GG 1   **Achieve Specific Goals**

The ~~process supports and enables achievement of the~~ specific goals of the process area are supported by the process by transforming identifiable input work products into~~to produce~~ identifiable output work products.

    GP 1.1   **Perform Specific Practices**

      Perform the specific practices of the process area to develop work products and provide services to achieve the specific goals of the process area.

      The purpose of this generic practice is to produce the work products and deliver the services that are expected by performing (i.e., executing) the process. These practices can~~may~~ be done informally~~,~~ without following a documented process description or plan. The rigor with which these practices are performed depends on the individuals managing and performing the work and can~~may~~ vary considerably.

GG 2   **Institutionalize a Managed Process**

The process is institutionalized as a managed process.

    GP 2.1   **Establish an Organizational Policy**

      Establish and maintain an organizational policy for planning and performing the process.

      The purpose of this generic practice is to define the organizational expectations for the process and make these expectations visible to those members of~~in~~ the organization who are affected. In general, senior management is responsible for establishing and communicating guiding principles, direction, and expectations for the organization.

GP 2.2   **Plan the Process**

Establish and maintain the plan for performing the process.

The purpose of this generic practice is to determine what is needed to perform the process and to achieve the established objectives, to prepare a plan for performing the process, to prepare a process description, and to get agreement on the plan from relevant stakeholders.

GP 2.3   **Provide Resources**

Provide adequate resources for performing the process, developing the work products, and providing the services of the process.

The purpose of this generic practice is to ensure that the resources necessary to perform the process as defined by the plan are available when they are needed. Resources include adequate funding, appropriate physical facilities, skilled people, and appropriate tools.

GP 2.4   **Assign Responsibility**

Assign responsibility and authority for performing the process, developing the work products, and providing the services of the process.

The purpose of this generic practice is to ensure that there is accountability for performing the process and achieving the specified results throughout the life of the process. The people assigned must have the appropriate authority to perform the assigned responsibilities.

GP 2.5   **Train People**

Train the people performing or supporting the process as needed.

The purpose of this generic practice is to ensure that ~~the~~ people have the necessary skills and expertise to perform or support the process.

GP 2.6   **Control Work Products~~Manage Configurations~~**

Place selected~~designated~~ work products of the process under appropriate levels of control.

The purpose of this generic practice is to establish and maintain the integrity of the selected~~designated~~ work products of the process (or their descriptions) throughout their useful life.

GP 2.7   **Identify and Involve Relevant Stakeholders**

Identify and involve the relevant stakeholders of the process as planned.

The purpose of this generic practice is to establish and maintain the expected involvement of relevant stakeholders during the execution of the process.

GP 2.8   **Monitor and Control the Process**

Monitor and control the process against the plan for performing the process and take appropriate corrective action.

The purpose of this generic practice is to perform the direct day-to-day monitoring and controlling of the process. Appropriate visibility into the process is maintained so that appropriate corrective action can be taken when necessary. Monitoring and controlling the process can involve~~involves~~ measuring appropriate attributes of the process or work products produced by the process.

GP 2.9   **Objectively Evaluate Adherence**

Objectively evaluate adherence of the process and selected work products against the~~its~~ process description, standards, and procedures, and address noncompliance.

The purpose of this generic practice is to provide credible assurance that the process and selected work products are~~is~~ implemented as planned and adhere~~adheres~~ to the~~its~~ process description, standards, and procedures. ~~This generic practice is implemented, in part, by evaluating selected work products of the process.~~ (See the definition of "objectively evaluate" in the glossary.)

GP 2.10   **Review Status with Higher Level Management**

Review the activities, status, and results of the process with higher level management and resolve issues.

The purpose of this generic practice is to provide higher level management with the appropriate visibility into the process.

GG 3   **Institutionalize a Defined Process**

The process is institutionalized as a defined process.

GP 3.1   **Establish a Defined Process**

Establish and maintain the description of a defined process.

The purpose of this generic practice is to establish and maintain a description of the process that is tailored from the organization's set of standard processes to address the needs of a specific instantiation. The organization should have standard processes that cover the process area, as well as have guidelines for tailoring these standard processes to meet the needs of a project or organizational function. With a defined process, variability in how the processes are performed across the organization is reduced and process assets, data, and learning can be effectively shared.

GP 3.2   **Collect Process Related Experiences~~Improvement Information~~**

Collect process related experiences~~Collect work products, measures, measurement results, and improvement information~~ derived from planning and performing the process to support the future use and improvement of the organization's processes and process assets.

The purpose of this generic practice is to collect process related experiences, including information and artifacts derived from planning and performing the process. Examples of process related experiences include work products, measures, measurement results, lessons learned, and process improvement suggestions. The ~~This generic practice is performed so that the~~ information and artifacts are collected so that they can be included in the organizational process assets and made available to those who are (or who will be) planning and performing the same or similar processes. The information and artifacts are stored in the organization's measurement repository and the organization's process asset library.

~~**GG 4**   **Institutionalize a Quantitatively Managed Process**~~

~~The process is institutionalized as a quantitatively managed process.~~

~~**GP 4.1**   **Establish Quantitative Objectives for the Process**~~

~~Establish and maintain quantitative objectives for the process, which address quality and process performance, based on customer needs and business objectives.~~

~~The purpose of this generic practice is to determine and obtain agreement from relevant stakeholders about specific quantitative objectives for the process. These quantitative objectives can be expressed in terms of product quality, service quality, and process performance.~~

GP 4.2   **Stabilize Subprocess Performance**

Stabilize the performance of one or more subprocesses to determine the ability of the process to achieve the established quantitative quality and process-performance objectives.

