Raytheon

Customer Success Is Our Mission

Managing CMMI® as a Project

Intelligence and Information Systems (IIS), Garland, Texas

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Raytheon Garland SCAMPI℠ (June 2003)

- Scope: SE/SW Level 3 Staged Model
- Conducted as "registered appraisal," led by SEI℠ Lead Appraiser
  - Diverse team: two customer representatives, three from other Raytheon sites, four from Raytheon Garland
- 6,400 objective evidence references reviewed
- 95 people interviewed in 23 separate sessions
  - Included Organizational and Program personnel, representing population of 1,900

- Lesson Learned: Managing the CMMI® Project as a development project was a successful strategy

Raytheon Garland Achieved CMMI®-SE/SW Level 3

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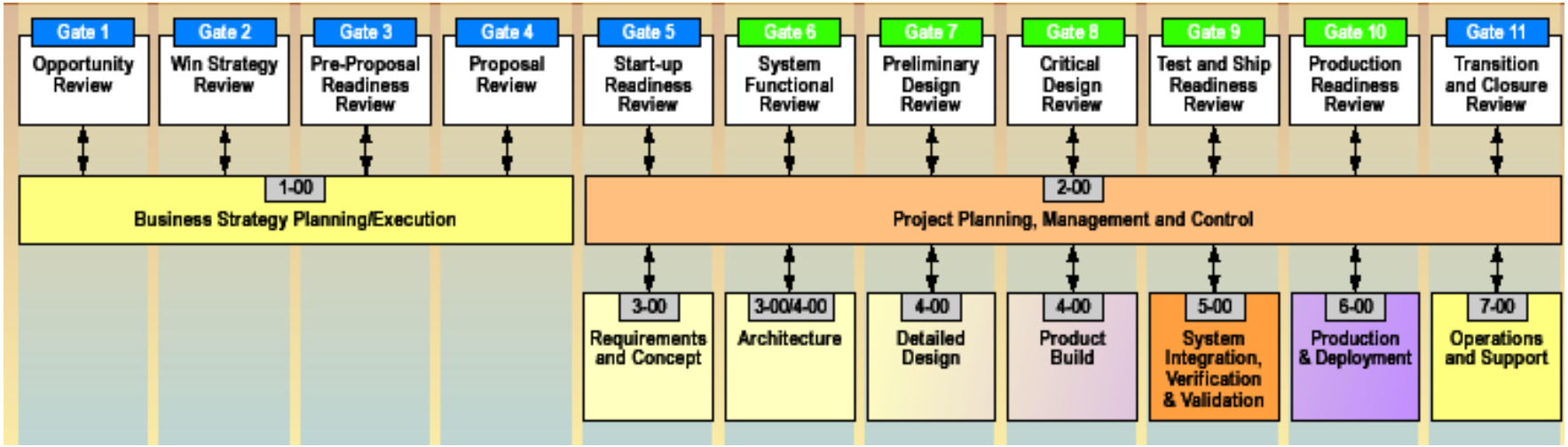
Overview

- Applying the model to the CMMI® Project is a viable approach
  - Specific Practices for most Process Areas apply
    - Project Planning, Project Monitoring and Control, Integrated Project Management
    - Risk Management, Configuration Management, Requirements Management
    - Measurement and Analysis, Decision Analysis and Resolution, Process and Product Quality Assurance
    - Requirements Development, Technical Solution, Product Integration, Verification, Validation
  - Examples follow for each Generic Practice
    - Time limitation precludes covering Specific Practices

