# Appraisals and CMMI Gotchas

## Lessons in CMMI Use and Appraisal Preparation

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Referenced articles are at www.processgroup.com/newsletter.htm

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# Agenda - Part 1

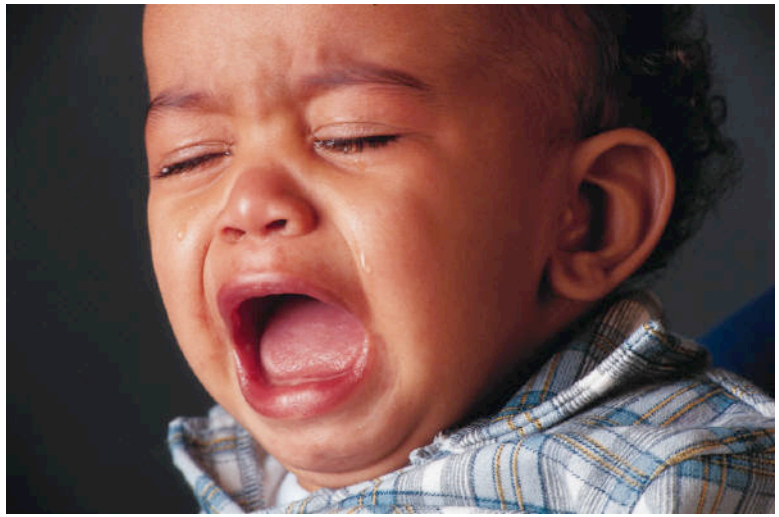
- Introduction
- Documentation
- Configuration Management
- Measurement and Analysis
- Supplier Agreement Management
- Project Planning
- Project Monitoring and Control

# Agenda - Part 2

- Integrated Project Management
- Training
- Equal-weighted Process Area practices?
- Appraisal Preparation - PIIDing
- Appraisal Interview Preparation
- Buying a Level?

# Introduction - CMMI HAZARDS!

- Want to use CMMI correctly?
- Plan to conduct a CMMI-based appraisal - hoping to arrive at Maturity Level X soon?
- Wish someone could prevent you from wasting your time and help you avoid a few hazards along the way?



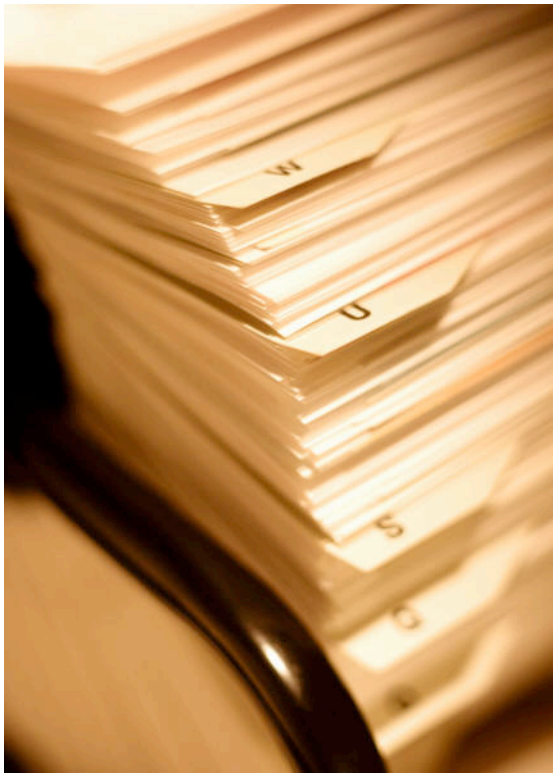
- Burnt out on CMMI or improvement?

# CMMI HAZARDS!

## Overview

**Using CMMI or preparing for an appraisal?**

- Avoid the hazard of creating a **paper factory**, instead focus an organizational results
- Avoid putting the emphasis on the **less important** issues
  - » e.g., policy recital, training records, emails that say “We assigned this to Fred”
- Spend your time making things better, not on a rote exercise
- Know some **common blind spots**



# Hazard: Drowning in Documentation

- **Easy to fall into the trap of the paper factory**
  - We are developers, so we develop!
  - What we really need is **guidance** for our jobs
    - » **Capture** best organization engineering and management practices
    - » Not necessarily **repeat** every book known to mankind!
- **What problem are we trying to solve?**
  - Make engineering easier, quicker, less hassle - NOT MORE


[Newsletter article]

