Development and Deployment of a Process Safety Curriculum in a North American Pipeline Company

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• 65 years. Global 100 most sustainable corporations. Based in Calgary, Canada. 5 business segments: Liquids Pipelines, Gas Distribution, Gas Pipelines, Processing & Energy Services, Sponsored Investments, and Corporate.

• Workforce of more than 11,000 people.

• **We distribute energy**, Canada's largest natural gas distribution company, Ontario, Quebec, New Brunswick and New York State.

• **We generate energy**, expanding our interests in renewable and green energy technologies including wind, solar energy, geothermal.

• **We transport energy**, operating world's longest, crude oil and liquids transportation system+ NG transmission and midstream
Goal to deploy a process safety program using adult learning best practices underpinned by a healthy safety culture. Break personal safety from Process Safety

**Curriculum Development and Deployment with unique Canadian Content**

- Face-to-face
  - Traditional lecture style, video address from CEO
  - Interactive group work and case studies
Curriculum Deployment

As of July 2016, “The Course” >18 classrooms over 6 regions across Canada and US @tank farms, office towers, terminals, over a period of 20 months with a high degree of success

Participants of the Introduction to Process Safety Course “The Course”
- New graduate to 30+ years of experience. Mature adults to social media gurus.
- Challenge to bring common experiences, common language of Process Safety.
- Having worked many years in industry they use newspapers, televisions, internet to learn
The Curriculum Deployment: the "Recipe"

- Face-to-face + computer-based
- Traditional lecture style, + video address from CEO - 1.5 hr
- Interactive group work and case studies – 2.5 hr
  - 2 group work + exercise of internalizing the curriculum presented into their everyday work responsibilities.
- Classroom arranged for five (5) pods of 5 learners.
The “Recipe”: Why group work?

“Fold” in case studies to improve knowledge retention
- 2 modern case studies:
  - Olympic Pipeline accident in Bellingham
  - Explosion at Caribbean Petroleum Terminal

“Add spice” through learner-led presentation to internally motivate learners:
- Hands-on learning, amongst peers. Achieving something they could not have done before.
- Learners may have subconscious fear of testing material.
- Group work creates cooperative environment.
Instructor as a facilitator; learner as presenter

Instructor A presents Process Safety elements

Instructor B assesses learners experience, department and communication style.

Instructor B presents case studies and presentation

Instructor A circulates, motivates and provides technical support.

3 learners given key jobs: Presenter, scribe, timer.
The “Recipe”

Our “Secret Sauce”
Cooking up the perfect group:
- 5-6 learners with industry experience of 50-55 years.
- Supervisors and direct reports, same department separated.
- Optimal class length.
- Nature of case studies.
- Instructor/learner ratio

“Building up the menu”
- Process Safety 201: Management of Change
- Process Safety 202: Risk Management
Personal Safety Vs. Process Safety

Consequence Of Incidents

Frequency Of Incidents

Very Often

Extremely Rare

Worker Safety Focus

Process Safety Focus

Slips, trips, falls

Medical aid

Large release

Common Themes:
• Leadership
• Staff Competencies
• Safety Culture
• Hazard Assessment

Pipeline Integrity and Process Safety

Adapted from Martin Sedgwick, Bill Fulton “Scottishpower’s Asset Management & Process Safety Journey”. 2011, p. 11.
Some results:

• 8-fold increase in “Operational” MOCs in 2013-2016.

• Revalidation PHAs: 6-fold increase from 2014 to 2016.

• Improvements to the incident investigation process: minor, medium and high impact.
Question and Answer Period