

Top 10 Signs You're Ready (or Not) For an Appraisal

*Gary Natwick
Harris Corporation*

Government Communications Systems Division



- \$1.8B in Sales
- 8,000 Employees
- ISO 9001:2000
- CMMI® Level 3
- SW-CMM® Level 4

DoD Programs



Civil Programs



National Programs



Strategic Management and Business Development



Homeland Security Programs



Harris Technical Services Corporation



- Increasing requirement for organizations to demonstrate compliance to CMMI®
 - Formal appraisals (SCAMPISM A)
 - Progress appraisals (SCAMPISM B&C)
- Appraisal preparation:
 - Time consuming & labor intensive
 - Success depends on getting it right the first (and sometimes only) time
- Risk of achieving an organization's process maturity goal can be minimized through:
 - Appraisal experiences, both positive and negative
 - Industry benchmarking

- Organization has Process Leadership
 - Senior Management Commitment
 - Dedicated Resources
 - Process Group
 - Budget
 - Tools
 - Process Model selection
 - CMMI[®]-SE/SW/IPPD/SS
 - Staged or Continuous representation
 - Monitor and enforce Process Compliance
 - All Qualifying projects
 - All Functional Organizations

Improvement Organization

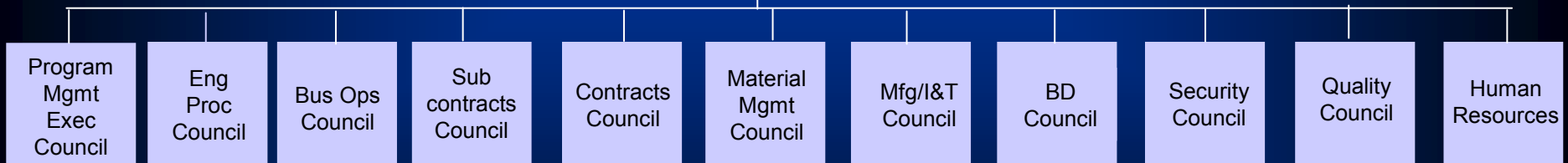


- President, GCSD Staff
- Steering Committee for integrated, division-wide process improvement
- Representatives from each functional organization

Division Process Council

Division Process Group

- Working Arm of the DPC
- Empowered representatives from each functional organization
- Owns and maintains (CCB) division-level process command media (Integrated Process Manual)
- Monitors and enforces process compliance



CMMI®-SE/SW Staged Representation



Maturity Level	Focus	Process Areas
5 Optimizing	<i>Continuous Process Improvement</i>	Organizational Innovation and Deployment Causal Analysis and Resolution
4 Quantitatively Managed	<i>Quantitative Management</i>	Organizational Process Performance Quantitative Project Management
3 Defined	<i>Process Standardization</i>	Requirements Development Technical Solution Product Integration Verification Validation Organizational Process Focus Organizational Process Definition Organizational Training Integrated Project Management Risk Management Decision Analysis and Resolution
2 Managed	<i>Basic Project Management</i>	Requirements Management Project Planning Project Monitoring and Control Supplier Agreement Management Measurement and Analysis Process and Product Quality Assurance Configuration Management
1 Initial		

- Organization has a Process Improvement Plan
 - Scope
 - Establish how implemented in organization & projects
 - Internal users (projects, managers, process group)
 - External users (customers, appraisal teams)
 - Process Improvement Organization
 - Process Improvement Objectives
 - Strategic
 - Tactical
 - Measurement
 - Appraisals
 - Primary source of candidate process improvements

- Organization has Integrated Processes
 - Organizational requirements
 - Process Model compliance (CMMI®)
 - Integration and collaboration across functional organizations
 - Disciplined repeatable processes with objective criteria
 - Entry/exit criteria, inputs, outputs, verification, measures
 - Planning each process, and tracking against plan
 - Tailoring standard processes and assets
 - Budgets, schedules, resources
 - Managing established baselines
 - Managing Stakeholder involvement
 - Measuring progress and improvement

What is a Process?



- Examples
- Metrics
- Reporting
- Standard process
- Templates, assets
- Historical data

Plan

- Budget
- Schedule
- Resources
- Roles

Corrective Action

Measures

- CM

Tasks, Activities, Procedures

-
-
-
-
-

Inputs

▼

Entry Criteria

Monitor

Outputs

▼

Exit Criteria



Training

Verification / Reviews / QA



Integrated Process Criteria



Overview A brief description of the process intent	
Entry Criteria State, Prerequisites, Criteria	Exit Criteria State, Prerequisites, Criteria
Inputs Required work products	Outputs Resulting work products
Required Activities Mandatory tasks to implement the process	
Measures Process performance against plans	
Organizational Improvement Information Metrics, reusable work products	
Verification Process compliance oversight	
Tailoring Approved tailoring, process specific	
Implementation Guidance Common implementation descriptions	
Supporting Documentation and Assets Applicable GCSD references.	

CMMI® Process Area Categories



CMMI®

Project Management

- Project Planning
- Project Monitoring and Control
- Supplier Agreement Management
- **Integrated Project Management**
- **Risk Management**
- **Quantitative Project Management**

Engineering

- Requirements Management
- **Requirements Development**
- **Technical Solution**
- **Product Integration**
- **Verification**
- **Validation**