The purpose of this generic practice is to stabilize the performance of one or more subprocesses of the defined process, which are critical contributors to overall performance, using appropriate statistical and other quantitative techniques. Stabilizing selected subprocesses supports predicting the ability of the process to achieve the established quantitative quality and process-performance objectives.

GG 5   **Institutionalize an Optimizing Process**

The process is institutionalized as an optimizing process.

GP 5.1   **Ensure Continuous Process Improvement**

Ensure continuous improvement of the process in fulfilling the relevant business objectives of the organization.

The purpose of this generic practice is to select and systematically deploy process and technology improvements that contribute to meeting established quality and process-performance objectives.

GP 5.2   **Correct Root Causes of Problems**

Identify and correct the root causes of defects and other problems in the process.

The purpose of this generic practice is to analyze defects and other problems that were encountered in a quantitatively managed process, to correct the root causes of these types of defects and problems, and to prevent these defects and problems from occurring in the future.

CAUSAL ANALYSIS AND RESOLUTION

The purpose of Causal Analysis and Resolution (CAR) is to identify causes of selected outcomes~~defects and other problems~~ and take action to improve process performance~~prevent them from occurring in the future~~.

SG 1   **Determine Causes of Selected Outcomes~~Defects~~**

Root causes of selected outcomes~~defects and other problems~~ are systematically determined.

SP 1.1   **Select Outcomes~~Defect Data~~ for Analysis**

Select outcomes~~the defects and other problems~~ for analysis.

SP 1.2   **Analyze Causes**

Perform causal analysis of selected outcomes~~defects and other problems~~ and propose actions to address them.

The purpose of this analysis is to define actions that will address selected outcomes~~develop solutions to the identified problems~~ by analyzing ~~the~~ relevant outcome data and producing action proposals for implementation.

SG 2   **Address Causes of Selected Outcomes~~Defects~~**

Root causes of selected outcomes~~defects and other problems~~ are systematically addressed ~~to prevent their future occurrence~~.

SP 2.1   **Implement ~~the~~ Action Proposals**

Implement ~~the~~ selected action proposals ~~that were~~ developed in causal analysis.

SP 2.2   **Evaluate the Effect of Implemented Actions~~Changes~~**

Evaluate the effect of implemented actions~~changes~~ on process performance.

SP 2.3   **Record Causal Analysis Data**

Record causal analysis and resolution data for use across projects~~the project~~ and the organization.

CONFIGURATION MANAGEMENT

The purpose of Configuration Management (CM) is to establish and maintain the integrity of work products using configuration identification, configuration control, configuration status accounting, and configuration audits.

SG 1   Establish Baselines

Baselines of identified work products are established.

SP 1.1   Identify Configuration Items

Identify ~~the~~ configuration items, components, and related work products ~~to~~that will be placed under configuration management.

SP 1.2   Establish a Configuration Management System

Establish and maintain a configuration management and change management system for controlling work products.

SP 1.3   Create or Release Baselines

Create or release baselines for internal use and for delivery to the customer.

SG 2   Track and Control Changes

Changes to the work products under configuration management are tracked and controlled.

SP 2.1   Track Change Requests

Track change requests for ~~the~~ configuration items.

SP 2.2   Control Configuration Items

Control changes to ~~the~~ configuration items.

SG 3   Establish Integrity

Integrity of baselines is established and maintained.

SP 3.1   Establish Configuration Management Records

Establish and maintain records describing configuration items.

SP 3.2   Perform Configuration Audits

Perform configuration audits to maintain the integrity of ~~the~~ configuration baselines.

DECISION ANALYSIS AND RESOLUTION

The purpose of Decision Analysis and Resolution (DAR) is to analyze possible decisions using a formal evaluation process that evaluates identified alternatives against established criteria.

SG 1   **Evaluate Alternatives**

Decisions are based on an evaluation of alternatives using established criteria.

SP 1.1   **Establish Guidelines for Decision Analysis**

Establish and maintain guidelines to determine which issues are subject to a formal evaluation process.

SP 1.2   **Establish Evaluation Criteria**

Establish and maintain ~~the~~ criteria for evaluating alternatives~~,~~ and the relative ranking of these criteria.

SP 1.3   **Identify Alternative Solutions**

Identify alternative solutions to address issues.

SP 1.4   **Select Evaluation Methods**

Select ~~the~~ evaluation methods.

SP 1.5   **Evaluate Alternative Solutions~~Alternatives~~**

Evaluate alternative solutions using ~~the~~ established criteria and methods.

SP 1.6   **Select Solutions**

Select solutions from ~~the~~ alternatives based on ~~the~~ evaluation criteria.

INTEGRATED PROJECT MANAGEMENT +IPPD

The purpose of Integrated Project Management (IPM) is to establish and manage the project and the involvement of ~~the~~ relevant stakeholders according to an integrated and defined process that is tailored from the organization's set of standard processes.

SG 1   **Use the Project's Defined Process**

The project is conducted using a defined process ~~that is~~ tailored from the organization's~~organization's~~ set of standard processes.

