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CMMI Based Risk Management: Managing the Risk Attributed to Supplier Processes

Presented By:

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Presentation Goals & Objectives

- **Defense Contract Management Agency (DCMA) surveillance activities can be effectively planned and implemented within the context of :**
 - **the CMMI**
 - **the contractor's process capability and improvement strategy**

- **DCMA surveillance can be used to identify the Risks which can be attributed to process; and monitor the effectiveness of contractor Risk Handling methods**

Topics to be Discussed

The DCMA Risk Management and Surveillance Requirements

- o DOD 5000.2R
- o Risk Management Guide for DOD Acquisition - 6th Edition v1.0
August 2006
- o Federal Acquisition Regulations

The application of CMMI to DCMA Surveillance Activities

- o Monitoring of Supplier Risk Management Program
- o Contractor Process Improvement
- o Award Fee Decisions
- o Pre-Award Surveys

The DCMA CMMI Based Surveillance Framework

The transformation of CMMI Based Surveillance Data into
customer desired Information

“Process” - A critical contributor to program risk

“To manage risk, the PMOs should focus on the critical areas that could affect the outcome of their programs. Work Breakdown Structure (WBS) product and process elements and engineering and manufacturing processes contain most of the significant risk events.”

“Critical risk processes are the developer’s engineering and production processes which historically have caused the most difficulty during the development and/or production phases of acquisition programs.”

“These processes include, but are not limited to, design, test, production facilities, logistics and management.”

Risk Management Guide for DOD Acquisition 6th Edition, v1.0 August 2006

The components of the CMMI offer the ideal suite of best practices to assist DCMA with in-plant surveillance and risk monitoring.

Government Risk: the probability/likelihood of acquiring a fully functional system on time, at the right price, with reasonable supportability and maintenance costs downstream.

Contractor Risk: involves the inherent chance of making a profit or incurring a loss and acquiring future business.



The Government PM and the Contractor may consequently have different views on specific Cost, Schedule, and Performance Risk levels **and the amount of process which is necessary**

Why should DCMA align the CMMI to DOD's Supplier Risk Management and Surveillance Mission?



DOD Agency Requirements:

DCMA is the DOD component which performs Contract Administration Services in-plant;

DCMA is required by Federal Law to administer contracts and perform Surveillance to assist the Government acquire systems which are developed, produced and managed from Contractor processes

Contract Process Requirements:

The contractor processes are key contributors to the risk of acquiring a System

Contractor Process and Improvement Initiatives:

The Contractor typically is modeling their processes and improvement Efforts to the CMMI architecture

CMMI Based Risk Management

What are the investment returns?

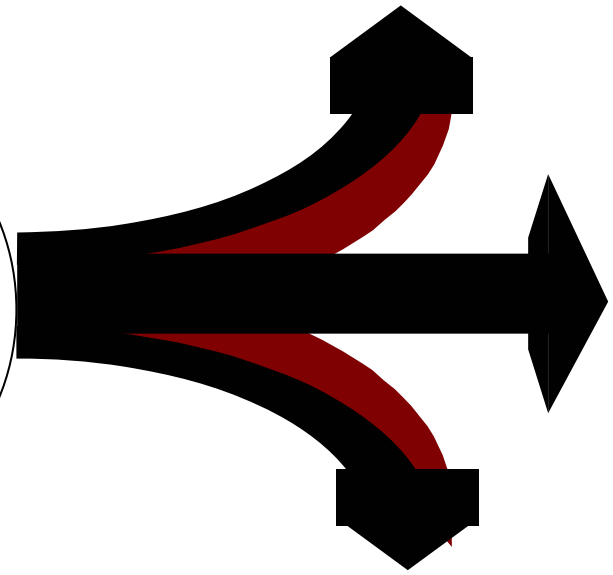


**Program-Process Risk
Information to be used by
DCMA, Contractor, and PMs**

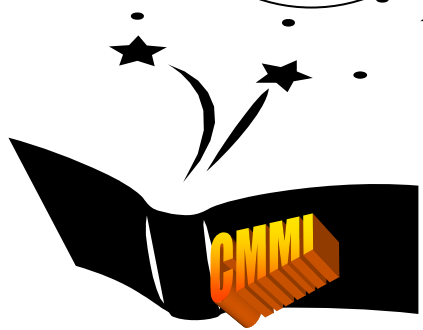
**DOD
POLICIES**

FAR

MOA



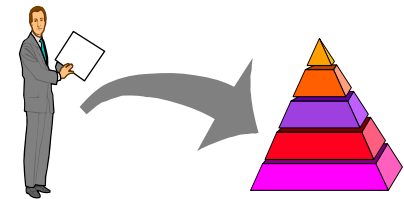
**Process
Capability &
Performance
Indicators for
Award Fee
Determination**



