support the organization's strategic goals is planned.
- **Goal 2: Workforce Competencies Are Developed.** Individuals develop the knowledge, skills, and process abilities needed to perform their roles in the organization's environmental standard processes.

#### 2. Institutional Goals

- **Goal 1: Practices Are Institutionalized.** The practices for Environment Competency development are established.

### Practice to Goal Relationship table

Goal	Practice
Specific Goal 1	Specific Practice 1,2,3,4
Specific Goal 2	Specific Practice 5,6,7,8,9,10,11
Institutional Goal 1	Institutional Practice 1,2,3,4,5

### Practices

- **Specific Practice**

- 1. Maintain Descriptions of Workforce Competencies**

This practice ensures that there is an understanding of the clusters of knowledge, skills, and process abilities that are needed for performing the organization's environmental standard processes and supporting the organization's strategic goals.

**Sub practices.**

- Analyze the organization's environmental strategies, critical business activities, and the organization's environmental standard processes to identify the needed workforce competencies
- Analyze changes in the environmental organization's products, services, processes, or technology, as needed, to determine when the workforce competencies need to be updated.
- Document the descriptions of the graduated knowledge, skills, and process abilities underlying each of the workforce competencies required to perform the organization's environmental standard processes.
- Review descriptions of the workforce competencies with subject matter experts in each workforce competency and other relevant stakeholders
- Place the descriptions of the workforce competencies under version control.
- Provide the descriptions of the workforce competencies to relevant stakeholders.
- Revise the descriptions of the workforce competencies as needed.

- 2. Identify Competency Development Opportunities**

This practice ensures that the organization identifies graduated development activities that support growth through increasing levels of capability in the organizations environmental workforce competencies, and that the availability of these activities is communicated to the managers and staff.

**Sub practices**

- Identify and document a set of graduated learning activities that develop the knowledge, skills, and process abilities appropriate to the various levels of capability in each workforce competency
- Identify and document the delivery vehicles and delivery timeframes for each of the competency development activities

- Identify and document the relationships among the competency development activities and delivery vehicles for each workforce competency
- Review the descriptions of the competency development activities with subject matter experts and other relevant stakeholders and obtain their agreement.
- Place the descriptions of the competency development activities for each workforce competency under version control.
- Provide the descriptions of the competency development activities for each workforce competency to relevant stakeholders.
- Revise the descriptions of the competency development activities for each workforce competency as needed

### 3. Determine environmental Competency Development Needs

This practice ensures that the magnitude of the organization's environmental competency development needs is understood, and the identification of these needs can be used as a basis for planning the organization's competency development activities.

#### Sub practices

- Evaluate the current capability of the individuals performing the organization's standard environmental processes against the competency description for their area of responsibility.
- Identify the overall staff capabilities that are needed in each of the workforce competencies to perform the organization's environmental standard processes.
- Identify the new component skills or areas of competence that will be need to be developed to support the organization's business strategies
- Determine the rate at which capability must be developed in each of the affected workforce competencies to support the organization's business strategies.
- Determine the portion of capability development in each workforce competency that will be pursued through competency development activities.
- Document the capability requirements in each affected workforce competency to be addressed through the organization's competency development activities.

### 4. Maintain Competency Development Plans

This practice ensures that the competency development activities required to support the competency development needs of the organization are planned in order that the required capabilities are available when needed.



### Sub practices

- Assign responsibility and authority for coordinating, managing, and implementing each of the competency development activities.
- Identify the participants who will participate in each of the competency development activities.
- Identify the specific schedule for each of the competency development activities.
- Identify the resources needed to perform each of the competency development activities.
- Resolve conflicts among the schedule for the competency development activities and the estimated and available resources.
- Document the organization's competency development plan.
- Place the organization's competency development under version control.
- Review the organization's competency development plan with relevant stakeholders, and obtain their agreement.
- Revise the organization's competency development plan as needed

### 5. Maintain Competency Development Materials

This practice ensures that the materials used in the organization's competency development activities satisfy their learning and development goals.

### Sub practices

- Document the description of each competency development activity.
- Determine whether to develop the competency development materials internally or acquire them externally.
- Develop or obtain the competency development materials.
- Review and approve the competency development materials.
- Pilot the competency development materials and take corrective actions as appropriate for portions of the materials that do not serve their intended learning goals.
- Place the competency development materials under version control.
- Provide the descriptions of the competency development activities to relevant stakeholders.
- Make the competency development materials for available to those who need them.
- Revise the competency development materials as needed.

### 6. Perform environmental Competency Development Activities

This practice ensures that the organization's managers and staff are provided with the opportunities to acquire the knowledge, skills, and process abilities that are identified as needed to perform the organization's environmental standard processes and support the organization's strategic goals.

#### Sub practices

- Schedule the competency development activities.
- Arrange for the facilities and resources needed to perform each of the competency development activities.
- Identify the people who will participate in each of the competency development activities.
- Confirm with each person that they will participate in their planned competency development activities.
- Confirm that each of the participants in a competency development activity has the prerequisite skills and knowledge to participate in the activity.
- Conduct each of the competency development activities.
- Provide appropriate coordination, mentoring, and assistance to the participants of the competency development activities to maximize their learning experiences.
- Determine whether each participant has achieved the learning necessary to receive credit for participating in the competency development activity.
- Track the delivery of the competency development activities against the plans.

### 7. Participate in environmental Competency Development

This practice ensures that the organization's managers and staff acquire the knowledge, skills, and process abilities needed to increase their capability for performing their roles in the organization's environmental standard processes.

#### Sub practices

- Identify which competency development activities each individual in an affected workforce competency should participate in based on their level of capability in their competency.
- Schedule competency development activities for each of the individuals in an affected workforce competency to provide timely improvement in their capability for performing their role in the organization's environmental standard processes.
- Motivate and assist units in arranging their business activities so that affected individuals are able to participate in their planned competency development activities.

- Provide appropriate encouragement and incentives for individuals so that they actively participate in the competency development activities.
- Record the participation and completion information for each individual who participates in the competency development activities

### 8. Monitor Competency Development Activities

This practice ensures that the managers responsible for the organization's environmental competency development plans and activities understand whether problems exist relative to satisfying the plans, and whether any corrective actions are needed.

#### Sub practices

- Review, on a regular basis, the actual status, performance, and results against the competency development plans.
- Collect and analyze measures of the actual status, performance, and results of the competency development activities
- Identify significant issues in plans that are not being satisfied or that are at risk of not being satisfied.

### 9. Measure Competency Development Effectiveness

This practice ensures that those responsible for managing the organization's environmental competency development activities understand whether any problems exist relative to the effectiveness of these activities and whether any corrective actions are needed.

#### Sub practices

- Obtain evaluations of the competency development activities from the participants, their managers or team leaders, and the staff conducting the skills development activities.
- Obtain data on the effectiveness of participants in retaining their learning and translating it into work performance.
- Establish quantitative evaluations and other feedback mechanisms on the effectiveness of the various competency development activities
- Collect analyze measures of the effectiveness of the competency development activities
- Review the evaluations and measures to determine how well the needs of the participants and their managers were met.

- Analyze measures of the effectiveness of the competency development activities to determine their impact on increasing the capability of individuals to perform their work and on improving the organization's business performance.
- Identify significant deficiencies in the effectiveness of the competency development activities.
- Periodically report on the effectiveness of the organization's competency development activities to relevant stakeholders

### 10. Correct Competency Development Problems

This practice ensures that significant problems in the organization's environmental competency development plans and activities are addressed.

#### Sub practices

- Analyze identified significant deviations from the organization's competency development plans to determine the causes and corrective actions to be performed
- Analyze identified significant deficiencies in the effectiveness of the organization's competency development activities to determine the causes and corrective actions to be performed.
- Review the planned corrective actions for the identified competency development problems with relevant stakeholders, and obtain their agreement.
- Perform the agreed-to corrective actions and track to closure.
- Evaluate the effects of the corrective actions and make adjustments as needed

### 11. Maintain Competency Development Records

This practice ensures that records are available that accurately describe the capabilities of individuals for consideration in work assignments or as input to other workforce practices such as promotions or adjustments to compensation.

#### Sub practices

- Establish appropriate levels of security are provided to protect the confidentiality of competency development records.
- Maintain records of all individuals who successfully complete each competency development activity as well as participants who are not successful.
- Maintain records of all staff that have been waived from specific competency development activities.

- Maintain records for each individual of the competency development activities they have completed or have been waived through.
- Make the competency development records for each individual available to the managers who are responsible for their development and assignments.
- Use the competency development records for each individual as input to workforce practices for which they provide relevant input or evidence.

## 6.3 Environmental Resource Management

### Purpose

Environmental Resource Management plans and manages the acquisition, allocation, and reassignment of people and other resources needed to develop, prepare, deploy, operate, and support the organization's environmental products and services.

### Goals

#### 1. Specific Goals

- **Goal 1: Environmental Resources Are Aligned With the Portfolio.** The organization's available resources are aligned with the resources needed for the organization's environmental product and service portfolio.
- **Goal 2: Resources Are Balanced With Capacity Plans.** The resources provided for the environmental product and service offerings are sustained and balanced with the capacity plans of the offerings.

#### 2. Institutional Goals

- **Goal 1: Practices Are Institutionalized.** The practices for Environment resource management are established.

### Practice to Goal Relationship table

Goal	Practice
Specific Goal 1	Specific Practice 1,2,3,4
Specific Goal 2	Specific Practice 5,6,7,8,9,10,11
Institutional Goal 1	Institutional Practice 1,2,3,4,5

### Practices

- **Specific Practice**

- 1. Maintain Portfolio Description**

This practice ensures that there is a clear understanding of the organization's portfolio of environmental product and service offerings so that the organization's managers can determine the work that needs to be performed and the capacity needed.

#### **Sub practices**

- Organize the information about the organization's current environmental product and service offerings and planned changes so that all the environmental product and service work can be determined.
- Determine and document the characteristics and features of each offering that affect the resources necessary for performing the product and service work
- Document the description of the portfolio.
- Place the description of the portfolio under version control.
- Make the description of the portfolio available to relevant stakeholders.
- Monitor the changes that are made to the organization's portfolio to determine if changes to the portfolio description are needed
- Revise the description of the portfolio as needed.

- 2. Maintain Budgets for environmental Resources**

This practice ensures that the organization establishes the financial constraints as a basis to balance the portfolio of environmental products and services with the resources that can be applied to perform the environmental product and service work.

#### **Sub practices**

- Review the existing budgets and actual expenditures for the environmental product and service offerings to aid in establishing the budget to cover the organization's portfolio of products and services.
- Establish budgets for each of the organizational resources needed to support the organization's product and services portfolio.
- Allocate and document the budgets for the different environmental product and service offerings, types of resources, and units responsible for the environmental product and service work.

- Allocate and document the budgets for the different organizational shared resources, types of resources, and units responsible for the shared resources.
- Place the budgets for organizational resources under version control.
- Periodically review the organization's portfolio of products and services and relevant business and organizational conditions to determine if adjustments need to be made to any of the budgets.
- Revise the organizational resources budgets and allocations as needed

### 3. Maintain Estimates of Resources

This practice ensures that the organization has an accurate estimate of the total resources of each type required to support all the environmental product and service offerings in its portfolio.

#### Sub practices

- Identify the categories of resources that need to be estimated.
- Obtain and analyze available historical data and other inputs that are needed to derive estimates of the resources.
- Derive and document estimates of the overall effort and specific skills required to support each of the environmental product and service offerings in the organization's portfolio
- Derive and document estimates of the non-people resources required to support each of the environmental product and service offerings in the organization's portfolio
- Resolve overlaps and opportunities to share organizational resources across the environmental product and service offerings in the portfolio.
- Aggregate the estimates, by resource type, for the environmental product and service offerings into an overall organizational estimate for the entire portfolio.
- Revise the estimates of the organizational resources that are needed to support the environmental product and service portfolio as needed.

### 4. Resolve Imbalance between Portfolio and Resources

This practice ensures that the organization can effectively support the portfolio of environmental product and service offerings.

#### Sub practices

- Identify the categories of resources that need to be budgeted.
- Obtain estimates of the resources needed for each offering.



- Compare the total resources required to support the environmental product and service portfolio to the relevant budgets to identify imbalances.
- Make appropriate adjustments to balance the quantity of each resource with the products and services in the portfolio
- Periodically monitored trends and projections of the actual consumption of each resource are to identify imbalances between the resource capacity and the products and services in the portfolio.
- Identify and perform appropriate corrective actions to avoid or minimize imbalances between the environmental product and service portfolio and the resources required to support them.

### 5. Maintain Organizational Resource Plans

This practice ensures, within the constraints of budget and other planning parameters, that plans exist to provide sufficient organizational resources when needed to support the products and services portfolio.

#### Sub practices

- Establish and maintained the plans for monitoring the resource utilization and projections for the environmental product and service work and reporting the information to executive and middle management.
- Establish and maintained the plans for the addition, reassignment, or reduction of people for performing the environmental product and service work.
- Establish and maintained the plans for acquiring, deploying, maintaining, and retiring the resources needed to support the product and services portfolio
- Review the plan and commitment changes with relevant stakeholders, and obtain their agreement.
- Place the organizational resource plans under version control.
- Revise the organizational resource plans as needed

### 6. Integrate Resource Management into Environmental standard processes

This practice ensures that the organization exploits the benefits of its environmental standard processes for effectively managing the organization's resources so that the environmental product and service work is performed effectively and efficiently

### Sub practices

- Define needed changes to the organization's environmental standard processes and other organizational process assets that are needed to incorporate the resource management activities into the environmental product and service work.
- Document the needed changes to the organization's environmental standard processes and other organizational process assets.
- Negotiate the needed changes with those responsible for the organization's process assets.
- Document the agreed-to changes to the organization's environmental standard processes and other organizational process assets.
- Revise the descriptions of needed changes to the organization's environmental standard processes and other organizational process assets as needed

### 7. Allocate Organization's Resources to Units

This practice ensures that the organizational resources are equitably allocated to the units based on the work they have to do.

### 8. Integrate Suppliers of Resources

This practice ensures that suppliers are effectively integrated into the organizations defined processes for performing product and services work in order to improve the efficiency with which organizational resources are deployed for use.

### Sub practices

- Select suppliers and sources of resources.
- Establish sourcing agreements and supplier management practices to appropriately integrate their resource supply activities with organizational resource management activities and the environmental product and service work processes.
- Track the performance of suppliers and identify problems and issues.
- Take corrective action when problems and issues are identified in the performance of the suppliers of resources

### 9. Monitor Use of Organization's Resources

This practice ensures that the organization has accurate data from which to more accurately estimate, plan, and manage the quantity of each organizational resource required to support the product and services portfolio.

### Sub practices

- The utilization of each type of organizational resource is tracked at appropriate points in the defined processes for each environmental product and service offering.
- The quantity consumed of each type of resource is aggregated across all offerings in the product and services portfolio to characterize trends in the use of organizational resources.
- Actual utilization for each type of resource is compared to capacity plans at both the organizational and offering levels to monitor status, identify trends, and detect significant deviations from plan.
- Reports concerning the utilization of each type of organizational resource are provided to relevant stakeholders.
- Trends in the utilization of organizational resources are compared to budgets for the resources and reports on trends are made available to relevant stakeholders.

### 10. Model Consumption of Organization's environmental Resources

This practice ensures that the organization learns from monitoring the resource acquisition, allocation, and utilization activities and results, and makes appropriate adjustments.

### Sub practices

- Develop models of trends in resource acquisition, allocation, and utilization observed in the data gathered in monitoring the consumption of organizational resources.
- Integrate models of trends in resource acquisition, allocation, and utilization into the procedures used in estimating and planning the organizational resource requirements for each environmental product and service offering.
- Use models of trends in resource acquisition, allocation, and utilization in monitoring the consumption of organizational resources by each product and service offering to aid in determining the need for corrective action.
- Evaluate and adjust models of trends in resource acquisition, allocation, and utilization as changes occur in the technology, standard or defined processes, or content of the product and services portfolio that affect the resource requirements for supporting product and service offerings.
- Maintain models of trends in resource acquisition, allocation, and utilization under appropriate levels of configuration control.

### 11. Correct Organizational Resource Imbalances

This practice ensures that adjustments are made as needed to best balance the availability and consumption of organizational environmental resources.

#### Sub practices

- Take corrective actions as needed to mitigate significant deviations between actual and planned utilization of specific organizational resources within a product and service offering.
- Reallocate the organization's resource across work units or product and service offerings to mitigate imbalances in allocation or utilization.
- Reallocate organizational resources in response to changes in the organization's product and services portfolio.
- Involve sources, suppliers, and other relevant stakeholders in corrective actions or reallocations that affect their business processes or agreements.
- Identify and eliminate, to the extent possible, causes of significant imbalances in organizational resources.

## 6.4 Environmental Configuration Management

### Purpose

Environmental Configuration Management identifies, manages, and controls the content and changes to the organization's configuration management (CM) product baselines that compose and support the organization's environmental service offerings

### Goals

#### 1. Specific Goals

- **Goal 1: Configurations Are Identified.** The organization's CM environmental baselines and their configuration items that will be controlled are identified.
- **Goal 2: Contents of Configurations Are Controlled.** The content of the organization's CM environmental baselines and their configuration items are managed and controlled
- **Goal 3. Configuration Management Information Is Reported** Information that describes the content and status of the organization's CM environmental baselines and their configuration items is maintained and reported to relevant stakeholders.

#### 2. Institutional Goals

- **Goal 1: Practices Are Institutionalized.** The practices for Environment Configuration management are established.

### Practice to Goal Relationship table

Goal	Practice
Specific Goal 1	Specific Practice 1,2,3,4,5
Specific Goal 2	Specific Practice 6,7,8
Specific Goal 3	Specific Practice 9,10,11,12
Institutional Goal 1	Institutional Practice 1,2,3,4,5

## Practices

- **Specific Practice.**

- 1. Maintain environmental Configuration Management Strategy**

This practice ensures that the people involved in developing, maintaining, controlling, and using the organization's environmental configuration items and CM product baselines understand how configuration management will be performed.

### Sub practices

- Determine the overall scope of environmental configuration management for the organization.
- Determine how the overall scope of configuration management will be divided into areas of responsibility.
- Define the organizational structure of work units, workgroups, and individual roles that will be responsible for configuration management.
- Define how the organization's environmental configuration management efforts and systems will be integrated and coordinated.
- Define how the configuration management activities and repositories of suppliers and customers will be integrated with those of the organization.
- Define how the relevant stakeholders will be represented in the organization's configuration management decisions.
- Document the organization's configuration management strategy.
- Review the organization's configuration management strategy with relevant stakeholders, and obtain their agreement.
- Place the organization's configuration management strategy under version control

- 2. Maintain Configuration Management Repositories**

This practice ensures that the repositories needed to store and manage the work unit's configuration items, CM product baselines, and associated data and records are adequate and appropriate.

### Sub practices

- Select and install configuration management repositories for storing the organization's configuration items, CM product baselines, and associated records.

- Select and install configuration management repositories for documenting, storing, and tracking problem reports and change requests against the organization's configuration items and CM product baselines.
- Establish the mechanisms and procedures to store, retrieve, and update the contents of the organization's configuration management repositories.
- Establish the mechanisms and procedures to appropriately control access to the contents of the organization's configuration management repositories.
- Establish the mechanisms and procedures to appropriately move the organization's configuration items and CM product baselines between configuration management control levels.
- Revise the organization's configuration management repositories as necessary.

### 3. Identify environmental Configuration Items

This practice ensures there is a shared understanding among relevant stakeholders as to which of the organization's environmental work products are maintained under configuration management, specific characteristics of these work products, and when each of these work products will be placed under configuration management.

#### Sub practices

- Identify the configuration items for the organization that will be controlled based on documented criteria.
- Assign unique identifiers to each environmental configuration items.
- Describe the important characteristics of each environmental configuration items
- Define when each configuration items will be placed under configuration management.
- Review the list of configuration items with relevant stakeholders, and obtain their agreement.
- Place the list of configuration items under configuration management.
- Revise the list of configuration items as necessary

### 4. Specify CM Product Baselines

This practice ensure that there is a shared understanding among relevant stakeholders as to when the organization's CM product baselines will be created, the configuration items that compose each CM product baseline, and how the CM product baselines will be used.

#### Sub practices

- Identify the organization's CM product baselines that compose and support the organization's product and service offerings.

- Assign unique identifiers to each CM product baseline.
- Specify the build and release procedures for each CM product baseline.
- Specify the intended users and uses of each CM product baseline.
- Describe the important characteristics of each CM product baseline and each configuration item.
- Review the specifications of the CM product baselines with relevant stakeholders, and obtain their agreement.
- Place the specifications of the CM product baselines under configuration management.
- Revise the specifications of the CM product baselines as necessary

### 5. Maintain Description of Configuration Architecture

This practice ensures that the interdependencies and relationships of the organization's configuration items and CM product baselines are understood and this knowledge is used to manage the organization's configurations.

#### Sub practices

- Obtain and analyze the available information on the organization's configuration items and CM product baselines and their uses.
- Determine the types of relationships that need to be covered in the description of the organizational configuration architecture.
- Define and document the organizational configuration architecture.
- Conduct work product inspections of the description of the organizational configuration architecture.
- Review the description of the organizational configuration architecture with relevant stakeholders, and obtain their agreement.
- Place the description of the environmental configuration architecture under configuration management.
- Revise the description of the environmental configuration architecture as necessary.

### 6. Manage Changes to Configurations

This practice ensures that the configuration items and the descriptions of the CM product baselines are updated in a controlled manner so that their contents remain in a known authorized state



### Sub practices

- Store the configuration items and the associated records in the configuration management repositories.
- Record the problem reports and change requests.
- Identify changes to be made to the configuration items.
- Obtain appropriate authorization for each revision to configuration items before the changes are made
- Control the check in and check out of configuration items in a manner that maintains the correctness and integrity of the configuration management repositories and its contents.
- Track the status of problem reports and change requests to closure.
- Review and approve the changes made to configuration items prior to incorporating the configuration items in the configuration management repositories.

### 7. Build CM Product Baselines

This practice ensures that the organization's CM product baselines or controlled service packs, as appropriate, contain the correct versions of the correct configuration items and that they are constructed as required.

### Sub practices

- Obtained appropriate authorization before building a CM product baseline or service pack for the organization.
- Obtain and verify the inputs needed to create each CM product baseline.
- Build each CM product baseline or service pack from the designated configuration items according to documented and approved build procedures. 4. Verify each CM product baseline or service pack build.
- Document each build of a CM product baseline or service pack.
- Place the documentation of each CM product baseline and service pack under version control.
- Store each build of a CM product baseline or service pack in a controlled product release repository.
- Report the results of each CM product baseline or service pack build to relevant stakeholders.

### 8. Deliver CM Product Baselines

This practice ensures that customers and internal users of the CM product baselines that compose or support the organization's product and service offerings receive the appropriate baselines and updates to them.

#### Sub practices

- Identify and document the organization's CM product baselines and service packs that will be delivered.
- Identify and document the recipients and methods and channels for delivery of the CM product baselines and service packs.
- Review the list of CM product baselines and service packs what will be delivered, the recipients, and the methods and channels for delivery with relevant stakeholders, and obtain their agreement.
- Deliver the CM product baselines and service packs.
- Report the results of the CM product baseline and service pack activities to relevant stakeholders.

### 9. Maintain Configuration Management Records

This practice ensures that records are maintained and available that accurately describe the organization's configuration management activities and the version and content of the organization's configuration items and CM product baselines

#### Sub practices

- Record the configuration management actions so that the content, status, and revision of each of the organization's configuration items and CM product baselines are known and previous versions can be recovered.
- Document the differences between successive versions of each configuration items and successive versions of each CM product baselines.
- Revise the organization's configuration management records as needed.

### 10. Audit Configuration Management Operations

This practice ensures that the organization's configuration management efforts are under control and can effectively manage the organization's configuration items and CM product baselines.

#### Sub practices

- Review the structure and facilities of the organization's configuration management repositories to determine if they are appropriate for the configuration management needs.

- Review the organization's configuration management activities and record for conformance with applicable configuration management standards and procedures.
- Review the contents of the configuration management repositories for completeness and correctness.
- Review the organization's configuration management records for completeness and correctness.
- Identify deficiencies in the organization's configuration management activities, configuration management repositories, and associated records.
- Define corrective actions for the identified deficiencies, review them with relevant stakeholders, and obtain their agreement.
- Perform corrective actions and track to closure.
- Document and archive the results and other relevant records of the audits.
- Report the results of the audits to relevant stakeholders.

### 11. Audit CM Product Baselines

This practice ensures that the organization's CM product baselines and service packs that are created and delivered are complete, correct, and usable for their purposes.

