

*River Corridor
Closure Project*

Proactive Use of HPI Techniques in Assessment

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Challenge - how can we use HPI techniques in a Proactive manner?

- Typically we apply HPI techniques in the performance of cause analysis,
- But can we leverage the same techniques in the performance of assessments - in other words, use the tools to be proactive in lieu of reactive.
- Before we can devise a way to use HPI Analysis as an assessment tool, we need to explore the premises of:
 - “HPI Techniques”,
 - When are we being proactive?

1. What are HPI techniques?

- In short, the practice of identifying:
 - latent organizational weaknesses,
 - weak or flawed barriers, and
 - error precursors
 - And mitigating them with performance tools

2. What is proactive?

- From the Prevention/Detection/Correction model:
 - Prevention (Designing for Success) = Proactive
 - Detection (Searching for Weaknesses) = Proactive
 - Correction (Fixing from Adverse Events) = Reactive

Why is Proactive Better than Reactive?

- Finding a weakness before it results in an event is much better than letting the event identify the weakness.
- HPI studies tell us that often corrective actions are causal factors associated with the next event
- Why this is – they are often remedial in nature, and are often hastily planned
- Because there is a sense of urgency to get it fixed. corrective actions tend to gravitate towards the easy to understand and easy to implement side
 - Easy and simple actions to address complex problems are rarely effective.
- Learning from consequential events is expensive.

If So, Then Why Are We Not Doing It?

Behavior verses Process driven perspective:

- Willing to say we believe in programs, plans, procedures.....
- Often times our practices don't reflect that belief
- We are wired to get'r done,
- Somewhere deep inside many of us there is that voice that screams out, can't we just do it and not spend so much time talking and planning it?
- In short, we tend to be biased towards action, not planning

Belief verses Reality – an Influence?

Belief in the real risk:

- Absent an event, we are often less than convinced that we are vulnerable to an event

In Practice, which is more effective?

- Root Cause Analysis
- Assessing

From an effectiveness point of view (defined as the ability to change organizational behaviors),.....

- RCAs are more effective than assessments.

WHY?

If we are doing an RCA, then:

- Event or adverse condition is **KNOWN** to exist
- Consequences are **KNOWN** to have occurred
- Management wants to know **WHY**,
- Management is open to cause and effect, and is open to ideas on how to fix it.

The “simple” challenge of the analyst is to:

- Discover the facts surrounding the event,
- Lay out a time line, and use cause and effect analysis to develop a scenario that matches the facts and the event.
- Once laid out the weaknesses are recognizable and as such can then be fixed.

Assessments don't have the same luxury..

- Event or adverse condition is NOT KNOWN to exist
- Consequences are NOT BELIEVED to be realistic
- Management wants to BELIEVE their processes are healthy, are NOT very open to ideas on how to fixit – show me the return for the investment
- Most assessments use a compliance approach and rarely challenge adequacy of design like a cause and effect analysis would do.
- Some assessors tend to provide consultation without really building the case that shows the vulnerability in a logical presentation that leaves little room for denial, like an RCA does

Theory to Practice: Using HPI techniques in Assessments

Typical Assessment approach:

- Identify requirements – develop a checklist
- Document Review - Do the procedures implement requirements?
- Observation – Do field activities match the process?
- Interview – Do key personnel understand expectations?

Focus?

Is that Compliance, Performance, or Both?

Performance – Depends on How it is Defined

If the Assessment answered.....

- Is it Working? – This tends to be more compliance
- Is it Effective? – Goes beyond just working and into efficiency – This is starting to get into Performance
- Is it Reliable? – Challenges assumptions and vulnerabilities, This really gets into Performance