**Real-Time Contractor
Process Improvement**

What it is:

- A framework for using the CMMI to perform Supplier Risk Management while performing surveillance required by the FAR.
- A tool for exposing and handling the acquisition risk which can be attributed to contractor processes.
- A 5 Step Method to capture surveillance results, which are organized and analyzed by the components of the CMMI
- A framework for linking and coordinating:
 - Surveillance required by the FAR
 - DOD Risk Management Policy and Guidance in a Post Award Environment
 - DCMA Process Reviews, Product Examinations, and Corrective Actions within the context of the CMMI
 - DCMA activities within contractor's process improvement strategies



Why it's CMMI Based:

- Defacto Standard and Common Language for Government & Industry
- Provides a suite of known “Best Practices” to focus surveillance efforts

When it's applied:

- Used Daily

Mapping the CMMI Process Areas to the DCMA Contract Administration Service surveillance requirements mandated by the FAR

FAR Subpart 42.3—Contract Administration Office Functions

42.302 Contract administration functions.

(a) The contracting officer normally delegates the following contract

Administration functions to a CAO:

(40) Perform engineering surveillance to assess compliance with contractual terms for schedule, cost, and technical performance in the areas of design, development, and production. PP, PMC, RD, RM, TS, PI, VER, VAL, IPM, RM, CM, PPQA, M&A, SAM

Mapping the CMMI Process Areas to the DCMA Contract Administration Service surveillance requirements mandated by the FAR

FAR Subpart 42.3—Contract Administration Office Functions

42.302 Contract administration functions.

(a) The contracting officer normally delegates the following contract Administration functions to a CAO:

(38) Ensure contractor compliance with contractual quality assurance requirements.

PPQA

Mapping the CMMI Process Areas to the DCMA Contract Administration Service surveillance requirements mandated by the FAR

FAR Subpart 42.3—Contract Administration Office Functions

42.302 Contract administration functions.

(a) The contracting officer normally delegates the following contract Administration functions to a CAO:

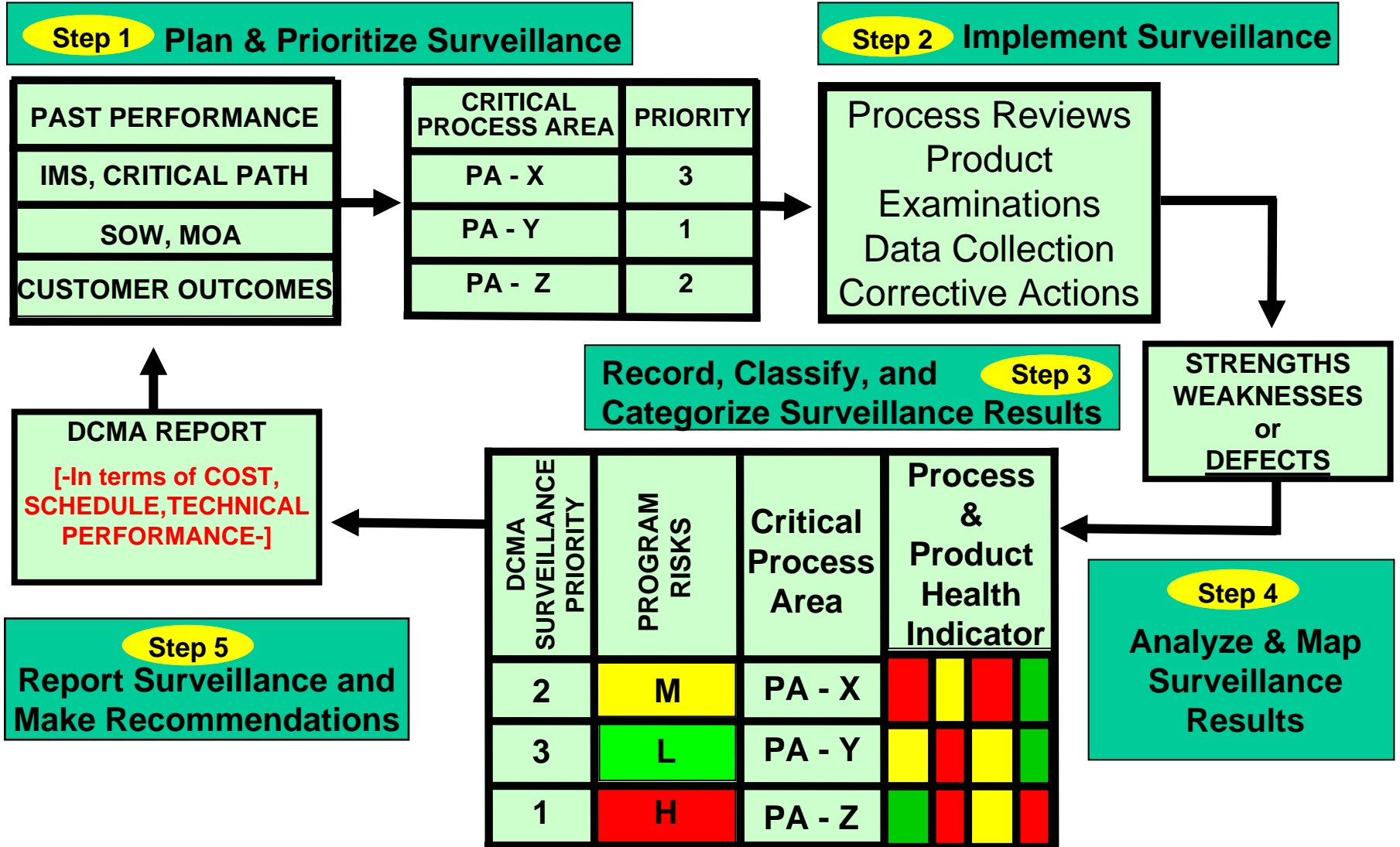
(41) Evaluate for adequacy and perform surveillance of contractor engineering efforts and management systems that relate to design, development, production, engineering changes, subcontractors, tests, management of engineering resources, reliability and maintainability, data control systems, configuration management, and independent research and development. PP, PMC, SAM, IPM, RSKM, REQM, RD, RM, TS, PI, VER, VAL

