

Appraisals and CMMI Gotchas

Lessons in SEI 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

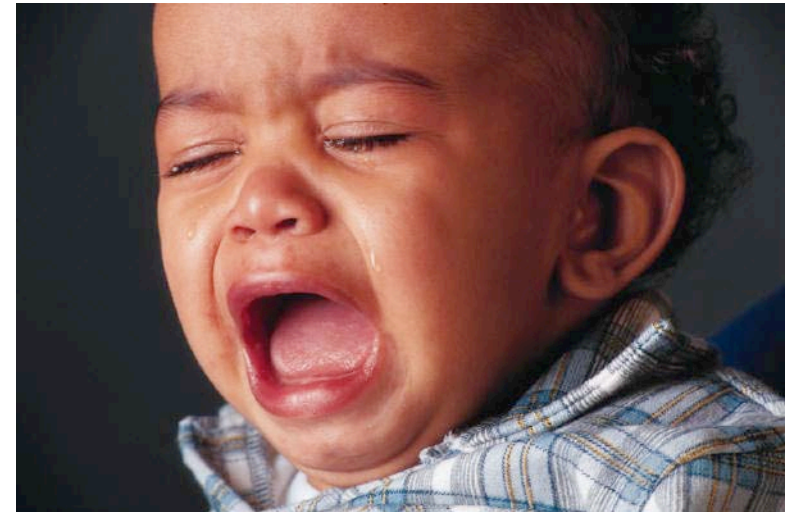
- **Introduction**
- **Documentation**
- **Configuration Management**
- **Measurement and Analysis**
- **Supplier Agreement Management**
- **Project Planning**
- **Project Monitoring and Control**
- **GP 2.8, GP 3.2 and Over-simplified MA**

Agenda - Part 2

- **Integrated Project Management**
- **Training**
- **Maturity Level 4 - Quantitative Management**
- **Maturity Level 4 without SPC?**
- **Maturity Level 5 - Optimizing**
- **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?



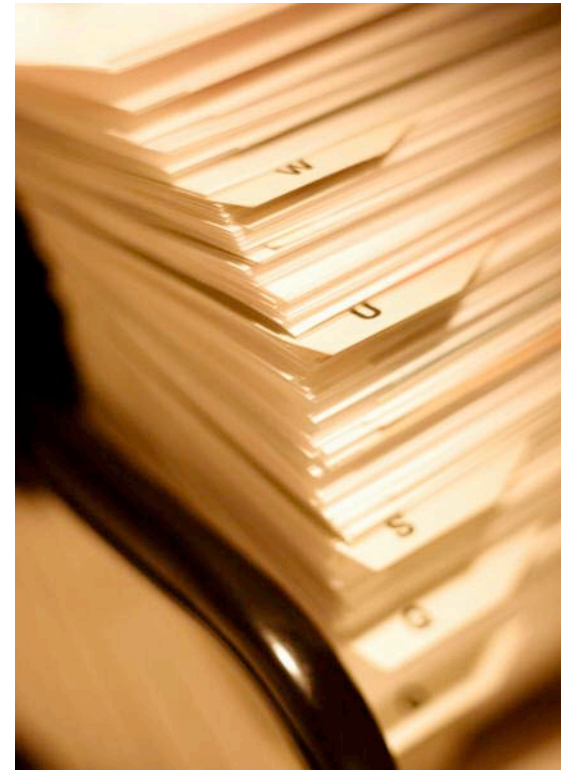
- Burnt out on CMMI or improvement?

CMMI HAZARDS!

Overview

Using CMMI or preparing for an appraisal?

- Avoid the hazard of creating a **paper factory**, instead focus on 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)

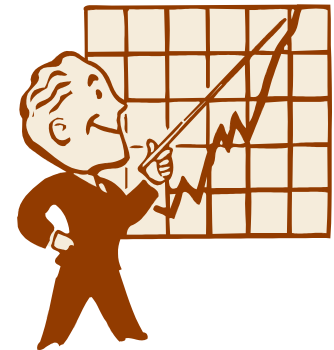
Hazard: over-simplification

- **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**



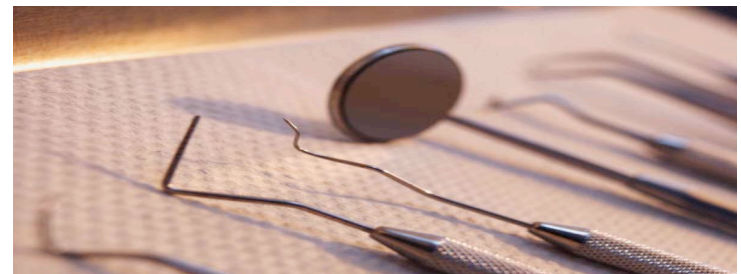
[Newsletter article]

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!