Apply the Model to the CMMI® Project

GP 2.1 Establish an organizational policy

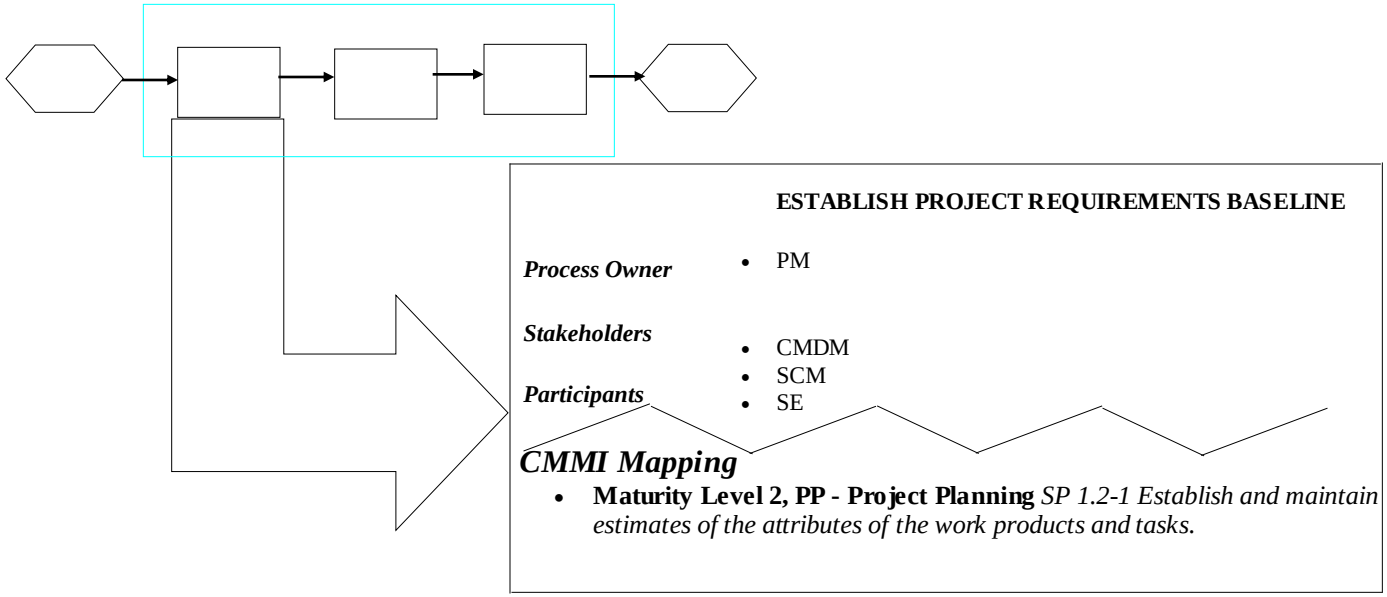
- Follow the Organization's Policy for Product Development
  - E.g., Raytheon Integrated Product Development Process (IPDP) Corporate Policy, and local policies (PM, Quality, Engineering, Supply Chain, Training)
    - "Gate" oriented process:



Apply Product Development Org Policy to CMMI® Project

GP 3.1 Establish a Defined Process

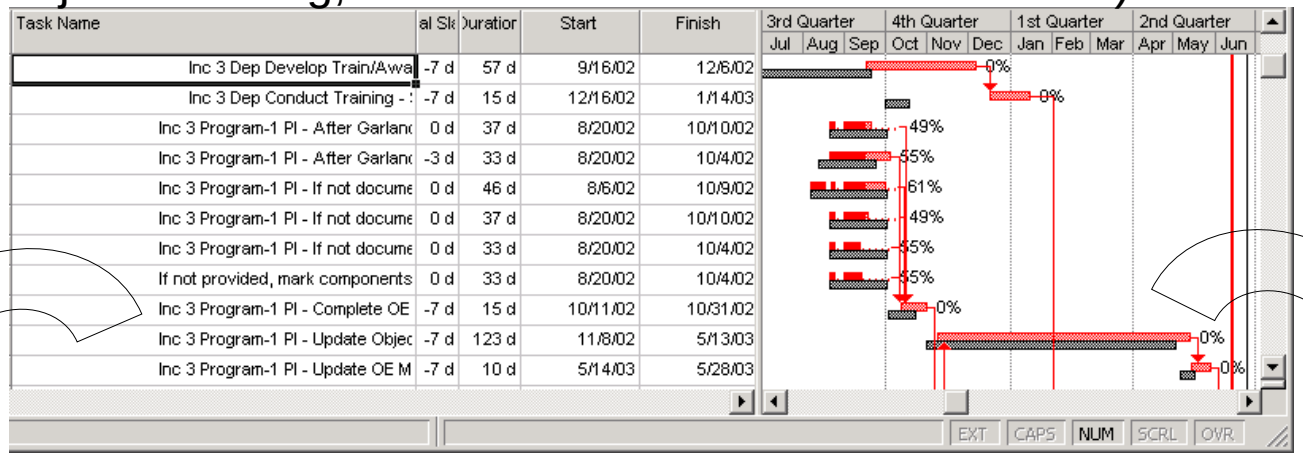
- Plan and conduct project tailoring for CMMI® Project
  - Delete/modify selected gates, stages, tasks
  - Assess impact of deletion/modification (including local procedures)
    - Tasks mapped to CMMI® practices
- Use and maintain the defined process



