Achieve Quick Improvements in Process Safety

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Steve Arendt, P.E., Vice President - Global Oil, Gas, and Chemicals

- 40 years in process safety and risk assessment
- Conducted 100s of PSM system design/implementations, audits, incident investigations, HAZID/HAZOP/LOPA/QRAs, best practice reviews, and safety culture evaluations
- ABS Group manager for the BP-Baker Panel PSM reviews
- 80+ articles and books on PSM and risk management, including CCPS Guidelines on
  - **Risk Based Process Safety**
  - **Implementing PSM, 2nd edition**
  - **Management of Change**
  - **Guidelines for Hazard Evaluation Procedures, 2nd Edition**
- CCPS Fellow and recipient of MKOPSC Merit Award

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Discussion Outline

- Background

- Foundations of effective PSM

- Quick win tactics for PS improvement

- Preserving/resurrecting your "drive to ZERO"

- Closing suggestions

Background

- Many companies have adopted continuous improvement as their primary strategy toward pursuing Operational Excellence in Process Safety

- CCPS has extended this strategy with its Vision 2020

- However, some companies (or countries) may not be succeeding to strive for the highest levels of process safety performance

- Perhaps, they need to "step-back" and re-implement some basic steps to create a solid foundation for moving forward in process safety

Foundation for an Effective PSM System

- Optimize your PSM/HSE system based upon hazards, complexity, resources and culture using the CCPS *Guidelines for Risk Based Process Safety*

- Use the essential features toolbox in RBPS for a fit-for-purpose" PSM system

- Avoid well-know PSM implementation "failure modes"

- Secure your foundation with competency and leadership at all levels

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HSE/Process Safety Culture and Leadership

- **Culture** is the tendency in all of us – and our organization – to want to do the **right thing** in the **right way** at the **right time**, **ALL the time** – even when no one is looking

- **Leadership** – throughout the organization - is critical for a good culture

- Best if you assess HSE/PS culture using interconnected methods/data sources:
  - Interviews
  - Surveys
  - Small group workshops and focus groups
  - Site observations and discussions
  - Performance data analysis

Create Quick/Inexpensive Process Safety Improvements

- Implement a management review process

- Improve process safety leadership at the shift leader level

- Create, monitor, and react to simple process safety metrics

- Make everyone an MOC sensor

- Do simple, effective root cause analysis to learn from everything

- Conduct effective process safety reviews/audits

Management Review Essential Features

- Written management practice procedure
- Top site leader
- Scheduled, not a surprise
- Special, not embedded
- Sufficient time
- Expect preparations
- Regularly conducted
  - Sites - monthly to quarterly; division/company - quarterly to annually
- Agenda and pre-read sent out in advance
- Attendance requirements
  - Site leader, SLT, element leader, worker, contractor

Management Review Essential Features

- Cover all PS/HSE elements are addressed during 1/2 audit-cycle – adjust frequency for "needy" elements
- Typical agenda - common to all meetings
  - Performance
  - Audits
  - Incidents
  - Metrics
  - Resources/headcount - What is needed to pursue improvement
  - Future challenges
- Typical questions/topics for each element
- Action item follow-up from previous MR
- Documented results and actions

Leadership Site Engagement Essential Features

- **Leadership Site Engagement Preparation**
  - Scope
  - Collect Information
  - Review of Major Hazards
  - Set Objectives
  - Personal Preparations
  - Complete Plan
- **Leadership Site Engagement Execution**
  - Site orientation
  - Site Leadership Meeting
  - Contractor Leadership Meeting
  - Workforce Meeting
  - Site Walk Around
- **Leadership Site Engagement Closure**
  - Workforce and Contractor Leadership Meetings
  - Site Leadership Meeting
  - Complete Closure

Intentional design of engagement content

Predetermined questions and areas to review

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Improve PS/HSE Leadership at the Shift Leader Level

Equip everyone with

**Advanced PS/HSE supervision skills
+
PS/HSE ownership
+
Soft skills
+
Culture skills
=**

Barrier Guardians and Culture Agents©

Create, Monitor, and React to Simple PS Metrics

- If you could only have a few, which ones would you pick?