#### Sub practices

- Define and document the purpose of the audit and the plan the audit.
- Review the development records and the organization's configuration management records associated with the organization's CM product baselines, service packs, and their component configuration items to ensure that the development and changes are correct and were appropriately made
- Review the CM product baselines and service packs that make up a release to ensure that all intended configuration items are included in the CM product baselines and are of the correct versions, as specified in the build authorization.
- Identify problems in the CM product baselines, service packs, their component configuration items, and associated records.
- Define corrective actions for the identified problems, review them with relevant stakeholders, and obtain their agreement. 6. Perform corrective actions and track to closure.
- Document and archive the results and other relevant records of the CM product baseline audits.
- Report the results of the CM baseline audits to relevant stakeholders.

### 12. Provide Configuration Management Reports

This practice ensures that relevant stakeholders for the organization's configuration management activities are kept informed of the relevant configuration management information so they can fulfill the configuration management roles and responsibilities or appropriately use the CM product baselines.

## 6.5 Environmental Product and Service Business Management

### Purpose

This process manages the business and financial aspects of the environmental product and service offering.

### Goals

#### 1. Specific Goals

- **Goal 1: Offering Features and Strategy Are Defined.** Capabilities and features of an environmental product and service offering are defined based on the needs of the customers and it's positioning in the market.
- **Goal 2: Offering Business Case Is Available.** The business case for including an environmental product and service offering in the organization's portfolio is available for making business and management decisions
- **Goal 3: Offering Business Aspects Are Managed.** The business and financial aspects of an environmental product and service offering are managed.

#### 2. Institutional Goals

- **Goal 1: Practices Are Institutionalized.** The practices for Environment product and service business management are established.

### Practice to Goal Relationship table

Goal	Practice
Specific Goal 1	Specific Practice 1,2,3,4,5,6
Specific Goal 2	Specific Practice 7,8,9,10,11,12
Specific Goal 3	Specific Practice 13,14,15,16,17,18
Institutional Goal 1	Institutional Practice 1,2,3,4,5

### Practices

- **Specific Practice.**

- 1. Evaluate the Market Situation and Trends**

This practice develops an understanding of the various factors, such as economic, political, technological, demographic, social, and cultural factors that impact the market situation for a product and service offering.

#### **Sub practices**

- Identify the factors that need to be evaluated with regard to their impact on the market situation for a new or existing product and service offering.
- Obtain forecasts that predict how the selected factors are anticipated to change in the future
- Evaluate the predicted changes for each factor, their likely effect on the product and service offering requirements and the likely changes or consequences.
- Document the evaluations and forecasts of the different factors.
- Review the evaluations and forecasts of the different factors with relevant stakeholders for accuracy and assess the impact of the likely changes.
- Place the evaluations and forecasts of the different factors under version control.
- Revise the evaluations and forecasts of the different factors as needed.

- 2. Evaluate the Competitive Situation**

This practice ensures that competitive information for an environmental product and service offering is formulated into intelligence that can be used for developing strategies for a product and service offering and for making related business decisions

#### **Sub practices**

- Identify information on the competitors' offerings that can be used in specifying and developing new or existing product and service offerings and the strategy and plans for the offerings
- Determine the best available and acceptable sources of information on the competitors' offerings.
- Obtain the information from the selected sources and compile or update the descriptions of the competitor product or service offerings.
- Review the information with relevant stakeholders for completeness, adequacy, and accuracy. 5. Analyze and assess the competitors' offerings.

- Compare and contrast the competitors' offerings to current and future planned offerings
- Place the descriptions and analysis of the competitors' offerings under version control.
- Revise the descriptions and analysis of the competitors' offerings as needed

### 3. Maintain Descriptions of Customer Environmental Needs

This practice ensures that the information on customer needs is available for the organization to use for making decisions about a product and service offering or changes to the environmental product and service offering requirements

#### Sub practices

- Establish profiles of the market segments (relevant characteristics of the customer set) to which the product or service offering is made available.
- Identify the information on customer demands, expectations, and constraints that is required in the definition of the new or existing product and service offering needs for each market segment
- Identify the best available and acceptable sources of the information for each market segment
- Establish mechanisms for accepting information on customer demands, expectations, and constraints from the selected sources.
- Elicit the information on customer demands, expectations, and constraints from the selected sources.
- Document the customer demands, expectations, and constraints for each market segment.
- Consolidate the customer demands, expectations, and constraints for the different market segment into a customer needs document for the offering.
- Review the customer needs document for the offering with relevant stakeholders for completeness and adequacy and obtain their agreement.
- Place the descriptions of the customer needs document for the offering under version control.
- Revise the descriptions of the customer needs document for the offering as needed.

### 4. Maintain Business Goals

This practice establishes the business goals as the basis for making business decisions and defining the business strategies and plans for an environmental product and service offering.

#### Sub practices

- Review the appropriate forecasts, analyses, strategies, plans, and estimates for the offering.
- Select the business goals and the associated target values necessary to meet those goals.

- Determine the supporting business requirements that need to be in place to meet the business goals.
- Review and agree the proposed business goals with relevant stakeholders both for feasibility and alignment and support of the organizational goals.
- Place the documented business goals under version control.
- Revise the documented business goals as require

### 5. Maintain Descriptions of Business Requirements

This practice determines the business requirements for an environmental product or service offering for current and future periods and determines additional capabilities and features for an environmental product and service offering that will be passed on for planning and development.

#### Sub practices

- Review the market and competitive situation, customer needs analyses, and business requirements identified and proposed to support the business goals or organization goals.
- Establish mechanisms for accepting proposed business requirements and requirements changes for the offering from the legitimate sources.
- Determine the desired changes to the business requirements of the offering for the current and future planning periods.
- Determine the business requirements of any new offering that needs to be developed within current and future planning periods.
- Document all the desired changes or new business requirements in the descriptions of the offering requirements, capabilities, and features.
- Review the desired changes or new business requirements with relevant stakeholders, and obtain their agreement on priority and importance.
- Place the updated or new business requirements for the product and service offerings under version control.
- Revise the business requirements for the product and service offerings as needed.

### 6. Identify Laws, Regulations, and Standards

Laws, regulations, and standards that are applicable to a product and service offering are identified. This practice ensures that the laws, regulations, and standards applicable to the product and service offering are understood so that they are adhered to.



### Sub practices

- Identify all legitimate sources of laws, regulations, and standards that apply to the work.
- Establish mechanisms for obtaining the applicable laws, regulations, and standards and revisions to them.
- Determine and document which clauses and provisions of the laws, regulations, and standards are applicable to the offering and how they apply.
- Review the applicable clauses and provisions of the laws, regulations, and standards with relevant stakeholders and obtain their agreement that they are the correct set applicable to the work.
- Provide the people responsible for planning and doing the work with the information about the applicable laws, regulations, organizational policies, and standards that they need to be able to adhere to them. 6. Place the documentation of the applicable clauses and provisions of the laws, regulations, and standards under version control
- Provide the people responsible for the work with the information about the applicable laws, regulations, organizational policies, and standards that they need to be able to adhere to them.
- Revise the documentation of the applicable clauses and provisions of the laws, regulations, and standards as necessary.

### 7. Maintain Estimates of Sales and Consumption

This practice obtains the quantitative revenue and volume data for an environmental product and service offering that can be used as a basis for defining business goals and strategies.

### Sub practices

- Identify or confirm the information types or needs that are required to be estimated in order to size the demand of the product and service offering.
- Determine or confirm the best available and acceptable sources of the information types or needs, where they exist.
- Assemble the information from the selected historical or other sources and determine or update the estimates of the sales and consumption.
- Review the estimates with relevant stakeholders for confidence and accuracy.
- Revise the estimates of the potential sales or consumption as required

### 8. Maintain Estimates of Costs

This practice ensures that the organization's costs associated with a product and service offering data are available to assess the business case for the offering, including the costs for development, manufacturing, sourcing, production, marketing, sales, distribution, deployment, operations, support, maintenance, and disposal of the offering.

#### Sub practices

- Review the component parts of the complete product and service offering, and the costs associated with each part.
- Construct a cost model in which all known costs can be recorded and allocated by activity or other category.
- Assemble and apportion the cost data for the component parts into the cost model for the current and future projected consumption or demand.
- Review the planned changes to any of the component parts and the additional or changed costs for those parts of the product and service offering.
- Review the cost breakdowns and projections with relevant stakeholders for completeness and accuracy.
- Place the cost breakdown and projections of the product and service offering under version control.
- Revise the cost breakdown and projections of the product and service offering as needed.

### 9. Maintain Offering Pricing Structure

This practice ensures that an environmental product and service offering and the selectable capability and feature options are priced to achieve the business goals

#### Sub practices

- Determine the pricing goals and strategies for the product and service offering.
- Develop a pricing model for the offering.
- Review the pricing model outputs with relevant stakeholders for completeness and adequacy.
- Place the pricing model and its outputs under configuration management
- Revise the pricing model and its outputs as needed.

### 10. Maintain Estimates of Financial Return

This practice ensures that management understands the financial business case for an environmental product and service offering

### Sub practices

- Consolidate the appropriate estimates of the sales and consumption, costs, and pricing of the product and service offering.
- Calculate the estimated total and cumulative financial return over the current and future planning periods, including the revenue and profit streams.
- Ascertain any other associated impacts or benefits made apparent as a result of the financial analysis.
- Review the financial analysis with relevant stakeholders for completeness and accuracy and obtain their agreement.
- Revise the financial analysis as needed.

### 11. Evaluate the Ability of the Organization

This practice determines the information about the organization that is needed to decide whether the organization should include an environmental product and service offering in its portfolio and to plan the work.

### Sub practices

- Identify what information on capacity and capability in the organization (for the component parts of the complete product or service offering) is needed to evaluate the ability of the organization to provide the product and service offering
- Determine the best available and acceptable sources of the information.
- Obtain the information from the selected sources and compile or update an analysis of the organizational ability.
- Review the analysis with relevant stakeholders for completeness and adequacy.
- Review the analysis for alignment to the organizational strategy and plans.
- Revise the analysis and reviews as needed.

### 12. Maintain Justification for Offering

This practice ensures that the business case for a product and service offering is readily available so that accurate and timely business and management decisions can be made.

### Sub practices

- Consolidate the analysis of capacity and capability, the cost breakdown, the estimates of financial return, and the business goals and strategy.

- Develop the product and service offering business case, detailing long and short term business and other benefits, reflected against current and future financial projections, and the current and future organization goals and requirements.
- Develop estimates for outsourcing all or some of the offering components, particularly those representing the largest gaps in organizational ability.
- Develop an appended risk analysis detailing the risks of providing the complete offering, the risks of not providing the offering, and the risks of outsourcing components of the offering.
- Review the offering business case with relevant stakeholders for completeness and adequacy and obtain their agreement.
- Place the offering business case under version control.
- Revise the offering business case as needed.

### 13. Maintain Offering Business Plans

This practice ensures that all aspects of the environmental product and service work for an offering are planned, including plans for development, manufacturing, sourcing, production, marketing, sales, distribution, deployment, operations, support, maintenance, and disposal

#### Sub practice

- Obtain and verify the inputs and the component plans needed to establish the business plan
- Define and document the product and service offering business strategy.
- Identify and document the constraints, assumptions, and other factors that affect the business plan (to support the strategy).
- Define and document the plan of activities and milestones to support accuracy in progress measurement and the meeting of business targets and commitments.
- Review the existing component plans to identify areas that are in conflict or disagreement.
- Identify and document significant conflicts, inefficiencies, unresolved dependencies, or missing responsibilities in the component plans.
- Identify changes to the component plans and resolve any significant issues.
- Review the strategy, business plan, and associated constraints, assumptions, and other factors with relevant stakeholders and obtain their agreement.
- Place the strategy, business plan, descriptions of the associated constraints, assumptions and other factors, and the component plans under version control.
- Revise the strategy and business plan as needed.

### 14. Maintain Business Risk Management Plans

This practice ensures that there is an awareness of the business risks that could jeopardize the environmental product and service offering or the organization so that these risks are appropriately considered in the planning and management of the business activities.

#### Sub practices

- Identify the business risks for the offering along with associated contextual information.
- Analyze the business risks for the offering to determine potential impact, likelihood of occurrence, circumstances that are likely to manifest the occurrence.
- Document the business risks for the offering and the associated analysis, priorities, and contextual information.
- Prioritize the business risks for the offering.
- Identify the business risks that will be addressed in the design, construction, and documentation of the offering, and coordinate to ensure they are addressed.
- Review the documented business risks with relevant stakeholders and obtain their agreement.
- Place the documented business risks under version control.
- Revise the documented business risks for the offering as needed

### 15. Track Offering Business Results

This practice determines whether the business plans for an environmental product and service offering are being satisfied so that immediate corrective actions can be taken to keep them on track with commitments and plans.

#### Sub practices

- Obtain and verify measures of status and delivery, as well as any other inputs needed to monitor progress, performance and results, relative to the business plan, business commitments, and other business or financial performance criteria.
- Review the measures and inputs against the business plans, business commitments, and other business or financial performance criteria.
- Identify issues or risks affecting or likely to affect the achievement of the business or financial targets and commitments

### 16. Manage Offering Business Risks

This practice ensures that appropriate actions are taken for the business risks that could jeopardize the environmental product and service offering.

#### Sub practices

- Review the identified risks on a periodic basis.
- Review the environmental product and service work, business activities, and business environment and situation to identify new risks, risks information that should be revised, and risks that can be removed from the actively-managed list.
- Identify each risk that is likely to become a serious problem.
- Identify preventive or mitigation actions to address each risk that is likely to become a serious problem.
- Perform the identified preventive or mitigation actions, as appropriate, and track to closure.
- Revise the documentation of the risks including description, status, evaluation, and priority, as needed.
- Review the revised risk documentation with relevant stakeholders, and obtain their agreement.
- Place the revised documentation of risks under version control.

### 17. Address Significant Deviations

This practice ensures that significant deviations are recognized and addressed so that the business plans and financial estimates and plans for an environmental product and service offering are achieved or adjusted to reflect a reasonable plan forward.

#### Sub practices

- Analyze identified issues and risks to determine the actual or likely deviations from the environmental product and service offering's business plans and commitments.
- Perform corrective actions to fix any existing critical problems caused by the deviation, where appropriate.
- Document issues and risks that result or are likely to result in significant deviations and designate them for analysis and corrective action.
- Determine and document corrective actions needed to address the identified deviations from the environmental product and service offering's requirements, estimates, plans, and commitments.

- Review the planned corrective actions with relevant stakeholders, and obtain their agreement.
- Perform the agreed-to corrective actions and track to completion.
- Document and archive the results and other relevant records of addressing the significant deviations

### 18. Communicate Offering Business Results

This practice ensures that those concerned with and affected by the business and financial results for a environmental product and service offering have a common, correct, and current understanding of the progress, accomplishments, issues, and risks so there are no surprises

#### Sub practices

- Identify the information on progress, accomplishments, issues, and risks for a environmental product and service offering that is related to the business plans and financial estimates
- Obtain the information from the selected sources and compile or update in the formats required by the business or other relevant stakeholders.
- Conduct reviews at points in time that are required by the business and financial reporting plan and that are meaningful to relevant stakeholders.
- Identify and document action items and track them to closure.
- Document issues and risks identified in the review.

## 6.6 Environmental Product and Service Work Management

### Purpose

Environmental product and service Work Management plans and manages the work and results for a environmental product and service offering using the organization's process assets and defined processes that are tailored from the organization's standard processes.

### Goals

#### 1. Specific Goals

- **Goal 1: Environmental product and service Work Is Planned.** The environmental product and service work for an offering is estimated and planned using defined processes and organizational process assets.
- **Goal 2: Environmental product and service Work Is Monitored.** The actual work activities, performance, and results for a environmental product and service offering are monitored against the defined processes, plans, and commitments.
- **Goal 3: Environmental product and service Work Corrections Are Made.** Corrective actions are performed when the work activities, performance, or results for a environmental product and service offering deviate significantly from the requirements, plans, and commitments.

#### 2. Institutional Goals

- **Goal 1: Practices Are Institutionalized.** The practices for Environment product and service work management are established.

### Practice to Goal Relationship table

Goal	Practice
Specific Goal 1	Specific Practice 1,2,3,4,5,6,7,8
Specific Goal 2	Specific Practice 9,10,11,12
Specific Goal 3	Specific Practice 13,14,15,16,17



Institutional Goal 1

Institutional Practice 1,2,3,4,5

## Practices

- **Specific Practice.**

- 1. Maintain Defined Processes**

This practice ensures that all activities for the environmental product and service work are well-defined, organized, and integrated across all the work efforts involved in a environmental product and service offering.

### Sub practices

- Select the organization's standard processes that best fit the characteristics of the environmental product and service work.
- Review and select other organizational process assets that are applicable to the preparation of the defined processes
- Tailor the selected standard processes and other organizational process assets according to the tailoring guidelines to produce the defined processes.
- Document the descriptions of the defined processes.
- Verify the descriptions of the defined processes against the applicable standards, requirements, organizational policies, and goals.
- Conduct peer reviews of the descriptions of the defined processes.
- Review the descriptions of the defined process with the relevant stakeholders, and obtain their agreement
- Place the descriptions of the defined processes under configuration management
- Revise the descriptions of the defined processes as needed.

- 2. Maintain Master Schedule**

This practice ensures that there is a shared understanding of the demand for the environmental product and service offering and the capacity that will be established to meet the demand.

### Sub practices

- Determine the anticipated demand profile for the offering
- Determine the performance and availability requirements and goals for the offering.
- Estimate the fault profile for the offering

- Define the demand/production plan to address the anticipated demand profile.
- Establish the capacity that is needed to support the offering demand/production plan.
- Define and document the capacity plan for the offering.
- Consolidate the demand/production plans, capacity plans, resource plans, and budgets into the master schedule for the offering
- Review the master schedule for the offering with relevant stakeholders, and obtain their agreement.
- Place the master schedule for the offering under version control.
- Revise the master schedule for the offering as needed

### 3. Maintain Master Operations and Support Plans

This practice ensures that the operations and support requirements for the environmental product and service offering are understood and appropriately addressed.

#### Sub practice

- Determine the operations and support requirements for the offering.
- Determine how the operations and support requirements will be satisfied.
- Define and document the master plans for satisfying the operations and support requirements.
- Verify the master operations and support plans against the requirements.
- Conduct peer reviews of the master operations and support plans.
- Review the master operations and support plans with the relevant stakeholders, and obtain their agreement
- Place the master operations and support plans under version control
- Revise the master operations and support plans as needed.

### 4. Maintain Definitions of Measures

This practice ensures that the quantitative information and data needed to guide management decisions for an environmental product and service offering and to support organizational requirements are available when needed

#### Sub practices

- Identify the measurement information needs for the environmental product and service work.
- Identify the measurement information needs for monitoring the operations and support activities, results, and projections against the requirements and plans.

- Determine the organizational measurement requirements.
- Select and define measures to address the measurement information needs and requirements.
- Define the procedures and methods for collecting, deriving, analyzing, and storing the measures.
- Review the measurement information needs, requirements, plans, and definitions of the measures with relevant stakeholders, and obtain their agreement.
- Place the definitions of measures under version control.
- Revise the measurement information needs, requirements, plans, and definitions of the measures as needed.

### 5. Maintain Assignment of Work Responsibilities

This practice ensures that all responsibilities for the environmental product and service work are appropriately assigned to the units and workgroups involved in the work and are integrated to address the overall workflow for the offering.

#### Sub practices

- Allocate the offering requirements and organize the work responsibilities for the offering to be consistent with the units and workgroups involved in the environmental product and service work.
- Negotiate the offering requirements and work responsibilities with the units and workgroup involved in the environmental product and service work.
- Negotiate commitments for performing the work activities with the responsible units and workgroup.
- Review the work responsibilities of the units and workgroup involved in the environmental product and service work to determine and resolve conflicts and synergies with other responsibilities of the units and workgroup.
- Document the description of the workflow among the units and workgroups involved in the environmental product and service work, including the critical inputs, outputs, and dependencies.
- Place the documentation of work responsibilities and workflow under version control.
- Revise the work responsibilities and workflow description as needed.

### 6. Maintain Commitment Agreements

This practice ensures that the critical dependencies affecting the environmental product and service work and the dependencies other work efforts and stakeholders have on the environmental product and service work will be satisfied, so that the work can be performed according to the plans

#### Sub practices

- Identify and document the critical dependencies the environmental product and service work has on other work efforts and stakeholders.
- Identify and document the critical dependencies that other work efforts and stakeholders have on the environmental product and service work effort.
- Negotiate and document commitments with those responsible for satisfying each critical dependency.
- Negotiate and document commitments with those who have critical dependencies on the environmental product and service work effort.
- Review the descriptions of the critical dependencies and the documented commitments with those making the commitments and obtain their agreement.
- Place the descriptions of the critical dependencies and the agreed-to commitments under version control.
- Revise the descriptions of the work unit's critical dependencies and commitments as needed

### 7. Maintain Risk Management Plans

This practice ensures that there is an awareness of the risks that could jeopardize the environmental product and service work for an offering so that these risks are appropriately considered in the planning and management activities

#### Sub practices

- Identify risks along with associated contextual information.
- Analyze the risks to determine potential impact, likelihood of occurrence, and the likely timeframe of occurrence.
- Prioritize the risks.
- Document the risks and the associated analysis, priorities, and contextual information.
- Review the documented risks with relevant stakeholders, and obtain their agreement.
- Place the documented risks under version control.
- Revise the documented risks as needed.

### 8. Maintain Integrated Work Plans

This practice ensures that all aspects of the plans for the environmental product and service work are consistent and aligned with each other so that the set of plans provides a complete and appropriate course of action.

#### Sub practices

- Identify and document significant conflicts, disagreements, inefficiencies, unresolved dependencies, or missing responsibilities in the plans and commitments of the units and workgroups involved in the environmental product and service work.
- Schedule the work activities in a sequence that accounts for critical factors and risks of the environmental product and service work
- Establish an integrated work plan to align the work plans, commitments, and activities of the units and workgroups involved in the environmental product and service work
- Establish objective criteria for the review and approval of critical inputs, outputs, and commitments between units and workgroups.
- Review the work plans and commitments for the offering against the plans, commitments and activities of related offerings to identify conflicts or other issues.
- Negotiate changes to the work plans and commitments with relevant stakeholders to resolve any significant issues.
- Revise the work plans to incorporate the negotiated changes.
- Review the negotiated work plans and commitments with relevant stakeholders, and obtain their agreement.
- Place the work plans for the offering under version control.
- Revise the work plans for the offering as needed.

### 9. Manage Environmental product and service Work

This practice ensures that the day-to-day performance and results of the environmental product and service work are understood so that corrective actions can be performed to keep performance and results in line with the requirements plans, and commitments.

#### Sub practices

- Obtain the work status inputs from the units and workgroups involved in the environmental product and service work.

- Monitor the critical inputs, outputs, commitments, and workflow between units and workgroups involved in the environmental product and service work to identify any issues that may jeopardize achieving the requirements and plans.
- Obtain inputs from customers and other relevant stakeholders regarding the performance and results of the offering and the environmental product and service work.
- Collect and analyze measures and other information to understand the operations and support activities and results.
- Collect and analyze measures and other information to understand the status of the environmental product and service work.
- Identify requirements for the offering and allocated requirements that are not being satisfied or that are at risk of not being satisfied.
- Identify plans and commitments that are not being satisfied or that are at risk of not being satisfied.
- Adjust plans, work assignments, and activities to resolve any identified issues and risks

### 10. Manage Risks

This practice ensures that appropriate actions are taken for the risks that could jeopardize the environmental product and service work.

#### Sub practices

- Review the identified risks on a periodic basis.
- Review the work requirements, plans, commitments, and activities to identify new risks, risks information that should be revised, and risks that can be removed from the actively-managed list.
- Identify each risk that is likely to become a serious problem.
- Identify preventive or mitigation actions to address each risk that is likely to become a serious problem.
- Perform the identified preventive or mitigation actions, as appropriate, and track to closure.
- Revise the documentation of the risks including description, status, evaluation, and priority, as needed.
- Review the revised risk documentation with relevant stakeholders, and obtain their agreement.
- Place the revised documentation of risks under version control

### 11. Report Utilization of Organization's Resources

This practice ensures that executive management has accurate resource utilization data so that they are able to maintain an appropriate allocation and assignment of the organization's resources needed to develop, prepare, deploy, operate, and support the organization's environmental products and services.

#### Sub practices

- Measure, on a regular basis, the amount of each type of resource consumed in performing the environmental product and service work for an offering
- Compare the amount of each type of resource consumed against the plans for the environmental product and service work.
- Revise the estimates of future needs for amount of each type of resource.
- Document the measures of actual consumption and estimates of future needs for each type of resource along with the associated analysis.
- Report the results of the resource review to executive management
- Revise the measures of actual consumption, the estimates of future needs for each type of resource, and the associated analysis as needed

### 12. Contribute to Organization's Process Assets

This practice ensures that the organization's process assets improve through their use in the environmental product and service work.