Tailor Org Direction/Guidelines/Enablers

GP 2.2 Plan the Process

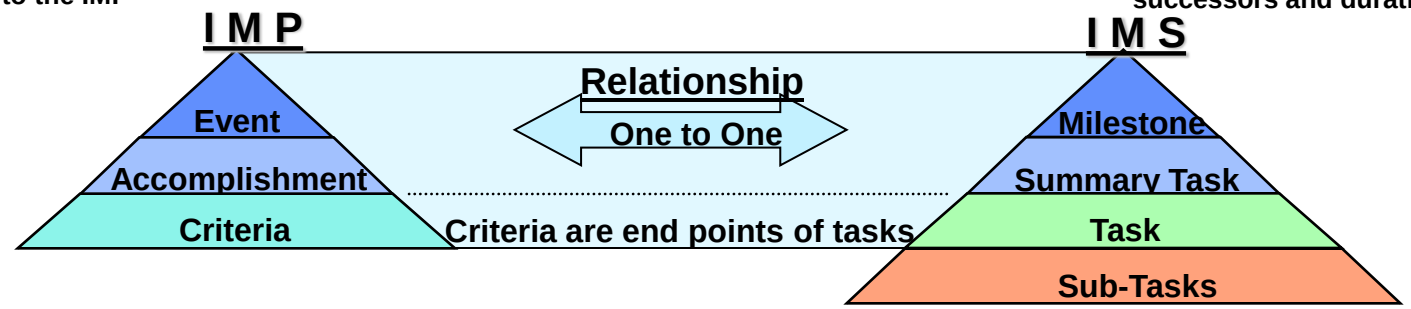
- Develop Integrated Master Plan and Schedule (IMP, IMS)
  - Perform detailed planning and associated **resource** commitment
    - Include Basis of Estimate (BOE) for each task/subtask (see Specific Practices for Project Planning; also each GP that follows this slide)



Task Name	al Sk	Duratior	Start	Finish
Inc 3 Dep Develop Train/Awa	-7 d	57 d	9/16/02	12/6/02
Inc 3 Dep Conduct Training -	-7 d	15 d	12/16/02	1/14/03
Inc 3 Program-1 PI - After Garlan	0 d	37 d	8/20/02	10/10/02
Inc 3 Program-1 PI - After Garlan	-3 d	33 d	8/20/02	10/4/02
Inc 3 Program-1 PI - If not docume	0 d	46 d	8/6/02	10/9/02
Inc 3 Program-1 PI - If not docume	0 d	37 d	8/20/02	10/10/02
Inc 3 Program-1 PI - If not docume	0 d	33 d	8/20/02	10/4/02
If not provided, mark components	0 d	33 d	8/20/02	10/4/02
Inc 3 Program-1 PI - Complete OE	-7 d	15 d	10/11/02	10/31/02
Inc 3 Program-1 PI - Update Objec	-7 d	123 d	11/8/02	5/13/03
Inc 3 Program-1 PI - Update OE M	-7 d	10 d	5/14/03	5/28/03

Tasks with alignment to the IMP

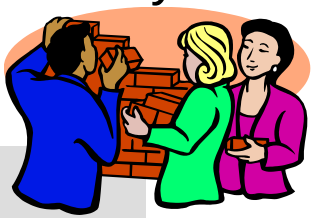
Network schedule with predecessors, successors and durations



Plan in Detail to Minimize Rework

GP 2.3 Provide Resources

- Budget
  - Overhead, allocation, indirect, direct, inter-organizational transfer
  - Supplies & expense (other direct cost) for appraisal team
- Facilities
  - Closed/open area access & flow of data
- People
  - Ensure key roles on CMMI® project are staffed by trained, available, full-time/part-timers with right skill-set
- Tools
  - Identify tool requirements at onset of project (e.g., defect tracking, action item, risk management, objective evidence collection tools)
  - Provide early tool deployment to prevent rework and inconsistency between tracking mechanisms



Adequate Resources Foster Success

GP 2.4 Assign Responsibility

- Address in IMP (Stakeholders and Staffing) and IMS (Resources assigned to each task)
  - E.g., Sponsors, PM, Risk Manager, Process Group, Process Action Teams, Deployment Team, Verification/Validation Team
- Ensure IMS is Linked with predecessor/successor relationship between tasks (to provide visibility of resource issues)
- Assign a Control Account Manager (CAM) to each major area
  - E.g., Process Action Teams
- Assign a Responsible Individual (RI) to each task, risk, action item, non-compliance, requirement