  1. Process Safety incidents – ANSI/API RP 754 Tiers 1 and 2
  2. Process Safety incident precursors – RP 754 Tier 3
  3. Failure to follow procedures/SWPs – BBS at-risk observation or SWP audit rate
  4. Failure to fix identified process safety problems – action item backlogs or aging, equipment deficiencies backlogs
  5. Failure to identify process safety deficiencies– inspection (all sources) backlog, failure to identify/report incidents or do adequate RCA
  6. Failure to assess risk – MOC circumvention or low quality, PHA schedule backlog, PHA quality review
  7. Safety culture weaknesses – Map RCs of incidents to cultural causal factors

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Choose Your Metrics Wisely…

- Address all pyramid levels?
- Includes most risk barriers?
- Indicators have accident prevention value?
- Reproducible/consistent?
- Auditable?
- Prevention power/diagnostic?
- Sensitive/timely?
- Easy to use/not too expensive?

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Metrics Advice

- Don't pick too many

- Make sure they roll up properly

- Make sure they add value

- Don't just pick things you can measure; make certain they affect accident risk

- Think through how you will use them; anticipate unintended behaviors

- Make them visible – positive culture influence

- Don't be afraid to change them

Getting Value from Metrics

- Making them up alone doesn't do anything

- Proper refresh rate, consistency/quality in calculations will generate credibility

- To get 1st-order benefits, make sure they filter through the chain of command to affect the performance of departments and people

- To get ancillary benefits, you can't hide them. You must widely advertise them and talk about them to get the culture improvement benefit

- Once you see there is an issue, you MUST act. Watching metrics alone doesn't affect performance

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Make Everyone an MOC Sensor

- MOC problems is a leading cause of process safety incidents
- Many MOC programs are becoming a collage of electronic jig-saw puzzle pieces that is hard to keep knit together Monitor three types of MOC leading indicators:
  - Circumvention of MOC process (regular scrutiny of CCMS work order logs and nurturing of maintenance planners will help avoid this one
  - Quality deficiencies in MOC reviews becoming endemic due to electronic system "tick-boxing"
  - Broader awareness of EVERYONE that could be affected using more effective delivery and follow-up schemes

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Apply Effective Root Thinking EVERYWHERE

- Do simple, effective root cause analysis to learn from everything

- Prepare for using more than one RCA method, based upon need

- Train your investigators, but you MUST exercise them or quality will suffer

- Apply RCA for chronic problems – repeat PHA action items and audit non-conformancies

- And develop SMARTER action items with an assurance process

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Action Items Should Be SMARTER

- **S**pecific – Action must be specific. If it states an objective to be accomplished, it should describe at least on way this objective might be accomplished. It cannot be generic in nature. There should not be multiple actions hidden in the action.

- **M**easurable – It should be possible to measure when the action is complete

- **A**ccountable – The action must be assigned to a responsible person and with a target date for completion

- **R**elevant – The action must address the causes identified through improved prevention, detection, and/or correction of the causes

- **T**imely – The target date for completion must be timely and realistic

- **E**valuated – Criteria for evaluating recommendation effectiveness are identified

- **R**eviewed – The completion and effectiveness of the action are reviewed (verified)

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Conduct Effective Process Safety Reviews/Audits

- If you have effective metrics program combined with an active management review process, you'll be able to extend out the audit cycle

- And when audits are needed, your metrics program can help target elements that need the scrutiny, thus simplifying audits

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For Others, How Do You Preserve Your "Drive to ZERO"

- When improvement stops, what do you do?

- People wonder why, and there is pressure from many directions – internal and external

- Key questions

  - Can you believe your measuring data and methods?