#### Sub practices

- Propose changes to the organization's standard processes and tailoring guidelines, criteria, and procedures based on their use in establishing and maintaining, and implementing the defined processes.
- Propose improvements to the organizational process assets.
- Store appropriate process and product measures in the organization's measurement repository
- Submit documentation for possible inclusion in the organization's process asset library.
- Document lessons learned from the project for inclusion in the organization's process asset library

### 13. Address Significant Deviations

This practice ensures that significant deviations from the requirements, estimates, plans, and commitments for the environmental product and service offering and work are recognized and addressed so that adjustments are made to reflect a reasonable plan forward.

#### Sub practices

- Analyze identified issues and risks to determine the actual or likely deviations from the offering requirements, estimates, plans, and commitments.
- Perform corrective actions to fix any existing critical problems caused by the deviation, where appropriate
- Document issues and risks which result or are likely to result in significant deviations and designate them for analysis and corrective action.
- Determine and document corrective actions needed to address the identified deviations from the offering requirements, estimates, plans, and commitments.
- Review the planned corrective actions with relevant stakeholders, and obtain their agreement.
- Perform the agreed-to corrective actions and track to completion.

### 14. Address Deviation Causes

This practice ensures that, where possible, actions are taken so that significant deviations from the environmental product and service requirements, estimates, plans, and commitments and other issues, of the type that occurred in the past, do not recur.

#### Sub practices

- Review significant deviations and other issues to determine which of these are likely to recur.
- Analyze the significant deviations and other issues to determine their likely causes.
- Document the likely causes of each identified significant deviation and issue so that corrective actions can be performed.
- Determine and document preventive actions that are expected to prevent the future occurrence of identified problems and similar problems.
- Review the proposed preventive actions with relevant stakeholders, and obtain their agreement.
- Perform the agreed-to preventive actions and track to completion.
- Document as risks any significant recurring problems that are not addressed with preventive actions.



### 15. Communicate Progress

This practice ensures that relevant stakeholders by the environmental product and service work activities and results have a common, correct, and current understanding of the progress, accomplishments, issues, and risks so there are no surprises.

#### Sub practices

- Obtain and verify the inputs needed to present the progress, accomplishments, issues, and risks with relevant stakeholders
- Conduct reviews at points in time that are meaningful to the environmental product and service work and to relevant stakeholders
- Identify and document action items and track them to closure.
- Document issues and risks identified in the review.

### 16. Revise Plans

This practice ensures that the environmental product and service work plans reflect an accurate description of the current situation and that all elements of the plan are kept consistent with each other

### 17. Apply Lessons Learned

This practice ensures that the people performing the environmental product and service work learn from their experiences, and apply these lessons

#### Sub practices

- Review the environmental product and service offering requirements, estimates, plans, commitments, and work activities periodically to identify lessons learned.
- Review the analyses performed on significant deviations and actions performed to identify lessons learned.
- Document and store the derived lessons learned.
- Review the documented lessons learned with those who are knowledgeable and relevant stakeholders.
- Incorporate the documented lessons learned into the offering plans, processes, and procedures.
- Make lessons learned available to the managers and staff involved in the environmental product and service work.

## 6.7 Environmental Product and Service Preparation

### Purpose

Product and Service Preparation establishes the requirements for a product and service offering and develops and prepares the offering so that it is ready for deployment and use.

### Goals

#### 1. Specific Goals

- **Goal 1: Environmental Offering Requirements Are Specified.** The requirements for the environmental product and service offering are defined and documented.
- **Goal 2: Environmental Offering Is Constructed.** The environmental product and service offering is designed, developed, constructed, and documented to satisfy its requirements.
- **Goal 3: Environmental Offering is Demonstrated.** The environmental product and service offering is demonstrated to be ready to be deployed, operated, and supported.

#### 2. Institutional Goals

- **Goal 1: Practices Are Institutionalized.** The practices for Environment product and service preparation are established.

### Practice to Goal Relationship table

Goal	Practice
Specific Goal 1	Specific Practice 1,2,3,4
Specific Goal 2	Specific Practice 5,6,7,8,9,10,11
Specific Goal 3	Specific Practice 12,13,14,15,16,17
Institutional Goal 1	Institutional Practice 1,2,3,4,5

### Practices

- **Specific Practice.**

- 1. Maintain Offering Requirements Specification**

This practice ensures that a single source of agreed-to baseline requirements for the environmental product and service offering is documented and serves as the basis for construction of the offering and for future evolution and changes to the offering.

#### Sub practices

- Review the customer requirements, business requirements, laws, regulations, and standards for the offering to ensure that issues affecting the requirements specification are identified and resolved
- Document the requirements specification for the offering to address the applicable customer requirements, business requirements, laws, regulations, and standards.
- Identify and document derived requirements and changes to previously derived requirements for the offering.
- Document the source of each requirement and the associated critical decisions and rationale for each requirement.
- Identify and document the methods that will be used to verify and validate each requirement.
- Review the requirements specification with relevant stakeholders, and obtain their agreement.
- Conduct work product inspections of the requirements specification.
- Place the requirements specification under configuration management
- Revise the requirements specification as necessary

- 2. Validate Offering Requirements**

This practice ensures that the requirements accurately and completely specify the environmental product and service offering that will satisfy the needs of the customers and users.

#### Sub practice

- Identify the requirements that will be validated and the methods that will be used to validate each requirement.
- Establish and maintain the requirements validation plans, descriptions of validation activities, and validation procedures.

- Place the requirements validation plans, descriptions of validation activities, and validation procedures under version control. • Perform the requirements validation activities according to the defined validation plans, validation scenarios, and procedures.
- Identify and document requirements validation issues and proposed corrective actions. 6. Review the requirements validation issues and proposed corrective actions with the customers, users, and other relevant stakeholders, and obtain their agreement on the corrective actions.
- Perform the agreed-to corrective actions and track to closure
- Revise the requirements validation plans, descriptions of validation activities, and validation procedures, and perform re-validation as needed.

### 3. Maintain Allocation of Offering Requirements

This practice ensures that the components of the environmental product and service offering, in aggregate, will satisfy the overall requirements of the offering.

#### Sub practices

- Analyze the requirements and requirements changes to determine how they should be allocated to the components of the offering.
- Identify and document derived requirements and changes to previously derived requirements that result from the requirements allocation
- Identify and document the external interface requirements for the offering and changes to these requirements.
- Identify and document the internal interface requirements among offering components and changes to these requirements.
- Define and document the allocation of the requirements and requirements changes for each offering component.
- Conduct work product inspections of the requirements allocation
- Place the requirements allocation under configuration management.
- Revise the requirements allocation as necessary

### 4. Maintain Requirements Traceability

This practice ensures that all the requirements for the environmental product and service offering are appropriately addressed and that no superfluous capabilities, features, or functions are included in the offering.

### Sub practices

- Define the traceability that is needed among work products for the offering.
- Document the bi-directional traceability between the various levels of offering requirements.
- Document the bi-directional traceability for the offering requirements to the associated plans and work products
- Review the traceability documentation with relevant stakeholders and obtain their agreement.
- Place the traceability documentation under configuration management
- Revise the traceability documentation as needed

### 5. Maintain Offering Capacity Models

This practice ensures that the expected demand/production schedule for a deployed environmental product and service offering is understood and modeled so that the offering can support the expected demand and satisfy the throughput processing requirements and goals

### Sub practices

- Define and document descriptions of the user transactions that will be performed, the functions that the offering will provide, and the processing flow for the offering.
- Determine the relationships among the major activities of the processing flow for the offering.
- Identify the requirements and goals, along with the priorities, that define the overall demand/production schedule for the offering
- Obtain forecasts that define how the overall demand/production schedule for the offering will change in the future.
- Identify the factors and events that influence the demand/production schedule for the primary activities
- Construct the capacity model for the offering.
- Verify and validate the capacity model.
- Place the capacity model under version control.
- Perform corrective actions to address the problems in the capacity model and track to closure
- Revise the capacity model and the supporting analyses as needed.

### 6. Address Offering Business Risks

This practice ensures that appropriate provisions are built into an environmental product and service offering to manage inherent business risks.

### Sub practices

- Identify the business risks for the offering along with associated contextual information.
- Analyze the business risks for the offering to determine potential impact, likelihood of occurrence, circumstances that are likely to manifest the occurrence.
- Document the business risks for the offering and the associated analysis, priorities, and contextual information.
- Prioritize the business risks for the offering.
- Select the business risks that will be addressed in the design, construction, and documentation of the offering.
- Review the documented business risks with relevant stakeholders and obtain their agreement.
- Identify requirements, design, construction, and documentation provisions that can reduce the likelihood or impact of the selected business risks and arrange for the incorporation of these provisions.
- Place the documented business risks under version control.
- Revise the documented business risks for the offering as needed.

### 7. Maintain Offering Design and offering components

This practice ensures that the components that are constructed satisfy their requirements and will assemble to produce the specified environmental product and service offering.

### Sub practices

- Identify and document alternative design solutions that satisfy the offering requirements.
- Define and document the criteria that will be used to evaluate the alternative design solutions for the offering
- Select the design solution for the offering that provides the best fit to the evaluation criteria.
- Define and document that data model for the offering.
- Document the design solution, including the data model, for the offering along with the critical design decisions and associate rationale.
- Review the offering design solution with relevant stakeholders and obtain their agreement.
- Conduct work product inspections of the offering design solution
- Place the offering design solution under configuration management
- Revise the offering design solution as necessary

### 8. Maintain Designs of Offering Components

This practice ensures that the components that are constructed satisfy their requirements and will assemble to produce the specified environmental product and service offering

#### Sub practices

- Identify and document alternative design solutions that satisfy the requirements for each component.
- Define and document the criteria that will be used to evaluate the alternative design solutions for each component.
- Select the set of design solutions that define the design of each component.
- Document the design for each component along with the critical design decisions and associate rationale.
- Review the design for each component with relevant stakeholders and obtain their agreement
- Conduct work product inspections of the design for each component
- Place the design for each component under configuration management.
- Revise the design for each component as necessary.

### 9. Maintain Offering Changes for Organization Assets

This practice ensures that the process needs for developing, preparing, deploying, operating, supporting the environmental product and service offering are in place when needed

#### Sub practices

- Review the offering requirements and designs to identify needed changes to the organization's standard processes and other organizational process assets that are needed for the environmental product and service work
- Document the needed changes to the organization's standard processes and other organizational process assets.
- Negotiate the needed changes with those responsible for the organization's process assets.
- Document the agreed-to changes to the organization's standard processes and other organizational process assets.
- Revise the descriptions of needed changes to the organization's standard processes and other organizational process assets as needed

### 10. Construct Offering Components

This practice ensures that all the components that are needed for the environmental product and service offering are ready to be integrated and verified.

#### Sub practices

- Review the requirements and design for each offering component to ensure that issues affecting the construction of the component are identified and resolved.
- Determine which of the offering components will be developed, obtained as a reused component, or acquired from a supplier.
- Make arrangements to acquire the selected offering components from external sources.
- Obtain and modify the selected reused components, as appropriate, to satisfy the component requirements.
- Construct the selected offering components to satisfy the component requirements.
- Perform unit verification of the offering components as appropriate.
- Conduct work product inspections of the offering components.
- Place the offering components under configuration management.
- Revise the offering components as necessary

### 11. Maintain Offering Documentation

This practice ensures that the essential information that is needed by the people who deploy, operate, and support the environmental product and service offering is available when needed.

#### Sub practices

- Review the offering requirements, design, and construction to determine if any problems exist that affect the deployment, operation, and support documentation.
- Define, document, and obtain agreement with those responsible for the requirements, design, and construction of the offering on corrective actions that will be performed to fix problems affecting the documentation, and track to closure.
- Develop preliminary versions of the deployment, operation, and support documentation during the early phases of the offering development and preparation for review by the customer and other relevant stakeholders.
- Conduct work product inspections of the deployment, operation, and support documentation
- Verify the final version of the deployment, operation, maintenance, and support documentation against the final version of the offering



- Perform corrective actions to address problems identified in the deployment, operation, and support documentation.
- Place the deployment, operation, and support documentation under configuration management
- Revise the deployment, operation, and support documentation as necessary

### 12. Monitor Preparation of Offering

This practice ensures that immediate corrective actions can be performed when problems are identified in the design, development, and construction of the environmental product and service components

#### Sub practices

- Perform regular reviews with representative of the units, workgroups, and suppliers involved in the design and construction of the components for the offering to coordinate and monitor these activities and resolve issues.
- Identify critical dependencies among the units, workgroups, and suppliers involved in the design and construction of the components for the offering, and negotiate commitments for these dependencies.
- Track the commitments of the units, workgroups, and suppliers involved in the design and construction of the components for the offering.
- Perform reviews of critical work products produced by a unit, workgroup, or supplier as input to another unit or workgroup.
- Identify any issues regarding the commitments of the units, workgroups, and suppliers and any other issues with the design and construction of the offering components.
- Perform corrective action for any identified issues related to the design and construction of the offering components

### 13. Integrate Offering Components

This practice ensures that all the components of the environmental product and service offering assemble, integrate, and interface with each other correctly

#### Sub practices

- Identify the offering components to be integrated and the integration sequence.
- Establish and maintain the integration plans, integration exercises, and integration procedures.

- Conduct work product inspections of the integration plans, integration exercises, and integration procedures.
- Place the integration plans, integration exercises, and integration procedures under version control.
- Confirm that each offering component is available and ready prior to assembling and integrating it.
- Integrate the offering components according to the defined integration sequence, plans, and procedures.
- Evaluate the assembled product components according to the defined integration plans, integration exercises, and integration procedures.
- Identify and document integration problems.
- Perform corrective actions to address the identified problems and track to closure
- Perform regression evaluations, as appropriate, whenever the components being integrated or the integration environment changes.
- Revise the integration plans, integration exercises, and integration procedures, and perform re-integration as needed.

### 14. Verify Offering

This practice ensures that the components of the product and service offering, individually and collectively integrated, satisfy their requirements.

#### Sub practices

- Identify the requirements to be verified for each verification exercise.
- Establish and maintain the verification plans, verification exercises, verification procedures, and verification criteria.
- Conduct work product inspections of the verification plans, verification plans, verification exercises, verification procedures, and verification criteria
- Place the verification plans, verification plans, verification exercises, verification procedures, and verification criteria under version control.
- Confirm that the offering component to be verified are properly assembled and integrated as planned prior to performing the verification.
- Verify the assembled and integrated components against their requirements according to the defined verification plans, verification exercises, verification procedures, and verification criteria.

- Identify and document verification problems
- Perform corrective actions to address the identified problems and track to closure.
- Revise the verification plans, verification exercises, verification procedures, and verification criteria, and perform re-verification as needed.

### 15. Validate Offering

This practice ensures that the environmental product and service offering satisfies the needs of the customers and users

#### Sub practices

- Select the functions, capabilities, and features of an offering that will be validated.
- Establish and maintain the validation plans, validation exercises, validation procedures, and validation criteria for the offering
- Review the validation plans, validation exercises, validation procedures, and validation criteria for the offering with the customers and other relevant stakeholders.
- Conduct work product inspections of the validation plans, validation exercises, validation procedures, and validation criteria.
- Place the validation plans, validation exercises, validation procedures, and validation criteria under version control.
- Confirm that the offering configuration to be validated and the validation environment are set up as planned prior to performing the validation.
- Perform validation on the selected functions, capabilities, and features of an offering according to the defined validation plans, validation exercises, validation procedures, and validation criteria.
- Identify and document validation problems.
- Perform corrective actions to address the identified problems and track to closure
- Revise the validation plans, validation exercises, validation procedures, and validation criteria, and perform re-validation as needed

### 16. Accept Offering

This practice ensures that the (internal or external) owner of the environmental product and service offering concurs that the offering satisfies its requirements and is ready for deployment and operations.

### Sub practices

- Establish and maintain the acceptance plans, acceptance exercises, acceptance procedures, and acceptance criteria for the offering.
- Review the acceptance plans, acceptance exercises, acceptance procedures, and acceptance criteria with the customer and obtain their agreement.
- Conduct work product inspections of the acceptance plans, acceptance exercises, acceptance procedures, and acceptance criteria.
- Place the acceptance plans, acceptance exercises, acceptance procedures, and acceptance criteria under version control.
- Confirm that the offering configuration is properly assembled, integrated, and verified as planned, prior to performing the acceptance.
- Perform the acceptance exercises according to the defined acceptance plans, acceptance exercises, acceptance procedures, and acceptance criteria.
- Identify and document acceptance problems.
- Perform corrective actions to address the identified problems and track to closure.
- Revise the acceptance plans, acceptance exercises, acceptance procedures, and acceptance criteria, and repeat the acceptance exercises as needed

### 17. Assemble Offering Deployment Package

This practice ensures that a complete and correct delivery and deployment package for an environmental product and service offering is assembled

### Sub practices

- Obtained appropriate authorization before assembling the delivery and deployment package.
- Obtain and verify the offering components needed for the delivery and deployment package.
- Assemble the delivery and deployment package.
- Verify the delivery and deployment package
- Document the delivery and deployment package.
- Place the delivery and deployment package and the documentation of the package under configuration management

## 6.8 Environmental Product and Service Deployment

### Purpose

Environmental product and service Deployment installs, modifies, replaces, and removes the people, equipment, computing and communication infrastructure, supplies, and other resources used in operating and supporting a environmental product and service offering.

### Goals

#### 1. Specific Goals

- **Goal 1: Offering Deployment Is Planned.** The plans for deploying the environmental product and service offering are defined, documented, and agreed to.
- **Goal 2: Offering Is Deployed.** The environmental product and service offering is deployed to support the needed capacity.
- **Goal 3: Deployed Offering Is Demonstrated.** When a environmental product and service offering is deployed, that offering and the other affected offerings are demonstrated to be ready for operations.

#### 2. Institutional Goals

- **Goal 1: Practices Are Institutionalized.** The practices for Environment product and service work management are established.

### Practice to Goal Relationship table

Goal	Practice
Specific Goal 1	Specific Practice 1,2,3,4,5
Specific Goal 2	Specific Practice 5,6,7,8,9,10,11
Specific Goal 3	Specific Practice 12,13,14,15
Institutional Goal 1	Institutional Practice 1,2,3,4,5

### Practices

- **Specific Practice.**

- 1. Estimate Changes to Capacity**

This practice ensures that the effects of the environmental product and service offering deployment on capacity needs are understood so that appropriate adjustments to the capacity can be made.

#### Sub practices

- Determine the current capacity in place for the existing environmental product and service offerings.
- Estimate and document the change in capacity needed to operate and support the offering after the planned deployment.
- Review the capacity estimates with relevant stakeholders and obtain their agreement.

- 2. Define Offering Deployment Approach**

This practice ensures that an approach for the deployment of the environmental product and service offering is defined, and that relevant stakeholders understand and agree to the planned approach.

#### Sub practices

- Identify the critical characteristics of the deployment and the installation sites that affect the deployment approach or plans.
- Review reports from previous deployments to identify and incorporate applicable lessons learned.
- Define and document the overall approach for the deployment.
- Review the deployment approach with relevant stakeholders and obtain their agreement.

- 3. Maintain Offering Deployment Plans**

This practice ensures that the deployment plans for the environmental product and service offering exist, contain the necessary details, and are agreed to so that the deployment can be performed appropriately.

#### Sub practices

- Identify the resources needed for performing the deployment.
- Identify the specific components and the version of each component that will be deployed.
- Assign responsibility and authority for the deployment activities.
- Define the deployment activities and the schedule for the deployment activities.

- Define the communications that need to be made concerning the deployment, including the information that will be communicated, who needs to be informed, when the communications will occur, and the media that will be used.
- Document the plan for the deployment.
- Review the deployment plan with relevant stakeholders and obtain their agreement.
- Place the deployment plan under version control.
- Revise the deployment plan as needed.

#### 4. Maintain Offering Deployment Plans

This practice ensures that migration plans exist for the deployment of an environmental product and service offering, that they contain the necessary details, and that they are agreed to so that the migration can be accomplished with minimal disruption.

##### Sub practices

- Determine who will be affected by the deployment and how they will be affected.
- Identify the migration support that needs to be provided to relevant stakeholders.
- Define the activities and the associated capacity required to support the migration of relevant stakeholders.
- Define the schedule, responsibility, and authority for the migration activities.
- Define the communications that need to be made concerning the migration, including the information that will be communicated, who needs to be informed, when the communications will occur, and the media that will be used.
- Document the migration plan.
- Review the migration plan with relevant stakeholders and obtain their agreement.
- Place the migration plan under version control.
- Revise the migration plan as needed.

#### 5. Coordinate Offering Deployment Plans

This practice ensures that the plans for the deployment of the environmental product and service offering, the associated migration plans, and other plans and activities that are related and could affect one another are adjusted so that the deployment and migration can proceed according to the plans.

##### Sub practices

- Identify the plans and ongoing activities that are related to the deployment and migration of the offering.
- Review the related plans and ongoing activities to determine the interactions and effects on each other.
- Resolve conflicts among the deployment and migration plans and the related plans and ongoing activities.
- Monitor the implementation of the deployment and migration plans and the related plans and ongoing activities to identify any plan changes that are needed
- Document the changes to the deployment and migration plans and the related plans that are needed to resolve conflicts.
- Review the changes to the deployment and migration plans and the related plans and ongoing activities with relevant stakeholders and obtain their agreement.
- Revise the deployment and migration plans and the related plans as needed.

### 6. Deploy Offering

This practice ensures that the environmental product and service offering deployment activities are performed as defined in the agreed-to plans.

#### Sub practices

- Obtain the correct version of each of the components that are needed for the deployment.
- Perform the deployment as planned.
- Monitor the deployment against the plans.
- Identify any significant deviations from the deployment plans and other issues.
- Perform corrective actions to address significant deviations from the deployment plans and other issues.
- Provide regular reports of deployment status and results to relevant stakeholders.
- Record lessons learned from the deployment.

### 7. Adjust Capacity

This practice ensures that the capacity is adjusted (either increased or decreased) to reflect the environmental product and service offering deployment.

#### Sub practices

- Determine the changes in capacity required at each of the affected installation sites.
- Obtain additional resources that are needed.



- Deploy the additional capacity and remove the surplus capacity at each affected installation site as appropriate.
- Evaluate and monitor the effects of the change in capacity to ensure the capacity is appropriate, and make adjustments if necessary

### 8. Deploy Offering Documentation Changes

This practice ensures that the customers and the people performing the environmental product and service work have the up-to-date documentation.

#### Sub practices

- Determine the documentation and documentation changes that are needed at each of the affected installation sites.
- Determine the form, format, and number of copies of the documentation and documentation changes that are needed at each of the affected installation sites.
- Obtain the needed documentation and documentation changes.
- Distribute or make the documentation and documentation changes available to relevant stakeholders.
- Review the documentation and documentation changes with relevant stakeholders to ensure they understand the content and how it affects them.
- Remove the obsolete documentation.

### 9. Deploy Offering Process Changes

This practice ensures that the process documentation for all environmental product and service offerings remains up-to-date when an offering is deployed, and that the people performing the environmental product and service work have the up-to-date documentation.

#### Sub practices

- Determine the process documentation and documentation changes that are needed at each of the affected installation sites.
- Determine the form, format, and number of copies of the documentation and documentation changes that are needed at each of the affected installation sites.
- Obtain the needed process documentation and documentation changes.
- Distribute or make the process documentation and documentation changes available to relevant stakeholders

- Review the process documentation and documentation changes with relevant stakeholders to ensure they understand the content and how it affects them.
- Remove the obsolete process documentation

### 10. Maintain Offering Transition Support

This practice ensures that the appropriate additional support is provided during the transition associated with the deployment of the environmental product and service offering

#### Sub practices

- Determine the nature and amount of support required during the transition.
- Obtain the support resources and skills needed for the transition.
- Provide the transition support needed to relevant stakeholders.
- Evaluate and monitor the transition support provided to ensure it is adequate and effective, and make adjustments if necessary.

### 11. Adjust Staffing and Skills

This practice ensures that the people performing the environmental product and service operations and support work are provided with any additional skills they will need after the deployment of an offering

#### Sub practices

- Identify skills gaps and additional training and development needs for the people performing the work.
- Remove and reassign staff based on the match of available skills to the skills needed to perform the work.
- Provide the additional training and development opportunities.
- Monitor and evaluate the people performing the work to determine if they obtained the additional needed skills, and make adjustments if necessary.

### 12. Verify Offering Deployment

This practice ensures that a deployed environmental product and service offering meets all the specified requirements and agreements

#### Sub practices

- Establish and maintain the deployment verification plans, verification exercises, verification procedures, and verification criteria.