How can we measure Effectiveness/Reliability

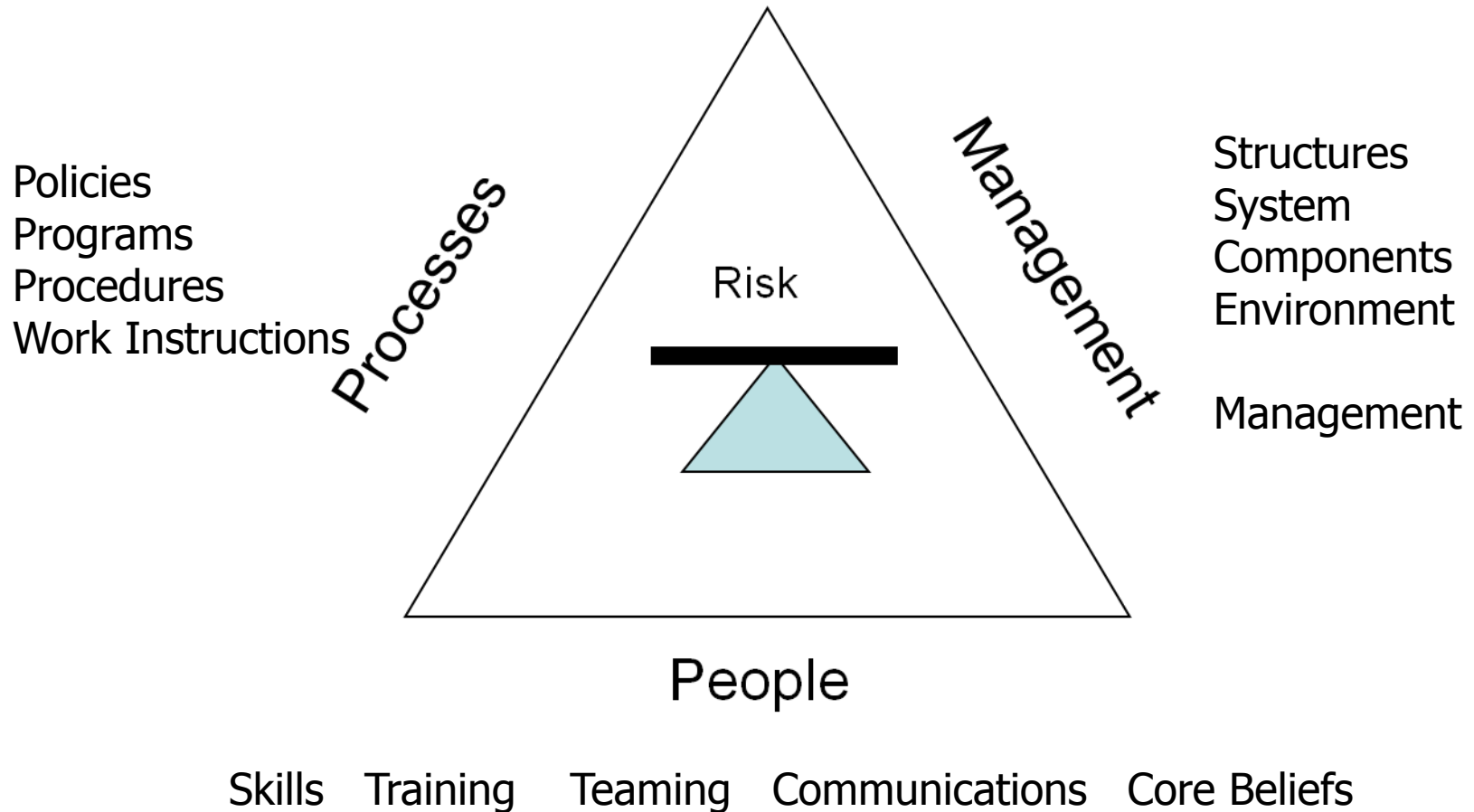
In order to know if the process we are assessing is reliable, we need to know....

Design Basis – What are all of the inputs to the process that the process should be addressing

System Design – The strategy to implement in such a way to meet all of the Design inputs