# Configuration Management (CM)

## Hazard: over-simplification

- **CM looks pretty straight forward, once people start to understand the discipline**
- **Don't avoid CM audits - make them useful [SP 3.2]**
  - Use physical audits to help ensure that products are released correctly, e.g.,
    - » Verify **differences** between source and release = change list
    - » Compare **checksum** value between source and release
- **What problem(s) are we trying to solve?**
  - Producing the right stuff and getting it to the customer
  - Keeping track of our stuff, protecting ourselves from loss

# Measurement and Analysis (MA)

## Hazard: skip parts or overkill

- **Organizations often have metrics but entirely skip the first half of this Process Area:**
  - Defining: objectives, metrics, analysis, reporting, information storage
- **Or take the other extreme and overdo measurement and goal definitions**
  - 34 objectives, a procedure for documenting objectives, 82 core metrics
- **Need a good balance for:**
  - Spending enough time to arrive at **appropriate goals**
  - Specifying what **measures** are needed
  - Clarifying how they will be **analyzed and stored**
- **What problem are we trying to solve?**
  - Knowing why we are measuring in order to get the most value out of it and not waste time on useless metrics

[Newsletter article]

# Supplier Agreement Management (SAM)

## Hazard: ill-advised avoidance

- **A group might declare SAM Not Applicable:**
  - They really do have a supplier, but are used to dealing with them
- **Initially there are no suppliers**
  - Then suppliers are added, but SAM is not invoked
- **What problem(s) are we trying to solve?**
  - Assessing and managing risks caused by suppliers
  - Establishing agreements and expectations for delivery
  - Providing visibility into supplier activities before it is too late

# Project Planning (PP)

## Hazard: skimping on size estimation and risk management

- **Many people either skip size, or don't spend enough time finding a good use for size or attribute estimation [SP 1.2]**
  - "My project size is 2,000 hours"
  - "I estimate LOC, but track effort"
- **Others underutilize risk at the project level [SP 2.2]**
  - Risks should come from the team, not just the manager
  - Risks should be more than boilerplate "We might not have resources"
  - Risks should be made very visible to customers + management
- **What problem are we trying to solve?**
  - Clarifying **how big the project is**
  - Understanding what can **really** go wrong
  - Thinking through potential issues ahead, while there is **time to react** / recover

[Newsletter article]

# Project Monitoring and Control (PMC)

## Hazard: missing valuable information that could save the day

- **No useful way to track actual work progress [SP 1.1]**
  - Actual work effort (**labor**)
  - Actual amount of work accomplished (**size**)

- **What problem are we trying to solve?**
  - Use data to determine if current **resource** expenditure (hours or money) can be **sustained**
  - Know the **volume of work** and how much each project **actually costs**
    - » How much we lost this time, or how much future projects might cost
  - Proactively manage and identify re-planning points while there is time to recover
    - » **Identifying large changes in effort or size**

[Newsletter article]

# Integrated Project Management (IPM)

## Hazard: not having proactive visibility

- **Not use thresholds to trigger corrective action [SP 1.5]**
  - At Level 3, corrective action and escalation are more objective ("We are 10% behind") than emotional ("I think things will speed up")
  - Organizational and project knowledge are used to establish thresholds
- **Process tailoring not based on organizational learning [SP 1.1]**
  - Level 3 is often interpreted as "**Processes are standardized** across all projects," rather than "**Standard processes are tailored** for each project"
- **What problem are we trying to solve?**
  - We have MEANINGFUL data, let's really use it!
  - Have organizational wisdom available and used

# Integrated Project Management (IPM) Without Historical Data?

## Hazard: databases full of data are not enough!

- **Organizational Process Definition (OPD) and IPM not well understood**
  - OPD sets up a Process Asset Library and measurement repository for use by projects (IPM)
  - Not all Lead appraisers know or communicate this
- **What problem are we trying to solve?**
  - Run projects based on historical and current data

# Do Software Engineers Need Training?

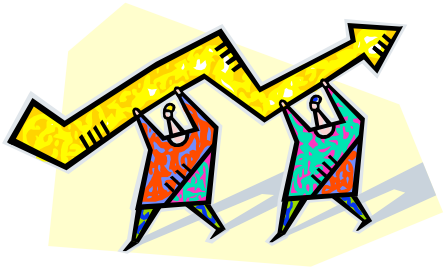
## Hazard: trivial training

- **Project Planning (Sp 2.5)**
  - Make sure you have the skills for THIS project
- **Organizational Training**
  - Make sure you have the skills for current work, and work to come
- **What problem are we trying to solve?**
  - Engineers and managers don't have the skills to perform their roles correctly (as per process definition) and/or efficiently
  - Prevent mistakes due to lack of skills