SP 1.1   **Establish the Project's Defined Process**

Establish and maintain the project's~~project's~~ defined process from project startup through the life of the project.

SP 1.2   **Use Organizational Process Assets for Planning Project Activities**

Use ~~the~~ organizational process assets and the measurement repository for estimating and planning project ~~the project's~~ activities.

SP 1.3   **Establish the Project's~~Project's~~ Work Environment**

Establish and maintain the project's~~project's~~ work environment based on the organization's~~organization's~~ work environment standards.

SP 1.4   **Integrate Plans**

Integrate the project plan and ~~the~~ other plans that affect the project to describe the project's defined process.

SP 1.5   **Manage the Project Using ~~the~~ Integrated Plans**

Manage the project using the project plan, ~~the~~ other plans that affect the project, and the project's defined process.

SP 1.6   **Establish Teams**

Establish and maintain teams.

SP 1.7   Contribute to ~~the~~ Organizational Process Assets

Contribute process related~~work products, measures, and documented~~ experiences to ~~the~~ organizational process assets.

SG 2   **Coordinate and Collaborate with Relevant Stakeholders**

Coordination and collaboration ~~between~~of the project ~~and~~with relevant stakeholders ~~are~~is conducted.

SP 2.1   **Manage Stakeholder Involvement**

Manage the involvement of ~~the~~ relevant stakeholders in the project.

SP 2.2   **Manage Dependencies**

Participate with relevant stakeholders to identify, negotiate, and track critical dependencies.

SP 2.3   **Resolve Coordination Issues**

Resolve issues with relevant stakeholders.

SG 3   **Apply IPPD Principles**

The project is managed using IPPD principles.

The purpose of this specific goal and its practices is to create an IPPD environment that enables integrated teams to efficiently meet the project's requirements and produce a quality product.

SP 3.1   **Establish the Project's Shared Vision**

Establish and maintain a shared vision for the project.

SP 3.2   **Establish the Integrated Team Structure**

Establish and maintain the integrated team structure for the project.

SP 3.3   **Allocate Requirements to Integrated Teams**

Allocate requirements, responsibilities, tasks, and interfaces to teams in the integrated team structure.

SP 3.4   **Establish Integrated Teams**

Establish and maintain integrated teams in the structure.

SP 3.5   **Ensure Collaboration among Interfacing Teams**

Ensure collaboration among interfacing teams.

MEASUREMENT AND ANALYSIS

The purpose of Measurement and Analysis (MA) is to develop and sustain a measurement capability ~~that is~~ used to support management information needs.

SG 1   **Align Measurement and Analysis Activities**

Measurement objectives and activities are aligned with identified information needs and objectives.

     SP 1.1   **Establish Measurement Objectives**

Establish and maintain measurement objectives ~~that are~~ derived from identified information needs and objectives.

     SP 1.2   **Specify Measures**

Specify measures to address ~~the~~ measurement objectives.

     SP 1.3   **Specify Data Collection and Storage Procedures**

Specify how measurement data are~~will be~~ obtained and stored.

     SP 1.4   **Specify Analysis Procedures**

Specify how measurement data are~~will be~~ analyzed and communicated~~reported~~.

SG 2   **Provide Measurement Results**

Measurement results, which address identified information needs and objectives, are provided.

     SP 2.1   **Obtain~~Collect~~ Measurement Data**

Obtain specified measurement data.

SP 2.2   **Analyze Measurement Data**

Analyze and interpret measurement data.

SP 2.3   **Store Data and Results**

Manage and store measurement data, measurement specifications, and analysis results.

SP 2.4   **Communicate Results**

~~Communicate~~Report results of measurement and analysis activities to all relevant stakeholders.

ORGANIZATIONAL INNOVATION AND DEPLOYMENT

The purpose of Organizational Innovation and Deployment (OID) is to select and deploy incremental and innovative improvements that measurably improve the organization's processes and technologies. The improvements support the organization's quality and process-performance objectives as derived from the organization's business objectives.

SG 1   Select Improvements

Process and technology improvements, which contribute to meeting quality and process-performance objectives, are selected.

SP 1.1   Collect and Analyze Improvement Proposals

Collect and analyze process- and technology-improvement proposals.

SP 1.2   Identify and Analyze Innovations

Identify and analyze innovative improvements that could increase the organization's quality and process performance.

SP 1.3   Pilot Improvements

Pilot process and technology improvements to select which ones to implement.

SP 1.4   Select Improvements for Deployment

Select process and technology improvements for deployment across the organization.

SG 2   Deploy Improvements

Measurable improvements to the organization's processes and technologies are continually and systematically deployed.

SP 2.1   Plan the Deployment

Establish and maintain the plans for deploying the selected process and technology improvements.

SP 2.2   Manage the Deployment

Manage the deployment of the selected process and technology improvements.

SP 2.3   Measure Improvement Effects

Measure the effects of the deployed process and technology improvements.

ORGANIZATIONAL PROCESS DEFINITION ~~+IPPD~~

The purpose of Organizational Process Definition (OPD) is to establish and maintain a usable set of organizational process assets, ~~and~~ work environment standards, and rules and guidelines for teams.

SG 1   **Establish Organizational Process Assets**

A set of organizational process assets is established and maintained.

SP 1.1   **Establish Standard Processes**

Establish and maintain the organization's~~organization's~~ set of standard processes.

