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Space and Airborne Systems

CMMI, Configuration Management, and Baseball How to Score

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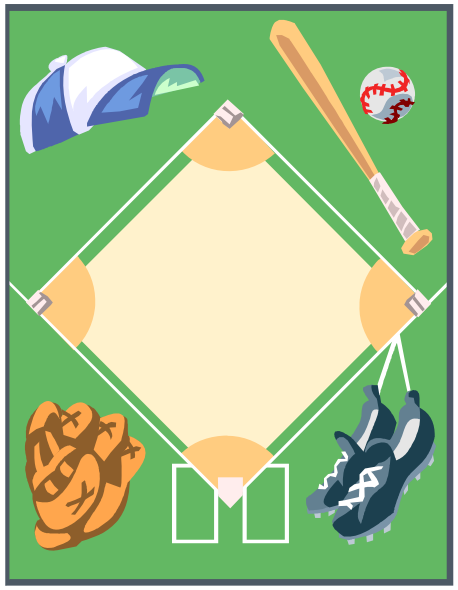
Topics

- CMMI and Baseline Management
- CM and Baseline Management
- How to Score
- Summary



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Purpose

- **Describe the CM Baseline Management process and how it relates to:**
  - CMMI
  - Program Execution
  - Baseball

- **Describe the consequences of poor Baseline Management performance**

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Common Terms

- **The following terms are used in a generic manner:**
  - Baseline: An approved work product at a specific revision/version and date. A baselined work product is one that is released and controlled by CM.
  - Configuration Baseline: A set of one or more baselined work products which represent the approved version of a predefined collection of work products.
  - Change Request (CR): A request to change a baselined work product. The CR on programs could be an PCR, EO, SCR, SPCR, STR, etc.
  - Configuration Control Board (CCB): The board that reviews and dispositions CRs against baselined work products. The board that performs this function could be called any one of a number of names – ERB, CRB, SCCB, CCB, PRB, etc.

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What is Configuration Management?

- **Configuration Management (CM) is a process that establishes and maintains the integrity of work products.**
- **Consists of five functional areas:**
  - **Planning** – How will CM be performed on a project?
  - **Configuration Identification** – How will configuration items be established and work products identified and what are their relationships within a product structure?
  - **Configuration Control** – How will the work products and changes to the work products be controlled?
  - **Status Accounting** – How will the status of the CM processes and program work products be managed and communicated?
  - **Reviews & Audits** – How will the establishment and use of the CM processes be verified? How will the control of work products be verified?

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What is Baseline Management? (1)

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What is a baseline? What does it mean to "baseline" something?	⇢	Defining Baselines
What's in a baseline?	⇢	Identifying Baselines
How do I change what's in a baseline?	⇢	Controlling Baselines
What changed since yesterday? last year? last baseline?	⇢	Status Accounting of Baselines
Why should I believe the CM system?	⇢	Reviews & Audits of Baselines
What baselines are needed on my project?	⇢	Planning Baselines

What is a baseline & why do we have to manage it?

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What is a Baseline? (2)

- **Individual work products**
  - Baseline “the verb”
    - For individual work products, the act of releasing a work product into the configuration management system.
  - Baseline “the noun”
    - The version or versions of the work product in the configuration management system.
- **Configuration Baseline**
  - Common Configuration Baselines include the Functional, Allocated, and Product Baselines.

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How are Baselines Identified?

- **Individual work products have identifiers**
  - drawing number
  - document ID
  - code file version number
- **...and revision or version indicators**
  - revision letter (e.g., Rev. A)
  - version number, e.g., Version 1.2)
- **Configuration Baselines also have an identifier and a revision/version indicator**
  - Facilitates capture of different versions or snapshots of the collection as the work products, which comprise the collection, change
  - The CM information system should provide the status of a Configuration Baseline at selected points
    - by date
    - software build number
    - hardware serial number

Individual/Configuration Baselines must be identified to be effectively managed.

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How are Baselines Controlled?

- **An activity or event triggers a work product release**
  - Preliminary Design Review – Requirements
  - Critical Design Review - Design
- **For Initial Baseline:**
  - The baseline is audited to defined criteria for the type of work product
  - The configuration records and references are created in the CM system
  - The baseline is released in the CM System
  - The Configuration Baseline is established as identified in the CM Plan
- **For Changing Baselines:**
  - Evolving baselines are maintained in the CM System as the CCB authorizes changes to be incorporated into new versions of work products and Configuration Baselines.

Baselines are established and evolve in the CM System

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CMMI and Baseline Management

- **In a CMMI-compliant CM process, baselines are**
  - Created (CM SP 1.3)
    - Authorized by an approval board (e.g., CCB)
    - Using controlled items in the CM system
    - Identified in the CM System, including the current configuration baselines
  - Managed
    - Using specific baseline processes (CM GP 2.2, 3.1)
    - Within an established CM System (CM SP 1.2)
    - Controlled changes to baselines (CM SP 2.2)
  - Verified
    - Audited baselines as they're established (CM SP 3.2)
    - Audited controlled baselines using CM records (CM SP 3.1, GP 2.9)

Good CM processes include Baseline Management

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Baseline Management and Baseball (1)

- **There are parallels between good Baseline Management and winning at baseball**
  - With a more mature understanding of processes and mature products (work products/players) it is easier to be successful (stable baselines/home runs)
  - Both have recognized industry standards
  - Team members must work together to be successful
  - New technologies/players can go through a try out period to identify strengths and areas to develop. For companies, this evolving set of work products are a company asset and should be baselined and managed.
  - Good management is essential to being successful
    - Day to day
    - Long term