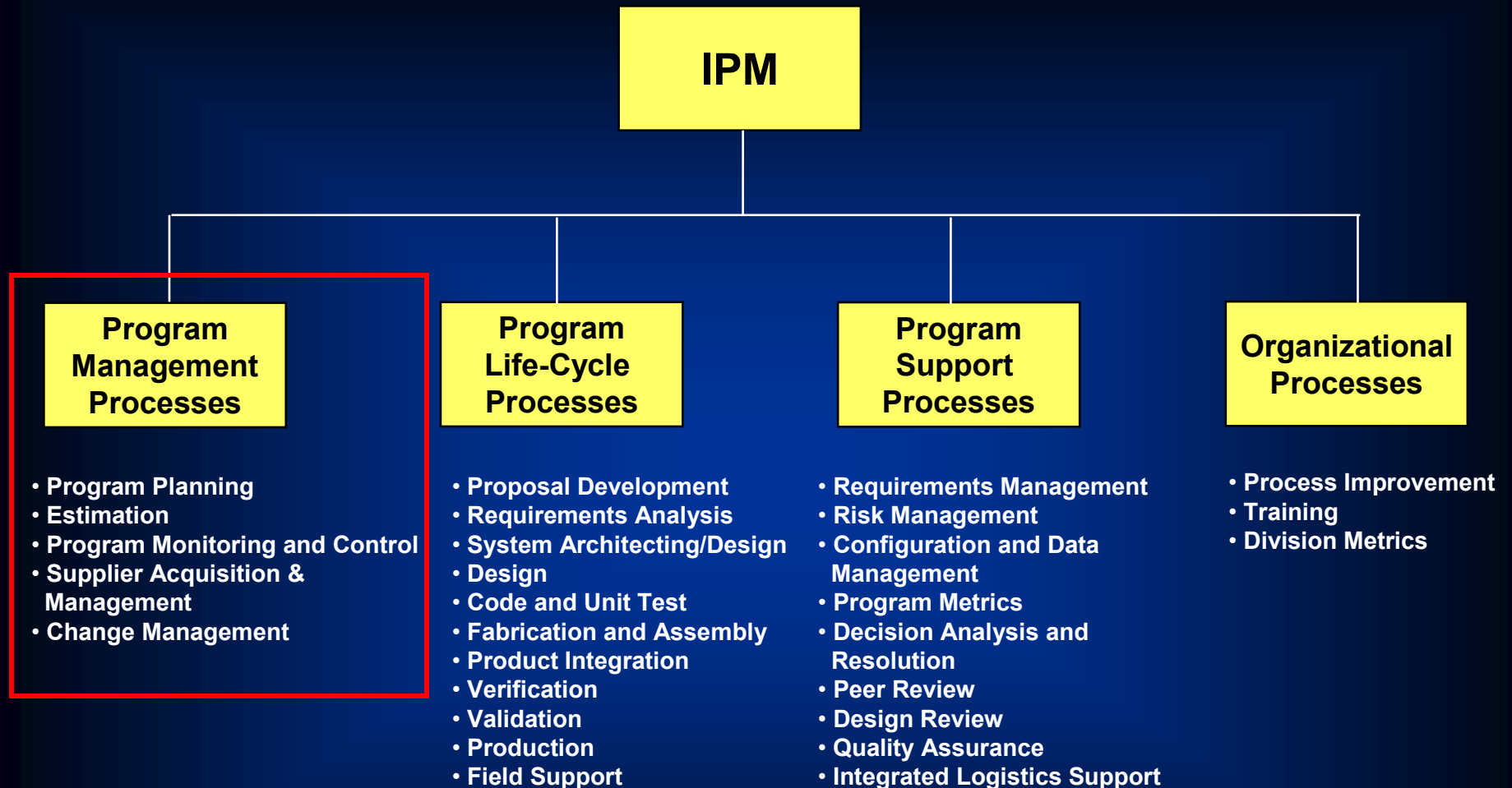
Support

- Configuration Management
- Process and Product Quality Assurance
- Measurement and Analysis
- **Decision Analysis and Resolution**
- **Causal Analysis and Resolution**