SP 1.2   **Establish Lifecycle Model Descriptions**

Establish and maintain descriptions of ~~the~~ lifecycle models approved for use in the organization.

SP 1.3   **Establish Tailoring Criteria and Guidelines**

Establish and maintain ~~the~~ tailoring criteria and guidelines for the organization's~~organization's~~ set of standard processes.

SP 1.4   **Establish the Organization's Measurement Repository**

Establish and maintain the organization's measurement repository.

SP 1.5   **Establish the Organization's Process Asset Library**

Establish and maintain the organization's~~organization's~~ process asset library.

SP 1.6   **Establish Work Environment Standards**

Establish and maintain work environment standards.

SP 1.7~~2.2~~   **Establish Rules and Guidelines for ~~Integrated~~ Teams**

Establish and maintain organizational rules and guidelines for the structure, formation,~~structuring~~ and operation of teams.~~forming integrated teams.~~

~~**SG 2**   **Enable IPPD Management**~~

~~*Organizational rules and guidelines, which govern the operation of integrated teams, are provided.*~~

~~**SP 2.1**   **Establish Empowerment Mechanisms**~~

~~*Establish and maintain empowerment mechanisms to enable timely decision making.*~~

SP 2.3   Balance Team and Home Organization Responsibilities

Establish and maintain organizational guidelines to help team members balance their team and home organization responsibilities.

ORGANIZATIONAL PROCESS FOCUS

The purpose of Organizational Process Focus (OPF) is to plan, implement, and deploy organizational process improvements based on a thorough understanding of ~~the~~ current strengths and weaknesses of the organization's processes and process assets.

SG 1　　**Determine Process Improvement Opportunities**

Strengths, weaknesses, and improvement opportunities for the organization's~~organization's~~ processes are identified periodically and as needed.

　　SP 1.1　　**Establish Organizational Process Needs**

Establish and maintain the description of ~~the~~ process needs and objectives for the organization.

　　SP 1.2　　**Appraise the Organization's Processes**

Appraise the organization's~~organization's~~ processes periodically and as needed to maintain an understanding of their strengths and weaknesses.

　　SP 1.3　　**Identify the Organization's~~Organization's~~ Process Improvements**

Identify improvements to the organization's~~organization's~~ processes and process assets.

SG 2　　**Plan and Implement Process Actions~~Improvements~~**

Process actions that address improvements to the organization's processes and process assets are planned and implemented.

　　SP 2.1　　**Establish Process Action Plans**

Establish and maintain process action plans to address improvements to the organization's~~organization's~~ processes and process assets.

　　SP 2.2　　**Implement Process Action Plans**

Implement process action plans.

SG 3　　**Deploy Organizational Process Assets and Incorporate Experiences~~Lessons Learned~~**

Organizational~~The organizational~~ process assets are deployed across the organization and process -related experiences are incorporated into ~~the~~ organizational process assets.

　　SP 3.1　　**Deploy Organizational Process Assets**

Deploy organizational process assets across the organization.

SP 3.2	**Deploy Standard Processes**
	Deploy the organization's set of standard processes to projects at their startup and deploy changes to them as appropriate throughout the life of each project.

SP 3.3	**Monitor the Implementation**
	Monitor the implementation of the organization's set of standard processes and use of process assets on all projects.

SP 3.4	**Incorporate ~~Process-Related~~ Experiences into ~~the~~ Organizational Process Assets**
	Incorporate process -related experiences~~work products, measures, and improvement information~~ derived from planning and performing the process into ~~the~~ organizational process assets.

ORGANIZATIONAL PERFORMANCE MANAGEMENT

The purpose of Organizational Performance Management (OPM) is to proactively manage the organization's performance to meet its business objectives.

SG 1   Manage Business Performance

The organization's business performance is managed using statistical and other quantitative techniques to understand process performance shortfalls, and to identify areas for process improvement.

SP 1.1   Maintain Business Objectives

Maintain business objectives based on an understanding of business strategies and actual performance results.

SP 1.2   Analyze Process Performance Data

Analyze process performance data to determine the organization's ability to meet identified business objectives.

SP 1.3   Identify Potential Areas for Improvement

Identify potential areas for improvement that could contribute to meeting business objectives.

SG 2   Select Improvements

Improvements are proactively identified, evaluated using statistical and other quantitative techniques, and selected for deployment based on their contribution to meeting quality and process performance objectives.

SP 2.1   Elicit Suggested Improvements

Elicit and categorize suggested improvements.

SP 2.2   Analyze Suggested Improvements

Analyze suggested improvements for their possible impact on achieving the organization's quality and process performance objectives.

SP 2.3   Validate Improvements

Validate selected improvements.

SP 2.4   Select and Implement Improvements for Deployment

Select and implement improvements for deployment throughout the organization based on an evaluation of costs, benefits, and other factors.

SG 3   **Deploy Improvements**

Measurable improvements to the organization's processes and technologies are deployed and evaluated using statistical and other quantitative techniques.

SP 3.1   **Plan the Deployment**

Establish and maintain plans for deploying selected improvements.

SP 3.2   **Manage the Deployment**

Manage the deployment of selected improvements.

SP 3.3   **Evaluate Improvement Effects**

Evaluate the effects of deployed improvements on quality and process performance using statistical and other quantitative techniques.