What are the Advantages of Using CMMI?

- **Validates Government expectations of Contractor to achieve/maintain appropriate levels of process capability and performance**
- **DCMA is on-site Govt. Rep – Utilizing knowledge and past experience with day-to-day process and product performance.**
- **DCMA surveillance is a continuous assessment of process performance - data always current – differs from snap-shot appraisal methods**



CMMI - Based Risk Management Framework



Step 2 Implement Surveillance

Transformation of Data onsite

Process Reviews
Product
Examinations
Data Collection
Corrective Actions

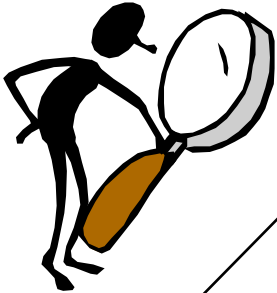
DCMA CMMI Based
Observations

DCMA Surveillance Notes
gathered during: Process
Reviews,
Product Examinations, Data
Analysis,
Corrective Actions

DCMA Findings – Issues -
Concerns

Step 2 Implement Surveillance

Process Reviews
Product Examinations
Data Collection
Corrective Actions



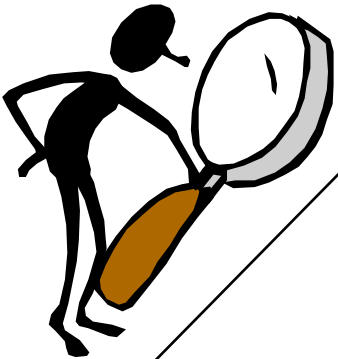
Surveillance Data Collection Technique –
Conversation & Discussion



CMMI based data is collected while attending meetings and through day to day discussions of process with the contractor

Step 2 Implement Surveillance

Process Reviews
Product Examinations
Data Collection
Corrective Actions



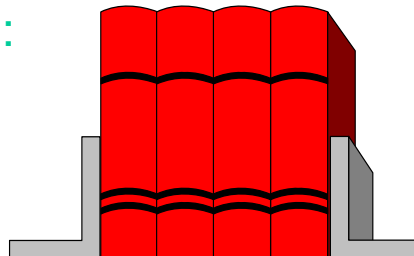
Surveillance Data Collection Technique – Review of Documentation

How is documentation used by KTR?