# CMMI Use

## Hazard: each process area practice is treated as EQUAL

- **Each CMMI practice should not necessarily be equally weighted during implementation. Example:**
  - Policy vs. estimating effort or risk
  - Training records vs. performing validation
- **The correct weighting can be given when you:**
  - Focus on what you are trying to accomplish (real jobs)
  - Use the CMMI and its components to improve
  - Fix real problems



- **What problem are we trying to solve?**
  - Real world, day-to-day work gets better (easier, faster, higher quality, less stress, less busy-work, less rework, less risk)

# Appraisal Preparation - PIIDing*

## Hazard: creating documents to please the appraiser

- **As an appraisal date approaches, people find themselves focused on providing required appraisal evidence:**
  - A lot of time can be **wasted chasing down documents**
  - When practices are **institutionalized** correctly, the evidence needed **already exists**
- **What problem are we trying to solve?**
  - Evidence should never be created to please an appraiser
  - Artifacts examined should be the **real work** of the organization
  - For example, evidence of responsibilities could be an organization chart or a schedule with assignments

*Practice Implementation Indicator

# Appraisal Interview Preparation

## Hazard: wasting time rehearsing

- **Some people prepare using mock interviews**
  - Appraisals should be about how you DO YOUR **REAL** work
  - Interview practice might make folks feel more comfortable, but this can:
    - » Induce stress over remembering to say the right answers
    - » Focus your people on CMMI terms and rote answers
- **What problem are we trying to solve?**
  - Time to practice for an appraisal takes away from getting real work done
  - Participants should be able to answer the questions because the answers describe how they do their jobs

# Buying a Level?

## Hazard: doesn't help run your business

- **What if you choose "easy" appraiser**
  - Has your business improved?
  - Giving you credit for too much can:
    - » Build a poor foundation for the future
    - » Upset your customer(s) who now have higher expectations about your abilities
    - » Devalue the ratings
    - » Cause more audits
- **What problem are we trying to solve?**
  - Someone told us to be at a level, so we are looking for the quick path
  - CMMI intent is to set you on an improvement path, not to pass a test

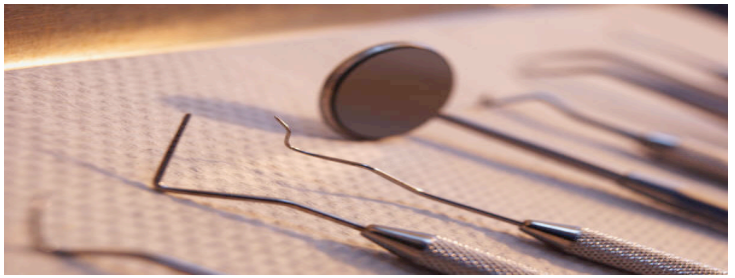
# Q & A

# Additional Slides

# GP 2.8, GP 3.2 and Over-simplified MA

## Hazard: I measured it because CMMI SAID I HAD TO!

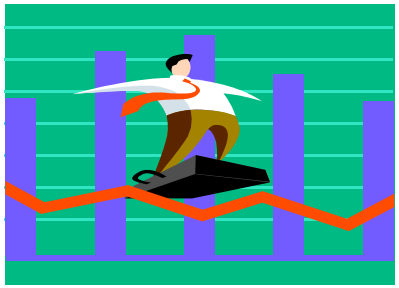
- **MA comprises of only 7 PA measures, and GP 2.8 and 3.2 are academic**
  - What is it telling you?
- **What problem are we trying to solve?**
  - Gp 2.8 (on each PA) - How's it going this time?
  - Gp 3.2 (on each PA) - Are the PA related processes as implemented meeting our needs, getting better or worse?
  - MA should help you run your business, not just CMMI!



# Maturity Level 4

## Hazard: having a metric or statistics wizard is enough

- **Assume that if we can just find that one magic metric, we will be Level 4 (maybe even 5)**
  - It's not really about a metric or two; it's about using **statistical thinking** to do your work!
- **Assume that a metrics person can do all of Quantitative Project Management (QPM)**
  - Allowing project managers to focus on their regular day-to-day tasks!