ORGANIZATIONAL PROCESS PERFORMANCE

The purpose of Organizational Process Performance (OPP) is to establish and maintain a quantitative understanding of the performance of selected processes in the organization's set of standard processes in support of achieving quality and process -performance objectives, and to provide the process -performance data, baselines, and models to quantitatively manage the organization's projects.

SG 1 **Establish Performance Baselines and Models**

Baselines and models, which characterize the expected process performance of the organization'sorganization's set of standard processes, are established and maintained.

SP 1.1 **Establish Quality and Process Performance Objectives**

Establish and maintain the organization's quantitative objectives for quality and process performance, which are traceable to business objectives.

SP 1.2 **Select Processes**

Select the processes or subprocesses in the organization'sorganization's set of standard processes that are to be included in the organization'sorganization's process -performance analyses and maintain traceability to business objectives.

SP 1.32 **Establish Process -Performance Measures**

Establish and maintain definitions of the measures that are to be included in the organization's process -performance analyses.

SP 1.4 **Analyze 3   Establish Quality and Process -Performance and Objectives**

Establish and maintain quantitative objectives for quality and process performance for the organization.

SP 1.4 **Establish Process -Performance Baselines**

Analyze the performance of the selected processes, and establishEstablish and maintain the organization's process -performance baselines.

SP 1.5 **Establish Process -Performance Models**

Establish and maintain the process -performance models for the organization's set of standard processes.

ORGANIZATIONAL TRAINING

The purpose of Organizational Training (OT) is to develop ~~the~~ skills and knowledge of people so they can perform their roles effectively and efficiently.

SG 1   **Establish an Organizational Training Capability**

A training capability, which supports the <u>roles in the organization</u>~~organization's management and technical roles~~, is established and maintained.

     SP 1.1   **Establish ~~the~~ Strategic Training Needs**

Establish and maintain ~~the~~ strategic training needs of the organization.

     SP 1.2   **Determine Which Training Needs Are the Responsibility of the Organization**

Determine which training needs are the responsibility of the organization and which <u>are</u>~~will be~~ left to the individual project or support group.

     SP 1.3   **Establish an Organizational Training Tactical Plan**

Establish and maintain an organizational training tactical plan.

     SP 1.4   **Establish <u>a</u> Training Capability**

Establish and maintain <u>a</u> training capability to address organizational training needs.

SG 2   **Provide ~~Necessary~~ Training**

Training ~~necessary~~ for individuals to perform their roles effectively is provided.

     SP 2.1   **Deliver Training**

Deliver ~~the~~ training following the organizational training tactical plan.

     SP 2.2   **Establish Training Records**

Establish and maintain records of ~~the~~ organizational training.

     SP 2.3   **Assess Training Effectiveness**

Assess the effectiveness of the organization's training program.

PRODUCT INTEGRATION

The purpose of Product Integration (PI) is to assemble the product from the product components, ensure that the product, as integrated, behaves properly (i.e., possesses the required functionality and quality attributes),functions properly, and deliver the product.

SG 1   **Prepare for Product Integration**

Preparation for product integration is conducted.

SP 1.1   **Establish anDetermine Integration StrategySequence**

Establish and maintain aDetermine the product component integration strategysequence.

SP 1.2   **Establish the Product Integration Environment**

Establish and maintain the environment needed to support the integration of the product components.

SP 1.3   **Establish Product Integration Procedures and Criteria**

Establish and maintain procedures and criteria for integration of the product components.

SG 2   **Ensure Interface Compatibility**

The product component interfaces, both internal and external, are compatible.

SP 2.1   **Review Interface Descriptions for Completeness**

Review interface descriptions for coverage and completeness.

SP 2.2   **Manage Interfaces**

Manage internal and external interface definitions, designs, and changes for products and product components.

SG 3   **Assemble Product Components and Deliver the Product**

Verified product components are assembled and the integrated, verified, and validated product is delivered.

SP 3.1   **Confirm Readiness of Product Components for Integration**

Confirm, prior to assembly, that each product component required to assemble the product has been properly identified, behavesfunctions according to its description, and that the product component interfaces comply with the interface descriptions.

The purpose of this specific practice is to ensure that the properly identified product component that meets its description can actually be assembled according to the product integration strategy~~sequence~~ and ~~available~~ procedures. The product components are checked for quantity, obvious damage, and consistency between the product component and interface descriptions.

SP 3.2   Assemble Product Components

Assemble product components according to the product integration strategy~~sequence~~ and ~~available~~ procedures.

SP 3.3   Evaluate Assembled Product Components

Evaluate assembled product components for interface compatibility.

SP 3.4   Package and Deliver the Product or Product Component

Package the assembled product or product component and deliver it to the ~~appropriate~~ customer.

PROJECT MONITORING AND CONTROL

The purpose of Project Monitoring and Control (PMC) is to provide an understanding of the project's progress so that appropriate corrective actions can be taken when the project's performance deviates significantly from the plan.

SG 1   **Monitor the Project Against the Plan**

Actual project progress and performance and progress of the project are monitored against the project plan.

    SP 1.1   **Monitor Project Planning Parameters**

    Monitor the actual values of the project planning parameters against the project plan.

    SP 1.2   **Monitor Commitments**

    Monitor commitments against those identified in the project plan.

    SP 1.3   **Monitor Project Risks**

    Monitor risks against those identified in the project plan.

    SP 1.4   **Monitor Data Management**

    Monitor the management of project data against the project plan.