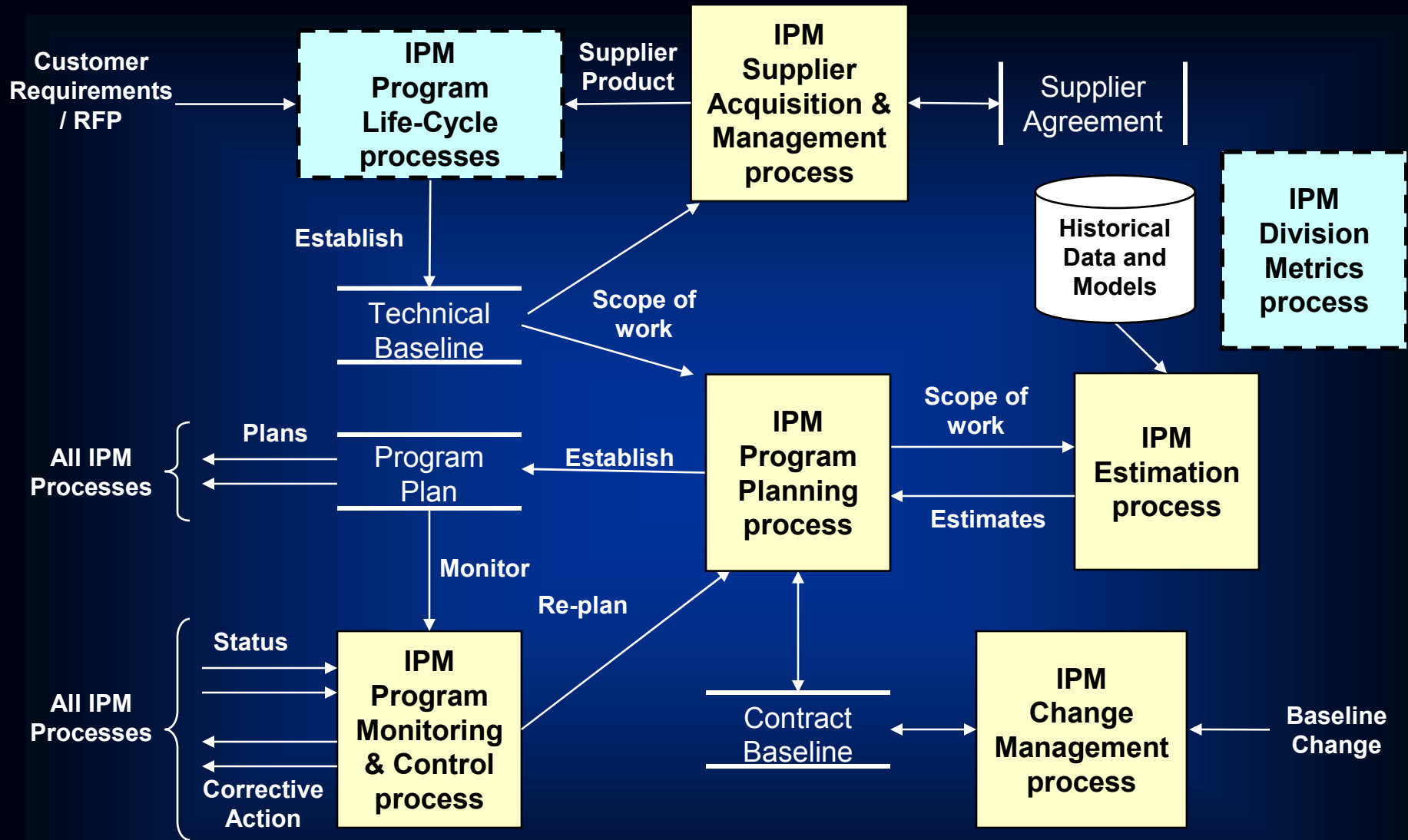
Process Management

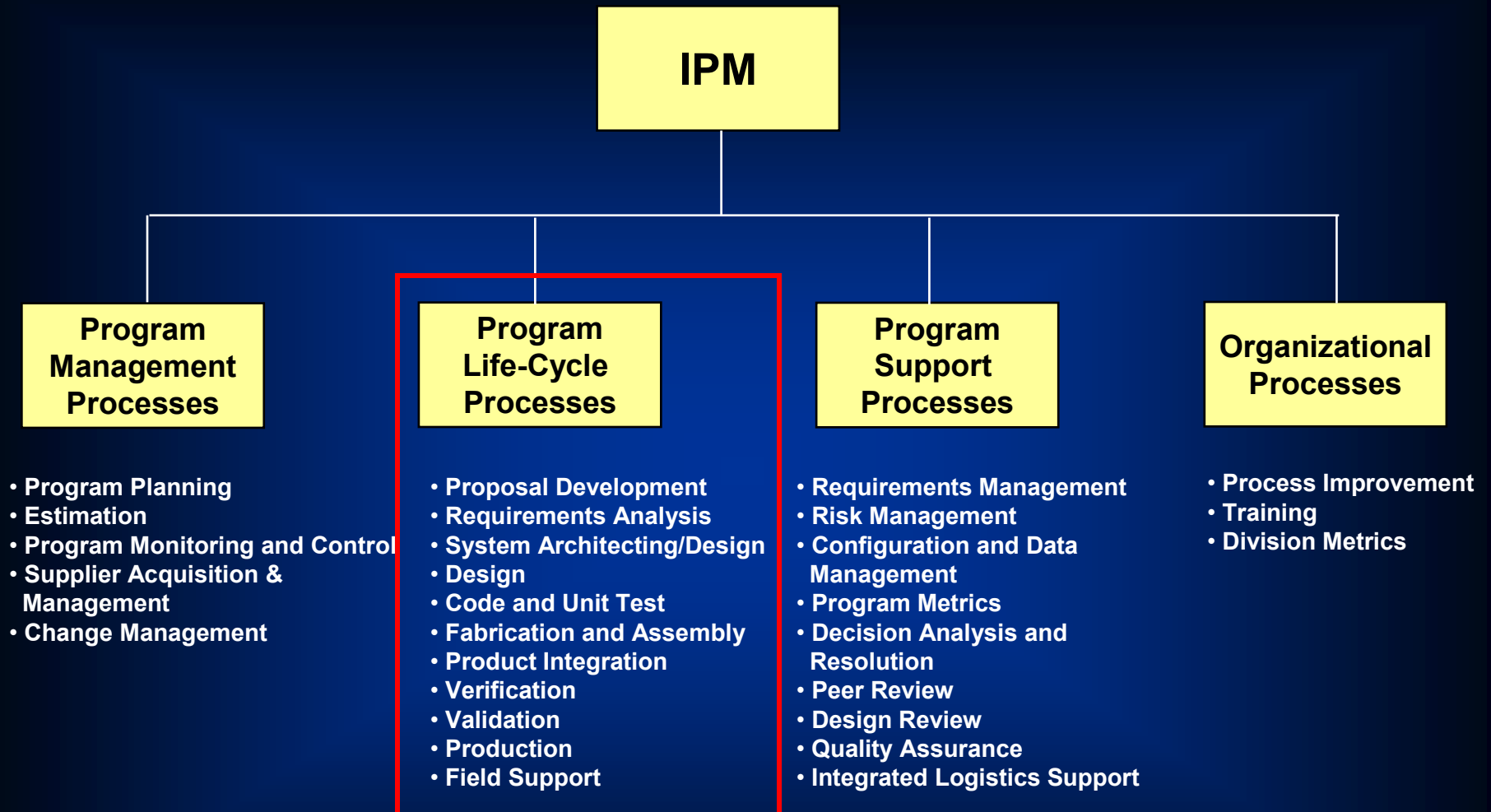
- **Organizational Process Focus**
- **Organizational Process Definition**
- **Organizational Training**
- **Organizational Process Performance**
- **Organizational Innovation and Deployment**

- **Maturity Level 2**
- **Maturity Level 3**
- **Maturity Level 4**
- **Maturity Level 5**