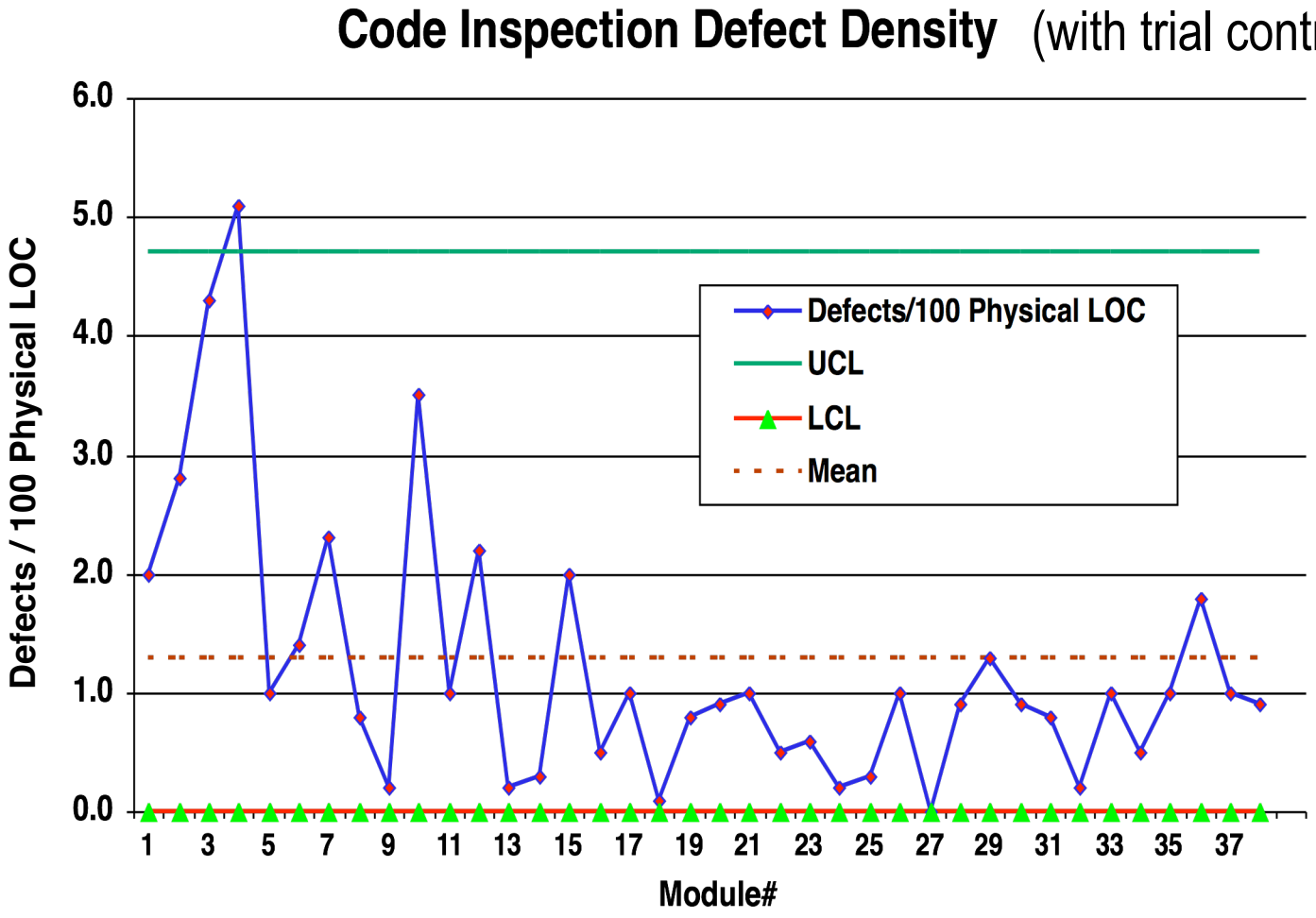
- **What problem are we trying to solve?**
  - Understand statistical variation and remove special causes
  - Run projects quantitatively and **sub processes statistically**
  - Base decisions on what we now know and predict ahead

# Level 4 Without SPC?

## Hazard: numbers alone are not enough!

- **Very specific words used in the model**
  - Run projects quantitatively and **sub processes statistically**
    - » Understand statistical variation
    - » Remove special causes of variation
    - » Use some type of SPC
- **What problem are we trying to solve?**
  - Make business decisions based on calculated natural bounds
  - Use data to predict outcomes statistically