  - If so, can you improve?

  - Then, how can you sustain it?

  - How to continue driving to zero?
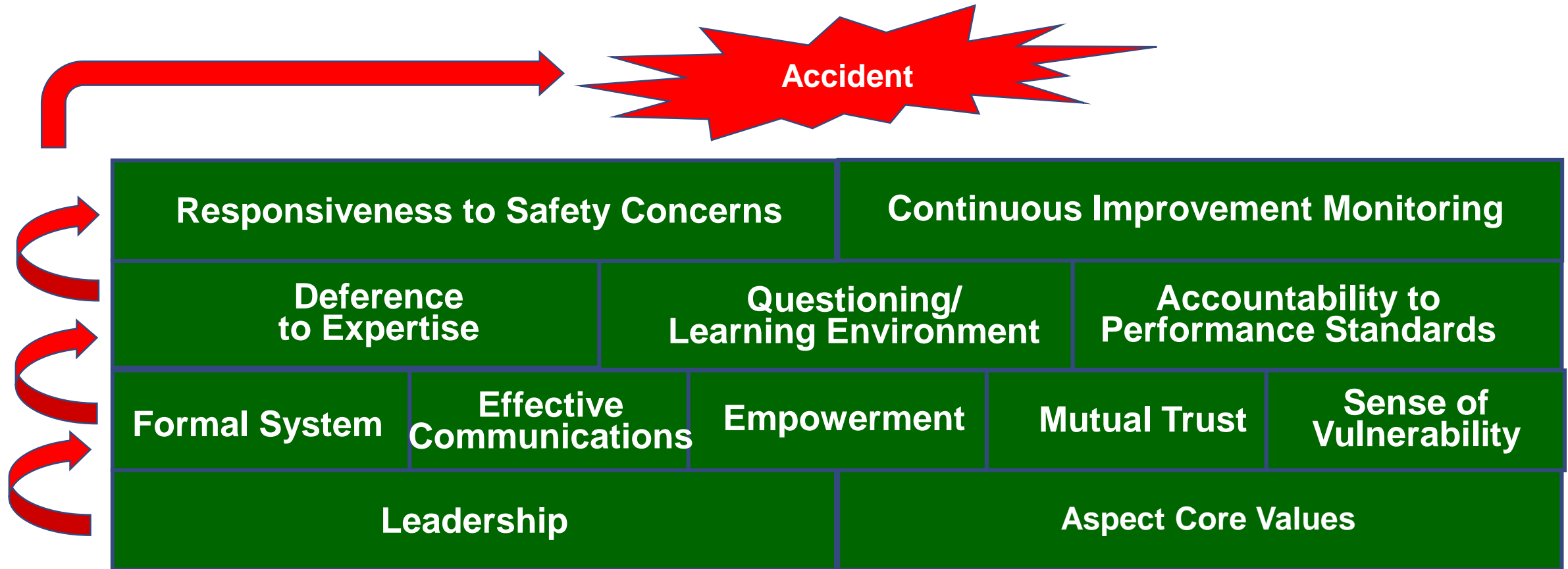
Diagnosing HSE/PS Performance Deficiencies

- Examine learning mechanisms and corrective action processes
  - Incident investigations and root cause analysis effectiveness
  - Audit effectiveness
  - Action item completion work processes and results
- Examine leading indicators to see if they have HSE/PS improvement value vs just things easy to collect and are really being used to drive performance
- Examine the effectiveness of existing behavior based safety (BBS) program – many BBS programs lose value and need to be re-energized
- Do an HSE/PS culture disease screening – determine whether there is evidence of chronic problems that never stay fixed
- Conduct an HSE/PS culture evaluation
- Then, improve the areas where the problems are