*Define & Standardize **process***
*Indicate a Commitment to Use **a process***
*Provide evidence of **process use***
*Collect data about **process performance***

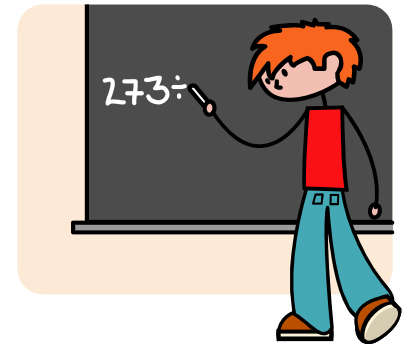
Document Categories:

Organization Level
Project Level
Implementation Level



Findings – Issues – Concerns are Used to:

- o ***Identify Strengths & Weaknesses to the customer and the supplier***
- o ***Adjust surveillance activities to handle the risk by working with the supplier to improve processes***



Step 2 Implement Surveillance

Transformation of Data onsite

Process Reviews
Product
Examinations
Data Collection
Corrective Actions

DCMA CMMI Based
Observations

DCMA Surveillance Notes
gathered during: Process
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Corrective Actions

DCMA Findings – Issues -
Concerns

**Record, Classify, and
Categorize Surveillance Results** **Step 3**

**STRENGTHS
WEAKNESSES
or
DEFECTS**



DCMA Data Sources: Proposal Evaluations, Process Reviews, Product Examinations, Corrective Action Requests

VE SG.2 Perform Peer Reviews

- SDFs of TYZ_acad, and TYT_acad do not contain peer review records as required by project SSPM
- SQA and Project manager inputs to cost proposal did not include hours for SQA activities and /or Engineering activity to support peer reviews of design objects on three CSCIs.

Record, Classify, and Categorize Surveillance Results **Step 3**

**STRENGTHS
WEAKNESSES
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VE SG.2 Perform Peer Reviews

- Design reviews are not being held on the fgU-PN4 program
- Software Development Plan, IMS, and Software Development Files do not reflect the planning for reviews of fgU-PN4 design objects
- DCMA review of SDFs reflect the absence of design review records as prescribed by XYZ's mandated process IDR_006A.

Record, Classify, and Categorize Surveillance Results

Step 3

STRENGTHS
WEAKNESSES
or
DEFECTS



DCMA Data Sources: Proposal Evaluations, Process Reviews, Product Examinations, Corrective Action Requests

VERIFICATION (VER)

- *Defects are not being identified on three CSCIs within the Audio Conference Upgrade Project (VE SG 3)*
- *Peer Reviews of Design Objects are not planned for three software configuration items on the Audio Conference Upgrade Project. (VE SG 2)*



Analysis Step 1 **summarize CMMI based *Observations* into *Finding* statements within each Process Area when applicable**

Analysis Step 2 **generate a Risk related *Issue* or *Concern* which would be sent to the Customer and also warrant a DCMA action to handle the risk.**

Analysis Step 3 **generate *Consequence / Impact Statements***

Analysis Step 4 **generate a DCMA *Risk Monitoring Strategy***

Step 4

**Analyze & Map
Surveillance
Results**

Step 5

**Report Surveillance and
Make Recommendations**



DCMA Data Sources: Proposal Evaluations, Process Reviews, Product Examinations, Corrective Action Requests

DCMA Monthly Report to Customer

Issue/Concern: XYZ Corporation's failure to conduct design peer reviews on three CSCI development efforts may result in defects going undetected until the test phase.

Consequences / Impact:

The test effort will likely be extended.

An increase in development cost and a slippage in schedule should be expected if the developers are to rework and retest the fixes associated with the defects uncovered in the test phases.

Step 5

**Report Surveillance and
Make Recommendations**



DCMA Data Sources: Proposal Evaluations, Process Reviews, Product Examinations, Corrective Action Requests

DCMA Monthly Report to Customer

Finding/Issue/Concern: XYZ

Corporation's failure to conduct design peer reviews on three CSCI development efforts may result in defects going undetected until the test phase.

Consequences / Impact:

The test effort will likely be extended.

An increase in development cost and a slippage in schedule should be expected if the developers are to rework and retest the fixes associated with the defects uncovered in the test phases.