# Code Quality Example

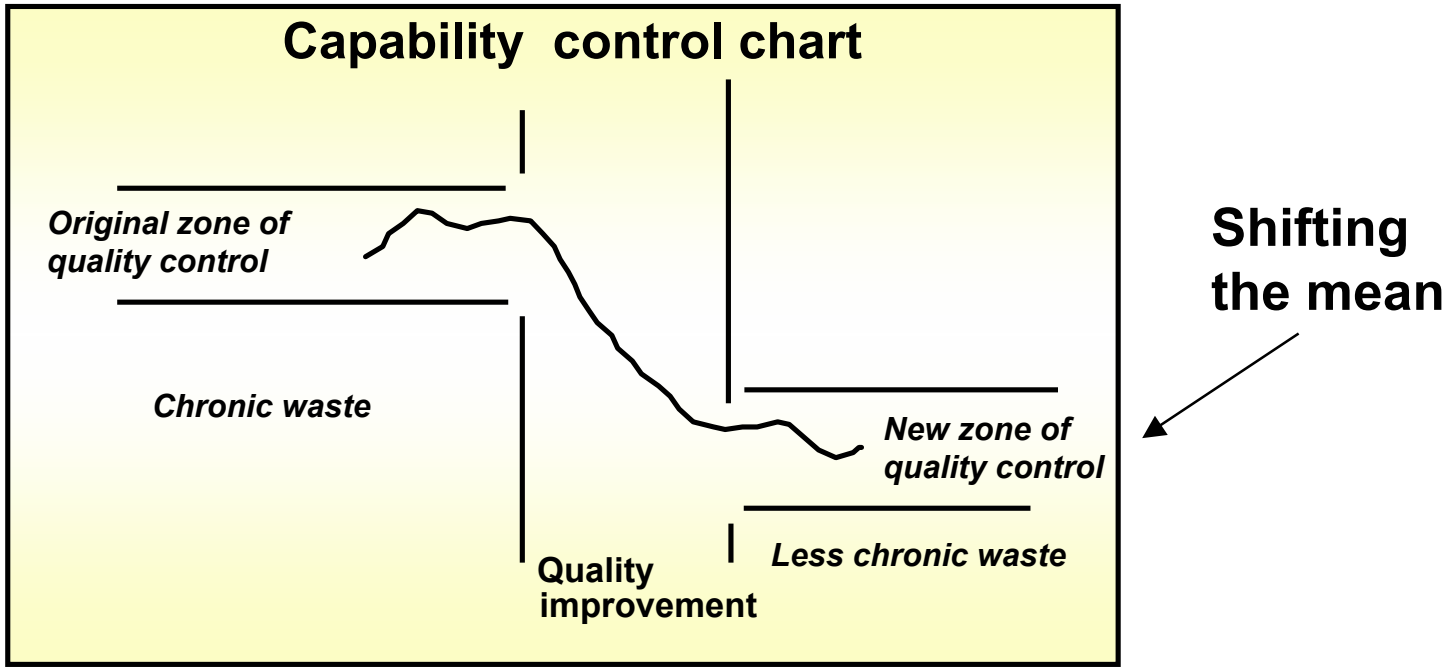



- **Manufacturing control system**
- **OO/C++**
- **167 KLOC**
- **13 defects/KLOC in code**
- **1.38 defects/KLOC in test**

[From client with permission]

# Maturity Level 5

## Hazard: not building on statistically stable (L4) processes




**Continual improvement means measurably improving process capability in a controlled fashion.**

Chart from CMMI Intro. © **2002 by Carnegie Mellon University**

# Maturity Level 5 (Cont.)

## Hazard: not building on statistically stable (L4) processes

- **It is easy to interpret Level 5 Process Areas as qualitative. You might think that:**
  - Casual Analysis and Resolution (CAR) could consist of **brainstorming** causes
  - Organizational Innovation and Deployment (OID) could be mistaken for **qualitative** improvement
    - » Qualitative improvement is L3 Organizational Process Focus (OPF) and Organizational Process Definition (OPD)
- **What problem are we trying to solve?**
  - Level 4 is intended to collect and use data statistically for prediction, control and decisions. Level 5 practices build on that to:
    - » Reduce variation of selected sub processes (remove common causes of variation), AND / OR shift the mean

# Maturity Level 4 and 5 Crack Down?

## Hazard: an SEI audit takes away your dreams of Level 4/5

- **Some appraisers have been too generous**
  - Did they NOT understand the Model?
  - Did they SELL a level?
- **What to do now?**
  - Re-educate people on the intent and details of Level 4/5?
  - Be harsh on lead appraisers now?
  - Take away levels?
- **What problem are we trying to solve?**
  - Devaluation of Level 4 and Level 5
    - » "I have a vendor in <city X>. They say they are Level 5 but don't even act Level 2."