- Conduct work product inspections of the deployment verification plans, verification plans, verification exercises, verification procedures, and verification criteria.
- Place the deployment verification plans, verification plans, verification exercises, verification procedures, and verification criteria under version control.
- Verify the deployed changes and the overall offering according to the deployment verification plans, verification exercises, verification procedures, and verification criteria.
- Verify that the changes have not affected other offerings in ways that are not acceptable. 6. Identify deployment verification problems.
- Perform corrective actions to address the identified problems and track to closure.
- Revise the deployment verification plans, verification exercises, verification procedures, and verification criteria, and perform re-verification as needed.

### 13. Accept Deployed Offering

This practice ensures that the owners of the environmental product and service offerings and other relevant stakeholders are satisfied with the offering as deployed before switch-over to the deployed offering.

#### Sub practices

- Identify the owners of affect offerings and others who will approve the deployment.
- Establish and maintain the deployment acceptance plans, acceptance exercises, acceptance procedures, and acceptance criteria for the offering.
- Review and obtain agreement with relevant stakeholders on the deployment acceptance plans, acceptance exercises, acceptance procedures, and acceptance criteria.
- Perform the deployment acceptance exercises according to the acceptance plans, acceptance exercises, acceptance procedures, and acceptance criteria.
- Identify and document deployment acceptance problems.
- Perform corrective actions to address the identified problems and track to closure.
- Document the results of the acceptance demonstration.
- Revise the deployment acceptance plans, acceptance exercises, acceptance procedures, and acceptance criteria, and repeat the acceptance exercises as needed.

### 14. Migrate Customers and Staff

This practice ensures that relevant stakeholders by the termination of the environmental product and service offering are properly supported as they migrate from the terminated offering.

### Sub practices

- Provide migration and transition support information to the customers, users, and people performing the environmental product and service work.
- Solicit and document concerns about the migration and transition that are identified by the customers, users, and people performing the environmental product and service work.
- Define corrective actions to address concerns about the migration and transition as appropriate.
- Review the defined corrective actions with relevant stakeholders and obtain their agreement.
- Perform the agreed-to corrective actions to address concerns about the migration and transition and tracked to closure.
- Notify relevant stakeholders when the migration begins and at important stages in the migration.
- Provide migration support to relevant stakeholders as planned.
- Monitor the migration progress and identify issues.
- Perform corrective actions to address issues in the migration and track to closure.

### 15. Support Parallel Operations

This practice ensures that a terminated or replaced environmental product and service offering will continue to operate for as long as necessary to allow customers and users to migrate or until a business decision is made to discontinue the offering.

### Sub practices

- Estimate the capacity needed and associated timeframe for transitioning off the terminated or replaced offering.
- Define the plan for continuing support for the terminated or replaced offering.
- Review the plan for continuing support for the terminated or replaced offering with relevant stakeholders and obtain their agreement.
- Provide the parallel support for the terminated or replaced offering as needed.
- Monitor and measure the deployed offering and related offerings following deployment to identify latent problems with the deployment.
- Monitor the transition off the terminated or replaced offering and adjust or update the plans for continuing parallel operations

- Terminate the parallel operations when the customers have transitioned off the terminated or replaced offering or when the owner of the deployed offering determines the parallel operations should be terminated.

## 6.9 Environmental Product and Service Operations

### Purpose

Environmental product and service Operations provides the customers of the environmental product and service offering with the capabilities and features of the offering.

### Goals

#### 1. Specific Goals

- **Goal 1: Offering Resources and Information Are Provided.** Resources, information, and support for the environmental product and service offering are provided, as needed, to the customers
- **Goal 2: Offering Transactions Are Performed.** The transactions for the environmental product and service offering are performed and intermediate and final results are verified and communicated to relevant stakeholders.
- **Goal 3: Results of Offering Transactions Are Finalized.** Results of the transactions for an environmental product and service offering are assembled, verified, stored, and communicated to relevant stakeholders.

#### 2. Institutional Goals

- **Goal 1: Practices Are Institutionalized.** The practices for Environment product and service operations are established.

### Practice to Goal Relationship table

Goal	Practice
Specific Goal 1	Specific Practice 1,2,3,4
Specific Goal 2	Specific Practice 5,6,7,8,9
Specific Goal 3	Specific Practice 10,11,12
Institutional Goal 1	Institutional Practice 1,2,3,4,5

### Practices

- **Specific Practice.**

- 1. Provide Offering Information to Customers**

This practice ensures that the customers understand the overall environmental product and service offering, the capabilities and features, the transactions that can be performed, and how they can participate in initiating and performing each transaction

#### Sub practices

- Provide each customer with a standard package of information on the environmental product and service offering.
- Provide each customer with the standard statement of agreements and commitments for the environmental product and service offering
- Obtain customer feedback on the availability, usefulness, appropriateness, completeness, accuracy, and quality of the information provided and on the media or mechanisms used.
- Perform corrective actions to address individual customer problems in the information provided.
- Revise the standard package of information as needed

- 2. Provide Offering Resources to Customers**

This practice ensures that the facilities, supplies, and resources provided to the customers as part of the environmental product and service offering are adequate and readily available to them when and where they are needed.

#### Sub practices

- Determine the functions, features, and capabilities that are authorized for each customer.
- Make available the facilities, supplies, and resources that customers need to perform their role in the offering.
- Monitor the availability and adequacy of the facilities, supplies, and resources against the utilization on a regular basis.
- Identify actual or likely problems in the availability and adequacy of the facilities, supplies, and resources.
- Perform corrective actions to address problems in the availability and adequacy of the facilities, supplies, and resources.

- Document, as problem reports, chronic shortfalls in the availability of the facilities, supplies, and resources.

### 3. Establish Customer Point of Contact

This practice ensures that the customers are provided with easily locatable and accessible points of contact where they can obtain assistance they need to understand the environmental product and service offering and perform their role in the transactions.

#### Sub practices

- Establish points of contact that are needed to resolve customer questions, information needs, and issues.
- Provide the customers with information on how to access the points of contact and the types of questions, information needs, and issues they can address.
- Measure, monitor, and evaluate the support provided by the points of contact and the customer usage.
- Identify any actual or likely problems in the capability of the points of contact to handle the customer questions, information needs, and issues.
- Perform corrective actions to address any actual or likely problems in the capability of the points of contact to handle the customer questions, information needs, and issues.
- Document, as problem reports, chronic problems in the capability of the established points of contact to handle the customer questions, information needs, and issues.

### 4. Provide Customer Assistance

This practice ensures that appropriate assistance that customers may need is easily and readily accessible so that problems can be prevented or resolved before any serious difficulties are encountered.

#### Sub practices

- Identify the types of problems that customers are expected to encounter and the expected level of support needed.
- Provide assistance, as needed, to customers to address problems they encounter in understanding and using the offering and its transactions.
- Measure and evaluate the critical parameters of the assistance provided.
- Regularly review the responsiveness of assistance provided to the customers.



- Regularly review the correctness and completeness of the assistance provided to the customers.
- Regularly review the customer satisfaction with the assistance provided.
- Identify any actual or likely problems in the capability, ability, and performance for providing assistance to the customers.
- Perform corrective actions to address any actual or likely problems in the capability, ability, and performance for providing assistance to the customers.
- Document, as problem reports, chronic problems in the capability, ability, and performance for providing assistance to the customers

### 5. Verify Inputs for Transactions

This practice ensures that all the inputs required to perform a transaction are obtained, authenticated to confirm the acceptability of the source, and verified to confirm that they are adequate for performing the transaction.

#### Sub practices

- Obtain the transaction request from the customer.
- Verify that the customer is authorized to perform the requested transaction.
- Perform corrective actions to address any issues regarding customers attempting to perform unauthorized transactions.
- Identify the inputs to the transaction and the states they must be in to support performance of the transaction.
- Review the inputs before performing the transaction to ensure that the inputs are available and in a state sufficient to support performance of the transaction.
- Identify any issues regarding the inputs for a transaction being unavailable or insufficient to support performance of the transaction.
- Perform corrective actions to address any issues regarding the inputs being unavailable or insufficient to support the performance of the transaction.
- Review any resubmitted inputs to a transaction to ensure they are sufficient to support performance of the transaction.
- Identify and document recurring problems with inputs to transaction for local action, where possible, or communicate them to management for action.

### 6. Perform Transaction Work Steps

This practice ensures that the work steps that need to be carried out for a transaction are performed

#### Sub practices

- Assign responsibility for the work steps of each transaction to the work unit, workgroup, or individual responsible for each work step.
- Review the actions that will be performed for each transaction to ensure they comply with work agreements and work procedures before initiating the work step.
- Ensure that the work steps for each transaction are performed in accordance with the work agreements and work procedures.
- Monitor the work flow for each transaction as the work steps are performed, and perform corrective actions as needed.
- Verify the results of each transaction for completeness and accuracy.
- Collect and store the outputs and other records of each transaction as specified in the work agreements and work procedures

### 7. Identify Transaction Exceptional Conditions

This practice ensures that any significant conditions that occur that are not addressed in the process descriptions for a transaction are identified, recorded, and understood so they can be properly addressed.

#### Sub practices

- Identify and document observed exceptional conditions encountered when performing transactions.
- Document the state of the transaction at which the exceptional condition occurred to facilitate recovery and completion of the transaction.
- Restore the transaction to a defined consistent state

### 8. Address Transaction Exceptional Conditions

This practice ensures that any significant conditions that occur that are not addressed in the process descriptions for a transaction are addressed in an approved manner.

#### Sub practices

- Identify specific actions for handling each exceptional condition that has been identified.

- Review the identified actions for the exceptional condition with those authorized to approve the actions and obtain their agreement.
- Perform the approved actions for the exceptional condition.
- Verify that the implemented actions appropriately address the exceptional condition.
- Inform relevant stakeholders of the exceptional condition, the actions taken, and the results of the actions.
- Complete the transaction for which the exceptional condition was encountered.
- Document, as problem reports, apparent problems in the environmental product and service offering that might contribute to the exceptional condition occurring.

### 9. Provide Intermediate Results to Customers

This practice ensures that customers are kept informed of the progress and status of the transactions in which they are participating, as well as other information, prompts, or choices they need to be made aware of in order to perform the transactions.

### 10. Provide Transaction Results to Customers

This practice ensures that the customers are provided with documented records of the transactions they have requested or performed.

### 11. Communicate Transaction Information

This practice ensures that information on the results of the transactions performed for an environmental product and service offering is made available to all relevant stakeholders, including the customers and other relevant stakeholders who are internal to the organization.

### 12. Store Permanent Transaction Data

This practice ensures that a complete record of each completed transaction is stored, such that the records are available to satisfy any statutory and organizational requirements and to support appropriate future needs of the customers and the organization.

#### Sub practices

- Identify the requirements for storing the permanent records for the completed transaction.
- Assemble all the information necessary to provide a permanent record of the completed transaction.
- Verify that the assembled information meets the requirements for the permanent records of the completed transaction.
- Place the permanent records for the completed transaction under version control.

- Store the permanent records for the completed transaction in accordance with the applicable laws, regulations, and organizational policies

## 6.10 Environmental Product and Service Support

### Purpose

Environmental product and service Support maintains the infrastructure, supplies, and other resources needed to sustain the operations and availability of a deployed environmental product and service offering.

### Goals

#### 1. Specific Goals

- **Goal 1: Environmental Offering Components Are Maintained.** The offering infrastructure, supplies, and other resources needed to operate and support the environmental product and service offering are maintained over the life of the offering
- **Goal 2: Environmental Offering Disruptions Are Managed.** The offering infrastructure, supplies, resources, mechanisms, data, and information are managed to be able to operate a environmental product and service offering during and following disruptive events.
- **Goal 3: Offering Support Is Provided.** Problems and issues identified in deploying, operating, and supporting a environmental product and service offering are resolved.

#### 2. Institutional Goals

- **Goal 1: Practices Are Institutionalized.** The practices for Environment product and service support are established.

### Practice to Goal Relationship table

Goal	Practice
Specific Goal 1	Specific Practice 1,2,3,4
Specific Goal 2	Specific Practice 5,6,7,8
Specific Goal 3	Specific Practice 9,10,11,12,13,14,15
Institutional Goal 1	Institutional Practice 1,2,3,4,5

### Practices

- **Specific Practice.**

- 1. Maintain Supply of Consumables**

This practice ensures that there is always an adequate supply of consumables available at all installation sites and in all stages of operations of a environmental product and service offering.

#### Sub practices

- Determine the rate of usage for all consumables.
- Determine the replenishment lead time and replenishment procedures for each of the consumables.
- Monitor the available supply of each consumable on a regular basis.
- Replenish the consumables as needed to maintain an adequate supply.

- 2. Update Built-In Offering Data**

This practice ensures that controlled parameters of the environmental product and service offering that have to be changed on a periodic or event-driven basis are appropriately and correctly updated and are correctly reflected when performing the transactions

#### Sub practices

- Identify the data, rules, and information parameters that have to be updated, when they have to be updated, and the source of the updates.
- Obtain and prepare the current updated data, rules, and information parameters.
- Place the data, rules, and other information that are updated under version control.
- Update the built-in parameters of the offering as required.
- Verify that the updates of the built-in parameters were performed correctly.
- Inform relevant stakeholders when updates of the built-in parameters are completed.

- 3. Maintain Offering Infrastructure**

This practice ensures that the offering infrastructure for the environmental product and service offering are operational and available for use.

#### Sub practices

- Establish and maintain plans and schedules for periodic maintenance on the offering infrastructure.
- Perform periodic maintenance on the offering infrastructure as planned.

- Monitor the offering infrastructure on a regular basis to determine the need for unplanned maintenance needs.
- Perform unplanned maintenance on the offering infrastructure as necessary.
- Verify that the offering infrastructure has been restored to full operational capability following any maintenance activities.
- Maintain records of the periodic and unplanned maintenance activities.
- Inform relevant stakeholders on a regular basis about the maintenance activities and operational status of the offering infrastructure.
- Document, as problem reports or change requests, any components or functions of the offering infrastructure that are significant sources of maintainability or operational problems.

#### 4. Maintain System Availability

This practice identifies, as quickly as possible, problems in the operations and availability of the offering infrastructure and ensures that the downtime and performance degradations are minimized.

##### Sub practices

- Monitor the offering infrastructure for availability and operational integrity problems.
- Measure and evaluate the availability and operational integrity of the offering infrastructure to identify availability and performance problems.
- Identify corrective actions to address the immediate effects of the identified significant availability or operational integrity problems of the offering infrastructure and to enable quick recovery or provide alternative means of operations.
- Review the identified corrective actions with relevant stakeholders and obtain their approval.
- Perform the agreed-to corrective actions and track to closure.
- Verify that the implemented corrective actions accomplish the desired effects and that no undesired effects result.
- Inform relevant stakeholders, throughout the repair activities, about the status and outlook for restoring the availability and operational integrity of the offering infrastructure.
- Document, as problem reports or change requests, any significant availability or operational integrity problems.

#### 5. Maintain Business Continuity Plans

This practice ensures that plans and mechanisms exist for maintaining appropriate operations of the environmental product and service offering during and following disruptive events so that the customers and the people operating the offering can perform their activities.

### Sub practices

- Determine the requirements for continuous operations of the offering.
- Identify and classify the business functions and assets that are critical to performing the offering.
- Define the facilities needed to maintain disaster recovery capabilities.
- Define the mechanisms and procedures needed to maintain planned disaster recovery capabilities and be able to respond to emergencies.
- Define teams and assign responsibility and authority for responding to emergencies.
- Document the business continuity plans for the offering.
- Review the business continuity plans with relevant stakeholders and obtain their agreement.
- Place the business continuity plans under version control.
- Revise the business continuity plans as necessary.

### 6. Maintain Disaster Recovery Facilities

This practice ensures that the plans, procedures, infrastructure, supplies, and other resources are in place and up to date so that the organization can maintain planned disaster recovery capabilities and be able to recover from disasters and continue to perform the environmental product and service offerings with minimal disruption to the organization and to the customers.

### Sub practices

- Identify and document the requirements for the organization's environmental disaster recovery facilities.
- Develop and document the plans and procedures for preparing for and recovering from disasters.
- Review the requirements for the environmental disaster recovery facilities and the disaster recovery plans and procedures with relevant stakeholders and obtain their agreement.
- Develop or acquire the disaster recovery infrastructure, supplies, and other resources that comprise the disaster recovery facilities.
- Verify the disaster recovery facilities, plans, and procedures to ensure they satisfy their requirements and support the disaster recovery needs.
- Place the disaster recovery plans, procedures, infrastructure, and supplies under configuration management.
- Review the disaster recovery facilities, plans, and procedures on a regular basis to identify any significant deficiencies in supporting the disaster recovery needs.



- Verify the disaster recovery stored information on a regular basis for completeness, integrity, recoverability, and to ensure there are no significant deficiencies in supporting the disaster recovery needs.
- Revise the disaster recovery plans, procedures, infrastructure, supplies, and other resources as needed.

### 7. Back Up Offering Data

This practice ensures that the data and information needed to recover from disasters and smaller incidents is appropriately collected and maintained so that they are readily recoverable should the need arise.

#### Sub practices

- Identify the data and information that is needed to recover from disasters and smaller incidents so that an offering can be provided with minimal impact.
- Document the data and information that must be backed up and the schedule.
- Review and obtain agreement with relevant stakeholders on the data and information and schedule for back up.
- Collect and store the backup data and information according to the plans.
- Place the specification of the backup data and information and the actual backup data and information under version control.
- Verify the stored data and information on a regular basis for completeness, integrity, and recoverability.
- Revise the definition of data and information that will be backed up and the back-up schedule as needed.

### 8. Restore Offering Data

This practice ensures that data and information is restored to a consistent known state when the need for restoring backed-up data and information arises, either as part of a broad recovery effort or to support a specific recovery need.

#### Sub practices

- Determine the specific need for restoring data and information.
- Determine the version of backed-up data and information that is most appropriate to the need.
- Restore the backed-up data and information.
- Verify that the restoration of the data and information was completed successfully

- Verify that the restoration of the data and information is compatible with the other data and information that are used.
- Inform relevant stakeholders when the restoration of the data and information is successfully completed.

### 9. Provide Assistance for Environmental product and service Work

This practice ensures that actual and likely problems in understanding and performing the environmental product and service work for an offering are recognized and addressed quickly so that the people performing the work are not unnecessarily impacted or slowed down in their work.

#### Sub practices

- Establish mechanisms to identify problems and seek assistance in solving them for the people involved in the environmental product and service work.
- Collect and maintain documentation on each reported problem, and track each reported problem to final resolution.
- Provide appropriate assistance to address the reported problems.
- Inform relevant stakeholders by each reported problem of the resolution.
- Identify common and similar problems that are encountered
- Define, package, and make available to relevant stakeholders information and assistance that address each of the common and similar problems.
- Monitor the effects of the assistance provided, the steps performed in providing the assistance, the responsiveness to the problems, and the satisfaction of relevant stakeholders to ensure the assistance accomplished the intended purpose.
- Take corrective action, including escalation as appropriate, when significant issue are identified in the assistance provided, the responsiveness to problems, and the satisfaction of relevant stakeholders.
- Document, as problem reports or change requests, any significant or recurring problems that people are experiencing in deploying, delivering, and supporting a environmental product and service offering.

### 10. Manage Offering Change Requests

This practice ensures that problems and the need for additional functions and capabilities are captured and maintained in a form that ensures they will be acted on.

### 11. Plan Offering Change Requests

This practice ensures that the environmental product and service offering problem reports and change requests are fully understood in terms of the size and complexity of the changes required, the impact to the users (if not implemented and if implemented), and the plans for making the changes.

#### Sub practices

- Analyze each problem report and change request by itself and in relationship to other related problem reports and change requests, and document the analysis.
- Replicate or verify identified problems.
- Prioritize the changes based on the size and complexity of the changes and the impact to the users.
- Group related changes into environmental product and service offering change packages.
- Define and document a plan for implementing and deploying the environmental product and service offering change packages.
- Define and document the procedure and criteria for verifying and validating the changes and related components that were not changed to ensure they were affected in ways that were not expected.
- Review the plan for implementing, verifying, validating, and deploying the environmental product and service offering change packages with relevant stakeholders and obtain their agreement.
- Revise the analysis and priority of the changes and the plan for implementing, verifying, validating, and deploying the environmental product and service offering change packages as needed.
- Establish, maintain, and make available to relevant stakeholders complete records on all problem reports and change requests, their status, and associated analysis and information.

### 12. Prepare Offering Change Package

This practice ensures that the change package for an environmental product and service offering, when deployed, will accomplish what is intended and needed, and that it will not unduly disrupt the ongoing operations involved in providing the environmental product and service offerings.

#### Sub practices

- Obtain approval for the changes that are included in an offering change package from relevant stakeholders.

- Implement the approved changes.
- Verify that the changes were made correctly.
- Validate that the changes made appropriately resolve the problem reports and change requests.
- Obtain approval for deploying the environmental product and service offering change package according to the implementation and deployment plan.

### 13. Accept Offering Change Package

This practice ensures that the offering owners and other relevant stakeholders approve the deployment of an offering change package before it is deployed.

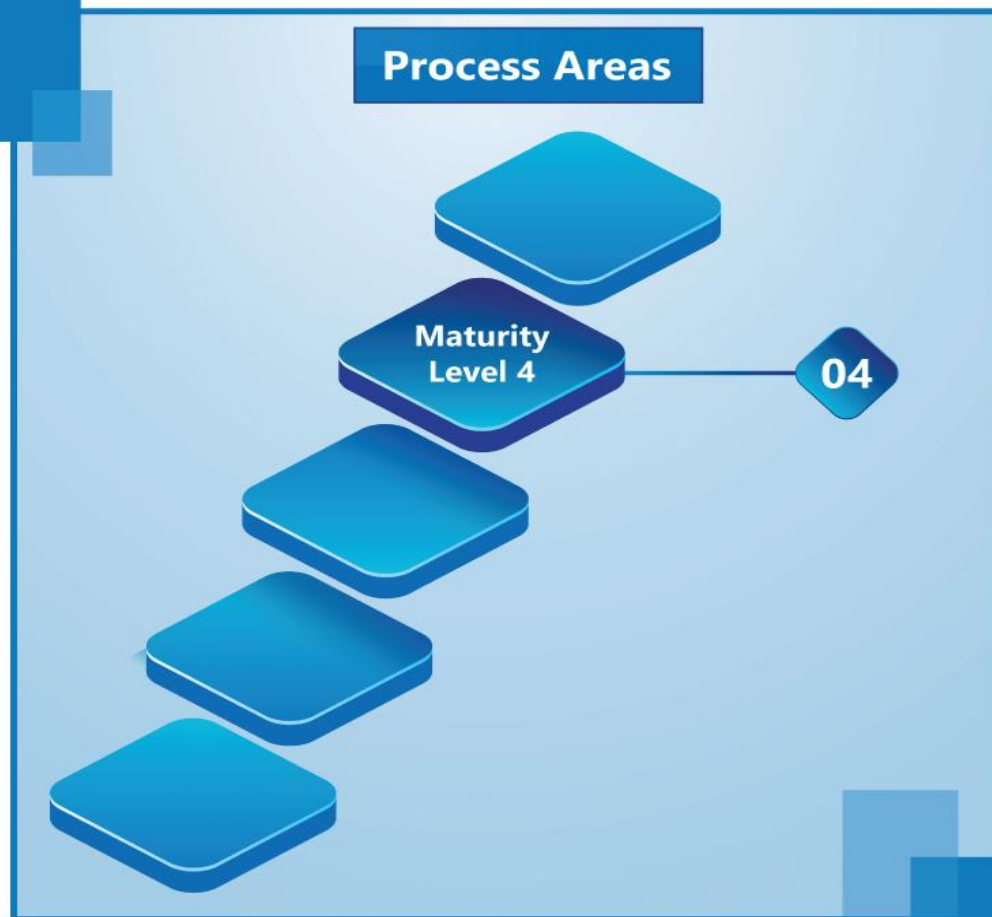
### 14. Deploy Offering Change Package

This practice ensures that the latest approved version of all the components of a environmental product and service offering are deployed and that all the components are at the appropriate consistent level of revision.

### 15. Communicate Offering Information

This practice ensures that the users of the equipment and computing and communication infrastructure for the environmental product and service offering are provided with information they need to plan and do their work.

## Process Areas: Maturity Level 4



The following section describes the process areas that belong to maturity level 4: Quantified

## 7.1 Environmental Common Asset Management

### Purpose

Environmental Common Asset Management determines the common characteristics of the organization's current and future Environmental products and services and exploits this commonality to improve the performance, quality, cycle time, throughput, and predictability of the organization's processes.

### Goals

#### 1. Specific Goals

- **Goal 1: Common Environmental Assets Are Developed** Work products, lessons, knowledge, and other results from performing the organization's Environmental processes are captured and developed into common assets.
- **Goal 2: Common Assets Are Deployed.** Common Environmental assets are deployed for use across the organization.