    SP 1.5   **Monitor Stakeholder Involvement**

    Monitor stakeholder involvement against the project plan.

    SP 1.6   **Conduct Progress Reviews**

    Periodically review the project'sproject's progress, performance, and issues.

    SP 1.7   **Conduct Milestone Reviews**

    Review the project's accomplishments and results of the project at selected project milestones.

SG 2   **Manage Corrective Action to Closure**

Corrective actions are managed to closure when the project'sproject's performance or results deviate significantly from the plan.

    SP 2.1   **Analyze Issues**

    Collect and analyze the issues and determine the corrective actions necessary to address themthe issues.

SP 2.2   **Take Corrective Action**

Take corrective action on identified issues.

SP 2.3   **Manage Corrective Actions~~Action~~**

Manage corrective actions to closure.

PROJECT PLANNING

The purpose of Project Planning (PP) is to establish and maintain plans that define project activities.

SG 1   **Establish Estimates**

Estimates of project planning parameters are established and maintained.

SP 1.1   **Estimate the Scope of the Project**

Establish a top-level work breakdown structure (WBS) to estimate the scope of the project.

SP 1.2   **Establish Estimates of Work Product and Task Attributes**

Establish and maintain estimates of __work product and task__~~the~~ attributes ~~of the work products and tasks~~.

SP 1.3   **Define Project Lifecycle __Phases__**

Define ~~the~~ project lifecycle phases on which to scope the planning effort.

SP 1.4   **__Estimate__ ~~Determine Estimates of~~ Effort and Cost**

Estimate the __project's__~~project~~ effort and cost for ~~the~~ work products and tasks based on estimation rationale.

SG 2   **Develop a Project Plan**

A project plan is established and maintained as the basis for managing the project.

SP 2.1   **Establish the Budget and Schedule**

Establish and maintain the project's budget and schedule.

SP 2.2   **Identify Project Risks**

Identify and analyze project risks.

SP 2.3   **Plan ~~for~~ Data Management**

Plan for the management of project data.

SP 2.4   **Plan __the Project's__~~for Project~~ Resources**

Plan for ~~necessary~~ resources to perform the project.

SP 2.5   **Plan ~~for~~ Needed Knowledge and Skills**

Plan for knowledge and skills needed to perform the project.

SP 2.6	**Plan Stakeholder Involvement**	
	Plan the involvement of identified stakeholders.	

SP 2.7	**Establish the Project Plan**	
	Establish and maintain the overall project plan ~~content~~.	

SG 3   Obtain Commitment to the Plan

Commitments to the project plan are established and maintained.

SP 3.1	**Review Plans That Affect the Project**	
	Review all plans that affect the project to understand project commitments.	

SP 3.2	**Reconcile Work and Resource Levels**	
	<ins>Adjust</ins>~~Reconcile~~ the project plan to <ins>reconcile</ins>~~reflect~~ available and estimated resources.	

SP 3.3	**Obtain Plan Commitment**	
	Obtain commitment from relevant stakeholders responsible for performing and supporting plan execution.	

PROCESS AND PRODUCT QUALITY ASSURANCE

The purpose of Process and Product Quality Assurance (PPQA) is to provide staff and management with objective insight into processes and associated work products.

SG 1   Objectively Evaluate Processes and Work Products

Adherence of the performed process and associated work products ~~and services~~ to applicable process descriptions, standards, and procedures is objectively evaluated.

SP 1.1	**Objectively Evaluate Processes**	
	Objectively evaluate <ins>selected</ins>~~the designated~~ performed processes against ~~the~~ applicable process descriptions, standards, and procedures.	

SP 1.2	**Objectively Evaluate Work Products ~~and Services~~**	
	Objectively evaluate <ins>selected</ins>~~the designated~~ work products ~~and services~~ against ~~the~~ applicable process descriptions, standards, and procedures.	

SG 2   **Provide Objective Insight**

Noncompliance issues are objectively tracked and communicated, and resolution is ensured.

SP 2.1   **Communicate and ~~Resolve~~Ensure Resolution of Noncompliance Issues**

Communicate quality issues and ensure the resolution of noncompliance issues with the staff and managers.

SP 2.2   **Establish Records**

Establish and maintain records of ~~the~~ quality assurance activities.

QUANTITATIVE PROJECT MANAGEMENT

The purpose of Quantitative Project Management (QPM) is to quantitatively manage the project ~~project's defined process~~ to achieve the project's established quality and process -performance objectives.

SG 1 **Prepare for Quantitative Management**

Preparation for quantitative management is conducted.

~~**SG 1**~~ ~~**Quantitatively Manage the Project**~~

~~The project is quantitatively managed using quality and process-performance objectives.~~

SP 1.1 **Establish the Project's Objectives**

Establish and maintain the project's quality and process -performance objectives.

SP 1.2 **Compose the Defined Process**

Using statistical and other quantitative techniques, ~~Select the subprocesses that~~ compose a ~~the project's~~ defined process that enables the project to achieve its quality and process performance objectives~~based on historical stability and capability data~~.

SP 1.3 **Select ~~the~~ Subprocesses and Attributes~~that Will Be Statistically Managed~~**

Select ~~the~~ subprocesses and attributes critical to evaluating performance and that help to achieve the project's quality and~~of the project's defined~~ process performance objectives~~that will be statistically managed~~.