Program Management Processes





Program Life-Cycle Processes - 1



IPM Proposal Development process	IPM Requirements Analysis process	IPM System Architecting/ Design process	IPM Design process	IPM Fab/Assembly process	IPM Product Integration process
				IPM Code and Unit Test process	
IPM Verification Process					
IPM Validation Process					

	Program Startup Review						
	▼	▼	▼	▼	▼	▼	▼
Life-Cycle Phase	Business Acquisition	System Requirements	System Design	Prelim Design Detail Design	Fab, Code, Integration	Integration	Verification
Baseline	Proposal Baseline	Requirements Baseline	Functional Baseline	•Allocated •Design	Developmental Configuration		Product Baseline
Milestones / Reviews	TBR PCR	SRR	SDR	PDR CDR		TRR	System Test PCA, FCA
Key Products	Proposal Prog Plans (P) Sys Arch (P)	Prog Plans Requirements CONOPS Operational Threads / Use Cases	Sys Arch Sys Design Interface Defn Technical Data Package Traceability	Prelim Design Detail Design Design docs Test cases / descriptions Traceability	Assembled Components Component test procs / results	Integration plan (F) Integration procedures Integration results	Test procedures Test results Traceability Delivered systems

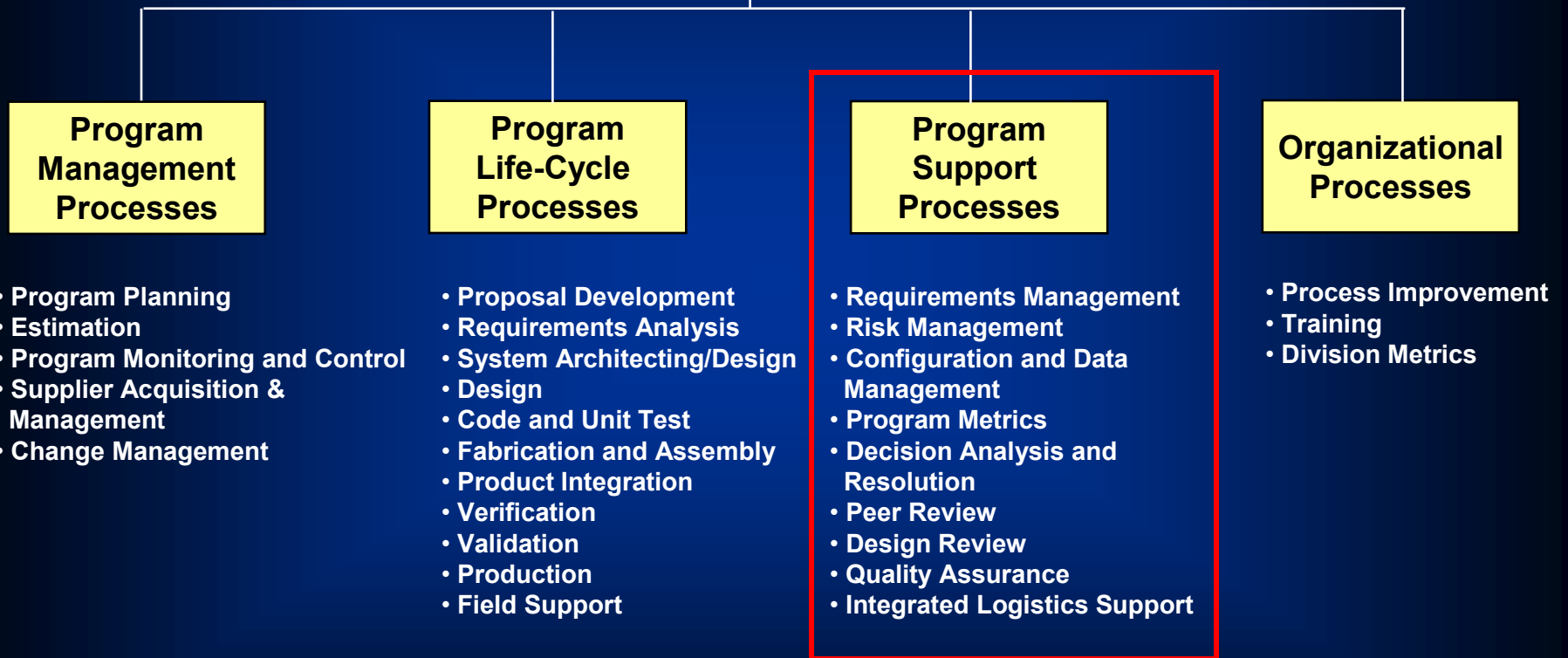
Program Life-Cycle Processes - 2



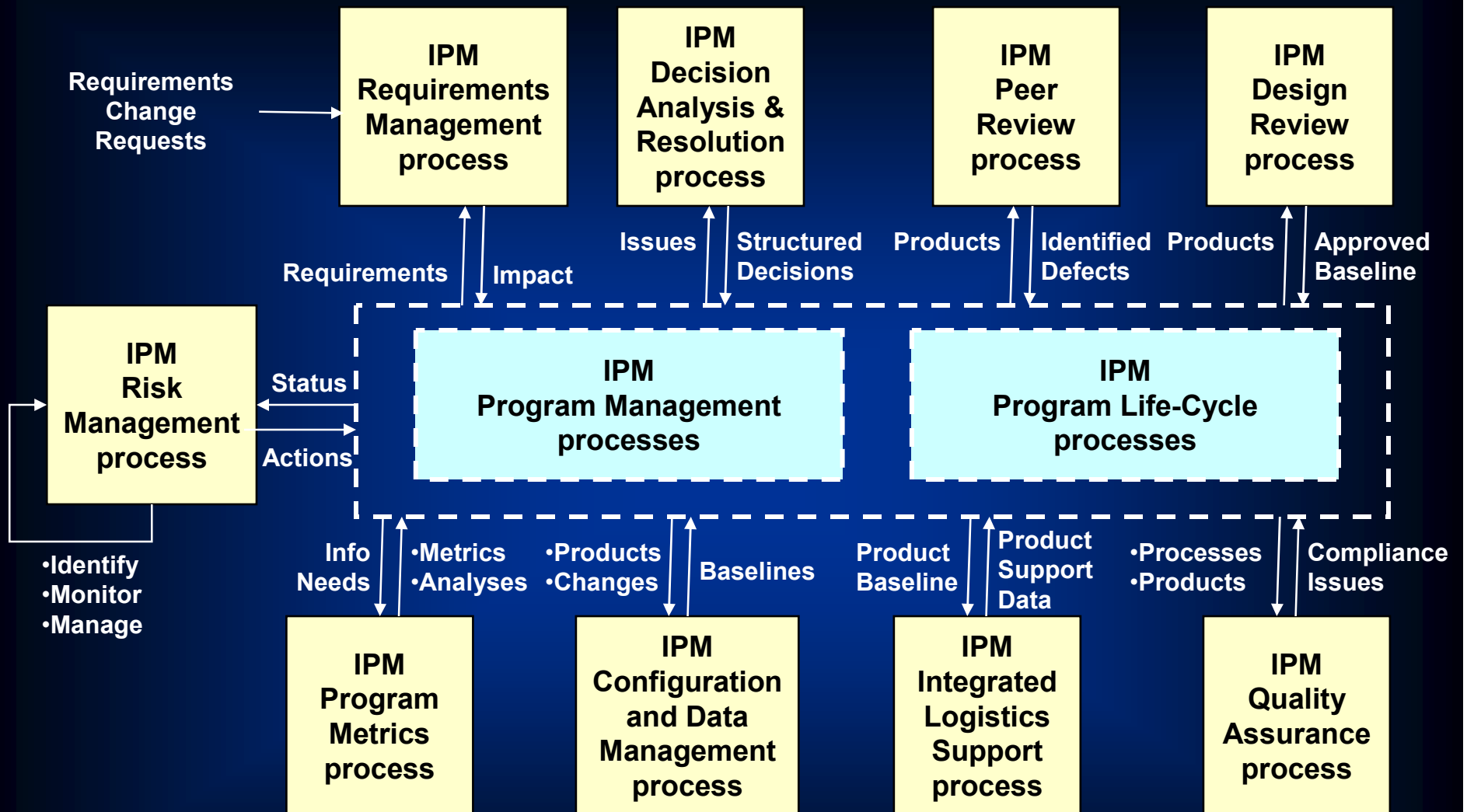
	IPM Production process	IPM Field Support process
	IPM Verification process	
	IPM Validation process	