Step 5

**Report Surveillance and
Make Recommendations**



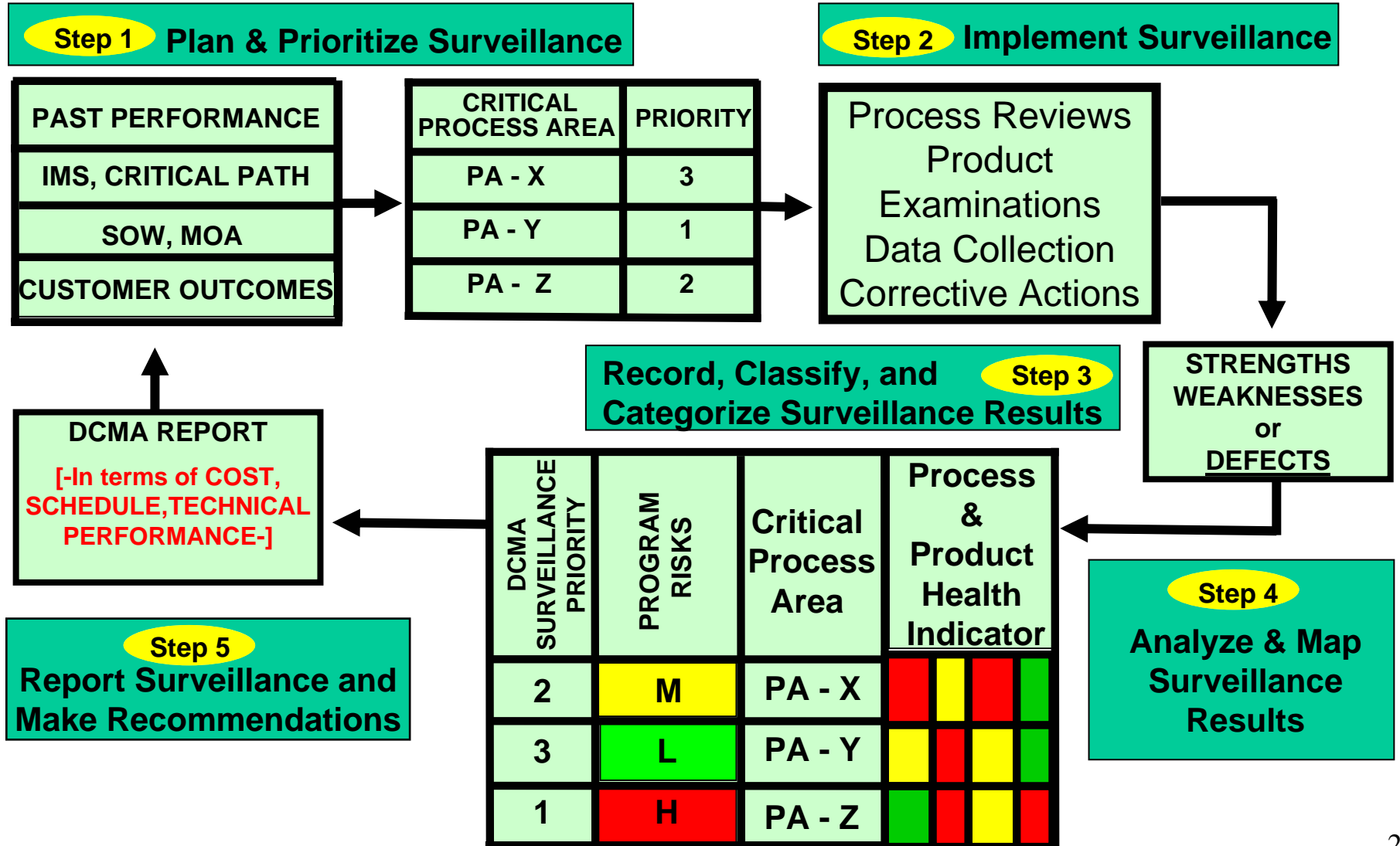
DCMA Data Sources: Proposal Evaluations, Process Reviews, Product Examinations, Corrective Action Requests

DCMA Monthly Report to Customer

DCMA Risk Handling and Monitoring Plan for next 30 days

- Increase independent DCMA inspection of design products using contractor defined standards and conventions and/or tool set
- Increase activity in planning efforts of follow-on efforts to ensure proposals include estimates for design peer reviews
- Work with contractor SEPG to ensure absence of design peer reviews are reported by contractor's SQA oversight function

CMMI - Based Risk Management Framework



**Record, Classify, and
Categorize Surveillance Results** **Step 3**

**STRENGTHS
WEAKNESSES
or
DEFECTS**



DCMA Data Sources: Proposal Evaluations, Process Reviews, Product Examinations, Corrective Action Requests

CM SG.3 Establish Integrity; SG.2 Track and Control Changes; SG.1 Establish Baselines