SP ~~2.~~1.4 **Select Measures and Analytic Techniques**

Select ~~the~~ measures and analytic techniques to be used in quantitative management~~statistically managing the selected subprocesses~~.

SG 2 **Quantitatively~~Statistically~~ Manage ~~Subprocess Performance~~**

~~The performance of selected subprocesses within~~ the **Project**

The project~~project's defined process~~ is quantitatively~~statistically~~ managed.

SP 2.12 ~~Apply Statistical Methods to Understand Variation~~

Establish and maintain an understanding of the variation of the selected subprocesses using the selected measures and analytic techniques.

~~**SP 2.3**~~ **Monitor the Performance of** ~~the~~ **Selected Subprocesses**

Monitor the performance of ~~the~~ selected subprocesses using statistical~~to determine their capability to satisfy their quality~~ and other quantitative techniques~~process-performance objectives, and identify corrective action as necessary~~.

SP 2.21.4 **Manage Project Performance**

Manage~~Monitor~~ the project using statistical and other quantitative techniques to determine whether or not the project's objectives for quality and process performance will be satisfied~~, and identify corrective action as appropriate~~.

SP 2.3 **Perform Root Cause Analysis**

Perform root cause analysis of selected issues to address deficiencies in achieving the project's quality and process performance objectives.

~~**SP 2.4**~~ ~~**Record Statistical Management Data**~~

Record statistical and quality management data in the organization's measurement repository.

REQUIREMENTS DEVELOPMENT

The purpose of Requirements Development (RD) is to elicit,~~produce and~~ analyze, and establish customer, product, and product component requirements.

SG 1   Develop Customer Requirements

Stakeholder needs, expectations, constraints, and interfaces are collected and translated into customer requirements.

    SP 1.1   Elicit Needs

    Elicit stakeholder needs, expectations, constraints, and interfaces for all phases of the product lifecycle.

    SP 1.2   Transform Stakeholder Needs into~~Develop the~~ Customer Requirements

    Transform stakeholder needs, expectations, constraints, and interfaces into prioritized customer requirements.

SG 2   Develop Product Requirements

Customer requirements are refined and elaborated to develop product and product component requirements.

    SP 2.1   Establish Product and Product Component Requirements

    Establish and maintain product and product component requirements, which are based on the customer requirements.

    SP 2.2   Allocate Product Component Requirements

    Allocate the requirements for each product component.

    SP 2.3   Identify Interface Requirements

    Identify interface requirements.

SG 3   Analyze and Validate Requirements

The requirements are analyzed and validated,~~ and a definition of required functionality is developed~~.

    SP 3.1   Establish Operational Concepts and Scenarios

    Establish and maintain operational concepts and associated scenarios.

    SP 3.2   Establish a Definition of Required Functionality and Quality Attributes

    Establish and maintain a definition of required functionality and quality attributes.

SP 3.3   **Analyze Requirements**

Analyze requirements to ensure that they are necessary and sufficient.

SP 3.4   **Analyze Requirements to Achieve Balance**

Analyze requirements to balance stakeholder needs and constraints.

SP 3.5   **Validate Requirements**

Validate requirements to ensure the resulting product will perform as intended in the end user's environment.

REQUIREMENTS MANAGEMENT

The purpose of Requirements Management (REQM) is to manage ~~the~~ requirements of the project's products and product components and to ~~ensure alignment~~identify inconsistencies between those requirements and the project's plans and work products.

SG 1 **Manage Requirements**

Requirements are managed and inconsistencies with project plans and work products are identified.

SP 1.1 **Understand~~Obtain an Understanding of~~ Requirements**

Develop an understanding with the requirements providers on the meaning of the requirements.

SP 1.2 **Obtain Commitment to Requirements**

Obtain commitment to ~~the~~ requirements from ~~the~~ project participants.

SP 1.3	**Manage Requirements Changes**
	Manage changes to ~~***the***~~ ***requirements as they evolve during the project.***

SP 1.4	**Maintain Bidirectional Traceability of Requirements**
	Maintain bidirectional traceability among ~~***the***~~ ***requirements and work products.***

SP 1.5	**Ensure Alignment**~~**Identify Inconsistencies**~~ **Between Project Work and Requirements**
	Ensure that~~***Identify inconsistencies between the***~~ ***project plans and work products*** ***remain aligned with***~~***and the***~~ ***requirements.***

RISK MANAGEMENT

The purpose of Risk Management (RSKM) is to identify potential problems before they occur so that risk -handling activities can be planned and invoked as needed across the life of the product or project to mitigate adverse impacts on achieving objectives.

SG 1   **Prepare for Risk Management**

Preparation for risk management is conducted.

    SP 1.1   **Determine Risk Sources and Categories**

    Determine risk sources and categories.

    SP 1.2   **Define Risk Parameters**

    Define ~~the~~ parameters used to analyze and categorize risks~~,~~ and ~~the parameters used~~ to control the risk management effort.

    SP 1.3   **Establish a Risk Management Strategy**

    Establish and maintain the strategy to be used for risk management.

SG 2   **Identify and Analyze Risks**

Risks are identified and analyzed to determine their relative importance.

    SP 2.1   **Identify Risks**

    Identify and document ~~the~~ risks.

    SP 2.2   **Evaluate, Categorize, and Prioritize Risks**

    Evaluate and categorize each identified risk using ~~the~~ defined risk categories and parameters, and determine its relative priority.