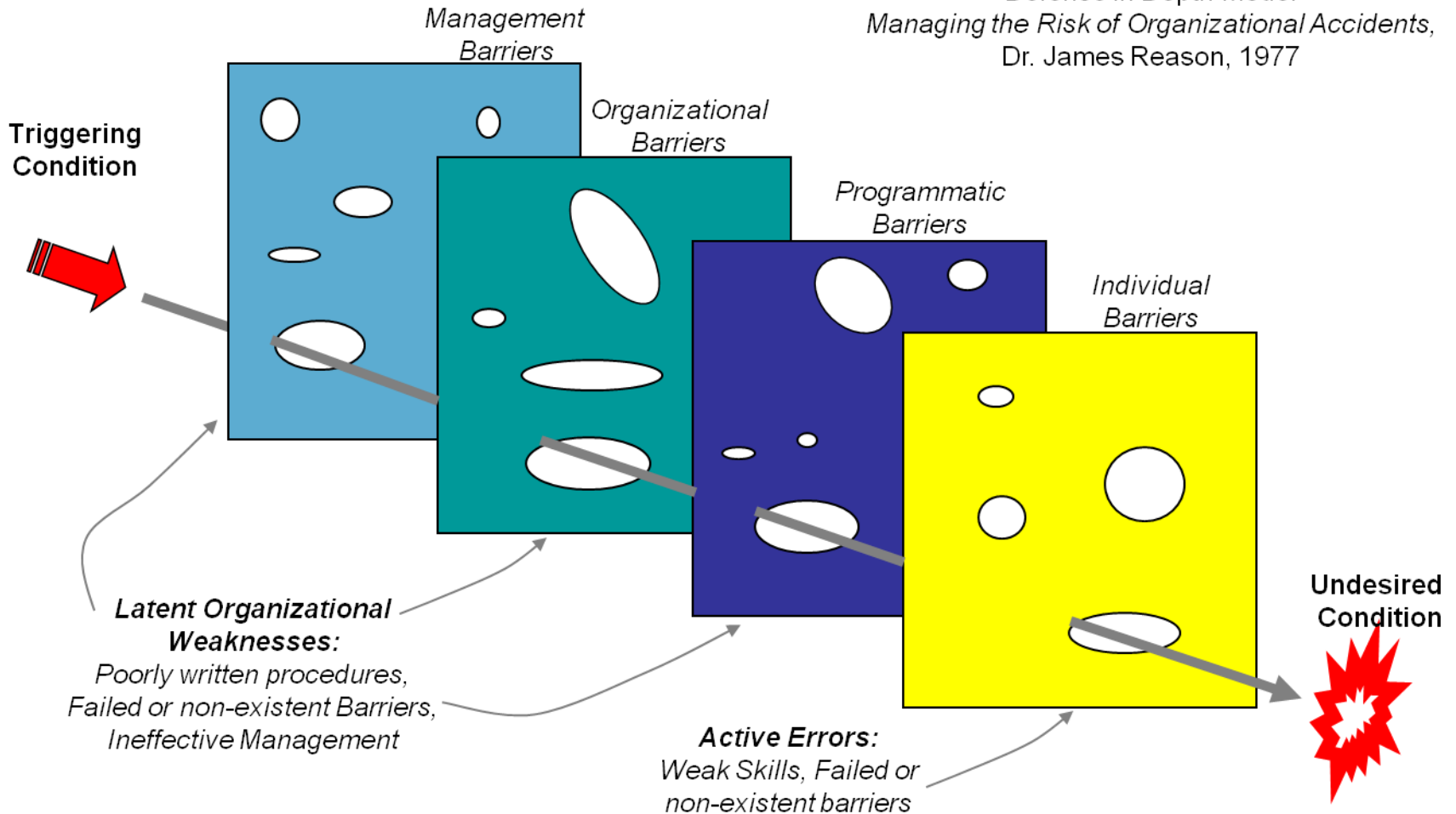
Procedure/Training/Management Balance – How all three are integrated so that the field performance meets the System Design

Balanced Approach – Graded Approach



Why not Assess like we do RCAs?

"Defense in Depth Model"
Managing the Risk of Organizational Accidents,
Dr. James Reason, 1977



Theory to Application

Assessment of Compaction Activities at Landfill



Compactor – Primary Method

Bull Dozer – Alternate Method



Theory to Application

WCH Assessment of Landfill Cell Operations

- Waste gets distributed and then compacted to minimize settling and creation of void spaces

Basic process:

- Waste cans deliver waste to the landfill
- Waste is treated if needed
- Waste debris to dirt ratios established
- Build a “lift” to 15” or 30” heights over a selected area
- Compact Waste with heavy equipment
- Generate Record
- Add more waste, repeat process.

Specific Operations

Primary Method:

- Build a 30" lift with Bull Dozer – Uses Computer Aided Earthmoving System (CAES) to monitor height
- Compact with a Compactor – Uses CAES to monitor height and movement – CAES will tell when done.