	Other IPM Program Life-Cycle processes (as applicable)	
Life-Cycle Phase	Production	Field Support
Baseline	Product Baseline	Product Baseline
Milestones / Reviews	Production Readiness Review	
Key Products	Production plan Delivered systems As-built documents Test results	Site Transition / Install Plan Revisions to product baseline Test results

- IPM Production and Field Support processes apply only to the extent required by contract
 - May be not applicable
 - May implement revisions to the baseline products
 - May involve other life cycle processes
 - Requirements, design, implementation
- IPM Production Process
 - Produce and deliver multiple systems
- IPM Field Support Process
 - Site installation
 - Operations support
 - Engineering services

IPM



Program Support Processes



IPM

Program Management Processes

- Program Planning
- Estimation
- Program Monitoring and Control
- Supplier Acquisition & Management
- Change Management

Program Life-Cycle Processes

- Proposal Development
- Requirements Analysis
- System Architecting/Design
- Design
- Code and Unit Test
- Fabrication and Assembly
- Product Integration
- Verification
- Validation
- Production
- Field Support

Program Support Processes

- Requirements Management
- Risk Management
- Configuration and Data Management
- Program Metrics
- Decision Analysis and Resolution
- Peer Review
- Design Review
- Quality Assurance
- Integrated Logistics Support