- Audio Conference Enhancement Project SCM Plan was prepared during the proposal and updated 30 days after contract award --plan continues to be dynamic while under control of SCCB
- SCCB Software/Documentation Change Requests identified in audit of the S/DCR database reflect activity against SCM Plan
- Review of the SCM Plan's revision history against S/DCRs reflect routine use and control of management plan

**Record, Classify, and
Categorize Surveillance Results** **Step 3**

**STRENGTHS
WEAKNESSES
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DEFECTS**



DCMA Data Sources: Proposal Evaluations, Process Reviews, Product Examinations, Corrective Action Requests

CM SG.3 Establish Integrity; SG.2 Track and Control Changes; SG.1 Establish Baselines

- **Audio Conference Enhancement Project SCM Plan Appendix IV includes a detailed list of software work products to be placed under formal configuration control;**
- **list includes components of software development and support environment**

Record, Classify, and Categorize Surveillance Results **Step 3**

**STRENGTHS
WEAKNESSES
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DCMA Data Sources: Proposal Evaluations, Process Reviews, Product Examinations, Corrective Action Requests

Project Planning (PP) SG.3 Develop a Project Plan

- **Audio Conference Enhancement Project SCM Plan Appendix IV includes a detailed list of software work products to be placed under formal configuration control (PP SP2.3);**
- **List includes components of software development and support environment (PP SP2.3, CM SP1.1)**

**Record, Classify, and
Categorize Surveillance Results** **Step 3**

**STRENGTHS
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DCMA Data Sources: Proposal Evaluations, Process Reviews, Product Examinations, Corrective Action Requests

CM SG.3 Establish Integrity; SG.2 Track and Control Changes; SG.1 Establish Baselines

-Customer approved changes initiated within Requirements Traceability Management (RTM) tool are directly linked to change control function of development documentation CM SP1.3-1, SP1.2-1; REQM SP1.3-1

-Impact of change requests on development/test documentation and code is readily identified in computer generated reports CM SP1.2-1

Record, Classify, and Categorize Surveillance Results

Step 3

STRENGTHS
WEAKNESSES
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DEFECTS



DCMA Data Sources: Proposal Evaluations, Process Reviews, Product Examinations, Corrective Action Requests

CONFIGURATION MANAGEMENT (CM)

- *Audio Conference Upgrade Project planning activities include strong emphasis on the establishment of and compliance with a Software Configuration Management Plan (PP SP2.3);*
- *Management controls ensure regular use of activities outlined in the plan and the accuracy of the plan itself (PMC SP1.4)*

Step 4

**Analyze & Map
Surveillance
Results**



Analysis Step 1 **summarize CMMI based *Observations* into *Finding* statements within each Process Area when applicable**

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Step 4

**Analyze & Map
Surveillance
Results**



DCMA Data Sources: Proposal Evaluations, Process Reviews, Product Examinations, Corrective Action Requests

CONFIGURATION MANAGEMENT (CM)

- *Audio Conference Upgrade Project SCM function provides routine access and rigorous identification and control over software work products throughout development life cycle*

Step 5

**Report Surveillance and
Make Recommendations**



DCMA Data Sources: Proposal Evaluations, Process Reviews, Product Examinations, Corrective Action Requests

DCMA Monthly Report to Customer

Finding/Issues/Concern: XYZ Corporation's strong emphasis into the identification, status, and change control over work product configurations will likely enhance the customer/user's ability to maintain integrity and traceability of system configuration throughout system life cycle.

Step 5

**Report Surveillance and
Make Recommendations**



DCMA Data Sources: Proposal Evaluations, Process Reviews, Product Examinations, Corrective Action Requests

DCMA Monthly Report to Customer

Consequences / Impact:

Inconsistencies among work products caused by inadvertent or unauthorized changes will likely be uncovered and corrected throughout development life cycle.

Increased visibility into product functionality and development progress will likely occur.

The likelihood of cost overruns or schedule slippages occurring as a result of inconsistencies among work products should be reduced.

Step 5

**Report Surveillance and
Make Recommendations**



DCMA Data Sources: Proposal Evaluations, Process Reviews, Product Examinations, Corrective Action Requests

DCMA Monthly Report to Customer

DCMA Risk Handling and Monitoring Plan for next 30 days

Reduce DCM independent auditing/oversight of project SCM function. Establish periodic spot-check validation of SQA audit function of SCM activity.

Work with contractor SEPG and SQA to identify other opportunities for process improvement requiring DCM and contractor SQA insight.