Alternate Method

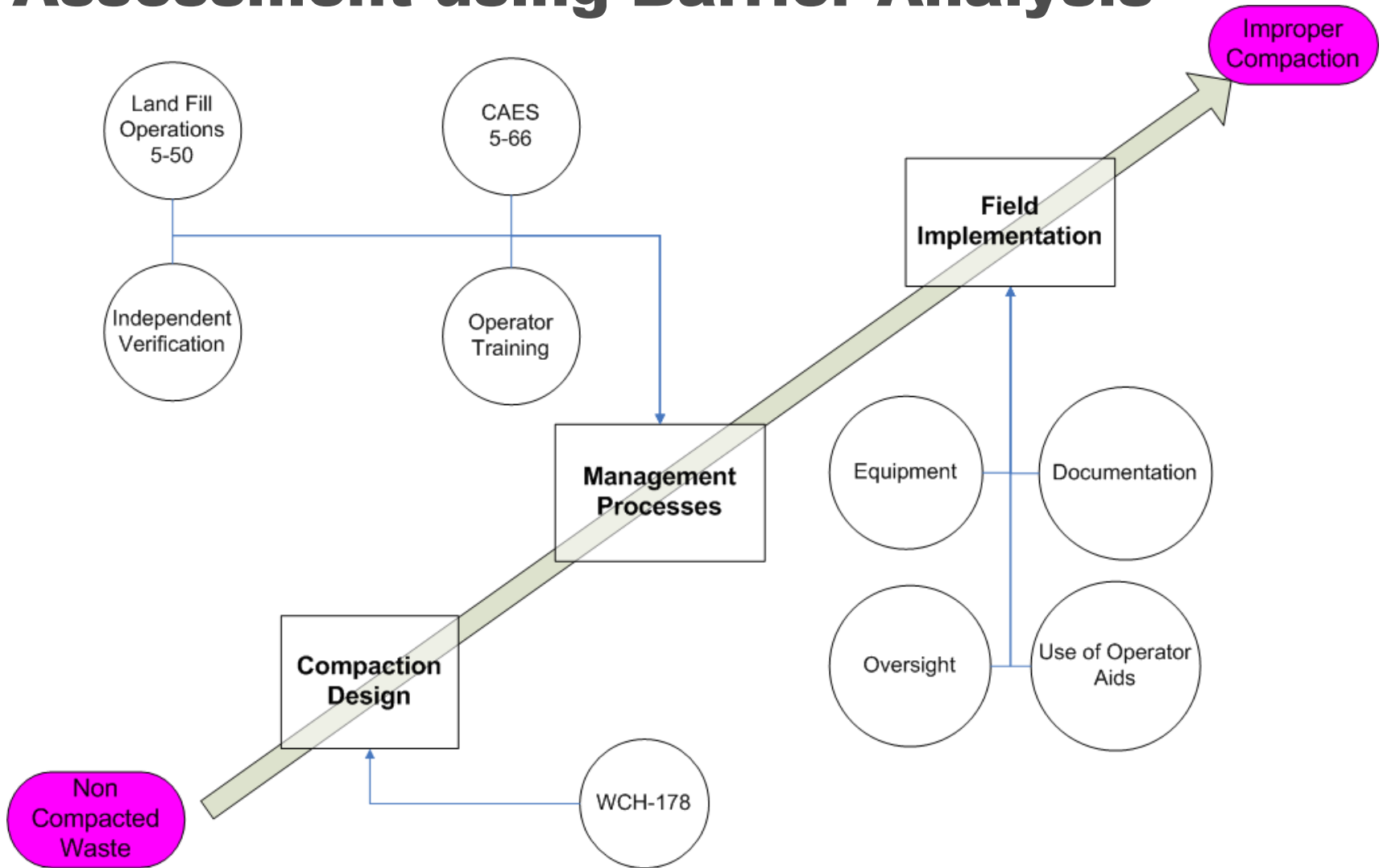
- Build a 15" lift with Bull Dozer – Uses Computer Aided Earthmoving System (CAES) to monitor height
- Compact with a Bull Dozer – Movement tracked by Operator and logged on a form.