Safety Culture Disease Screening
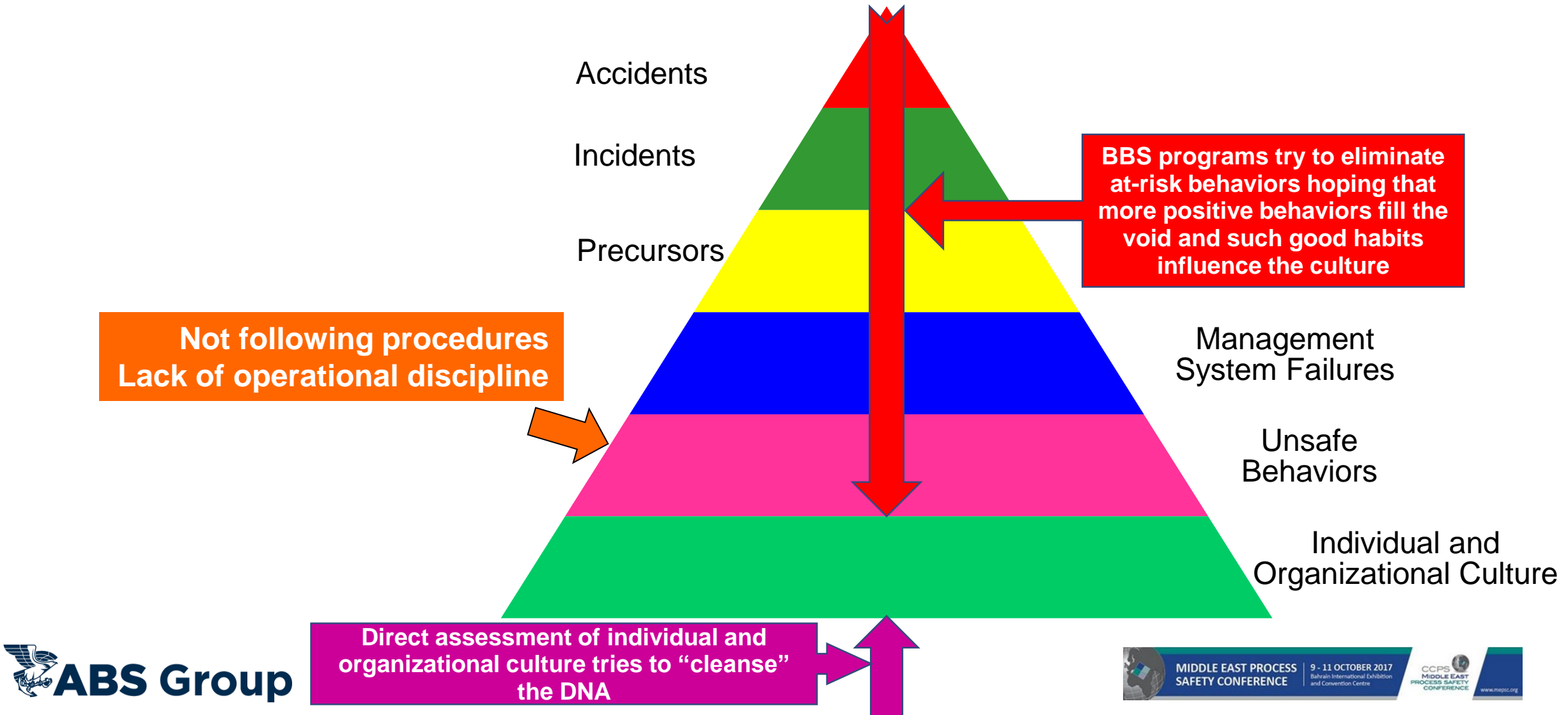*Do you have any of the following symptoms?*

- Chronic work backlogs

- Problems that never seem to get better

- Poor reporting

- Investigations identify symptoms, not root causes

- Many incidents involve "people not following procedures"