Organizational Processes

- Process Improvement
- Training
- Division Metrics

Organizational Processes



Organizational Processes

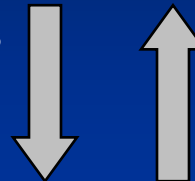
Division Objectives

IPM Process Improvement process

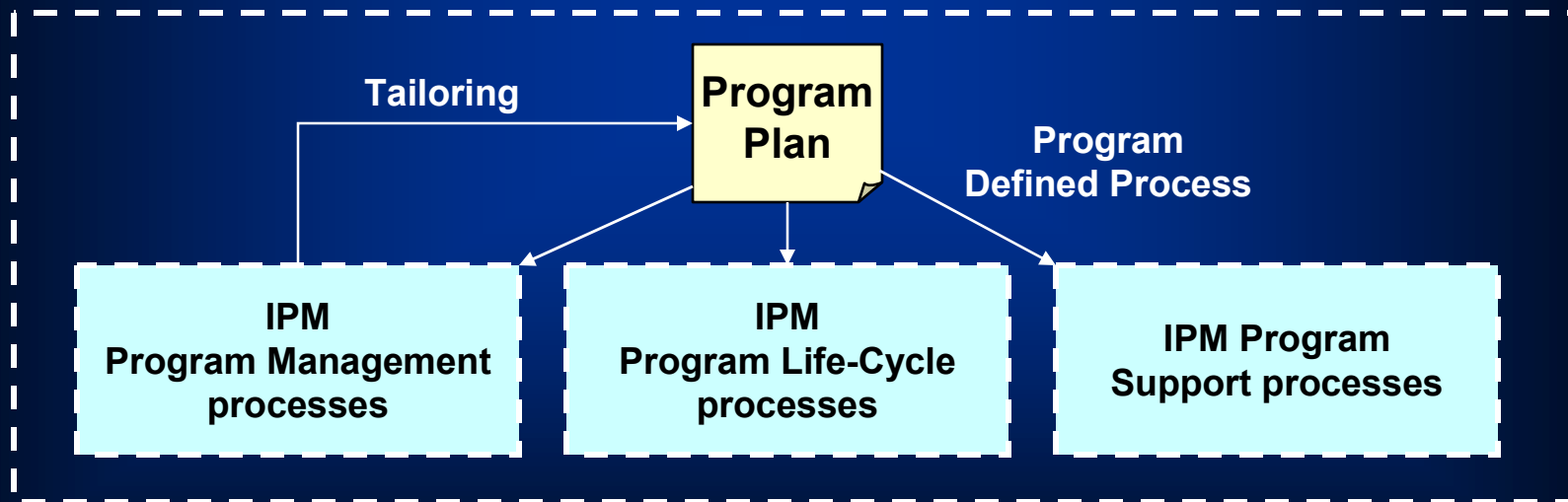
IPM Division Metrics process

IPM Training process

- Standard process
- Historical metrics
- Process assets
- Trained staff

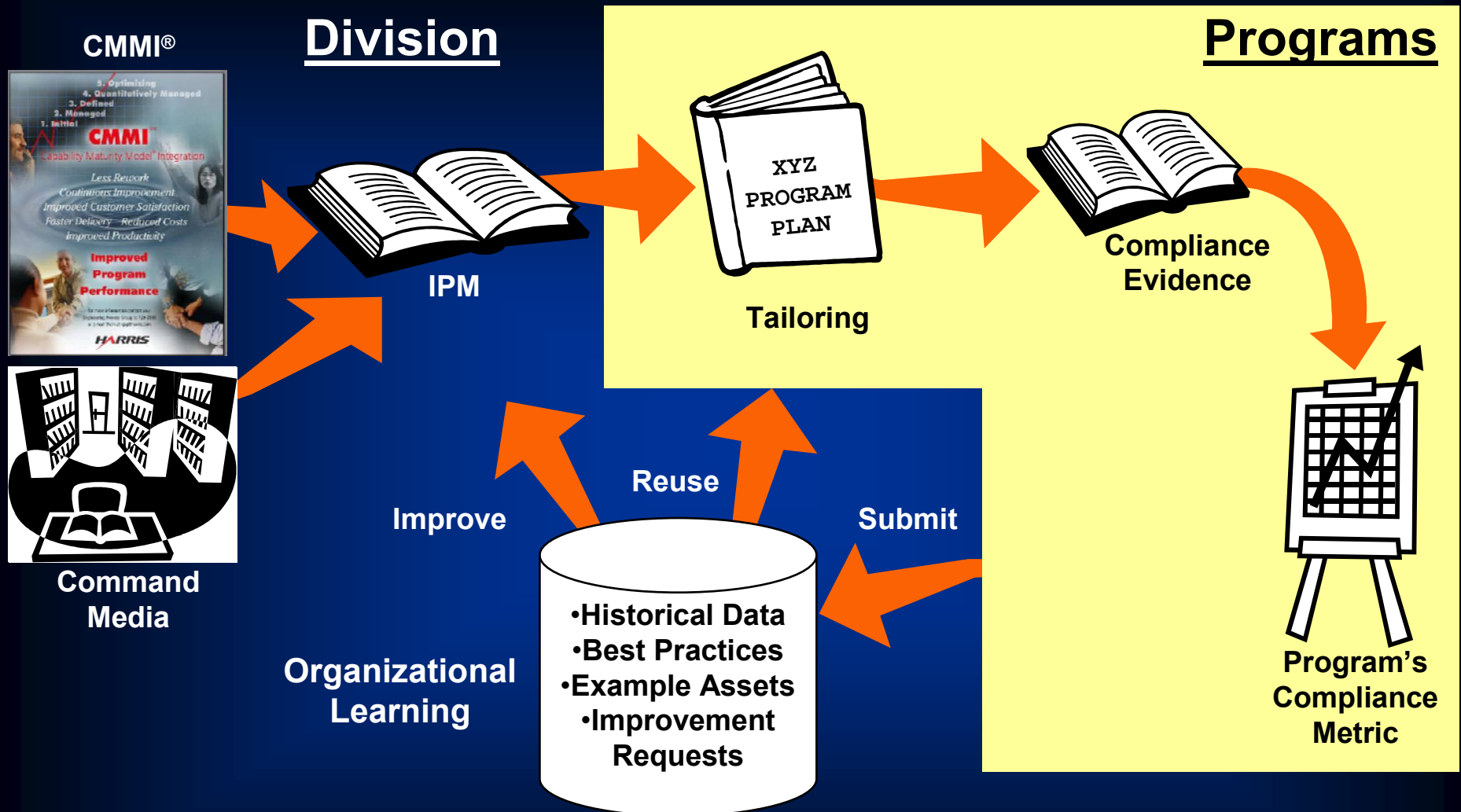


- Program metrics
- Program assets
- Lessons learned



- Process Compliance is Audited & Monitored

Integrated Compliance Approach



- Program's process is tailored from "defined process"