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

Maturity Level 4

Hazard: having a metric or statistics wizard is enough

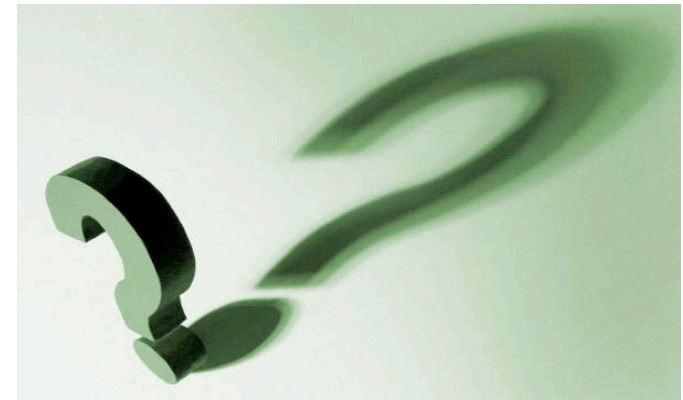
- **Assume that if we can just find that one magic metric, we will be Level 4 (maybe even 5)**
 - It's not really about a metric or two; it's about using **statistical thinking** to do your work!
- **Assume that a metrics person can do all of Quantitative Project Management (QPM)**
 - Allowing project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

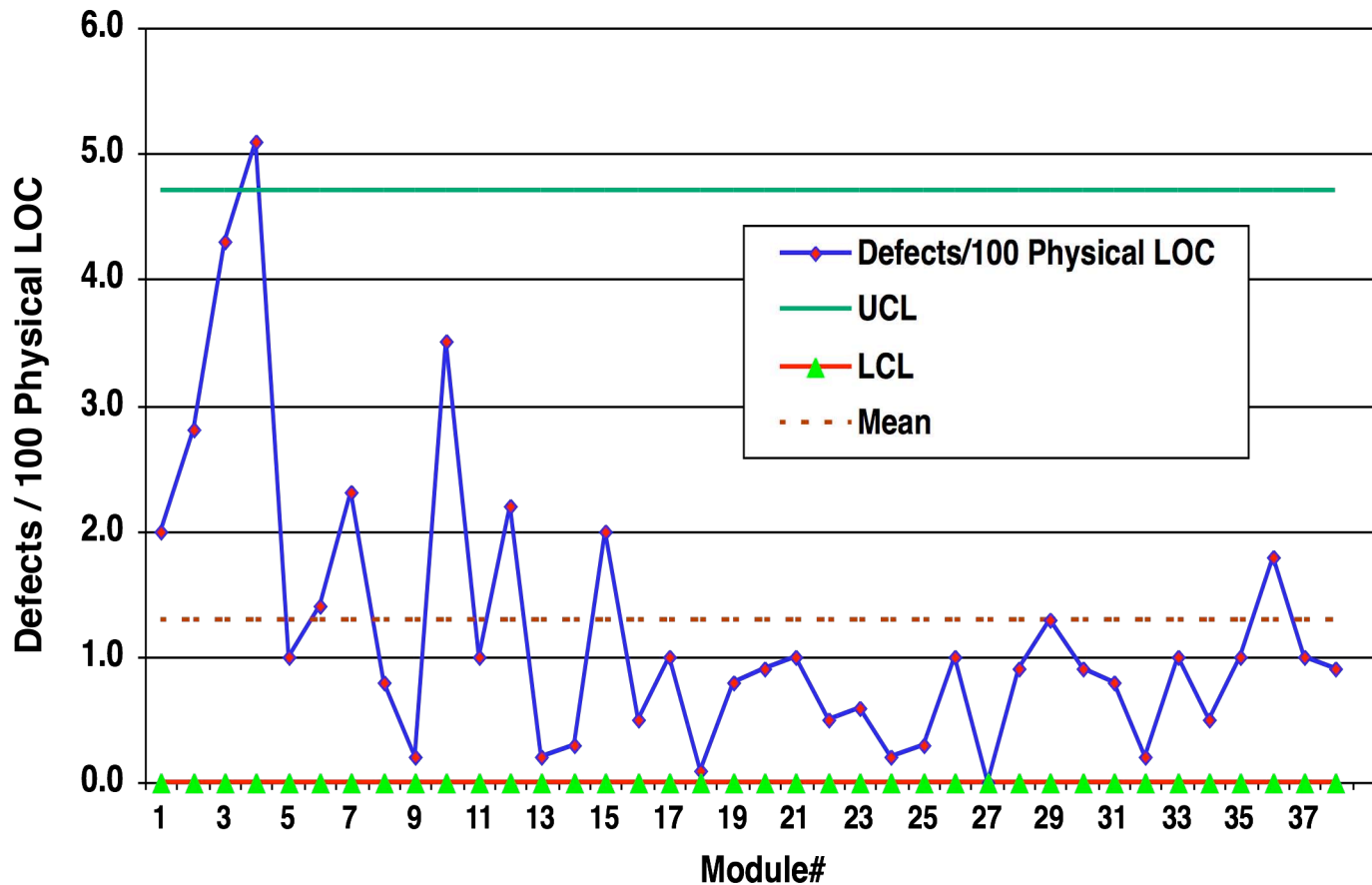
Hazard: numbers alone are not enough!

