Process Related Incident Measure (PRIM)

CSChE/ CCPA PSM Division

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What is PRIM About?

- It’s about monitoring & measuring process-related incidents in the chemical industry in Canada.
- Incidents like this.....
Why PRIM?

• To gain insight into trends using basic data and to have a discussion on what the data/trend is suggesting in order to make the chemical industry aware of areas for improvement in performance at their facilities.
How Does PRIM Work?

• **Survey** issued **annually** at beginning of year to CCPA member companies
• Raw Data **collected & compiled by CCPA**
• Raw Data **normalized** based on number of primary and secondary causes for each incident
• PRIM Analysis Team:
  • **Validate** accuracy of cause selection
  • Prepare **graphs**
  • Prepare “80-20” contribution analysis and identify changes in trends
Examples of Intervention From PRIM Effort

• Incident trend due to demographic changes led to development of guideline on Management of Organizational Change

• Recognition of continuing contribution from Process/Equipment Integrity system deficiencies in general (in particular deficiencies in PM program and maintenance procedures)
PRIM Results

Incident Severity Per Year

- 1999: 128 sites, 80 incidents (40 HLV, 20 Serious, 20 Major, 8 Critical)
- 2000: 134 sites, 85 incidents (42 HLV, 25 Serious, 18 Major, 12 Critical)
- 2001: 147 sites, 110 incidents (55 HLV, 35 Serious, 25 Major, 5 Critical)
- 2002: 157 sites, 120 incidents (65 HLV, 40 Serious, 30 Major, 5 Critical)
- 2003: 138 sites, 90 incidents (45 HLV, 30 Serious, 25 Major, 5 Critical)
- 2004: 115 sites, 70 incidents (35 HLV, 25 Serious, 20 Major, 10 Critical)
- 2005: 156 sites, 60 incidents (30 HLV, 20 Serious, 20 Major, 10 Critical)
PRIM Results

PRIM INCIDENT CAUSE ANALYSIS 1998/1999 TO 2005

PSM Element Possibly Involved

- 98/99
- 2000
- 2001
- 2002
- 2003
- 2004
- 2005
PRIM Results

PRIM 98/99 TO 2005 - Element 2 (Process Knowledge & Documentation)
PRIM Results

PRIM 98/99 TO 2005 - Element 3 (Cap. Project Review & Design Procedures)

% of Incidents Attributed to Element 3

- 3.1 Appropriation Request Procedures
- 3.2 Hazard Review
- 3.3 Siting
- 3.4 Plot plan
- 3.5 Process Design & Review Procedures
- 3.6 Project Mgmt Procedures & Controls

98/99
2000
2001
2002
2003
2004
2005
PRIM Results

PRIM SINCE 2004 - Element 4 (Managing Process Risk)

PSM ELEMENT 4 - Sub-Elements
PRIM Results

PRIM 2002 TO 2005 - Element 5 (Management of Change)

% of Incidents Attributed to Element:

5.1 Change of process technology
5.2 Change of facility
5.3 Organizational changes
5.4 Variance procedures
5.5 Permanent changes
5.6 Temporary changes

PSM ELEMENT 5 - Sub-Elements
PRIM Results

PRIM 98/99 TO 2005 - Element 6 (Process & Equipment Integrity)
PRIM Results

PRIM 98/99 TO 2005 - ELEMENT 7 (Human Factors)

% of Incidents Attributed to Element 7

- 7.1 Oper - Process/Equipment Interface
- 7.2 Admin. Control versus Hardware
- 7.3 Human Error Assessment

PSM ELEMENT 7 - Sub-Elements
Future Considerations

• Better explain human factors & human error in PRIM survey
• Use absolute numbers instead of % normalization
• Statistical analysis to confirm real trends
• What to do with High Learning Value incident information (omit/ define better/ how used in overall data)
• Should HLV incident posters, if developed, be posted on web?
• Start monitoring/ measuring process fires?
• Provide averages for companies to compare against?
• Expand HISAT survey on more significant components?
• Monitor more closely temporary operational change causes?