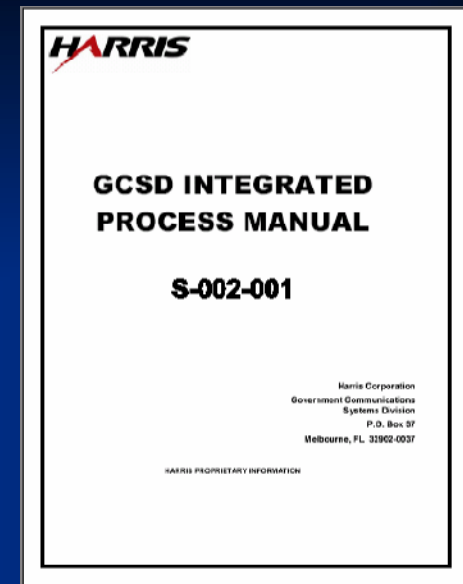
A	<u>A</u> ccept IPM statement as written (no changes)
T	<u>T</u> ailored; description of tailoring must be specified (e.g., modifications meeting intent of IPM statement)
D	<u>D</u> eviation; program alternative to IPM statement(s), or not implemented; Waiver Approval required
N	<u>N</u> ot applicable; specify rationale


- Approved by Division Management
- Establishes the approved baseline against which process compliance audits are performed
- Functional plans (SEMP, SDP, etc.) are reviewed and approved by cognizant functional manager

Program Process Evidence



Overview A brief description of the process intent	
Entry Criteria State, Prerequisites, Criteria	Exit Criteria State, Criteria
Inputs Needed work products, resources	Outputs Resulting work products
Required Activities Mandatory tasks to implement the process	
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Implementation Guidance Common implementation descriptions	
Supporting Documentation and Assets Applicable organizational references	




 Program evidence needed to demonstrate IPM process compliance

Integrated Process Manual

Tailoring

1. Program Plans
2. Program process baseline
3. Program execution
4. Compliance evidence
5. QA verification
6. Non-compliance mitigation

Program
Start-up

Program Phase
Execution

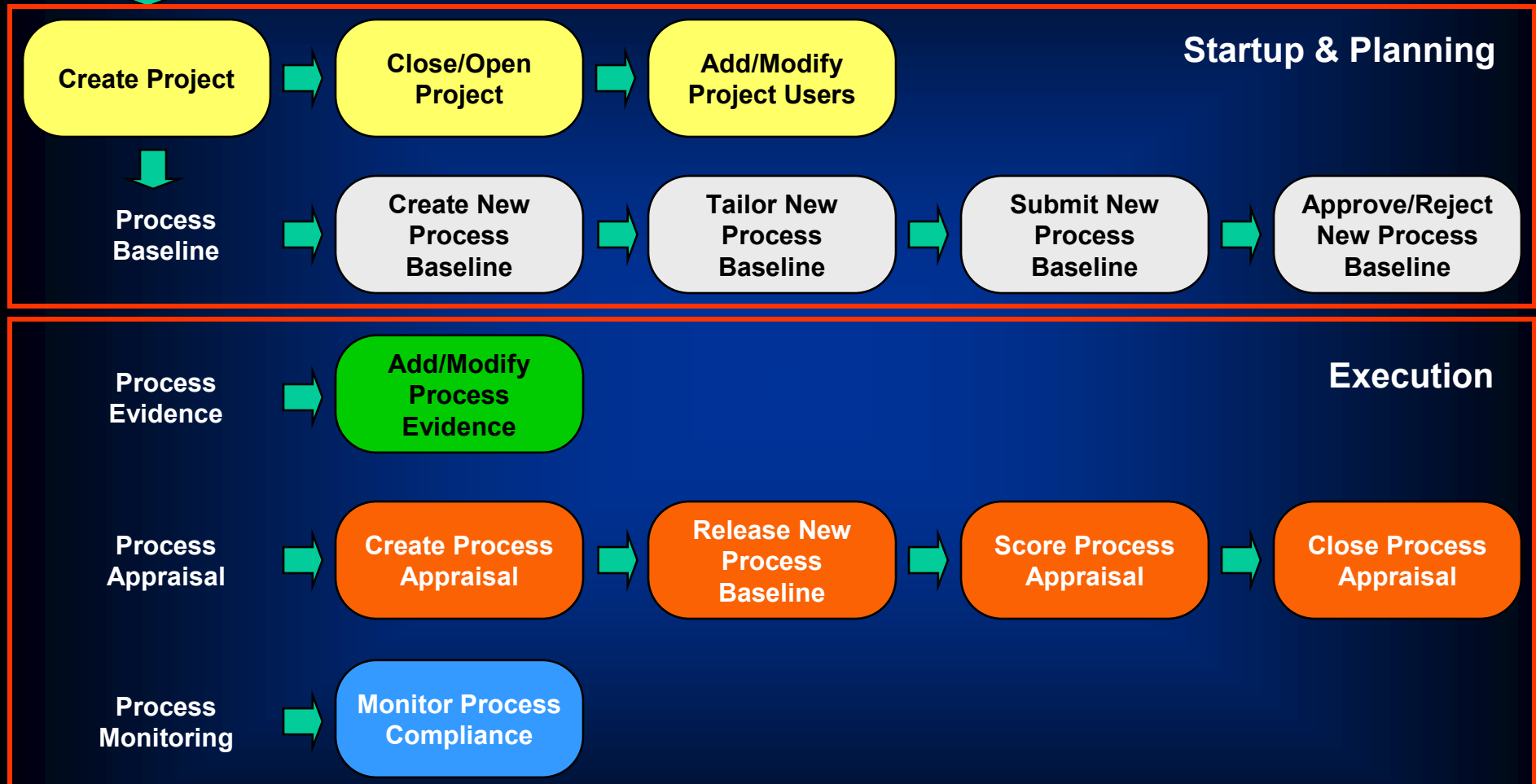
Program Appraisals

Process
Compliance
Monitor
(PCM)