#### 2. Institutional Goals

- **Goal 1: Practices Are Institutionalized.** The practices for Environment Common Asset Management are institutionalized.

### Practice to Goal Relationship table

Goal	Practice
Specific Goal 1	Specific Practice 1,2,3,4
Specific Goal 2	Specific Practice 5,6,7,8
Institutional Goal 1	Institutional Practice 1,2,3,4,5

### Practices

- **Specific Practice.**

- 1. Identify Common Attributes and Characteristics**

This practice determines the common attributes and characteristics that can be used as the basis for identifying, building, and collecting reusable components for the organization.

#### Sub practices

- Develop methods and procedures for analyzing the processes, work products, and infrastructure involved in developing, preparing, deploying, delivering, and supporting an organization's environmental products and services to identify common attributes and characteristics that could be reused in other products, services, or work processes
- Analyze the processes, work products, and infrastructure involved in developing, preparing, deploying, delivering, and supporting an organization's environmental products and services and identifying common attributes and characteristics.
- Represent common attributes and characteristics in a manner that makes them useful aides in identifying common assets and store them for future use.

- 2. Capture Reusable Results**

This practice helps reduce work and increase quality by collecting existing proven environmental assets for reuse

#### Sub practices

- Identify the work processes involved with information or work products that have been identified as potential contributors to common assets.
- Augment selected work processes with tasks for capturing information or work products that are potential contributors to common assets.
- Define roles and responsibilities in relation to capturing and storing information or work products that have been identified as potential contributors to common assets.
- Communicate the importance capturing information or work products that could contribute to common assets to those who are in position to capture the desired information or artifacts
- Capture the information and work products that are potential contributors to common assets.
- Store captured information and work products in a manner that retains the value of their attributes and characteristics

### 3. Identify environmental Common Assets

This practice ensures that the organization's environmental common assets provide optimum benefits to the organization

#### Sub practices

- Develop guidelines and criteria based on the organization's Environmental product and service portfolio and business strategies for determining which of the environmental products and service lines could benefit most from the capture and redeployment of common assets.
- Use the guidelines to determine which product or service lines should be the primary targets for developing common assets.
- Use the common attributes and characteristics to identify specific products, services, or work processes within selected environmental product or service lines would most likely to benefit from the development of common assets.
- Develop a strategy and plan for creating and exploiting common assets for selected products, services, and work processes.

### 4. Maintain environmental Common Assets

This practice creates common assets that will, through repeated reuse, reduce work and increase quality where these assets are used.

#### Sub practices

- Define standards for representing, developing, deploying, and storing common assets
- Evaluate captured information and work products to determine which can contribute most effectively to the development of common assets
- Create common assets using standard development processes and standards.
- Verify, validate, and authorize common assets for use.
- Prepare documentation, training, and other materials necessary for proper use of common assets.
- Establish and maintain a registry of common assets and how to access them.
- Store common assets in appropriate repositories and are maintain them with appropriate change, version, and where appropriate, configuration control.
- Revise common assets as necessary to ensure their viability and continued use.



### 5. Revise Standard Processes

This practice ensures that the people involved in the environmental product and service work appropriately participate in making common assets available to the organization

### 6. Include Provisions for Using Common Assets

This practice ensures that the people involved in the Environmental product and service work give proper consideration to the use of existing reusable common assets.

#### Sub practices

- Provide training as necessary to support the creation and use of common assets.
- Adjust work methods and technologies as necessary to support the creation and use of common assets.
- Adjust workforce practices to encourage the creation and use of common assets
- Provide mentoring as needed to support the creation and use of common assets.
- Adjust the work environment as necessary to support the creation and use of common assets.
- Incorporate common assets into training and development activities.
- Provide mentoring as needed to support the creation and use of common assets.
- Adjust the work environment as necessary to support the creation and use of common assets. Incorporate common assets into training and development activities

### 7. Deploy Common Assets

This practice ensures that common assets are readily accessible by the people involved in the environmental product and service work

#### Sub practices

- Establish and maintain plans for deploying and supporting common assets.
- Deploy common assets according to plans and release schedules.
- Monitor the deployment of common assets to evaluate progress and problems.
- Take corrective actions to address problems with deploying or using common assets.
- Deploy changes to common assets according to the organization's standard change, configuration, and release management processes.
- Communicate deployment schedules and methods to all affected parties

### 8. Provide Common Asset Information

#### Sub practices

- Capture information on the use and effectiveness of common assets.
- Capture information on the costs of developing, maintaining, deploying, and using common assets.
- Conduct return-on-investment and related analyses to determine the value realized through common assets.
- Provide the results of return-on-investment and related analyses to those who can incorporate the results into strategies and guidelines for selecting and developing common assets.
- Capture lessons learned from the use of common assets and provide them to those who develop, deploy, support, and train the use of common assets.
- Capture information on the use of common assets to identify problems with their deployment, adoption, or effectiveness.
- Analyze information on problems with the deployment, adoption, or effectiveness of common assets and take corrective action as appropriate.
- Provide status, usage, and value information to those using common assets to motivate their continued use and improvement.

## 7.2 Environmental Capability and Performance

### Purpose

Organizational Capability and Performance Management quantitatively characterizes the capability of the organization's standard processes, and develops and provides the capability data, baselines, and models to quantitatively manage the organization's environmental products and services and associated work efforts

### Goals

#### 1. Specific Goals

- **Goal 1: Goals And Capabilities Are Quantified.** Quantitative performance and quality goals for the organization's environmental products and services, and quantitative methods for managing the capability of the processes for the product and service work are defined.
- **Goal 2: Baselines and Quantitative Models Are Available.** Capability baselines and quantitative predictive models are developed and made available for use in quantitatively managing the organization's environmental product and service work.
- **Goal 3: Organization Capability is quantified.** The capability of the organization's standard processes is understood in quantitative terms.

#### 2. Institutional Goals

- **Goal 1: Practices Are Institutionalized.** The practices for Environment capability and performance management are institutionalized.

### Practice to Goal Relationship table

Goal	Practice
Specific Goal 1	Specific Practice 1,2,3
Specific Goal 2	Specific Practice 4,5,6,7
Specific Goal 3	Specific Practice 8,9,10

Institutional Goal 1

Institutional Practice 1,2,3,4,5

## Practices

- **Specific Practice.**

1. **Maintain Quantitative Goals.**

This practice ensures that the managers responsible for the organization's environmental products and services have a quantitative understanding of the performance and quality they are expected to achieve.

### Sub practices

- Obtain an understanding of the organization's business goals for its environmental products and services.
- Identify the performance and quality attributes of the organization's environmental products and services that are most related to their business goals
- Define measures for the identified performance and quality attributes that best characterize their relationship to business goals and maintain them under change and version control.
- Analyze the relevant business goals to determine the quantitative performance and quality results required to achieve them.
- Identify gaps between the capability of the organization's environmental standard product and service processes and the performance and quality results required to achieve its business goals.
- Establish performance and quality goals for the organization's environmental products and services based on the performance and quality risks the organization is willing to take, and maintain them under change and version control.
- Review the performance and quality goals for the organization's environmental products and services on a periodic and event driven basis and revise them as needed.
- Communicate the performance and quality goals for the organization's environmental products and services to all whose work affects the achievement of these goals

### 2. Maintain Process Attribute Measures

This practice ensures that the measures that are collected, analyzed, and reported are an accurate quantitative representation of how the organization's environmental standard processes and process elements are performed.

#### Sub practices

- Analyze the organization's standard environmental product and service processes to select process elements that most affect the performance or quality results of its products and services.
- Identify the attributes of each selected process element that have the strongest affect on the performance or quality results of the organization's environmental products and services.
- Define measures of the identified attributes of each selected process element that best characterize how the process element affects the performance or quality results of the organization's environmental products and services.
- Determine how the execution of each environmental process element is best characterized using these measures
- Define how measures of the attributes of selected process elements should be captured, handled, stored, transformed statistically, and analyzed to ensure their accuracy, validity, and reliability.
- Periodically review the attributes and related measures of selected process elements and how they are captured, handled, stored, transformed statistically, and analyzed to determine if they should be redefined to improve their accuracy, validity, or reliability and revise the them when necessary.
- Maintain the definitions of measures for characterizing the performance of environmental process elements and their collection and handling procedures under change and version control.

### 3. Maintain Capability Analyses

Definitions of statistical and other quantitative techniques for evaluating the capability of organization's environmental product and service processes for achieving performance and quality goals are established and maintained.

#### Sub practices

- Define intermediate performance and quality outcomes that can be measured at the completion of the process elements that most affect them.

- Define statistical or other quantitative methods to be used for representing the capability of the organization's standard product and service processes or its process elements
- Evaluate the conditions surrounding the application of the selected statistical or other quantitative techniques for evaluating the capability of the organization's standard environmental product and service processes and process elements to ensure they are valid.
- Periodically reevaluate the appropriateness of the measures and statistical or other quantitative techniques used in managing the capability of the organization's standard product and service processes and revise them when necessary.
- Maintain the organizations defined measures and quantitative analysis procedures under version and change control.

#### 4. Collect Measures

This practice ensures that the measures from the organization's environmental product and service work are captured and available for analyzing process capability and for building and refining the capability baselines and models.

- Collect and store the organization's process attribute measures and measures of the performance and quality of its environmental products and services in the organizational measurement repository.
- Collect measures through manual or automated methods as the product and service work is performed.
- Verify the accuracy of the collected measures.
- Define the controls involved in storing, managing, accessing, analyzing, and archiving data.
- Periodically review the status of data collection, management, and storage to ensure it is performed according to defined procedures and controls

#### 5. Maintain Capability Baselines

This practice ensures that the people involved in the environmental product and service work have information they can use for estimating, evaluating, and managing their work and results.

##### Sub practices

- Define how capability baselines will be developed, represented, and revised.
- Develop capability baselines from the data collected from ongoing product and service work according to the defined procedures.
- Store capability baselines and maintain them under change and version control.

- Periodically revalidate capability baselines against data from continuing samples of product and service work and revise them as necessary.

### 6. Maintain Predictive Models

This practice ensures that the people involved in the organization's environmental product and service work have reliable quantitative models they can use to statistically predict future outcomes based on past data.

#### Sub practices

- Model the chain of process elements that have the most direct effect on the performance and quality of the organization's environmental products and services.
- Define statistical or other quantitative methods that characterize the relationship between the performance attributes of each relevant process element in a model and the intermediate performance or quality outcomes affected by that process element.
- Evaluate how measures of process attributes or intermediate performance and quality results from various process elements interact with each other to characterize the overall capability of the standard end-to-end product or service process or to predict final performance or quality results.
- Construct quantitative predictive models that predict performance or quality results for the organization's environmental products and services.
- Prepare guidebooks, training, and other relevant materials to help those performing or managing organization's environmental product and service work use the quantitative predictive models effectively.
- Reevaluate the process elements and measures included in each quantitative predictive model each time a significant change is made to the standard process, to the related products and services, or to their performance and quality goals.
- Revise the process elements or measures included in a quantitative predictive model and the associated guidebooks, training, and related materials as needed to ensure the model yields the most accurate predictions possible.

### 7. Provide Baselines and Predictive Models

This practice ensures that the people involved in the organization's environmental product and service work have data and information from the rest of the organization to assist them in planning, managing, and performing their work.

### Sub practices

- Provide access to the organization's capability baselines and quantitative predictive models to the roles that use them.
- Provide courses, guidebooks, and other support materials through media that make them easily accessible to those who need guidance in applying the capability baselines and quantitative predictive models.
- Provide experts who can advise or mentor those using the capability baselines and quantitative predictive models on proper techniques, applications, and interpretations.
- Develop methods for rapidly deploying updated capability baselines and quantitative predictive models to those using them, including techniques for transitioning between versions in use.
- Maintain updated versions of the capability baselines and quantitative predictive models and communicate release and transition schedules to those affected.
- Collect status information of the use of capability baselines and difficulties experienced in deploying or using them.

### 8. Analyze Baselines and Predictive Models

This practice ensures that objective quantitative information is used to understand the performance and quality results of the organization's environmental product and service work and to guide management decisions.

### Sub practices

- Monitor and analyze the distributions underpinning capability baselines and the outcomes predicted by predictive models.
- Evaluate changes in the distributions underpinning capability baselines or predictions from predictive models for trends in the organization's capability for meeting its performance and quality goals.
- Extrapolate current trends in capability baselines and predicted results to assess the organization's capability for meeting its organization's environmental product and service goals in the future.
- Analyze the organization's process attribute data to understand how the execution of its organization's environmental product and service work affects its capability baselines, quantitative predictions, and the performance and quality of its products and services.



- Evaluate capability baselines and process attribute data in the organization's measurement repository to identify issues that should be addressed in a proactive business process improvement activity

### 9. Perform Corrective Actions

This practice ensures that significant issues in the organization's performance and quality results are addressed.

#### Sub practices

- Identify trends in the organization's environmental product and service work that deviate significantly from the organization's historical capability baselines or predicted results.
- Evaluate process attribute data in the organization's measurement repository and other root cause information to identify potential assignable causes when trends in the organization's capability baselines or predictive models deviate significantly from performance and quality goals
- Plan and implement corrective actions to the organization's standard environmental product and service processes to address trends that significantly deviate from the organization's expected capability or organization's environmental product and service results.
- Evaluate the effectiveness of corrective actions by monitoring their effect on capability baselines and predicted organization's environmental product and service results.
- Capture lessons learned from implementing corrective actions.

### 10. Provide Baseline and Model Reports

This practice ensures that executive management and the rest of the organization have appropriate visibility into the performance and quality results the organization is currently achieving and will likely achieve in the future.

#### Sub practices

- Organize results from analyses of the organization's performance and quality results, capability baselines, quantitative predictive models, and process attribute data into presentations and reports that are presented periodically to executive management and other stakeholders.
- Provide access to these presentations and reports to all affected stakeholders, using appropriate access controls.

- Provide briefings, guidebooks, and other support materials to help executive management and other stakeholders use the information contained in the presentations and reports for understanding trends in organizational capabilities, for making decisions, and for directing actions.
- Provide experts who can advise or mentor those using the presentations and reports on proper interpretation and use of the information they contain.
- Update presentations and reports periodically or on an event driven basis and highlight changes in results or interpretations.
- Maintain presentations and reports under change and version control.

## 7.3 Environmental Management Product and Service Process Integration

### Purpose

Organization's environmental product and service Process Integration interweaves the work processes of the different disciplines and roles involved in the organization's environmental product and service offering to improve the efficiency and effectiveness of interdependent work.

### Goals

#### 1. Specific Goals

- **Goal 1: Interdependent Processes Are Integrated.** The processes of the disciplines involved in an organization's environmental product and service offering are integrated to improve the efficiency and effectiveness of interdependent work.
- **Goal 2: Integrated Processes Are Used.** Integrated organization's environmental product and service processes are used in planning, managing, and performing the work involved in an organization's environmental product and service offering.

#### 2. Institutional Goals

- **Goal 1: Practices Are Institutionalized.** The practices for Environment Common Asset Management are institutionalized.

### Practice to Goal Relationship table

Goal	Practice
Specific Goal 1	Specific Practice 1,2,3
Specific Goal 2	Specific Practice 4,5,6,7
Institutional Goal 1	Institutional Practice 1,2,3,4,5

### Practices

- **Specific Practice.**

- 1. Analyze Process Dependencies**

This practice determined the cohesion and coupling among the environmental processes to help decide which processes should be integrated

#### Sub practices

- Identify process workflows within the organization's standard environmental product and service processes that exhibit high interdependency among different functions or departments.
- Analyze process workflows with high interdependency and represent the dependencies in terms of roles involved, cause of the dependency, required handoffs, shared resources, and method of coordination.
- Identify opportunities to improve process efficiencies where dependencies are shared among different functions or departments in the product or service workflow.

- 2. Analyze Process Dependencies**

This practice ensures that the people who perform the environmental product and service work and other relevant stakeholders know how the work is to be performed using the integrated processes so that the benefits of the integrated processes are realized.

#### Sub practices

- Define process improvements that increase the effectiveness of executing interdependent work processes among functions or departments.
- Organize the defined process improvements into a more functionally integrated environmental product and service process
- Develop training, guidebooks, and other materials that assist all affected parties to understand their roles in functionally integrated environmental product and service processes.
- Provide experts who can advise or mentor those involved in managing or performing functionally integrated environmental product and service processes.
- Evaluate the use of functionally integrated environmental product and service processes to identify inefficiencies or opportunities for further improvement.

- Make improvements to functionally integrated environmental product and service processes and manage their release to affected parties.
- Maintain functionally integrated environmental product and service processes under change and version control.

### 3. Define Measures For Integrated Processes

This practice ensures that the quantitative information and data needed to effectively plan and manage the environmental product and service are designed based on the integrated processes

#### Sub practices

- Evaluate the measures used for managing environmental product and service work to determine how they need to be adjusted to measure functionally integrated processes.
- Revise measures as necessary and create new measures as needed to measure functionally integrated environmental product and service processes.
- Maintain measures of functionally integrated processes are under change and version control.
- Prepare all affected parties for using measures of functionally integrated environmental product and service processes.
- Integrate measures of functionally integrated environmental product and service processes into process performance analyses, capability baselines, and quantitative predictive models as appropriate.

### 4. Adjust Organizational Structures and Practices

This practice ensures that the organizational structures and practices appropriately support the use of the integrated processes

#### Sub practices

- Evaluate the performance of functionally integrated environmental product and service processes to identify conflicts or problems created by organizational structures, reporting relationships, or workforce practices
- Adjust organizational structures as needed to resolve conflicts in reporting relationships, decision structure, or lines of authority.
- Establish multifunctional management teams or steering committees where necessary to support the performance of functionally integrated environmental product and service work.

- Adjust the work environment or work resources as necessary to support functionally integrated environmental product and service work.
- Empower those performing functionally integrated environmental product and service work where necessary to enhance their effectiveness.
- Adjust workforce practices as needed to resolve conflicts between the objectives of a multifunctional assignment and performance objectives, compensation or reward incentives, promotional criteria, or career paths.
- Enhance competency descriptions where appropriate to incorporate ability to work effectively in multi-functional settings

### 5. Adjust Work Efforts

This practice ensures that the environmental product and service work activities are performed in a consistent manner, according to the defined integrated processes, so that relevant stakeholders can realize the benefits of the integrated processes

#### Sub practices

- Redesign standard environmental product and service processes where appropriate to incorporate functionally integrated processes.
- Adjust the procedures used in affected work units to integrate with functionally integrated work where necessary.
- Adjust work assignments and objectives where appropriate to support functionally integrated environmental product and service work.
- Incorporate the collection and use of measures defined for functionally integrated environmental product and service processes where appropriate.

### 6. Manage Using Integrated Processes

This practice ensures that the environmental product and service work performance and results are managed in a consistent manner, based on the defined integrated processes, so that the benefits of the integrated processes are realized

#### Sub practices

- Plan for the performance of environmental product and service work using functionally integrated product and service processes where appropriate.
- Manage functionally integrated environmental product and service work using the adjustments made to organizational and workforce practices.

- Quantitatively manage functionally integrated environmental product and service work using measures, capability baselines, and quantitative models that have been developed for functionally integrated environmental product and service processes

### 7. Perform Integrated Processes

This practice ensures that the process interactions among the individuals, work units, and workgroups involved in multifunctional environmental product and service work is smooth and the work is performed efficiently and effectively

#### Sub practices

- Define roles to incorporate functionally integrated environmental product and service processes where appropriate.
- Prepare and perform assignments using functionally integrated environmental product and service processes where appropriate.
- Adjust communication and coordination methods as necessary to support the performance of functionally integrated environmental product and service processes.
- Review the performance of functionally integrated environmental product and service work periodically to ensure that it is being performed effectively using functionally integrated environmental product and service processes.
- Provide advice and mentoring where necessary to support more effective performance of functionally integrated environmental product and service work.

## 7.4 Environmental Quantitative Product and Service Management

### Purpose

Quantitative Environmental product and service Management plans and manages the work involved in the environmental product and service so that the product or service achieves its quantitative performance and quality goals.

### Goals

#### 1. Specific Goals

- **Goal 1: Goals and Management Mechanisms Are Defined.** Quantitative performance and quality goals for the environmental product and service and the defined processes, plans, models, and methods needed to achieve these goals are defined.
- **Goal 2: Achievement of Goals Is Managed.** The environmental product and service work is statistically managed to achieve the defined quantitative goals

#### 2. Institutional Goals

- **Goal 1: Practices Are Institutionalized.** The practices for Environment Common Asset Management are institutionalized.

### Practice to Goal Relationship table

Goal	Practice
Specific Goal 1	Specific Practice 1,2,3,4
Specific Goal 2	Specific Practice 5,6,7,8
Institutional Goal 1	Institutional Practice 1,2,3,4,5



### Practices

- **Specific Practice.**

1. **Maintain Quantitative Goals.**

This practice ensures that the quantitative performance and quality goals for the environmental product or service are aligned with the capability of the work efforts involved in the work and that there is a common understanding of these goals

#### **Sub practices**

- Identify the performance and quality needs or requirements for the environmental product or service offering.
- Establish the performance and quality goals for environmental product or service offering from its performance and quality needs or requirements and the quantitative performance and quality goals for the organization's environmental products and services
- Periodically review the environmental performance and quality goals to ensure they align with organizational and customer expectations.
- Revise performance and quality goals for the environmental product or service as necessary.
- Maintain the performance and quality goals for the environmental product or service under change and version control.

2. **Maintain Capable Processes and Plans**

This practice ensures that the capability of the defined processes and plans are appropriately adjusted to achieve the quantitative performance and quality goals for the environmental product and service.

#### **Sub practices**

- Identify the process elements to be incorporated into the defined process for the environmental product or service work.
- Identify in the process elements and transactions among process elements will affect the performance and quality outcomes of the environmental product or service.
- Select methods for performing the various process elements that combine to achieve the performance and quality goals defined for the environmental product or service.
- Adjust the measures of process attributes or intermediate performance and quality outcomes of a process element to meet the needs of planning and quantitatively managing the defined process.

- Develop a plan using the defined process for the environmental product and service offering that achieves its defined performance and quality goals.
- Resolve conflicts and inconsistencies when a defined process or plan for the environmental product and service offering cannot be constructed to achieve its defined performance or quality goals
- Coordinate the defined process, performance and quality goals, and plan for the product or service offering with all affected parties.
- Maintain the plan and defined process for the product or service offering under change and version control

### 3. Allocate Intermediate Goals

This practice ensures that the performance and quality contributions of all the process elements involved in the environmental product and service work are sufficient to achieve the overall environmental product or service goals.

#### Sub practices

- Identify process elements for which intermediate performance or quality goals should be defined.
- Allocate intermediate performance or quality goals to each identified process element.
- Evaluate the allocated set of intermediate performance and quality goals to ensure that in the aggregate they achieve the performance and quality goals of the product or service offering.
- Resolve conflicts among intermediate performance and quality goals by involving all affected parties in reaching a consensus that reduces the risk of attaining the performance and quality goals of the product or service offering.
- Incorporate the intermediate performance and quality goals into the plan for the environmental product and service offering, and maintain them under change and version control.
- Evaluate the intermediate performance and quality goals periodically to determine if they remain sufficient contributors to achieving the final performance and quality goals, and take corrective action when necessary.

### 4. Calibrate Quantitative Models and Methods

This practice ensures that the quantitative predictive models and other quantitative methods are adjusted to reflect the specific characteristics of the environmental product and service offering and

the capabilities of defined environmental product or service process and its component process elements

### Sub practices

- Evaluate historical data to identify conditions that affect the predictive capabilities of quantitative models or effectiveness of other quantitative methods for managing the environmental product or service offering.
- Calibrate the quantitative predictive models and other quantitative management methods to improve their usefulness and predictive capability under the conditions affecting the environmental product or service offering or its defined process.
- Evaluate the calibration of quantitative predictive models and other quantitative management methods periodically to identify needed recalibrations based on model use and effectiveness.
- Recalibrate quantitative predictive models and other quantitative management methods as needed and integrate the revised models into regular use as appropriate.
- Capture information regarding the conditions causing the need for recalibration, the actual adjustments, and the improved results from using the recalibrated models.
- Maintain the calibrations to quantitative predictive models and other quantitative management methods under change and version control.

### 5. Monitor Work Effort Results

This practice ensures that the managers responsible for the overall performance and quality results of the environmental product and service have the information from the work efforts that they need to predict whether the quantitative performance and quality goals will be achieved.

### Sub practices

- Collect data from the component work efforts of the environmental product and service offering for use in quantitatively managing achievement of the performance and quality goals.
- Verify the accuracy of the data and enter it into capability analyses, quantitative predictive models, or other quantitative management techniques as appropriate.
- Present the output of capability analyses, quantitative predictive models, or other quantitative management techniques in a form that is appropriate for each use to which such analyses will be put.

