PROCESS SAFETY
What, Why and How – a “lean” view

Peter Wilkinson
Agenda

+ What is “process safety?”

+ What is our mental model on accident causation?

+ What do I mean by “lean”

+ What are the options for improving process safety?

+ But first a safety moment…
Successful Safety Moments

+ Many companies start off meetings with a safety moment.
+ The goal is to keep safety at the forefront of people’s minds and demonstrate the company’s commitment to workplace health and safety.
+ How successful are they?
+ What makes a good or bad “safety moment”?
+ Here are some ideas; but first:
Characteristics of Good/ Poor Safety Moments

**Good:**
- Is directly relevant to your or your client’s business (or both);
- Is something that you really believe in – demonstrates passion/authenticity;
- Has real learnings that can be passed on;
- Where relevant includes “personal” and “process” safety;
- Is short and snappy - possibly with a handout.

**Poor:**
- Uses a familiar domestic situation (e.g. trimming the hedge);
- Has no particular relevance to your or the client’s business;
- Has few learnings beyond the obvious;
- Does not discriminate between “personal” and “process” safety;
- Takes too long to tell!
Personal vs Process Safety

**Personal Safety**

- Eliminating personal safety and health hazards to prevent or mitigate injuries, illness and fatalities;
- Personal safety incidents typically lead to individual or rarely two or three casualties from one incident.

**Process Safety**

- Appropriately designing, constructing, operating and maintaining facilities that handle potentially hazardous materials or energy to prevent releases of flammable or toxic fluids or energy;
- Process safety incidents lead to fires/exploding/spills with potential for disastrous consequences.
Personal vs Process Safety 2

**Personal Safety**

+ Behaviours of front line workers often in focus, BBS
+ Measurement using lagging indicators such as LTIFR, DAFWC etc

**Process Safety**

+ Designers, leaders through to front line workers – focus on the Human and Organisational factors
+ Lead and lagging indicators of asset integrity
+ Learning from dissimilar incidents – look for learning points not just similarities
How do accidents happen?
Human error is just one factor!

- Human error, unsafe acts
- Technical equipment, hardware failure
- System, process, procedure failure
The Swiss Cheese Model

+ Each slice represents a control or barrier between the hazard and potential losses.
+ In reality all controls have gaps or weaknesses. These gaps are continually varying in size and position in all the slices.
+ Effective risk management requires active monitoring of the “health” of the controls.
+ This model explains why risks do not eventuate most of the time – even with imperfect controls the trajectory of the event may be stopped by redundant defences.
+ Therefore the absence of incidents is **not the same as having effective controls!**
From HSE Guidance on setting process safety indicators
How do risks eventuate?

+ The vast majority of high profile risks eventuate because of a failure to effectively manage established controls for well known (but rare) risks.
“Lean” Process Safety?
What is Process Safety?
Other names meaning the same thing:

+ Lean aims to make the work simple enough to understand, do and manage.
Process Safety:

Known risks and Known Controls – so what is the problem?
Possible obstacles to getting better understanding of Process Safety

+ LTIFR is so embedded as a metric?
+ Simplistic “individual blame” mental model of incident causation is so widespread?
+ Over – emphasis on “behavioural safety?”
+ We lack the skills
+ Lack of understanding of how MAEs occur?
  • (systems, hardware + individual error)
+ Rarity of MAEs therefore not seen as credible?
+ Terminology
+ Over complication?
Terminology

+ Synonyms
  • Major Accident Events, Major Accident Hazards, Asset Integrity (OGP), Asset Reliability and Integrity Management (PTTEP), Safety Cases….

+ Problems with title “Process Safety”
  • obscures link to reliable and efficient (and hence profitable) operations
  • Does it include environmental outcomes – yes
  • But I’m in drilling or construction – I don’t do processing operations
Complicated Systems

+ Process Safety Structures
  - Energy Institute 20 Elements + 20 PSM guidelines (2014)
  - CCPS 20 Elements and 4 Pillars
+ Volume of Documentation
  - 30/40 or more procedures and standards
+ Terminology
  - Safety critical elements
  - Performance standards
  - SIL levels, LOPA
Process Safety:
Known risks and Known Controls – Key Assumption
So what can we do about this – conceptually and practically?

+ Have a “barrier” or “control” focus
+ Preventive and Mitigating barriers/controls
+ Focus on key points of barriers/controls – as reference procedures as required
+ Clarity of ownership (accountability) for both implementation of barriers/controls AND monitoring of barriers/controls
+ Present information on barriers in a simpler way
+ Involve key layers of the workforce in generating the information on barriers
So what can we do about this – conceptually and *practically*?

+ Apply lean principles:
  • Present information on barriers in a simpler, shorter and clearer way
  • Give examples of incidents related to specific barriers
  • Ask ourselves – Who is the audience for our material? Write in an appropriate style
  • Involve our audience to generate the information on barriers
Summary

+ Accident Causation always involves multiple causes – a focus on front line behaviour unlikely to be successful.
+ Consider a focus on barriers/controls + accountability for implementation and monitoring
+ Communicate in a way suitable for the audience
+ There is a business driver as well as a moral imperative for process safety
THANK YOU!

Q and A to both Peter and Andrew