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Baseline Management and Baseball (2)

- **The following topics illustrate the similarities between the Baseline Management process and Baseball:**
  - Individual Baseline
  - Baseline Verification
  - Configuration Baseline
  - Product Baseline
  - Opponents
  - Results of Winning

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Individual Baseline

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- **Configuration Management**
  - Identify Work Product
  - Create Work Product
  - Successful Peer Review
  - Successful CCB Review
  - Release (Baselined) Work Product

- **Baseball**
  - Identified player at bat
  - Player at First Base
  - Player at Second Base
  - Player at Third Base
  - Player at Home Plate (Score)

- **Comments**
  - Unless the Work Product is created (player able to advance to First Base), the process cannot begin
  - Unless its Peer and CCB reviewed and approved it can't advance to release
  - There are legitimate ways to advance when the ball isn't in play (stealing); however, not following the process creates problems (you're out!)
  - Status Accounting data about Individual Baselines are similar to a player's statistics – how it evolved and performed from inning to inning.

"Home Run" occurs when all steps are conducted smoothly

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Baseline Verification

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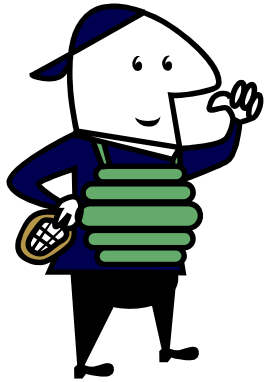
- **Configuration Management**
  - Baseline Audits
  - Process and Product Audits

- **Baseball**
  - Umpires



- **Comments**
  - Like baseball, Work Product Baselines are verified as they are established.
    - Audits are performed on work products prior to baseline (Home Plate Umpire)
    - Audits are performed on performance to the Baseline Management process (all Umpires looking to see if players are following the process)
  - Work Product and Configuration Baselines are audited to see if they are correctly controlled (Umpires and League)

Integrity of the process and products are verified

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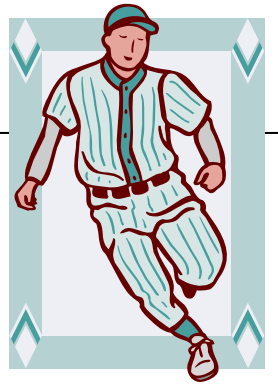
Configuration Baseline

- **Configuration Management**
  - Identify Configuration Baselines
  - Create Configuration Baseline
  - Change Configuration Baseline

- **Baseball**
  - Innings: identified in Baseball Rules
  - First Inning
  - …. Ninth Inning

- **Comments**
  - As the Configuration Baseline evolves, the status accounting data is maintained (similar to the evolving score in baseball).
  - The score at the end of each inning is a snapshot in time



As the game progresses the score (Conf Baseline) evolves

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Product Baseline

- **Configuration Management**
  - Identify Product Baseline/TDP
  - Control Product Baseline/TDP
  - Deliver Product Baseline/TDP

- **Baseball**
  - Identify schedule for a game
  - Conduct game
  - Complete 9 innings

- **Comments**
  - The game (components of Product Baseline/TDP) is identified ahead of time
  - The game is conducted and statistics kept about performance (Baseline Management and Status Accounting)
  - The baselined product is delivered (final score). Winning depends on how successful the teams were in scoring/developing and controlling good work products.
  - Errors have consequences, some impact the game more than others (the game could be prolonged/stretched out impacting period of performance)

As the game progresses errors can be disastrous to success

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Opponents (Preventing Success)

- **Configuration Management**
  - Insufficient Configuration Mgmt
  - No Defined Process
  - Poor Planning
  - Poor Execution
  - Poor Leadership
  - Poor Team Cohesiveness
  - Lack of Maturity
  - Lack of Training
  - Lack of Sufficient Resources

- **Baseball**
  - Opposing Team
  - Owners
  - Poor Team Execution
  - Poor Team Leadership
  - Poor Team Cohesiveness
  - Lack of Player Maturity
  - Lack of Player Training

- **Comments**
  - Many factors can hinder successful delivery of the Product Baseline/TDP on a program
  - With insufficient Configuration Management, it is difficult to successfully track the evolving Configuration Baseline and deliver the Product Baseline

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Results of Winning

- **Configuration Management**
  - Ability to easily provide any Work Product Baseline or Configuration Baseline
  - Repeat Customers
  - New Customers/Programs

- **Baseball**
  - Happy Owners
  - Loyal fans
  - New fans
  - Highly paid players/endorsement offers

- **Comments**
  - With successfully controlled baselines and deliveries, a company has a high probability of obtaining new programs and repeat customers.

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Summary

- **Ultimately, to win a baseball game, a team must be able to successfully score points and defend against their opponents**
- **Owners drive the success or failure of both the CM processes and Baseball teams. However, in the CM processes all participants are owners of the process, whereas only one rich guy owns the ball club.**
- **To be successful at delivering the correct product to your customer**
  - A Baseline Management process must be defined and followed
  - Work Product Baselines must be identified, controlled, and managed
  - Configuration Baselines must be established and maintained
  - Product Baselines/TDPs created and delivered from the controlled Baselines

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Acronyms

CCB	Configuration Control Board
CM	Configuration Management
CMMI	Capability Maturity Model Integrated
CR	Change Request
CRB	Change Review Board
EO	Engineering Order
ERB	Engineering Review Board
PCR	Program Change Request
PRB	Program Review Board
SCR	Software Change Request
SPCR	Software Problem Change Request
STR	Software Trouble Report
TDP	Technical Data Package

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