- Combine the outputs of the capability analyses, quantitative predictive models, or other quantitative management techniques into an integrated picture of progress and expected results for the product or service offering
- Involve appropriate parties in interpreting the output of capability analyses, quantitative predictive models, or other quantitative management techniques to establish a common understanding of the results.
- Maintain the output of capability analyses, quantitative predictive models, or other quantitative management techniques under change and version control.

### 6. Analyze Processes and Plans

This practice ensures that the capability of the defined processes and plans are continually monitored to identify risks to achieving the performance and quality goals of the environmental product and service.

#### Sub practices

- Review the intermediate performance and quality results of the environmental product or service work on a periodic and event driven basis to maintain awareness of actual progress toward achieving the performance and quality goals for the environmental product or service offering.
- Compare actual progress and results against plans and commitments for the environmental product or service work and identify significant deviations from expected progress or results.
- Evaluate the output of quantitative predictive models to predict the likelihood of achieving the final performance and quality goals from the intermediate progress and quality results.
- Evaluate the results of capability analyses from the ongoing environmental product and service work to determine whether the defined process elements are capable of achieving their allocated performance and quality goals.
- Use statistical or other quantitative methods to identify significant deviations from the expected results of predictive models or capability analyses.
- Combine the actual progress versus plans, predicted performance and quality outcomes, and capability analyses to establish the level of risk in achieving the intermediate and final performance and quality goals of the product or service offering

### 7. Perform Capability Corrective Actions

This practice ensures that, based on knowledge gained in performing the work, adjustments are made so that the confidence of achieving the quantitative performance and quality goals for the environmental product and service continually increases.

#### Sub practices

- Identify process elements whose capability or predicted performance and quality outcomes present unacceptable risk in achieving the allocated or overall performance and quality goals for the product or service offering.
- Evaluate the capability of alternative methods for performing process elements whose current capability is not sufficient to achieve the allocated or overall performance or quality goals.
- Identify potential changes to the defined process or its component process elements that would significantly reduce the risk of achieving the performance and quality goals of the product or service offering.
- Evaluate potential changes to the defined process or its process components using quantitative predictive models to determine their predicted results significantly reduce the risk of achieving the performance and quality goals of the product or service offering.
- Plan and implement corrective actions to the defined process or its component process elements that would significantly reduce the risk of achieving the performance and quality goals of the product or service offering.
- Evaluate the effectiveness of corrective actions by monitoring their capability for achieving allocated and overall performance and quality goals.

### 8. Record Goal Achievement Information

This practice ensures that the people involved and affected by the environmental product and service work and others in the organization who can use the information in their quantitative management activities have access to the information.

#### Sub practices

- Collect the data and results from the capability analyses, predictive models, and other quantitative methods and store them for use in managing the work for the environmental product and service offering.
- Collect and store the information and lessons learned from managing the work and corrective actions for the environmental product and service offering.

- Maintain the data, analytic results, lessons learned, and other information from managing the work for the environmental product and service offering under change and version control.
- Submit data, analytic results, lessons learned, and other information from managing the work for the environmental product and service offering to the organization's measurement repository.

## 7.5 Environmental Quantitative Process Management

### Purpose

Quantitative Process Management statistically manages the performance of a work effort that performs work for developing, preparing, deploying, operating, or supporting the environmental product and service so that the performance and quality goals assigned to that work effort are achieved.

### Goals

#### 1. Specific Goals

- **Goal 1: Work Effort Is Quantitatively Planned.** A work effort is planned to achieve its quantitative goals.
- **Goal 2: Process Variation Is Statistically Managed.** Variation in the performance of the work processes for a work effort is understood and managed to support achieving its quantitative goals.
- **Goal 3: Work Effort Is Statistically Managed.** A work effort is statistically managed to achieve its quantitative goals.

#### 2. Institutional Goals

- **Goal 1: Practices Are Institutionalized.** The practices for Environment Qualitative Process Management are institutionalized.

### Practice to Goal Relationship table

Goal	Practice
Specific Goal 1	Specific Practice 1,2,3
Specific Goal 2	Specific Practice 4,5,6
Specific Goal 3	Specific Practice 7,8,9,10
Institutional Goal 1	Institutional Practice 7,8,9,10

### Practices

- **Specific Practice.**

- 1. Incorporate Allocated Goals**

This practice ensures that the quantitative performance and quality goals for a work effort are consistent with the overall goals of the environmental product and service offering and with the capability of the work effort.

#### Sub practices

- Review the allocated performance and quality goals for the work effort of a work unit or work group.
- Determine that the allocated performance and quality goals are within the capability of the process elements performed by the work unit or work group and resolve any inconsistencies.
- Document the allocated performance and quality goals as work unit requirements
- Adjust work unit plans and commitments to ensure the inclusion of work efforts that designed to achieve the allocated performance and quality goals.
- Organize assignments and work methods to achieve the allocated performance and quality goals.
- Review the allocated performance and quality goals periodically to ensure they are valid objectives in achieving the overall performance and quality goals of the product or service offering, and revise them as necessary.
- Maintain the allocated performance and quality goals under change and version control.

- 2. Maintain Definitions of Measures**

This practice ensures that the quantitative information and data needed to understand and manage the work effort's process performance are defined.

#### Sub practices

- Identify attributes of the process elements involved in a work unit's work effort that are most likely to affect each process element's capability for achieving the allocated performance and quality goals.
- Define measures of the identified attributes that can be used to understand and control variation in the performance of a work efforts conducted by a work unit.
- Define additional measures best suited to evaluate progress toward achieving the allocated performance and quality goals as necessary



- Incorporate defined measures of process attributes and work efforts into the work unit's planning parameters and monitoring activities as appropriate.
- Review the defined measures of process attributes and work efforts periodically to ensure they continue to provide insight into process variation and the work unit's work efforts, and revise them as necessary.
- Maintain defined measures of the process attributes and work efforts of a work unit under change and version control.

### 3. Determine Quantitative and Analytic Techniques

This practice ensures that the techniques needed to effectively analyze the work effort's process performance and variations are defined and available to the people involved in the environmental product and service work.

#### Sub practices

- Define the quantitative and other analytic techniques to be used in understanding and controlling process variation and the work unit or work group's achievement of the allocated performance and quality goals.
- Develop training and other materials to support the work unit's use of quantitative and other analytic techniques.
- Provide automated support where possible for performing analyses of the work unit's performance of their work and achievement of their allocated performance and quality goals.
- Integrate the defined quantitative and other analytic techniques into the work unit's plans and work efforts and maintain them under change and version control.

### 4. Analyze Process Variation

This practice determines the primary potential contributors to process variation so that steps can be taken to monitor and control them.

#### Sub practices

- Collect and store data regarding process attributes from performance of the environmental product and service work effort.
- Plot process attribute data from a work unit's work efforts to understand the performance characteristics of the process elements such as their central tendency, variation, and shape of their distributions.
- Compare the results on process attribute data to their historical trends or baselines to identify unexpected trends.

- Use quantitative and other analytic techniques to evaluate factors that cause variation in the performance of process elements.
- Sources of variation should be compared statistically to determine which have the most significant impact on the measures of process attributes.
- Significant sources of variation are recorded for further investigation.

### 5. Investigate Assignable Causes

This practice determines if the exceptional variation in the process characteristics can be attributed to identifiable causes, and assesses the nature of these causes

#### Sub practices

- Evaluate significant sources of variation in performing the process elements to understand the nature of the underlying assignable causes.
- Determine whether the assignable causes are transient or persistent
- Re-evaluate assignable causes of process variation periodically to determine if their effects on process attributes remain constant, or whether changes need to be made in way these causes are managed.
- Record information on assignable causes and submit it to the organizational measurement repository.

### 6. Manage Assignable Causes

This practice ensures that, where possible, the circumstances that caused the identified exceptional variation do not recur.

#### Sub practices

- Plan corrective actions to address transient causes of variation in performing the work unit's product or service work.
- Implement corrective actions according to the plan and monitor the performance of the work unit's environmental product or service work to ensure transient causes has been eliminated or controlled.
- Design and implement the adjustments needed in the quantitative predictive models, capability baselines, and other quantitative management techniques to account for the effects of persistent assignable causes.
- Implement the adjusted models, baselines, and other techniques in quantitatively planning and managing the work unit's environmental product and service work.

- Monitor the results of adjusted models baselines, and other techniques to ensure they continue to accurately account for the effects of persistent causes of process variation, and revise the models, baselines, and techniques when necessary.
- Record information on the results of corrective actions and submit it to the organizational measurement repository.

### 7. Monitor Work Effort Results Quantitatively

This practice determines if the results of the environmental product and service work satisfy their allocated performance and quality goals and determines if corrective actions are needed.

#### Sub practices

- Collect the performance and quality data that results from performing the work unit's environmental product or service work on a continuing basis.
- Develop distributions of performance and quality results and compare them to the allocated performance and quality goals allocated to the sub processes performed by the work unit.
- Identify significant deviations between the actual performance and quality results and the capability required to achieve the allocated performance and quality goals.
- Use quantitative predictive models to determine if the deviations from the allocated performance or quality goals will significantly increase the risk of achieving the overall performance or quality goals of the product or service offering.
- Identify and communicate the need to take corrective action when the results of the environmental product or service work place achievement of the allocated or overall performance and quality goals at risk.

### 8. Identify Assignable Causes of Capability Issues

This practice identifies assignable causes of deviations between the results of the environmental product and service work and the allocated performance and quality goals in order to define the corrective actions needed.

#### Sub practices

- Review the assignable causes of variation in the performance of the environmental product and service work to determine if they provide insights or explanations for deviations between the results of the environmental product and service work and the allocated performance and quality goals.
- Compare the results of the environmental product and service work to relevant capability baselines to seek potential explanations for deviations from the expected results.

- Investigate other factors that may cause the capability demonstrated by the performance of the environmental product and service work to fall short of that needed to achieve the allocated performance and quality goals.
- Determine whether the environmental product and service work is being performed under conditions different from those from which the organization's capability baselines for the relevant process elements were computed, and whether new capability baselines and allocated performance and quality goals should be developed.

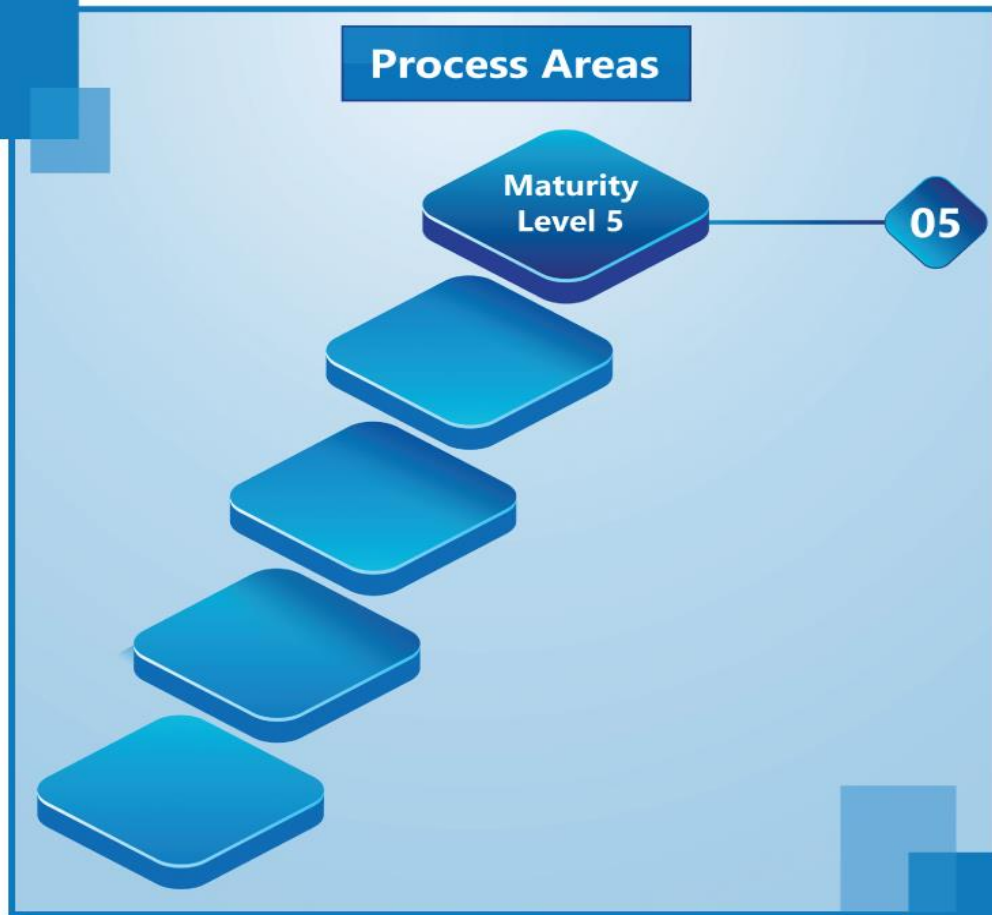
### 9. Address Deviations from Expected Results

This practice ensures that appropriate adjustments are made when it is determined that the work effort is not achieving the expected results with respect to their allocated performance and quality goals.

#### Sub practices

- Collect the data, analyses, and results from the analyzing and managing sources of variation in process attributes and the achievement of allocated performance and quality goals.
- Maintain the data, analytic results, lessons learned, and other information from managing the product or service work under change and version control.
- Submit data, analytic results, lessons learned, and other information from managing the environmental product or service work to the organization's measurement repository.

## Process Areas: Maturity Level 5



The following section describes the process areas that belong to maturity level 3: Holistic optimized of ESMM.

## 8.1 Environmental Improvement Planning

### Purpose

Organizational Improvement Planning establishes the organization's environmental quantitative improvement goals (based on the organization's environmental business issues, goals, and strategies), establishes the infrastructure for systematically pursuing improvements, and defines the strategy for achieving the goals.

### Goals

#### 1. Specific Goals

- **Goal 1: Organizational environmental Systems and Improvement Strategies Are Aligned.** The organizational infrastructure and management systems are aligned to support the organization's environmental strategies for continuous and measurable improvement of its performance and quality.
- **Goal 2: Improvement Needs Are Defined.** The organization's environmental improvement goals are defined in quantitative terms.
- **Goal 3: Improvement Work Is Aligned with Objectives.** The organization's improvement activities and results are kept consistent with the organization's environmental improvement strategies and quantitative improvement goals.

#### 2. Institutional Goals

- **Goal 1: Practices Are Institutionalized.** The practices for Environmental Improvement Planning are institutionalized.

### Practice to Goal Relationship table

Goal	Practice
Specific Goal 1	Specific Practice 1,2,3
Specific Goal 2	Specific Practice 4,5,6
Specific Goal 3	Specific Practice 7,8,9,10,11,12

Institutional Goal 1

Institutional Practice 7,8,9,10

## Practices

- **Specific Practice.**

1. **Maintain Descriptions of environmental Issues**

This practice ensures that there is a clear and agreed understanding of where the environmental improvement efforts should be focused.

### Sub practices

- Obtain and review the organization's environmental mission, environmental strategy, long-term environmental goals, and related sources of environmental direction and guidance.
- Identify and document the environmental problems, challenges, and issues that inhibit achievement of the organization's environmental goals.
- Estimate the financial or other benefits that can be achieved through improvements and compare these estimates to the estimates of the costs and other impacts of the improvement activities.
- Review the description of the goal-related environmental problems, challenges, and issues with relevant stakeholders and obtain their agreement.
- Revise the description of the goal-related environmental problems, challenges, and issues as necessary to reflect changing business conditions or goals.

2. **Adjust Management Systems**

This practice ensures that the organization's environmental approach to improvement is carefully planned and implemented, and not just a haphazard approach to improvement

### Sub practices

- Establish appropriate role descriptions and performance goals for managers and staff whose primary role includes the coordination and deployment of improvement activities.
- Adjust the performance planning and review process for the managers and staff whose primary role includes the coordination and deployment of improvement activities.
- Adjust the performance planning and review process for the managers and staff whose primary role is performing environmental product and service work to include an appropriate emphasis on improvement activities.

- Adjust the performance feedback and review process to ensure appropriate corrective actions are performed for those whose performance is unsatisfactory in supporting and implementing improvements in their own work or in the units they manage.
- Adjust the merit compensation and incentive awards processes, as appropriate, to include an appropriate emphasis on both business performance and participation and accomplishments in improving the organization's performance and results.
- Adjust the criteria for selecting among candidates for assignments or promotions to include an appropriate emphasis on both accomplishments in improving the organization's performance and results and accomplishments in business performance.

### 3. Maintain Improvement Goals

This practice ensures that the environmental managers and staff have a shared quantitative understanding of the organization's environmental improvement goals.

#### Sub practices

- Obtain an understanding of the organization's environmental goals.
- Analyze the relevant business goals to determine the quantitative performance and quality results needed to support them.
- Characterize the capability of the organization's environmental standard processes in terms of the measured performance and quality attributes of its environmental products and services
- Establish and maintain measures that provide near-term and long-term criteria for evaluating the success of the improvement activities against the business goals.
- Specify the organization's environmental improvement goals and their priorities.
- Review the organization's improvement goals with relevant stakeholders and obtain their agreement.
- Place the organization's environmental improvement goals under version control.
- Communicate the organization's environmental improvement goals across the organization.
- Revise the organization's environmental improvement goals as needed

### 4. Analyze Measures to Identify Improvements

This practice ensures that objective, quantitative information is used to compare and understand how best to expend the improvement resources.



### Sub practices

- Review the organization's environmental capability and performance measures against the organization's improvement goals.
- Identify improvements that could make significant contributions toward achieving the organization's environmental improvement goals.
- Estimate the benefits, costs, and other impacts of each selected improvement.
- Prioritize the improvements.
- Document the prioritized improvements along with the estimated benefits, costs, and other impacts
- Review the descriptions of the improvements with affected stakeholders and obtain their agreement.
- Place the descriptions of the improvements under version control.
- Revise the descriptions of the improvements as necessary

### 5. Gather Internal Inputs on Improvements

This practice ensures that the knowledge of the people doing the work and most affected by the improvements is used to determine which changes would be of benefit.

### Sub practices

- Determine candidate improvements that would improve performance, quality, and employee satisfaction.
- Prioritize the candidate improvements.
- Estimate the benefits, costs, and other impacts of each candidate improvement.
- Document the prioritized candidate improvements along with the estimates benefits, costs, and other impacts.
- Review and obtain agreement on the candidate improvements that will be implemented with relevant stakeholders.
- Place the descriptions of the candidate improvements under version control.
- Revise the list of candidate improvements as necessary

### 6. Obtain External Inputs on Improvements

This practice ensures that the organization's environmental improvement program maintains an appropriate focus on the external business environment.

### Sub practices

- Periodically solicit inputs from the organization's customers and other important external stakeholders to identify changes that would improve satisfaction with the organization's products and services.
- Regularly review the organization's environment and other external factors that are directly related to the organization's improvement goals and strategies.
- Perform quantitative process and performance benchmarks, as appropriate, to identify candidate improvements.
- Identify candidate improvements that would improve customer satisfaction or improve the organization's business position.
- Estimate the benefits, costs, and other impacts of each candidate improvement.
- Prioritize the improvements.
- Document the prioritized candidate improvements along with the estimates benefits, costs, and other impacts.
- Review the descriptions of the candidate improvements with affected stakeholders and obtain their agreement.
- Place the descriptions of the candidate improvements under version control.
- Revise the descriptions of the candidate improvements as necessary.

### 7. Maintain Organizational Improvement Plans

This practice ensures that the improvement efforts are aligned with the organization's environmental improvement strategies and goals and that the plans provide a complete and appropriate course of action.

### Sub practices

- Maintain an awareness of the organization's business goals, business strategies, operating plans, and improvement goals.
- Regularly review the list of candidate improvements that have been developed from internal and external inputs.
- Select the improvements that will be implemented and deployed.
- Define and document the plans for implementing and deploying the selected improvements.
- Define the measures that will be used for the organizational environmental improvement program and incorporate into the organizational improvement plans.

- Conduct work product inspections of the descriptions of the organizational improvement plans
- Review the organizational environmental improvement plans with affected stakeholders and obtain their agreement.
- Place the organizational improvement plans under version control.
- Revise the organizational improvement plans as necessary

### 8. Monitor Improvement Activities and Results

This practice ensures that the organization's executives and others responsible for the organization's improvement activities have the information they need to manage the improvement efforts so that the improvement goals will be achieved.

#### Sub practices

- Periodically review the status of the organization's improvement activities against the organizational improvement plans.
- Periodically collect and analyze measures of the organization's improvement activities and results to provide insights into progress and benefits.
- Aggregate the status, measures, and other information regarding the organization's improvement activities to provide a summary of the current status and issues.
- Periodically review the status, issues, measures, other results, outlook, and risks for the organization's environmental improvement activities with relevant stakeholders, including executive management.

### 9. Compare Improvement Measures to Goals

This practice ensures that the organization's executives and others responsible for the organization's environmental improvement activities have a statistical basis for determining whether the improvement goals are likely to be achieved and whether corrective actions are needed.

#### Sub practices

- Collect and analyze measures of the actual and projected results of the organization's improvement activities.
- Compare the actual and projected results of the organization's improvement activities against the applicable organizational goals.
- Periodically review the actual and projected results of the organization's improvement activities with relevant stakeholders, including executive management.
- Identify corrective actions, as needed, to address issues in the improvement activities.

### 10. Perform Corrective Actions on Improvement Work

This practice ensures that appropriate adjustments are made, when needed, to keep the improvement approach consistent with the overall strategy and to make sure the efforts and results will achieve the organization's quantitative improvement goals.

#### Sub practices

- Review proposed corrective actions with relevant stakeholders and obtain their agreement.
- Perform or assign the identified corrective actions, and track to closure.
- Document lessons learned from the issues and the corrective actions.

### 11. Incorporate Improvement Lessons Learned

This practice ensures that the organization learns from its improvement experiences and these lessons are applied.

#### Sub practices

- Capture and document lessons learned from all the organization's improvement activities.
- Review and organize the lessons learned for use in future improvement activities.
- Incorporate the lessons learned into the planning and management of the organization's improvement efforts and into the appropriate improvement artifacts.
- Disseminate the lessons learned to the appropriate improvement efforts and to other relevant stakeholders.
- Revise the lessons learned as necessary.

### 12. Communicate Improvement Information

This practice ensures that the people in the organization have an appropriate understanding of the organization's environmental improvement activities and results to help them take advantage of the improvements in developing, maintaining, delivering, managing, and improving the organization's products and services.

#### Sub practices

- Document records on the initiation, status, and implementation of the organization's improvement activities.
- Provide the organization's managers and staff with appropriate access to the descriptions of the organization's environmental improvement goals and strategies.
- Provide periodic executive reinforcement and updates on the improvement goals and strategies to the managers and staff in the organization.

- Communicate the status and results of improvement activities to the managers and staff in the organization on a periodic and event driven basis.
- Regularly publicize a summary of the major improvement activities and significant innovative improvements and results

## 8.2 Environmental Performance Alignment

### Purpose

Environmental Performance Alignment maintains proper alignment of the environmental strategies and the organization's quantitative environmental goals up and down the organizational levels and across the organization's environmental product and service offerings

### Goals

#### 1. Specific Goals

- **Goal 1: Environmental Strategy and Goals Are Aligned.** The plans, commitments and quantitative goals for the environmental product and service offerings, units, workgroups, and individuals are aligned with the organization's environmental strategies and quantitative business goals.
- **Goal 2: Environmental Performance and Results Are Aligned.** The performance and results of the individuals, workgroups, units, environmental product and service offerings, and organization are adjusted to address the organization's environmental strategies and achieve the organization's quantitative business goals.

#### 2. Institutional Goals

- **Goal 1: Practices Are Institutionalized.** The practices for Environmental Performance Alignment are institutionalized.

### Practice to Goal Relationship table

Goal	Practice
Specific Goal 1	Specific Practice 1,2,3
Specific Goal 2	Specific Practice 4,5,6,7,8
Institutional Goal 1	Institutional Practice 7,8,9,10

### Practices

- **Specific Practice.**

- 1. Allocate environmental Goals and Responsibilities to Units**

This practice ensures that the units and work efforts understand what they need to do so that the organization's environmental goals are achieved.

#### Sub practices

- Review the responsibilities, plans, and commitments of the environmental product and service offerings and units against the organization's environmental strategies and goals to determine how they can contribute to them.
- Allocate the organization's environmental goals to the organization's environmental product and service offerings and units.
- Review the environmental business goals with the responsible managers and obtain their agreement.
- Specify measures for judging the satisfaction of the environmental product and service offerings and units in achieving their business goals.
- Adjust the organization's environmental goals and strategies to reflect negotiations with the environmental product and service offering and unit managers.
- Document and archive the results and other relevant records of the allocation of the organization's environmental goals to the organization's environmental product and service offerings and units.
- Revise the allocation of the organization's environmental goals to the organization's environmental product and service offerings and units as needed.