- **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

Code Inspection Defect Density (with trial control limits)

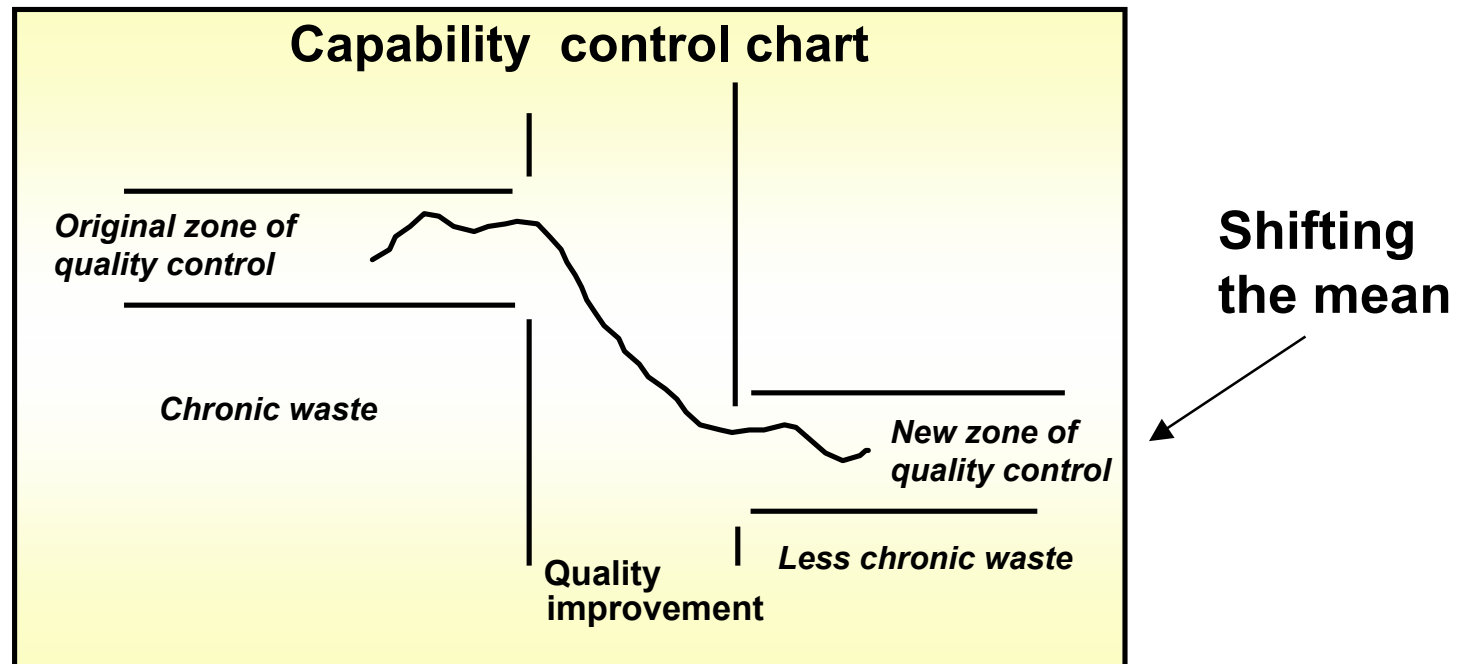


- Manufacturing control system
- OO/C++
- 167 KLOC
- 13 defects/KLOC in code
- 1.38 defects/KLOC in test

[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.

Maturity Level 5 (Cont.)

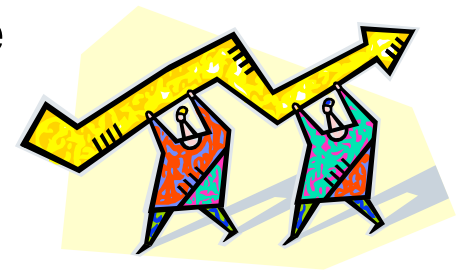
Hazard: not building on statistically stable (L4) processes

- 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

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

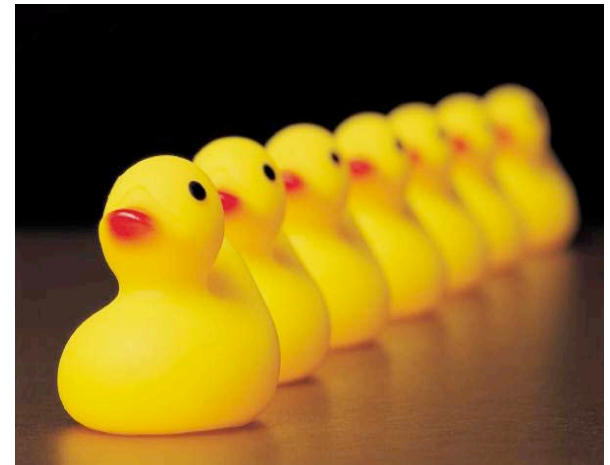
- **What if you choose “easy” appraiser**
 - Has your business improved?
 - Giving you credit for too much can:
 - » Build a poor foundation for the future
 - » Upset your customer(s) who now have higher expectations about your abilities
 - » Devalue the ratings
 - » Cause more audits
- **What problem 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



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.”



Q & A