- Repetitive barrier degradation patterns

- Repeated root causes – over and over and over…

- Corrective actions don't address root causes

- Fixes don't stay fixed

Foundations on the Pyramid
Pursue Culture from BOTH Directions

Accidents

Incidents

Precursors

BBS programs try to eliminate at-risk behaviors hoping that more positive behaviors fill the void and such good habits influence the culture

Management System Failures

Not following procedures Lack of operational discipline

Unsafe Behaviors

Individual and Organizational Culture

Direct assessment of individual and organizational culture tries to "cleanse" the DNA

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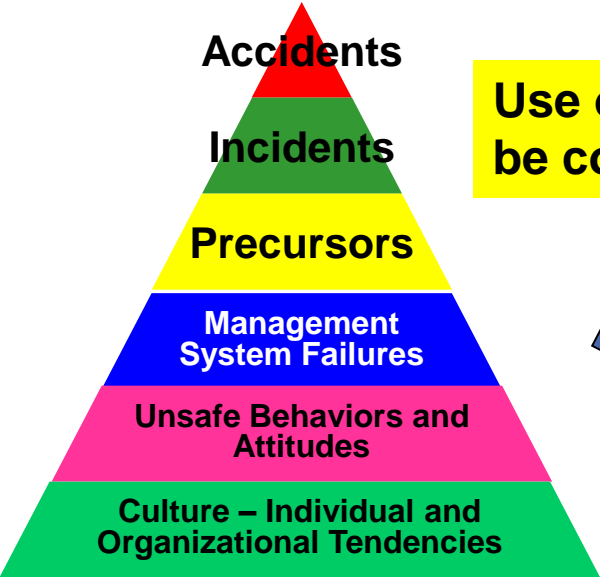CCPS MIDDLE EAST PROCESS SAFETY CONFERENCE www.mepsc.org
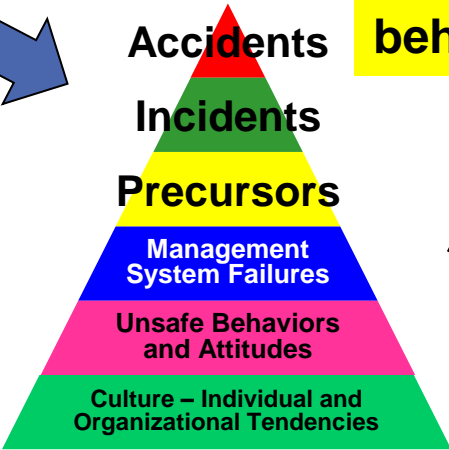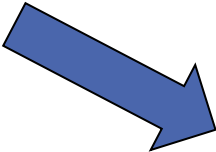
Closing Suggestions

- Use RBPS to help "manage generational change" in Process Safety

- Make everyone a **Barrier Guardian and Culture Agent**©

- Monitor "values drift" as execution occurs down the chain of command

- Monitor for signs of safety culture disease

- Vaccinate influencers with PS Leadership

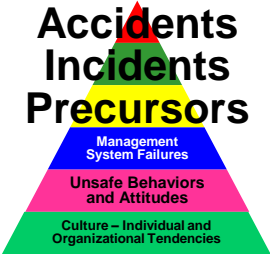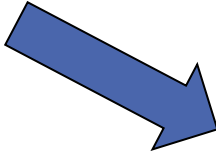# Continuous, Sustainable Improvement in HSE/Process Safety Performance Demands...

Effective RCA and corrective action creates improvement

Accidents

Incidents

Use of leading indicators to be continuous

Precursors

Management System Failures

Unsafe Behaviors and Attitudes

Culture – Individual and Organizational Tendencies

Accidents

Incidents

Precursors

Addressing culture and behaviors to be sustainable

Management System Failures

Unsafe Behaviors and Attitudes

Culture – Individual and Organizational Tendencies

Accidents
Incidents
Precursors

Management System Failures

Unsafe Behaviors and Attitudes

Culture – Individual and Organizational Tendencies

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