Note: Both Methods allow for operations without CAES

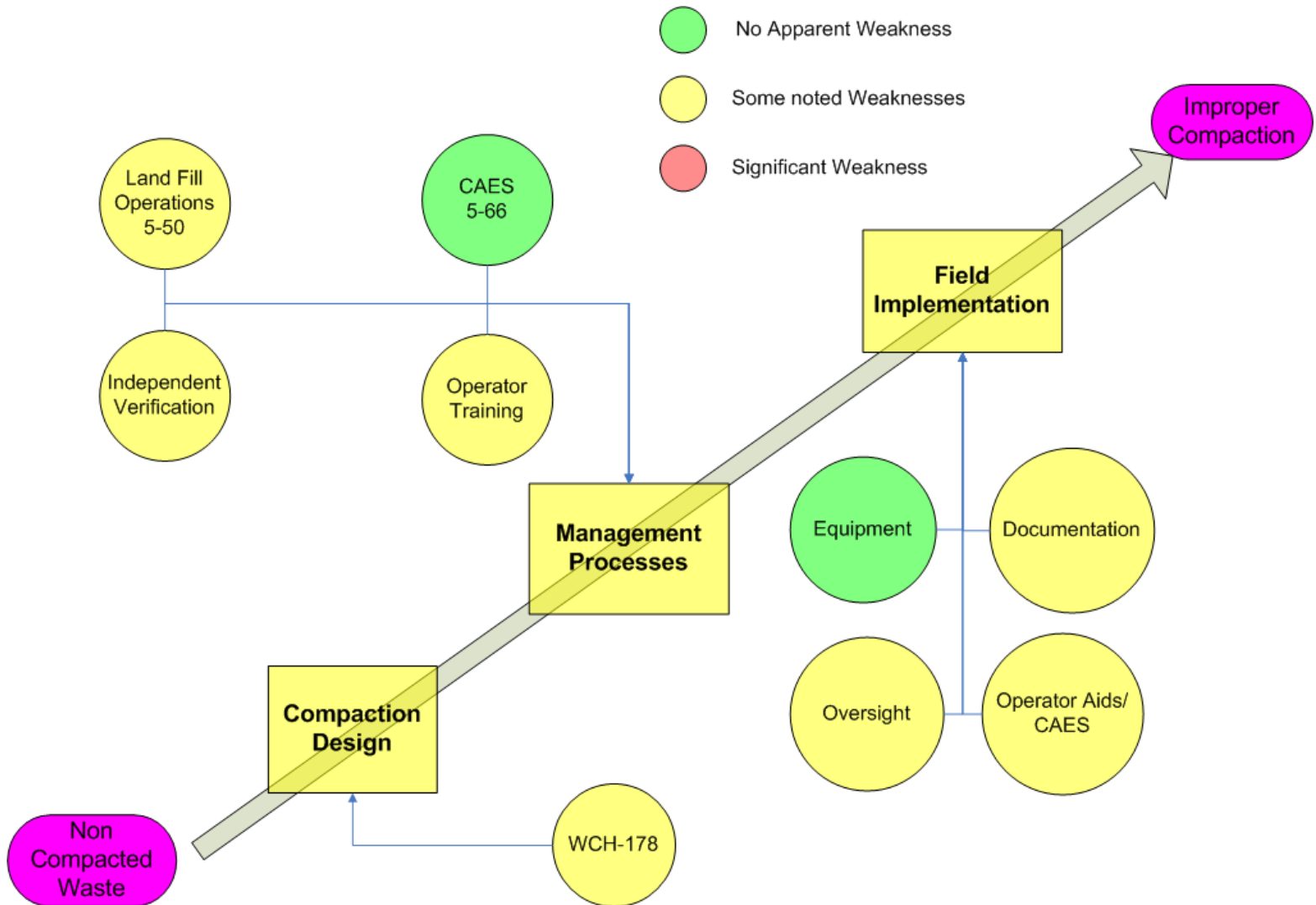
Assessment using Barrier Analysis

- Two Barrier Analyses were performed on the methods of compaction
- Each method was broken down into the following primary barriers:
 - Design
 - Adequacy of Design and the flow down into implementing procedures
 - Management Processes
 - Adequacy of Implementing Processes and flow down into field activities
 - Field Implementation
 - How field activities were being performed