RIs Make or Break the Schedule

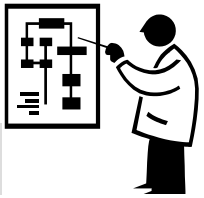
GP 2.5 Train People

- Determine project training requirements
  - Processes (schedule, risk, action item, objective evaluation, configuration management, requirements, design, deployment, OE collection, validation)
  - Tools (same list as for “Processes” if tool is used with the process)
  - CMMI Model for key personnel
- Determine who needs to be trained
  - Project Manager, Risk Manager, CAMs, RIs
  - Process Group staff, Process Action Teams
  - Deployment Team, Validation Team
- Include training of project personnel in IMP and IMS

Trained Resources Reduce Rework

GP 2.6 Manage Configurations

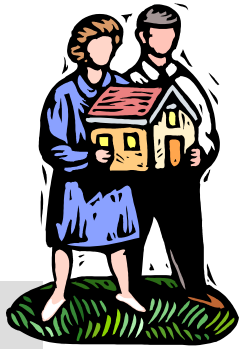
- Plan for Configuration and Data Management
  - Identify items to control
    - Project (e.g., budget, schedule, plans, data files)
    - Process (e.g., process descriptions, other process artifacts)
    - Programs (e.g., objective evidence)
  - Determine levels of control needed
    - E.g., product baseline, developmental baseline, work-in-progress
  - Identify mechanism for change control
    - On-line Change Request System, Change Control Board
- Document the plan and process
- Execute according to the plan



Controlled Changes Reduce Rework

GP 2.7 Identify and Involve Relevant Stakeholders

- Identify Relevant Stakeholders in the Plan(s)
  - E.g., IMP (Sponsors, Program Managers, Project Manager, Risk Manager, Process Group staff, Process Action Teams, Deployment Team, Validation Team, CAMs, RIs)
- Obtain COMMITMENT of Organizational leader - Can't be driven only from Software and Systems Engineering
  - Include CMMI® goal in performance goals of executive sponsors and flow into goals of direct reports
    - Establishes clear responsibility and accountability
  - Engage program management early
- Involve Relevant Stakeholders
  - Weekly/Monthly Status Meetings
  - Address issues on a case-by-case basis



Sponsors Set the Pace

GP 2.8 Monitor and Control the Process

- Identify what to monitor and mechanism, in the Plan(s)
  - Examples: cost & schedule performance (CPI/SPI), risks/mitigation plan progress, contingency/recovery plan progress, opportunities/capture plan progress, actions, non-compliances, requirements changes, design changes, validation progress
- Schedule monitor/control activities
  - E.g., weekly and monthly status meetings (topics: same as above)
- Use Decision Analysis and Resolution when appropriate (as documented in the Plan)
- Take corrective actions as needed, and track to closure
  - Based on Variance Reports, action items, change requests, etc.

Monitor to Determine Variances to Plan

GP 3.2 Collect Improvement Information

- Identify what to collect and collection method (e.g., Process Asset Library), in the Plan(s)
  - Examples:
    - Results of the monitor and control activities (see GP 2.8)
    - Change Requests and disposition
    - Lessons Learned (at each major milestone)

- Collect, review, and provide to the Org Repository, per the Plan

Share Improvement Information

GP 2.9 Objectively Evaluate Adherence

- Plan for Objective Evaluations
  - Examples:
    - Internal evaluations and audits
    - Gate Reviews (backup data)
    - External Process Group reviews
- Perform Objective Evaluations, per the Plan
- Address non-compliance issues (follow-up on observations and findings)
- Report results

Objectively Evaluate Performance

GP 2.10 Review Status with Higher Level Mgmt

- Identify what to review and frequency, in the Plan(s)
  - Examples:
    - Engineering and Business Monthly Operations Reviews
    - Monthly CMMI® Executive Steering Team Review
- Conduct reviews with higher level management as planned
  - Progress on actions from last review
  - Status of schedule, cost, risks, opportunities, non-compliances, validation (readiness for SCAMPI℠)
- Review critical issues on event-driven basis

Provide Visibility to Management

Summary

- CMMI® defines criteria for determining an organization's process maturity (an on-going effort)

- However,
  - To focus on achieving an organization's desired maturity level, the CMMI® Project should be managed as a development project (with appropriate tailoring)
  - Applying the model for planning and performing the project is a disciplined approach to achieving success

Manage the CMMI® Project as a Development Project