PCM Project Workflow



Project request
to DPG



Process Compliance Scores



**ASSESSMENT
STATUS COLORS**

**PROCESS COMPLIANCE
COLORS**

NY	Not Yet	<ul style="list-style-type: none"> To be appraised at a later date (i.e., the process has not yet been executed by the process and cannot be appraised)
NA	Not Applicable	<ul style="list-style-type: none"> Not applicable to the project (e.g., Code and Unit Test Process is not applicable to a production-type program)
NS	Not Scored	<ul style="list-style-type: none"> Pending an appraisal
FI	Fully Implemented	<ul style="list-style-type: none"> Direct artifacts are present and appropriate No substantial weaknesses
LI	Largely Implemented	<ul style="list-style-type: none"> Direct artifacts are present and appropriate One or more substantial weaknesses
PI	Partially Implemented	<ul style="list-style-type: none"> Direct artifact is absent or inadequate Substantiated by indirect artifact/affirmation One or more substantial weaknesses
NI	Not Implemented	<ul style="list-style-type: none"> Any situation not covered by the above

- Appraisal Plan is Approved
 - Purpose
 - Key Appraisal Participant Information
 - Appraisal Scope
 - Process Context Information
 - Key Appraisal Parameters
 - Planned Tailoring
 - Appraisal Outputs
 - Appraisal Constraints
 - Activities, Resources and Schedule
 - Milestones & Schedule
 - Risk Management
 - Affirmations

- Artifacts are Managed
 - Plan
 - Tools
 - Configuration control
 - Appraisal with active links
 - Artifact stability
 - Broken links
 - Moving data
 - Aging data
 - Version control
 - Baselines
 - Backups

- Artifacts have Descriptions and Locations
 - Organizational/project terminology and definitions
 - Explicit practice and/or artifact descriptions
 - Explicit artifact titles
 - Artifact locations
 - Online hyperlinks
 - Explicit for quick reference
 - Directories/folders for institutionalization
 - Explicit Process Model tags
 - CMMI practice mapping
 - Direct, indirect, and affirmation tagging

- Direct Artifacts

- Tangible outputs resulting directly from implementation of a practice
 - e.g., plans, documents, products

Required for:

- every applicable IPM practice
- every applicable project

- Indirect Artifacts

- Artifacts that are a side-effect or indicative of performing a practice
 - e.g., meeting minutes, reviews, logs, reports, metrics

- **Optional for IPM compliance (expected, but not required).**

- Affirmations

- Oral or written statements confirming or supporting implementation of the practice
 - e.g, interviews, questionnaires

- **In formal CMMI[®] appraisals (e.g., SCAMPISM), these are required to corroborate direct artifacts.**

- Evidence exists across Project Life Cycle
 - All project phases intersect with one or more organizational processes
 - Direct and indirect or affirmation for each occurrence

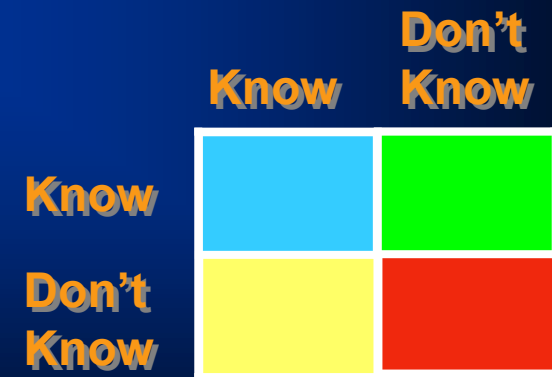
Evidence Collection across the Project Life Cycle



Program Phases									
IPM Processes	Business Acquisition	System Rqmts	System Design	Preliminary Design	Detailed Design	Fabrication, Code and Integration	Verification	Production	Field Support
Program Planning	X	X	X	X	X	X	X	X	X
Estimation	X	X	X	X	X	X	X	X	X
Program Monitoring & Control		X	X	X	X	X	X	X	X
Supplier Acquisition Mgmt	X	X	X	X	X	X		X	X
Change Management	X	X	X	X	X	X	X	X	X
Proposal Development	X								
Requirements Analysis	X	X							
System Architecting & Design	X	X	X						
Design	X			X	X				
Code and Unit Test						X			
Fabrication and Assembly						X			
Product Integration						X			
Verification	X	X	X	X	X	X	X	X	X
Validation	X	X	X	X	X	X	X		X
Production								X	
Field Support									X
Requirements Management	X	X	X	X	X	X	X	X	X
Risk Management	X	X	X	X	X	X	X	X	X
Configuration and Data Mgmt	X	X	X	X	X	X	X	X	X
Program Metrics		X	X	X	X	X	X	X	X
Decision & Analysis Resolution	X	X	X	X	X	X	X	X	X
Peer Reviews	X	X	X	X	X	X	X	X	
Design Reviews	X	X	X	X	X				
Quality Assurance	X	X	X	X	X	X	X	X	X
Integrated Logistics Support	X	X	X	X	X	X	X	X	X

- Evidence Themes exist for Process Areas
 - Within each Practice
 - Indirect artifacts compliment direct artifacts
 - Dates and versions are aligned
 - Across practices within each Goal
 - Artifacts form a common purpose
 - Continuity is established
 - Across goals within each Process Area
 - Project institutionalization is understood
 - Across projects with each Process Area
 - Organizational institutionalization is understood

- Evidence Readiness Reviews are Completed
 - Pre-appraisal (SCAMPI) Readiness Review
 - Verification (99-100%) vs. Discovery (1-0%)
 - Direct and indirect artifacts for every practice
 - Relevance to practice
 - Evidence Themes exist
 - Independent review is required
 - External appraisers is key
 - Know vs. Don't Know



Top 10 Signs You're Ready (or Not) *HARRIS*

1. Evidence Readiness Reviews are Completed
2. Evidence Themes exist for Process Areas
3. Evidence exists across Project Life Cycle
4. Artifacts have Descriptions and Locations
5. Artifacts are Managed
6. Appraisal Plan is Approved
7. Process Compliance is Audited & Monitored
8. Organization has Integrated Processes
9. Organization has a Process Improvement Plan
10. Organization has Process Leadership

Contact Information



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