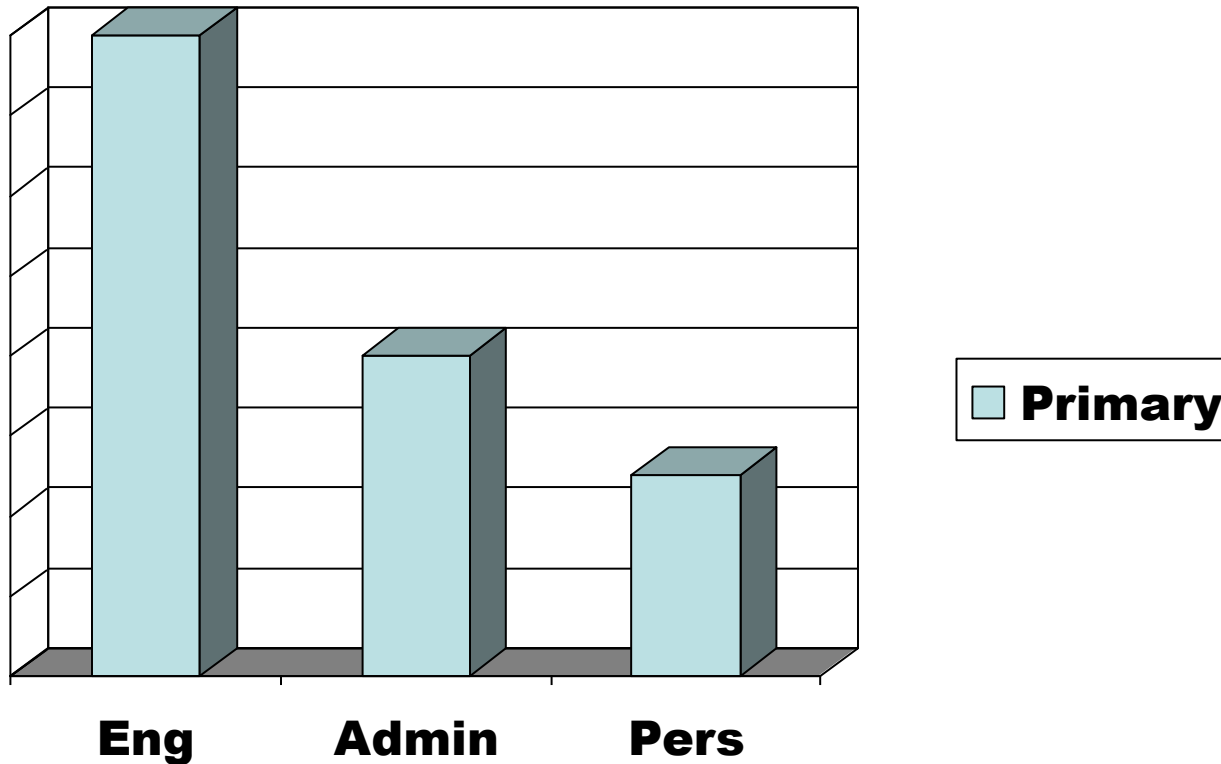
Assessment using Barrier Analysis



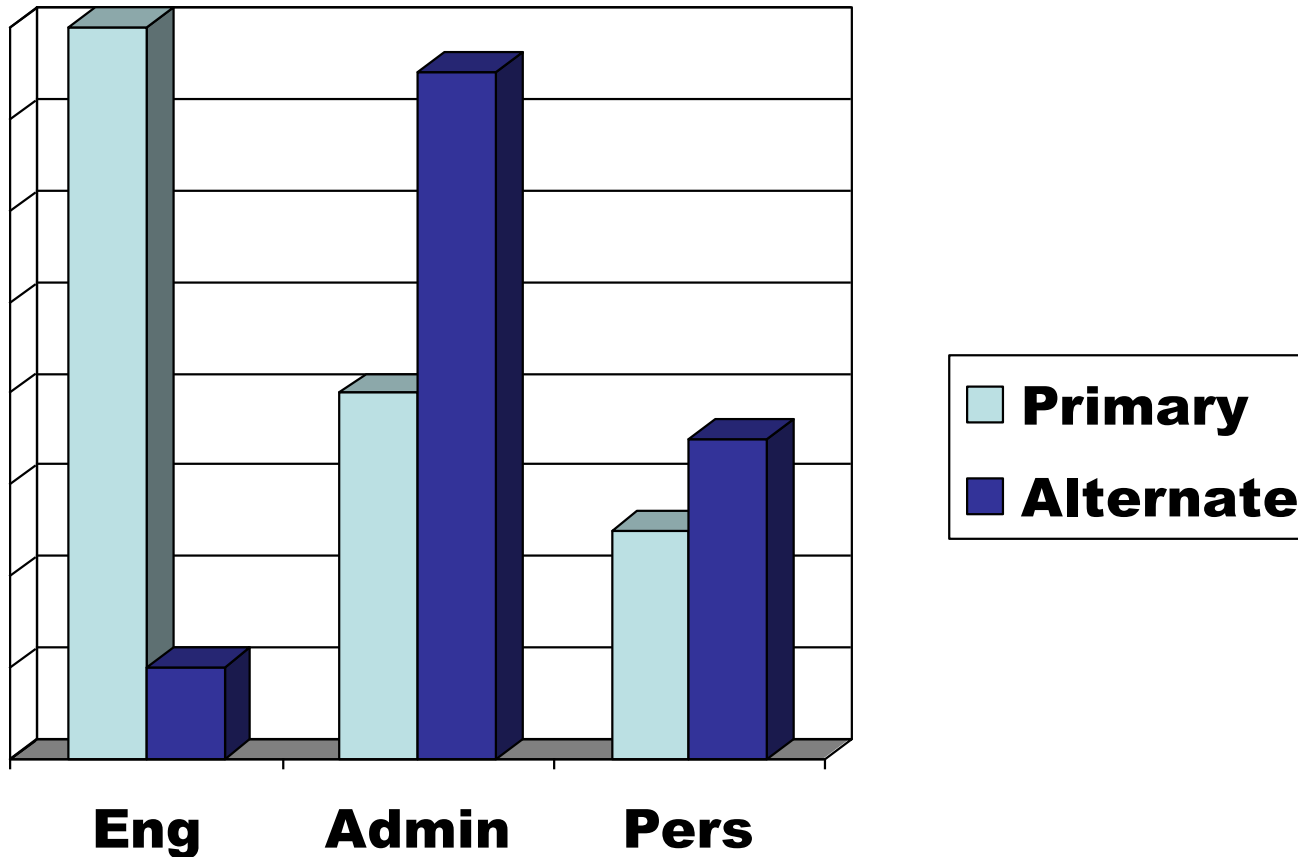
Results of Analysis for Primary Method



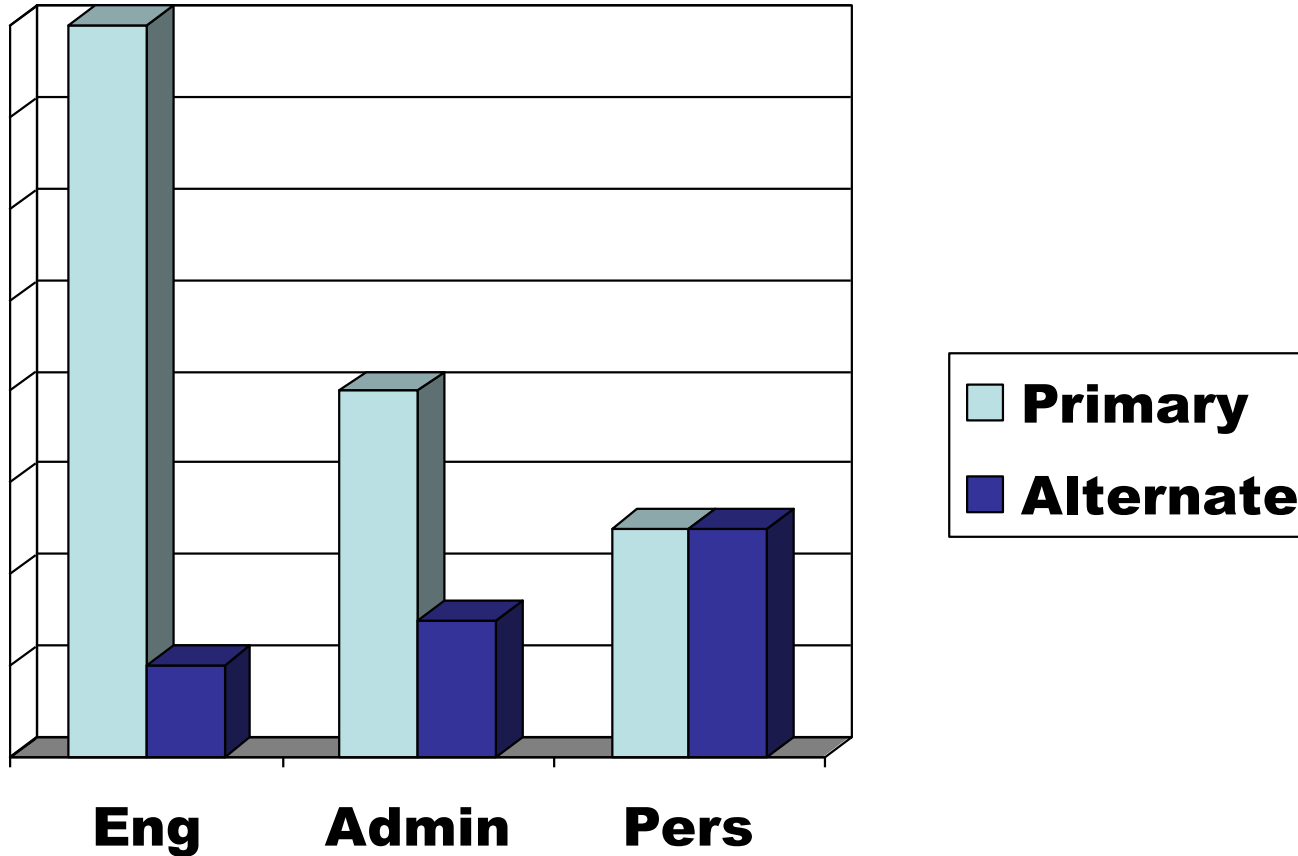
Control Hierarchy for Primary Method






Control Hierarchy How to Compensate for Reduction in Engineered Controls

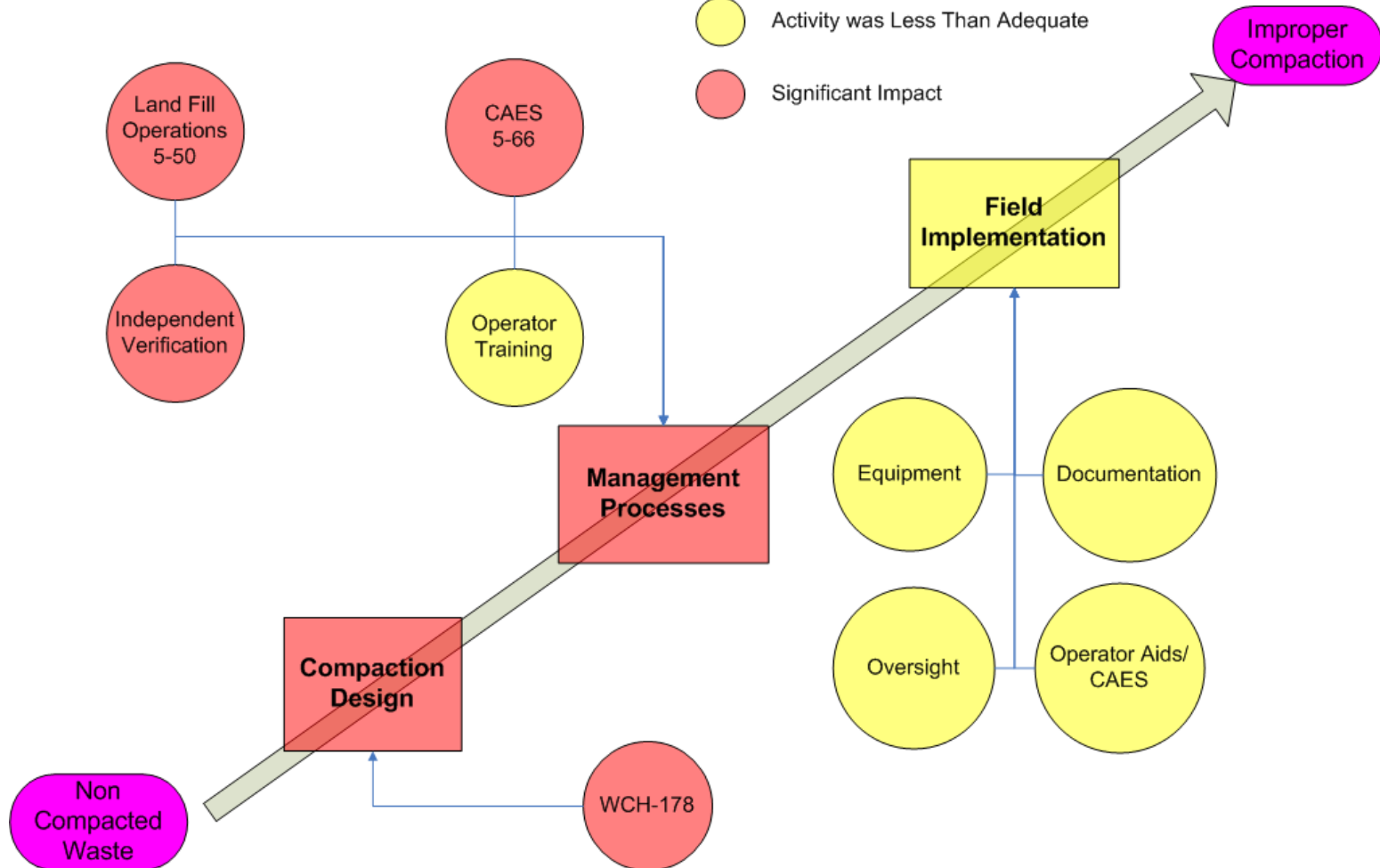


Control Hierarchy Primary vs Alternate Method



Results of Analysis for Alternate Method

-  No Apparent Weakness
-  Activity was Less Than Adequate
-  Significant Impact



Lessons Learned from this effort

- Need to compensate for a loss of engineering controls with heightened administrative controls,
- Compliance based assessments do not adequately reflect the effectiveness of a process, and
- Changes from normal operational expectations, if not routinely monitored, can result in operations outside of anticipated norms
- By presenting the condition of the primary and alternate methods to the operations group using a barrier analysis format it was easy to convince the team that actions were needed to shore up the expectations in the design document, upgrade the procedures, and improve field performance activities.

Questions