- 2. Adjust Unit Plans for Overall Results**

This practice ensures that the performance of the units make appropriate contributions to the organization's environmental goals and strategies and do not result in sub optimized performance for the organization.

#### Sub practices

- Allocate the organization's environmental goals to each environmental product and service offering and unit at each level of management.

- Incorporate process improvement activities in the plans for each environmental product and service offering and unit at each level of management to address the allocated business goals.
- Identify conflicts between the allocated environmental goals with the work plans and commitments for each environmental product and service offering and unit at each level of management.
- Perform corrective action to resolve identified conflicts and track to closure.
- Specify measures for monitoring the performance and results of the environmental product and service offerings and units in achieving the allocated environmental goals

### 3. Align Work Assignments within Units

This practice ensures that work is assigned to workgroups and individuals such that their efforts will make an appropriate contribution to achieving the work unit's environmental goals.

#### Sub practices

- Regularly review the work unit's environmental goals against the work plans, commitments, and activities of the workgroups and individuals.
- Regularly analyze the performance data of the workgroups and individuals to identify a mismatch with the work unit's environmental goals.
- Regularly adjust the work plans, processes, commitments and activities of the workgroups and individuals to align with the work unit's business goals.
- Specify measures for monitoring the environmental performance and results of the workgroups and individuals in supporting the achievement of the work unit's environmental goals.
- Coordinate improvement activities among the workgroups and individuals, as appropriate
- Identify performance conflicts among the work plans, processes, commitments and activities of the workgroups and individuals.
- Perform corrective action to resolve identified conflicts and track to closure

### 4. Monitor Local Alignment and Results

This practice ensures that objective and quantitative information is used to determine if there are any issues in the performance and results of individuals, work units, workgroups, units, and environmental product and service offerings relative to supporting the organization's environmental goals and strategies.



### Sub practices

- Periodically review the work plans, activities, and status of the individuals, work units, workgroups, units, and environmental product and service offerings.
- Periodically collect and analyze measures of the performance and results of the individuals, work units, workgroups, units, and environmental product and service offerings relative to the environmental goals allocated to the units.
- Analyze performance and results measures to identify performance misalignment among individuals, workgroups, or other entities composing the unit.
- Periodically collect and analyze measures of the performance and results of the individuals, work units, workgroups, units, and environmental product and service offerings relative to the environmental goals allocated to the units.
- Identify corrective actions, as needed, to address performance alignment issues.

### 5. Correct Local Alignment Deviations

This practice ensures that adjustments are made to the plans, commitments, and activities of the individuals, workgroups, units, and environmental product and service offerings so that they satisfy their environmental goals.

#### Sub practices

- Review proposed corrective actions with relevant stakeholders and obtain their agreement.
- Perform or assign the identified corrective actions, and track to closure

### 6. Monitor environmental Alignment and Results

This practice ensures that objective and quantitative information is used to determine if the performance and results of individuals, work units, workgroups, units, and environmental product and service offerings, in aggregate, are achieving the organization's environmental goals.

#### Sub practices

- Periodically review the performance of the units and environmental product and service offerings against the environmental improvement strategies.
- Periodically collect the measures of the performance and results of the units and environmental product and service offerings and analyze the measures relative to their environmental goals and the organization's environmental goals.
- Analyze performance and results measures to identify performance misalignment among the environmental product and service offerings and units

- Identify corrective actions, as needed, to address performance alignment issues across units and performance alignment issues with the organization's environmental goals.

### 7. Correct environmental Alignment Deviations

This practice ensures that adjustments are made, as appropriate, so that the organization's environmental goals are achieved

#### Sub practices

- Review proposed corrective actions for performance misalignment with relevant stakeholders and obtain their agreement
- Perform or assign the identified corrective actions, and track to closure.

### 8. Address Organizational Alignment Deviation Causes

This practice ensures that, where possible, actions are taken to address the root causes of misaligned performance so that future misalignment is less likely to occur.

#### Sub practices

- Analyze the misaligned environmental performance to determine its likely causes.
- Document the likely causes of each instance of misaligned performance so that corrective actions can be performed.
- Determine and document preventive actions that are expected to prevent the future occurrence of the identified misaligned performance.
- Review the proposed preventive actions with relevant stakeholders, and obtain their agreement.
- Perform the agreed preventive actions and track to completion.
- Document as risks any significant recurring problems that are not addressed with preventive actions.
- Communicate the results of the root cause analysis to relevant stakeholders for use in managing and improving performance-related work activities

## 8.3 Environmental Defect and Problem Prevention

### Purpose

Environmental Defect and Problem Prevention identifies and addresses the causes of defects and other problems that are the primary obstacles to achieving a work unit's or workgroup's plans and quantitative improvement goals so these defects and problems do not recur.

### Goals

#### 1. Specific Goals

- **Goal 1: Root Causes Are Determined** Root causes of defects and other problems that are the primary obstacles to achieving the plans and quantitative improvement goals of a work unit or workgroup are systematically determined.
- **Goal 2: Root Causes Are Addressed** Root causes of defects and other problems that are the primary obstacles to achieving the plans and quantitative improvement goals of a work unit or workgroup are systematically addressed to prevent them from recurring.
- **Goal 3: Prevention Information Is Disseminated** Information from the work unit's or workgroup's defect and problem prevention activities of a work unit or workgroup that is useful in other improvement activities is disseminated to relevant stakeholders.

#### 2. Institutional Goals

- **Goal 1: Practices Are Institutionalized.** The practices for Environmental qualitative process management are institutionalized.

### Practice to Goal Relationship table

Goal	Practice
Specific Goal 1	Specific Practice 1,2,3,4
Specific Goal 2	Specific Practice 5,6,7,8
Specific Goal 3	Specific Practice 9,10

Institutional Goal 1

Institutional Practice 1,2,3,4,5

## Practices

- **Specific Practice.**

1. **Select Defects and Problems for Analysis**

This practice selects the defects and other problems for further analysis to determine if preventive actions can be performed.

### Sub practices

- Obtain relevant information on defects and problems that have occurred.
- Select the defects and problems that will be analyzed to determine their root causes.
- Describe and document the characteristics of the selected defects and problems.
- Review the description of the selected defects and problems with those who are knowledgeable and obtain their agreement

2. **Identify Similar Defects and Problems**

This practice determines if there are defects and problems that are similar enough that they can be grouped and addressed as groups.

### Sub practices

- Review the defects and problems that are selected for causal analysis against the work activities.
- Identify types of defects and problems that are similar to the defects and problems selected for causal analysis.
- Revise the list of defects and problems selected for causal analysis to include the identified similar types of defects and problems

3. **Identify Root Causes**

This practice determines the root causes that need to be addressed if the defects and problems are to be prevented from recurring.

### Sub practices

- Include the people in the causal analysis who perform or are affected by the work that is related to the defect or problem being analyzed.
- Analyze the selected defects and problems to determine their root causes.

- Group the selected defects and problems into categories based on the determined root causes.
- Document the causal analysis activities that were performed and the results.
- Define and document proposed actions to prevent the future occurrence of similar defects and problems
- Review the proposed actions with affected stakeholders and obtain their agreement.

#### 4. Identify environmental Process Weaknesses

This practice identifies fixes to the process so that undetected defects and problems of the types previously encountered are caught and addressed closer to the point they are introduced.

##### Sub practices

- Review the work process flow and tasks against the defect or problem and its root cause to identify process steps that should have caught the defect or problem.
- Document the analysis and results of determining the process weaknesses that allowed the defect or problem to remain undetected.
- Define and document proposed actions to address the process weaknesses that allowed the defect or problem to remain undetected.
- Review the proposed actions with affected stakeholders and obtain their agreement

#### 5. Perform Root Cause Corrective Actions

This practice ensures that appropriate actions are performed so that the selected defects and problems are unlikely to recur, and are more likely to be identified and eliminated closer to the point they are introduced if they do occur.

##### Sub practices

- Analyze the preventive action proposals from causal analysis and determine their priorities.
- Analyze the action proposals for addressing process weaknesses and determine their priorities.
- Select the action proposals that will be addressed
- Assign responsibility for implementing each selected action proposals.
- Document action items resulting from the preventive action proposals.
- Implement the action items and track to closure.

### 6. Coordinate Defect and Problem Prevention Activities

This practice ensures that the priorities and the planned and implemented actions appropriately address a work unit's or workgroup's primary issues and obstacles to achieving its plans and goals.

#### Sub practices

- Review the output from the causal analysis meetings, including the action proposals and action items.
- Review actions taken by the other teams in the organization to assess whether these actions can be applied to the work effort's activities and processes.
- Periodically analyze the action proposals, action items, and their implementation, and adjust priorities and assignments as appropriate.
- Reassign action proposals to teams at another level in the organization, as appropriate
- Document the rationale for decisions and provide the decisions and rationale to affected stakeholders.
- Review and verify completed action proposals before they are closed.
- Ensure that significant efforts and successes in preventing defects and problems are recognized.

### 7. Inform Workgroups of Preventive Actions to Perform

This practice ensures that the identified preventive actions and process changes are implemented.

#### Sub practices

- Periodically prepare and distribute a summary of the major defect and problem categories to the people within the work unit or workgroup.
- Periodically prepare and distribute a list of defects and problems discovered, causal analyses performed, and resulting action proposals to the people within the work unit or workgroup.
- Provide guidance to the people performing the work tasks on actions to take to prevent defects and problems.

### 8. Measure Effects of Preventive Actions

This practice ensures that quantitative information is used to understand the benefits of the defect and problem prevention activities and their contribution to the work unit's and workgroup's goals.

#### Sub practices

- Periodically measure and analyze the change in the process performance of the work unit or workgroup, as appropriate.

- Periodically measure and analyze the change in the process capability of the work unit or workgroup, as appropriate.
- Identify and document issues uncovered by measuring the process performance or process capability of the work unit or workgroup.
- Review the identified process performance or process capability issues with the manager responsible for the work unit or workgroup and with other relevant stakeholders.

### 9. Document Prevention Data and Results

This practice ensures that the defect and problem prevention information is available for reference in future activities

#### Sub practices

- Record the defect and problem prevention information, measures, analyses, and results.
- Place the defect and problem prevention records under version control.
- Revise the defect and problem prevention records as necessary

### 10. Communicate Prevention Information

This practice ensures that the defect and problem prevention analysis, actions, and results from the work unit and workgroup are considered and appropriately incorporated into the other processes in the organization.

#### Sub practices

- Provide the defect and problem records to those who are responsible for related processes and work efforts.
- Provide the defect and problem records to the group responsible for the organization's process management activities.
- Document and submit change requests for the organization's standard processes to address defect and problem prevention action proposals

## 8.4 Environmental Continuous Capability Improvement

### Purpose

Environmental Continuous Capability Improvement continually and measurably improves the performance of the organization's processes by identifying and deploying incremental improvements

### Goals

#### 1. Specific Goals

- **Goal 1: Individual Processes Are Improved.** The performance and results of the individuals' personal work processes are continually and measurably improved.
- **Goal 2: Workgroup Processes Are Improved.** The performance and results of the work groups' work processes are adjusted for the workgroup characteristics and continually and measurably improved.

#### 2. Institutional Goals

- **Goal 1: Practices Are Institutionalized.** The practices for Environmental Continuous Capability Improvement are institutionalized.

### Practice to Goal Relationship table

Goal	Practice
Specific Goal 1	Specific Practice 1,2,3,4,5,6
Specific Goal 2	Specific Practice 7,8,9,10,11,12,13
Institutional Goal 1	Institutional Practice 1,2,3,4,5



### Practices

- **Specific Practice.**

- 1. Maintain Data for Personal Work Processes**

This practice ensures that each individual has an objective and quantitative basis for selecting areas of improvement and judging the results of improvements.

#### Sub practices

- Analyze personal work activities in order to describe unique personal aspects of performing work processes.
- Define measures of personal activities that are derived from standard measures of work performance.
- Refine measures of personal work continually to improve the insights derived from their analysis.
- Evaluate measures of personal work processes periodically and make revisions when necessary.

- 2. Evaluate Personal Work Processes**

This practice ensures that improvements can be selected based on maximizing the benefits to the individual and other relevant stakeholders.

#### Sub practices

- Measure personal work processes and evaluate personal capability and performance.
- Represent personal work processes in a format that supports analysis.
- Analyze personal work processes quantitatively to identify areas to improve.
- Identify root causes of inefficiencies or defects in personal work processes

- 3. Maintain Improvement Goals for Personal Work Processes**

This practice allows the individual's workgroup and work unit to understand the likely improvement contribution of each individual so they can set and manage their improvement goals and improvement plans.

#### Sub practices

- Review work group, work unit, or organizational goals for environmental process improvement to identify areas of focus related to personal work processes.
- Prioritize opportunities to improve personal work processes considering personal performance and work group, work unit, or organizational improvement goals.

- Set measurable goals for improving personal work processes in the areas of highest priority.
- Review personal improvement goals periodically to ensure they continue to represent the most valuable areas for personal improvement, and revise them as necessary.

#### 4. Implement Improvements to Personal Work Processes

This practice ensures that improvements become an inherent part of the individual's work processes.

##### Sub practices

- Identify improvements to personal work processes.
- Ensure improved personal work processes will be consistent with the work unit's defined processes and the organization's standard environmental product and service processes.
- Define and represent the improved personal work processes.
- Plan the actions required for improving personal work processes.
- Engage in training, practice, or other activities that support improvements to personal work processes.
- Use mentors or other experts, when available, to guide improvements to personal work processes.
- Incorporate improvements into personal work activities.
- Measure the performance and results to track progress against personal improvement goals, and take corrective actions when improvement results deviate significantly from goals.
- Use measures of improved personal work processes to plan personal work activities and commitments.

#### 5. Coordinate Improvements to Personal Work Processes

This practice ensures that other relevant stakeholders affected by changes in the individual's work processes understand the changes so they can make appropriate adjustments in their processes, activities, and expectations.

##### Sub practices

- Coordinate the improvements in personal work processes with the work activities and processes of work groups, work units, and other relevant stakeholders.
- Resolve conflicts or inefficiencies caused by improvements to personal work processes.
- Review commitments for personal work results and revise them as necessary based on improved work processes.

- Recalibrate quantitative predictive models, capability baselines, or other quantitative management techniques based on the results produced by improved work processes

### 6. Disseminate Individual Improvement Proposals

This practice ensures that others in the organization can take advantage of the individual's improvements.

#### Sub practices

- Document improvements to personal work processes and quantitative results from their performance.
- Submit improvement proposals to the organization's standard environmental product and service processes based on a judgment that the improved personal process is relevant to the work of others.
- Disseminate lessons learned from improving personal work processes to those who might benefit from them.

### 7. Maintain Data on Workgroup Processes

This practice ensures that each workgroup has an objective and quantitative basis for selecting areas of improvement and judging the results of improvements

#### Sub practices

- Analyze workgroup activities in order to describe unique group aspects of performing work processes.
- Define measures of workgroup activities that are derived from standard measures of work performance.
- Refine measures of workgroup processes continually to improve the insights derived from their analyses.
- Evaluate measures of workgroup work processes periodically and make revisions when necessary.

### 8. Maintain Data on Workgroup Processes

This practice ensures that the workgroup utilizes its members to so effectively and efficiently accomplish the assigned work.

#### Sub practices

- Analyze how workgroup members perform and integrate their personal work processes to accomplish the workgroup's work.

- Tailor the workgroup's define processes to incorporate adjustments that best integrate and exploit the workgroup's skills and capabilities.
- Collect data on the workgroup's performance of their tailored processes

### 9. Evaluate Workgroup Processes

This practice ensures that improvements can be selected based on maximizing the benefits to the workgroup and other relevant stakeholders.

#### Sub practices

- Measure workgroup processes and evaluate workgroup capability and performance.
- Represent workgroup work processes in a format that supports analysis.
- Analyze workgroup processes quantitatively to identify areas to improve.

### 10. Maintain Improvement Goals for Workgroup Processes

This practice allows the work units and organization to understand the likely improvement contribution of each workgroup so they can set and manage their improvement goals and improvement plans.

#### Sub practices

- Review work unit or organizational goals for process improvement to identify areas of focus related to workgroup work processes.
- Prioritize opportunities to improve workgroup processes considering personal, work unit, and organizational improvement goals.
- Set measurable goals for improving workgroup processes in the areas of highest priority.
- Review workgroup improvement goals periodically to ensure they continue to represent the most valuable areas for workgroup improvement, and revise them as necessary.

### 11. Implement Improvements to Workgroup Processes

This practice ensures that improvements become an inherent part of the workgroup's work processes.

#### Sub practices

- Identify improvements to workgroup processes.
- Ensure improved workgroup processes will be consistent with the work unit's defined processes and the organization's standard environmental product and service processes.
- Define and represent the improved workgroup processes.
- Plan the actions required for improving workgroup processes.

- Engage in training, practice, or other activities that support improvements to workgroup processes.
- Use mentors or other experts, when available, to guide improvements to workgroup processes.
- Incorporate improvements into workgroup activities.
- Measure the performance and results to track progress against workgroup improvement goals, and take corrective actions when improvement results deviate significantly from goals.
- Use measures of improved workgroup processes to plan workgroup activities and commitments

### 12. Coordinate Changes Made to Workgroup Processes

This practice ensures that other relevant stakeholders by changes in the workgroup's work processes understand the changes so they can make appropriate adjustments in their processes, activities, and expectations.

#### Sub practices

- Coordinate the improvements in workgroup processes with the work activities and processes of other workgroups, work units, and other relevant stakeholders.
- Resolve conflicts or inefficiencies caused by improvements to workgroup processes.
- Review commitments for workgroup results and revise them as necessary based on improved work processes.
- Recalibrate quantitative predictive models, capability baselines, or other quantitative management techniques based on the results produced by improved workgroup processes.

### 13. Disseminate Workgroup Improvement Information

This practice ensures that others in the organization can take advantage of the individual's improvements

#### Sub practices

- Document improvements to workgroup processes and quantitative results from their performance.
- Submit improvement proposals to the organization's standard environmental product and service processes based on a judgment that the improved workgroup process is relevant to the work of other workgroups.
- Disseminate lessons learned from improving workgroup processes to those who might benefit from them.

## 8.5 Environmental Innovative Improvement

### Purpose

Environmental organizational Innovative Improvement formulates a complete improvement solution that, when deployed, will achieve specific assigned quantitative improvement goals.

### Goals

#### 1. Specific Goals

- **Goal 1: Environmental Improvements Are Identified** Improvements are identified to address specific quantitative improvement goals assigned to a planned improvement effort.
- **Goal 2: Environmental Improvement Solution Is Developed.** A complete improvement solution that, when deployed, will achieve specific quantitative improvement goals, is developed and verified.
- **Goal 3: Improvement Solution Is Prepared for Deployment** A complete improvement solution that, when deployed, will achieve specific quantitative improvement goals, is prepared for deployment.

#### 2. Institutional Goals

- **Goal 1: Practices Are Institutionalized.** The practices for Environmental qualitative process management are institutionalized.

### Practice to Goal Relationship table

Goal	Practice
Specific Goal 1	Specific Practice 1,2,3,4
Specific Goal 2	Specific Practice 5,6,7
Specific Goal 3	Specific Practice 8,9
Institutional Goal 1	Institutional Practice 1,2,3,4,5

### Practices

- **Specific Practice.**

- 1. Establish Improvement Workgroup**

This practice ensures that achieving the goal is planned and managed as a project with well-defined requirements

#### Sub practices

- Obtain appropriate management sponsorship for the improvement effort.
- Determine the effort, knowledge, and skills needed for the improvement effort.
- Identify individuals with the appropriate knowledge, skills, and availability to participate in the improvement effort.
- Arrange for the appropriate assignment of people needed to the improvement effort.
- Arrange for appropriate skills development activities for the assigned people

- 2. Plan Improvement Work**

This practice ensures that the effort and resources required to perform the environmental improvement work are understood and obtained, appropriate commitments are established, and the plans for performing and managing the improvement work are in place.

#### Sub practices

- Identify, document, and obtain agreement on the environmental improvement goals and constraints that determine the improvement effort.
- Assign responsibility and authority for the improvement effort.
- Arrange for adequate funding and resources for the improvement effort.
- Assign responsibility and authority for performing the improvement work.
- Plan the involvement of relevant stakeholders in the improvement effort.
- Document the improvement work plan.
- Review the improvement work plan with relevant stakeholders and obtain their agreement.
- Place the improvement work plan under version control.
- Revise the improvement work plan as necessary

- 3. Identify Candidate Improvements**

This practice selects improvements that are likely to help achieve the assigned improvement goals for further evaluation and, depending on the evaluation results, for deployment into practice.

### Sub practices

- Analyze the organization's standard environmental processes to determine areas where improvements would be most helpful.
- Investigate improvements that could help achieve the applicable environmental improvement goals.
- Perform preliminary cost/benefit analysis for each of the candidate improvements.
- Determine and document which candidate improvements should undergo formal piloting or evaluation prior to broad scale deployment

### 4. Evaluate Candidate Improvements

This practice evaluates candidate innovative improvements to determine if they should be deployed into practice as part of an overall environmental improvement solution.

### Sub practices

- Identify the candidate innovative improvements that are medium or high risk and which need to be carefully evaluated before they are deployed.
- Determine the approach for evaluating each selected improvement.
- Define and document the evaluation plan for the selected improvements.
- Review the evaluation plan for the selected improvements with relevant stakeholders and obtain their agreement.
- Evaluate the selected improvements according to the plan.
- Observe and measure the results of the selected improvements.
- Document the results of the improvement evaluations and lessons learned.
- Use the results and lessons learned of the improvement evaluations to decide on next steps.
- Revise the plan and continue the evaluation of the innovative improvements as appropriate

### 5. Prepare environmental Improvement Solution

This practice ensures that the integrated set of improvements work together appropriately to support achieving the improvement goals

### Sub practices

- Define and document the plan for developing, preparing and evaluating a complete improvement solution.
- Review the development, preparation and evaluation plan for the complete improvement solution with relevant stakeholders and obtain their agreement.



- Evolve a complete environmental improvement solution from the candidate improvements.
- Continually measure and evaluate the complete improvement solution against the improvement goals applicable to the improvement effort.
- Predict the costs, contribution to achieving the quantitative improvement goals, and other impacts and benefits of the complete improvement solution as the solution evolves.
- Document the results of the evaluations and lessons learned.
- Identify significant deviations from the improvement plan, expected results, and other issues related to the complete improvement solution
- Identify corrective actions, as needed, to address significant deviations.
- Use the results and lessons learned of the development, preparation and evaluation to decide on next steps.
- Revise the plan and continue the development, preparation and evaluation of the complete improvement solution as appropriate.

### 6. Perform Corrective Action for Goals

This practice ensures that appropriate adjustments are made when the results of the pilots, evaluations, and statistical predictions indicate that the quantitative improvement goals will not be achieved or indicate other significant problems.

#### Sub practices

- Review proposed corrective actions with relevant stakeholders and obtain their agreement.
- Perform the identified corrective actions, and track the corrective actions to closure.
- Document lessons learned from issues and the corrective actions.

### 7. Incorporate Improvement Lessons Learned

This practice ensures that the workgroup or unit performing the improvement effort and the rest of the organization learn from the improvement effort.

#### Sub practices

- Capture and document lessons learned from the improvement planning and evaluation activities.
- Incorporate the lessons learned in the remaining development, preparation, evaluation, and deployment activities for the improvement effort.
- Disseminate the lessons learned to related improvement efforts and other relevant stakeholders.

- Revise the lessons learned as necessary.

### 8. Prepare Improvement Solution for Deployment

This practice ensures that the improvement solution, when deployed, will accomplish what is intended and needed, and that it will not unduly disrupt the ongoing operations in the organization.

#### Sub practices

- Obtained appropriate authorization before assembling the improvement solution deployment package.
- Assemble the improvement solution deployment package.
- Verify the improvement solution deployment package.
- Document the improvement solution deployment package.
- Place the improvement solution deployment package and the documentation of the package under configuration management.

### 9. Communicate environmental Improvement Information

This practice ensures that the people in the organization have an appropriate understanding of the planned improvement effort's activities and results to help them prepare for the deployment and use of the improvements.

## 8.6 Environmental Improvement Deployment

### Purpose

Environmental Improvement Deployment continually and measurably improves the organization's Environmental performance and quality by transitioning improvements into use in a systematic manner.

### Goals

#### 1. Specific Goals

- **Goal 1: Deployment of Environmental Improvements Is Planned.** Deployment of Environmental improvements that contribute to meeting the organization's Environmental quantitative improvement goals is planned, and the results are predicted in quantitative terms.
- **Goal 2: Environmental Improvements Are Deployed.** Environmental Improvements are deployed that continually and measurably improve the organization's performance and quality.
- **Goal 3: Environmental Improvement Program Is Improved.** Information on the organization's Environmental process improvement activities and results is recorded, analyzed, and communicated to improve the organization's Environmental improvement program.