SG 3   **Mitigate Risks**

Risks are handled and mitigated __as__, ~~where~~ appropriate~~,~~ to reduce adverse impacts on achieving objectives.

    SP 3.1   **Develop Risk Mitigation Plans**

    Develop a risk mitigation plan __in accordance with~~for the most important risks to the project as defined by~~__ the risk management strategy.

    SP 3.2   **Implement Risk Mitigation Plans**

    Monitor the status of each risk periodically and implement the risk mitigation plan as appropriate.

SUPPLIER AGREEMENT MANAGEMENT

The purpose of Supplier Agreement Management (SAM) is to manage the acquisition of products and services from suppliers.

SG 1   **Establish Supplier Agreements**

Agreements with the suppliers are established and maintained.

SP 1.1   **Determine Acquisition Type**

Determine the type of acquisition for each product or product component to be acquired.

SP 1.2   **Select Suppliers**

Select suppliers based on an evaluation of their ability to meet the specified requirements and established criteria.

SP 1.3   **Establish Supplier Agreements**

Establish and maintain supplierformal agreements with the supplier.

SG 2   **Satisfy Supplier Agreements**

Agreements with the suppliers are satisfied by both the project and the supplier.

SP 2.1   **Execute the Supplier Agreement**

Perform activities with the supplier as specified in the supplier agreement.

SP 2.2   **Monitor Selected Supplier Processes**

Select, monitor, and analyze processes used by the supplier.

SP 2.3   **Evaluate Selected Supplier Work Products**

Select and evaluate work products from the supplier of custom-made products.

SP 2.4   **Accept the Acquired Product**

Ensure that the supplier agreement is satisfied before accepting the acquired product.

SP 2.3   **Ensure 5   Transition of Products**

EnsureTransition the transition of acquired products acquired from the supplier to the project.

TECHNICAL SOLUTION

The purpose of Technical Solution (TS) is to <u>select,</u> design~~, develop~~, and implement solutions to requirements. Solutions, designs, and implementations encompass products, product components, and product related lifecycle processes either singly or in combination as appropriate.

SG 1   **Select Product Component Solutions**

Product or product component solutions are selected from alternative solutions.

    SP 1.1   **Develop Alternative Solutions and Selection Criteria**

    Develop alternative solutions and selection criteria.

    SP 1.2   **Select Product Component Solutions**

    Select the product component solutions <u>based on selection</u>~~that best satisfy the~~ criteria ~~established~~.

SG 2   **Develop the Design**

Product or product component designs are developed.

    SP 2.1   **Design the Product or Product Component**

    Develop a design for the product or product component.

    SP 2.2   **Establish a Technical Data Package**

    Establish and maintain a technical data package.

SP 2.3	**Design Interfaces Using Criteria**
	Design product component interfaces using established criteria.

SP 2.4	**Perform Make, Buy, or Reuse Analyses**
	Evaluate whether the product components should be developed, purchased, or reused based on established criteria.

SG 3	**Implement the Product Design**
	Product components, and associated support documentation, are implemented from their designs.

SP 3.1	**Implement the Design**
	Implement the designs of the product components.

SP 3.2	**Develop Product Support Documentation**
	Develop and maintain the end-use documentation.

VALIDATION

The purpose of Validation (VAL) is to demonstrate that a product or product component fulfills its intended use when placed in its intended environment.

SG 1 **Prepare for Validation**

Preparation for validation is conducted.

SP 1.1 **Select Products for Validation**

Select products and product components to be validated and ~~the~~ validation methods ~~to~~that will be used ~~for each~~.

SP 1.2 **Establish the Validation Environment**

Establish and maintain the environment needed to support validation.

SP 1.3 **Establish Validation Procedures and Criteria**

Establish and maintain procedures and criteria for validation.

SG 2 **Validate Product or Product Components**

The product or product components are validated to ensure ~~that~~ they are suitable for use in their intended operating environment.

SP 2.1 **Perform Validation**

Perform validation on ~~the~~ selected products and product components.

SP 2.2 **Analyze Validation Results**

Analyze ~~the~~ results of ~~the~~ validation activities.

VERIFICATION

The purpose of Verification (VER) is to ensure that selected work products meet their specified requirements.

SG 1 **Prepare for Verification**

Preparation for verification is conducted.

SP 1.1 **Select Work Products for Verification**

Select ~~the~~ work products to be verified and ~~the~~ verification methods ~~to~~that will be used ~~for each~~.

SP 1.2 **Establish the Verification Environment**

Establish and maintain the environment needed to support verification.

SP 1.3 **Establish Verification Procedures and Criteria**

Establish and maintain verification procedures and criteria for the selected work products.

SG 2 **Perform Peer Reviews**

Peer reviews are performed on selected work products.

SP 2.1 **Prepare for Peer Reviews**

Prepare for peer reviews of selected work products.

SP 2.2 **Conduct Peer Reviews**

Conduct peer reviews ~~of~~on selected work products and identify issues resulting from ~~these reviews~~the peer review.

SP 2.3 **Analyze Peer Review Data**

Analyze data about the preparation, conduct, and results of the peer reviews.

SG 3 **Verify Selected Work Products**

Selected work products are verified against their specified requirements.

SP 3.1 **Perform Verification**

Perform verification on ~~the~~ selected work products.

SP 3.2 **Analyze Verification Results**

Analyze ~~the~~ results of all verification activities.