#### 2. Institutional Goals

- **Goal 1: Practices Are Institutionalized.** The practices for Environmental improvement deployment management are institutionalized.

### Practice to Goal Relationship table

Goal	Practice
Specific Goal 1	Specific Practice 1,2,3
Specific Goal 2	Specific Practice 4,5,6
Specific Goal 3	Specific Practice 7,8,9
Institutional Goal 1	Institutional Practice 7,8,9,10

## Practices

- **Specific Practice.**

1. **Select Improvement for Environmental deployment**

This practice ensures that the Environmental improvements are selected for deployment based on what is best for the organization.

### Sub practices

- Review candidate improvement solutions and individual improvements for possible deployment into use.
- Estimate the contribution of the Environmental improvement solutions and individual improvements toward the organization's Environmental improvement goals.
- Estimate the cost, effort, and schedule for deploying the Environmental improvements.
- Identify potential barriers to deploying the Environmental improvements.
- Identify the risks associated with deploying the Environmental improvements.
- Prioritize the candidate improvements for deployment.
- Select the improvements that will be deployed.

2. **Plan Deployment**

This practice ensures that the effort and resources required to perform the deployment are understood and obtained, appropriate commitments are established, and the plans for performing and managing the Environmental improvement work are in place, so that the deployment is minimally disruptive to the organization.

### Sub practices

- Identify the Environmental improvement solutions and individual improvements that will be included in each deployment.
- Identify special adjustments that must be made for each Environmental improvement deployment for different parts of the organization.
- Plan the coordination of the Environmental deployment with other improvement activities and ongoing operations.
- Determine all the artifacts and activities that need to change for each Environmental improvement deployment
- Determine and document strategies to address potential barriers for each Environmental improvement deployment.

- Establish measures and improvement goals, based on the organization's improvement goals, for determining the contribution of each improvement deployment.
- Document the plan for each improvement deployment.
- Review the plan for each Environmental improvement deployment with relevant stakeholders and obtain their agreement.
- Revise the plan for each improvement deployment as necessary.

### 3. Predict Environmental Improvement Costs and Benefits

This practice ensures that there is a continually updated objective statistical basis to determine if the Environmental deployment, when completed, is likely to achieve the improvement goals and other plan objectives.

#### Sub practices

- Predict the costs, contribution to achieving the quantitative improvement goals, and other impacts and benefits of each Environmental improvement deployment
- Collect and analyze measures of the actual and extrapolated costs, contribution to achieving the quantitative Environmental improvement goals, and other impacts and benefits of each improvement deployment.
- Compare the actual and projected measures to the predictions.
- Revise the predictions based on the actual and extrapolated measures.
- Compare the predictions to the goals and constraints for each Environmental improvement deployment.
- Identify areas where the predictions differ significantly from the goals and constraints for the improvement deployment.
- Identify corrective actions, as needed, to address issues in the predictions for the Environmental improvement deployment.
- Document the results of the predictions and lessons learned

### 4. Manage Environmental Improvement Deployment

This practice maintains visibility into the deployment so that deployment issues are recognized early and corrective actions can be performed when appropriate.

#### Sub practices

- Deploy the improvements, according to the deployment plan, in a controlled and disciplined manner.

- Monitor the deployment of the improvements against the deployment plan.
- Provide training, mentoring, and consulting, as appropriate, to support the deployment of improvements.
- Observe, measure, and document the results of each Environmental improvement deployment as it is deployed
- Identify significant deviations from the Environmental improvement deployment plan, expected results, and other issues.
- Periodically review the status, issues, measures, other results, outlook, and risks with relevant stakeholders, including executive management, during and following the Environmental improvement deployment.
- Identify corrective actions, as needed, to address issues in the deployment.
- Document the results of the Environmental deployment and lessons learned.

### 5. Measure Environmental Deployed Improvements

This practice develops or obtains objective statistical information on Environmental improvements as they are being deployed into practice that can be used as a basis to determine whether the deployment is proceeding as planned and whether the costs and benefits are as predicted.

#### Sub practices

- Regularly measure the actual and projected cost, effort, and schedule for developing, evaluating, and deploying the improvements.
- Regularly measure and evaluate the value of the overall improvement solution against the improvement goals and constraints applicable to each Environmental improvement deployment.
- Regularly observe and measure the results of the improvements after deployment.
- Measure and analyze the progress toward achieving the organization's Environmental improvement goals.
- Identify any significant issues uncovered in observing and measuring the Environmental improvements during and after deployment.
- Identify corrective actions, as needed, to address any significant issues uncovered in observing and measuring the improvements during and after deployment.
- Store the measures of the Environmental improvement deployment in the organization's measurement repository.

### 6. Perform Environmental Improvement Deployment Corrective Actions

This practice ensures that significant issues in the results and measurements of the Environmental deployed improvements are recognized and addressed so that the deployment plans, commitments, and predictions can be adjusted to reflect a reasonable plan forward.

#### Sub practices

- Review proposed corrective actions with relevant stakeholders and obtain their agreement
- Perform the identified corrective actions, and track the corrective actions to closure.
- Document lessons learned from the issues and the corrective actions.

### 7. Incorporate Environmental Deployment Lessons Learned

This practice ensures that the workgroup or unit performing the Environmental improvement deployment and the rest of the organization, learn from the Environmental deployment effort.

#### Sub practices

- Capture and document lessons learned from the Environmental improvement deployment activities.
- Incorporate the lessons learned in the remaining deployment activities for the improvement effort.
- Disseminate the lessons learned to related improvement efforts and other relevant stakeholders.
- Revise the lessons learned as necessary

### 8. Maintain Deployment Records

This practice ensures that records are available that accurately describe the organization's Environmental deployment activities for consideration in performing future deployment work, and to learn from past experiences.

#### Sub practices

- Document information about the initiation, disposition, deployment, and results of the improvements.
- Produce reports on the improvement deployment activities.
- Revise the improvement deployment records as necessary.

### 9. **Communicate Environmental Deployment Information**

This practice ensures that the people in the organization have an appropriate understanding of the Environmental improvement deployment activities and results to help them prepare for the use of the improvements and to maintain buy in for the organization's Environmental improvement program.



## Institutionalization



## 9.1 Overview

Institutionalization is the building and reinforcement of an organization's culture and infrastructure that supports the methods, practices, and procedures of Environmental management operation. Institutionalization is making the environmental management process ingrained in the way work is done in the organization. It is a critical aspect of implementing any Environmental process.

Each process area of each Maturity level contains the same Institutionalization Goal and the same set of five institutionalization practices, which are:

- Describe the Process
- Plan the Work
- Provide Knowledge and Skills
- Control Performance and Results
- Objectively Assure Conformance



Figure 3: Institutional Practices

Performing these institutionalization practices helps ensure that the institutionalization goal for the process area is satisfied.

Institutionalization of a process includes:

- Performing the defined set of institutionalization practices for the process.
- Consistently performing the process such that it is persistent and recognized as the way the work is done.

In the above depiction one way arrows on the left signify inputs or preconditions for performing the process. Whereas two way arrows on the right signify receiving information from the performed process and providing feedback back into the performed process.

## 9.2 Institutional Goal and Practices

There is a single institutionalization goal that applies to all processes. It is included in each process area of each maturity level. Each process area contains the same set of five institutionalization practices, including the same sub practices.

- Describe the Process
- Plan the Work
- Provide Knowledge and Skills
- Control Performance and Results
- Objectively Assure Conformance

However, the implementation of these institutionalization practices evolves over the maturity levels. The five institutionalization practices must be implemented adequately for a process area in order for the institutionalization goal for that process area to be satisfied. The five institutionalization practices are described in their relevant sub section.

## 9.3 Describe the Process

This practice ensures that the people who perform the environmental process and other relevant stakeholders know how the environmental process work is to be performed so that the implemented process complies with applicable Laws, regulations, organizational policies, environmental standards and specifications and so that the work is performed consistently.

### Sub practices

- Determine the laws, regulations, organizational policies, environmental standards and specifications, and other requirements applicable to the process.

- Define and document the environmental process description for performing the work.
- Review the environmental process description with relevant stakeholders, and obtain their agreement.
- Revise the process description as necessary

## 9.4 Plan the Work

This practice ensures that reasonable plans exist for performing the environmental work so that the people involved and affected know what work is to be performed and have the time and resources that are needed.

### Sub practices

- Obtain appropriate management sponsorship for the environmental process and work activities.
- Identify, document, and obtain agreement on the requirements and constraints that determine the work that has to be planned and performed
- Arrange for adequate funding and resources for performing the work.
- Assign responsibility and authority for performing the work.
- Plan the involvement of relevant stakeholders in the work.
- Incorporate plan information in an approved plan document.
- Revise the plans as necessary.

## 9.5 Provide Knowledge and Skills

This practice ensures that the people have the knowledge and skills they need for their role in the environmental process.

### Sub practices

- Determine the roles to be performed by the affected individuals.
- Determine the environmental process knowledge and skills needed by the affected individuals.
- Determine the environmental process knowledge and skills gaps for each affected individual.
- Address the environmental process knowledge and skills gaps through appropriate activities such as training, seminars, conferences, coaching, mentoring, and on-the-job training.
- Document and archive the results and other relevant records of the training and development activities.

## 9.6 Control Performance and Results

This practice ensures that management has appropriate visibility into the environmental work performed and that, where possible and appropriate, corrective actions are performed to satisfy the plans and achieve the intended results.

### Sub practices

- Review accomplishments, outlook, issues, results, and outputs for the implemented environmental process against the applicable requirements, plans, and commitments.
- Measure the appropriate attributes of the environmental process and work products to obtain appropriate insight.
- Identify any significant issues from the reviews.
- Determine the impacts on other affected work units and workgroups based on the results of the review.
- Identify corrective actions as appropriate.
- Perform the corrective actions and track to closure.

## 9.7 Objectively Assure Conformance

This practice provides management with credible assurance that the environmental process is implemented as planned and that the process and results of the process conforms to applicable laws, regulations, specifications, organizational policies, and environmental standards business rules, process descriptions, and work procedures.

### Sub practices

- Objectively evaluate the process descriptions and work procedures against the applicable laws, environmental regulations, environmental standards and specifications, organizational policies, and business rules.
- Objectively evaluate the performed environmental process against the applicable laws, regulations, specifications, organizational policies, business rules, process descriptions, and work procedures.
- Objectively evaluate the designated environmental work products and services against the applicable laws, environmental regulations, environmental standards and specifications, organizational policies, business rules, process descriptions, and work procedures.
- Review the results of the evaluations with the responsible staff and managers.
- Resolve non-conformance issues with the responsible staff and managers

## Reference



## Glossary

Terminology	Description
<b>Business Continuity</b>	The capability of a business to survive a disaster or other disruptive event and to continue its operations with minimal disruption or downtime during and after the event
<b>Business Rules</b>	Specification of obligations and constraints that guide how procedures or activities are performed. There are usually explicit enforcement mechanisms in place to ensure conformance.
<b>CM</b>	<p><b>Configuration Management</b></p> <p>The discipline of identifying the work products that make up a CM product baseline for an effort at discrete points in time, controlling changes to the work products and the CM product baselines, creating and releasing CM product baselines for internal use and for delivery to customers, and recording and reporting change processing and implementation activities and status.</p>
<b>Environmental Policy</b>	A guiding principle typically established by executive management that establishes rules for an organization to guide environmental process actions and influence and determine decisions. Environmental policies are established to ensure that work is performed in ways that are consistent across the organization and acceptable to executive management
<b>ESMM</b>	<p><b>Environmental Services Maturity Model</b></p> <p>Environmental Service Maturity Model (ESMM) is a well-established capability management framework with an objective to address current challenges faced by various organizations with regards to its environmental services</p>
<b>Facilities</b>	The physical constructions, equipment, and other components that are needed and used in performing environmental work. Examples include buildings, offices and other rooms, computers, peripherals, networks, tools (including software tools), workstations, desks, chairs, and storage cabinets

# 10 References

<b>Institutionalization</b>	The building and reinforcement of infrastructure and organization culture that supports methods, practices, and procedures so that they are the ongoing way of doing business, even after those who originally defined them are gone
<b>Integration</b>	The process of combining product and service components into more complex product and service components or into a complete product and service offering
<b>Knowledge</b>	The information and understanding that someone must have to perform a task successfully. Knowledge provides the basis for performing a skill.
<b>Ripple Effect</b>	Ripple effect occurs when a change (positive/ negative) in one of the organizational perspective, can trigger changes (positive/ negative) in other perspectives, hence causing a ripple. The ripple effect can be best used to explain complex outcomes, such as failures occurring despite of positive enforcement in some areas by corporate organizations.
<b>Process</b>	A set of tasks or activities performed to achieve a given purpose or a specified result
<b>Program</b>	A set of predefined tasks or activities performed to achieve a given purpose or a specified result
<b>Process Area</b>	A maturity model construct that contains a cluster of related practices in an environmental area, that when implemented collectively, provides a process capability that is an important component of the maturity level at which it resides
<b>Process Performance</b>	A measure of the actual results achieved by performing a process
<b>Service</b>	Work carried out for or on behalf of others
<b>Service Level Agreement</b>	A document which defines the relationship between two parties, the nature of the services each parties provides to the other, and the measures used to monitor the level of service provided against the agreed level of service.
<b>Skills</b>	The behaviors that an individual must be able to perform in order to accomplish specific tasks. Skills may involve behaviors that directly



# 10 References

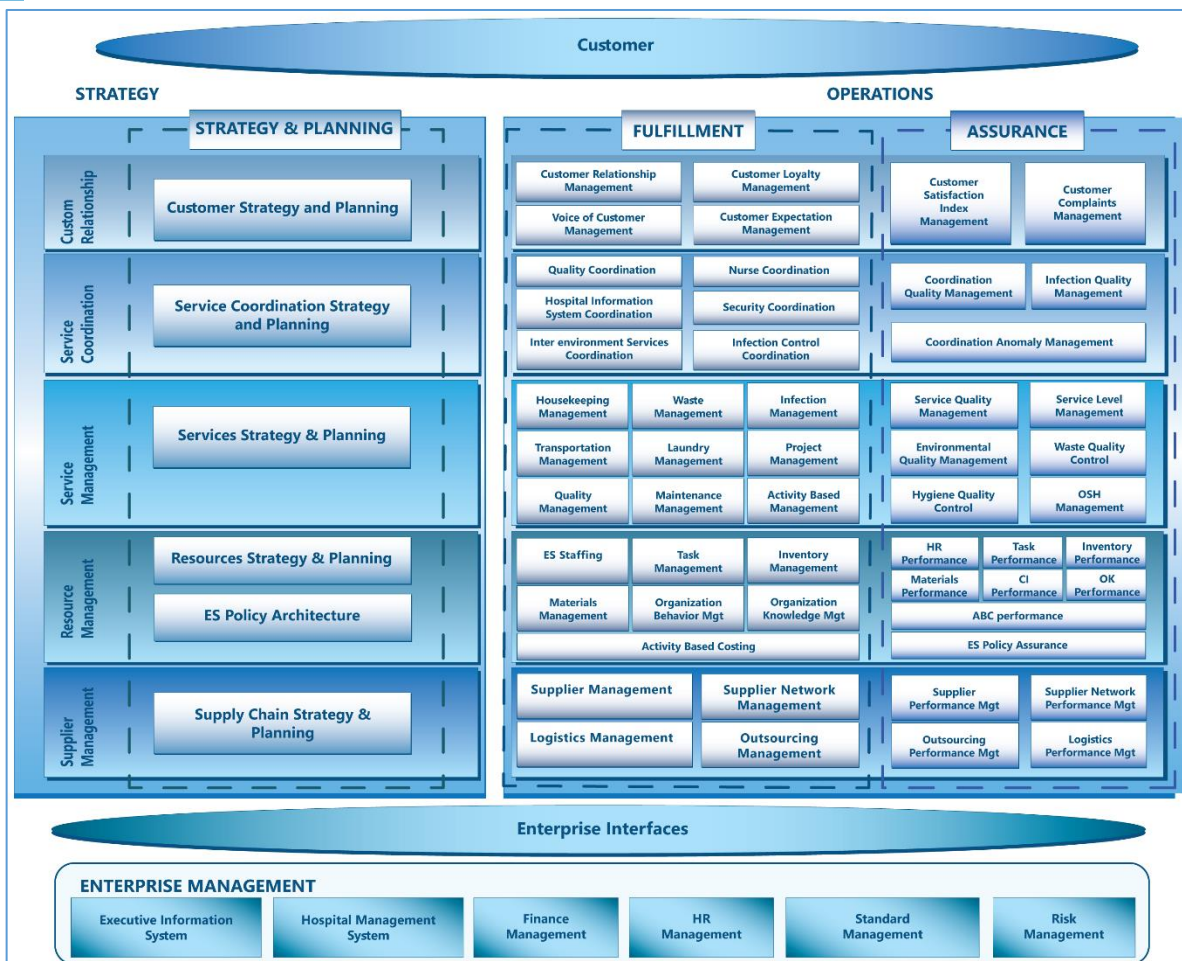
	accomplish the task or that provide the support of, or coordination with, others involved in accomplishing tasks.
<b>Supply Chain Management</b>	The coordination and flow management of materials, resources, information, and money as they move from suppliers to users or clients to distributors to retailers to customers to users, usually with the intent of ensuring adequate supply and reducing inventory at each stage
<b>Task</b>	A specific, definable activity to perform an assigned piece of work, often finished within a certain time
<b>Throughput</b>	The normal or average number of clearly-defined activities or transactions that are processed according to a well-defined procedure in a given period of time or for a given quantity of effort expended
<b>Validation</b>	The process of determining whether, or to what extent, a product or a service will fulfill the needs of the customers and end users. Validation ensures that the delivered product or service is what the customers and end users need
<b>Verification</b>	The process of evaluating a product, a work product, a service, or an activity to determine whether it satisfies its specified requirements
<b>Version Control</b>	A method by which the content of a work product is changed in a controlled manner and the version of the work product in use at a given time (past or present) is recorded and known.
<b>WBS</b>	<b>Work break down structure</b> A hierarchical representation of work to be performed. It is built by iteratively decomposing the work into manageable units, and is intended to reflect how the work is conceptualized, planned, and managed. Each descending level representing a more detailed definition of the work.
<b>Work Group</b>	A collection of people who work closely together on tasks that are highly interdependent, in order to achieve shared goals. A workgroup may or may not be a permanent organizational component.
<b>Work Product</b>	Any artifact created in performing any process. These artifacts can include files, documents, parts of a product, process descriptions, specifications, invoices, etc.

# 10 References

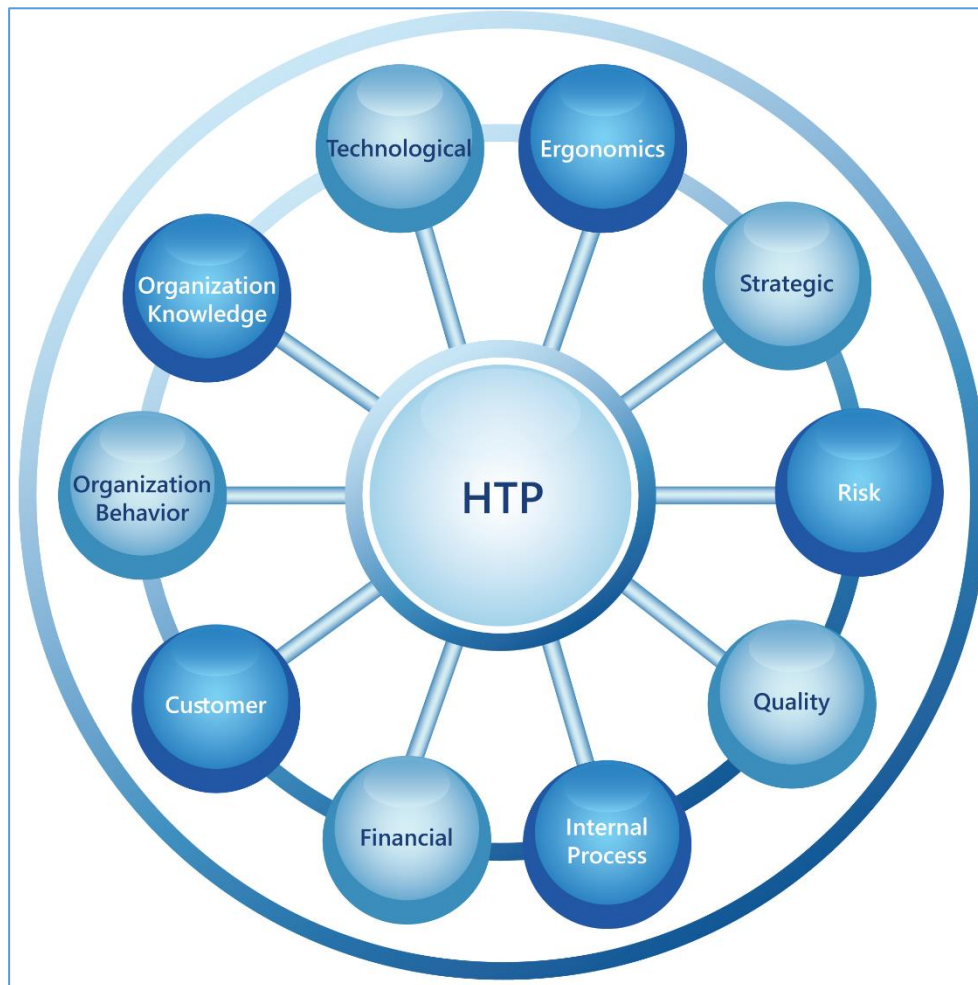
## Work Unit

A well-defined collection of people, managed as a single unit within the organization, who work closely together on tasks specifically related to developing, preparing, maintaining, and delivering the organization's products and services or performing internal business functions.

## ESM – Environmental Services Map



## HTP-Holistic Ten Perspectives



Holistic Ten Perspectives (HTP), also known as Holistic Tradeoff Model is a very comprehensive, robust and rigorous framework which can be used for in-depth

Analysis of Systems Architecture, Enterprise Architecture, Strategy Engineering, Business Case Engineering, Scenarios Driven Analysis ... etc. This Model also known as Cogwin Ten perspectives has been developed by Cognitive Windows in collaboration with some researchers, and Business Practitioners. This model has been applied

in Healthcare, Banking, and Telecommunications industry for over eight years. This model is grounded to System Dynamics model, and aims to analyze the root cause of complex problems that are triggered by the interaction of numerous perspectives, and constraints.

Some of the prime applications of HTP are Designing System Architecture, Business Process Engineering and Optimization, Strategy Engineering and Optimization, Business Cases Implementation, Organization mobilization and Organization restructuring. The model comprises of following ten interrelated perspectives: holistic ten perspectives model

1. **Ergonomics.** This perspective analyses the degree to which a workplace environment fits the user in terms of physical ergonomics, cognitive ergonomics and organizational ergonomics. More information can be found here.
2. **Strategy.** This perspective evaluates the effectiveness of long term business direction and plan in order to achieve desired business goals and objective.
3. **Risk.** This perspective identifies the possible occurrence of negative results, or negative implications.
4. **Quality.** This perspective evaluates the overall improvement.
5. **Internal Process.** This perspective identifies the degree of effectiveness of internal processes.
6. **Finance.** This perspective identifies the degree of efficiency in management of investments, funds and cash flows.
7. **Customer.** This perspective evaluates the degree to which potential customer expectations and behavior is affected.
8. **Organization Behavior.** This perspective evaluates the degree to which potential customer expectations and behavior is affected.
9. **Organization Knowledge.** This perspective identifies the degree to which organization's knowledge changes.
10. **Technology.** This perspective identifies the degree to which organization's technology changes.

A distinct feature of this model is that it has the capability to analyze the ripple effect which occurs when a change (positive/ negative) in one of the perspective, can trigger changes (positive/ negative) in other perspectives, hence causing a ripple. The ripple effect can be best used to explain complex outcomes, such as failures occurring despite of positive enforcement in some areas by corporate organizations.

For instance, promoting a new Client Management System in an organization (positive reinforcement in technology perspective) might be considered as a positive enforcement for entire organization, but on the contrary its complexity in user interface might result into organizational resistance to change (negative reinforcement in Organization behavior perspective). The organization resistance would further result in delays to meet customer expectations

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(negative reinforcement in Customer perspective) and also increase the probability of errors and mistakes (negative reinforcement in Risk perspective). Thus, despite of a positive change in technology perspective, due to ripple effect the entire quality of the organization might decrease.

On a broader note, this model can be used to understand the behavior and nature of anomalies and eventually the root cause of these anomalies.