Near Misses: What Do They Mean to Management?

Edmond Baruque, COSS
Audubon Field Solutions
Houston, TX
"If you have an apple and I have an apple...and we exchange these apples, then you and I will still have one apple each. But... if you have an idea, and I have an idea...and we exchange these ideas, then each of us will have two ideas."

George Bernard Shaw
SESSION OBJECTIVES

- Review incident prevention basics
- Discuss obstacles to effective incident reporting
- Share some published accident investigation results
- Share a perspective of near-miss reporting attractive to management
OLD MANAGEMENT STYLE

- Production
- Inventory
- Human Resources
- Procurement
- Public Relations
- Compliance
- Personal Safety
- Process Safety
- Facilities Safety
- Environmental Safety
- Equipment Integrity
- Communities Safety
COMMON RULE (most cases)

- Supervisory and senior manager levels make their best efforts to provide good production results to owners and shareholders because most rewards come in the form of economic bonuses linked to the production and profitability.
COMMON RULE (most cases)

- Willingly or un-willingly, expected profits and bonuses tend to influence managers and supervisor actions which send confusing messages to the front-line employee, about production versus safety performance.
MANAGEMENT EVOLUTION

- Production
- Inventory
- Human Resources
- Procurement
- Public Relations
- Compliance

HSE=EHS=SHE=EHS=HSSE

MANAGEMENT SYSTEMS
In the eyes of many Company persons:

- “Vast number of documents and the HSE management processes are not closely linked to the core business control and management processes”
CUSTOMIZED SAFETY MANAGEMENT SYSTEMS

Examples:

- ExxonMobil- Operations Integrity MS
- Dow Chem.- Loss Prevention Principles
- Chevron- Operational Excellence MS
- BP - Operations Integrity Assurance System
STANDARIZED MANAGEMENT SYSTEMS

Examples:

- 14001 EMS,
- OHSAS 18001,
- ANSI/AIHA Z10,
- others
IN THE PAST

- Some CEOs thought “accidents were inevitable” and they considered them as part of the cost of doing business.
TODAY

Most CEOs statements refer to

- “accidents are preventable”
- “ZERO” is achievable
MANAGEMENT OBJECTIVES INTEGRATION

- Integrating safety objectives to other Company objectives like reputation, quality, profitability, flexibility, security and energy efficiency
HUMAN BEHAVIOR PATTERNS
(operator & supervisor roles)

- Design considers operator decision making
- Operator performance will depend on human to machine interface
HUMAN TO MACHINE INTERFACE

- Human to machine interface may require specialized training to operate
- Understanding of system behavior and messages (alarms, noise, etc.)
HUMAN TO MACHINE INTERFACE

- Forewarnings given by the system may be misunderstood by the operator
- Integrity of the system and the safety of the people in the risk influenced area may be jeopardized
HUMAN TO MACHINE INTERFACE

- How important is it for all stakeholders that plant senior management responds wisely to these warnings that become near-misses?
THE MISSING LINKS
ARE NOT MISSING
WHERE WAS THE LINK?

“How could this happen?”

“It was so sudden…"

“Safety has been our priority…”

Everything was done to prevent a situation like this…
INCIDENT INVESTIGATION

I I TEAM

Management rep.
Employee with knowledge
HSE person (s)
HSE committee member
Union rep.,
“Outside” expert
Government rep.

From: Canadian Centre for Occupational Health and Safety (CCOHS)
INCIDENT INVESTIGATION

- Injured worker(s)
- Environmental/Capital/Reputation
- Recollection of facts
- Physical Evidence
- Eyewitness Accounts
- Interviewing personnel
- Reviewing background Information
- Analysis and conclusions
- Recommendations
- Report writing
- Follow-up
LESSONS LEARNED

- Many companies have been very proactive to the investigation of the events they have suffered.
- Investigation results are available to the public and are used by the industry as part of the lessons learned process by which the industries become safer.
Before

After

“The three personnel attempted to light up the diesel burner at about 12:30am. They made several attempts but were unsuccessful.

Investigations revealed that the startup team encountered some difficulties in lighting the boiler with LPG some time back.

To overcome the problem, they devised a temporary manual bypass method. This bypass method was not the same as the operational procedures.

There was no Management of Change approval put up for management approval to use the temporary bypass method.

The explosion that occurred inside the furnace of the utility steam boiler killed two workers (ages 21 and 23) and injured very badly a third one.”
Can a Manager focusing in production afford this?

Before

After

No serious injury occurred
Short term impact on environment
Economic losses for the company were in the hundreds of millions
Can a Manager focusing in production afford this?

IDENTIFYING A NEAR-MISS

• Can Plant personnel identify a near-miss?

In plants using steam managers and supervisors become complacent when listening to some banging in the steam piping systems: these could be the near-miss announcement for a major serious incident like condensation induced water hammer.
IDENTIFYING A NEAR-MISS

- Safety initiatives, focused in reducing amount of exposure that occurs in the workplace.

- While not all exposure is equal in terms of consequences, the same things that cause the near-misses are the precursors for serious incidents with devastating consequences for families, society and companies.
“The valve used to isolate the pump for maintenance was a ¼ turn plug valve”

“In preparing the pump for maintenance, the operator relied on the valve wrench to determine that the suction valve was open. He moved the wrench to what he believed was the closed position with the wrench perpendicular to the flow of product.”

“Interviews with several operators revealed that some operators used the valve wrench’s position relative to the flow to determine whether the valve was open or closed, while others referred to the position indicator on the valve stem. The valve was actually open.”

“Before leaving the area to obtain materials needed to remove the pump, the mechanic noticed that the valve position indicator on the suction valve body showed that the valve was open. He did not relate this information to his co-workers.”
FROM: U.S. Chemical Safety And Hazard Investigation Board, Oil Refinery Fire and Explosion, Case Study No. 2004-08-I-NM, 2005

Fluid: Alkylate
150psi & 350°F
IDENTIFYING A NEAR-MISS

FROM: U.S. Chemical Safety And Hazard Investigation Board, Oil Refinery Fire and Explosion, Case Study No. 2004-08-I-NM, 2005

“The primary, electric, and steam-driven spare isostripper recirculation pumps had 23 work orders submitted for repair of seal-related problems or pump seizures in the one-year period prior to the incident”
FROM: U.S. Chemical Safety And Hazard Investigation Board, Oil Refinery Fire and Explosion, Case Study No. 2004-08-I-NM, 2005

• “The release produced a loud roaring sound that could be heard throughout the refinery”

The mechanic was blown over an adjacent pump and suffered broken ribs. Material was blown into the mechanic specialist’s eyes. Alkylate covered the plant operator’s clothing, ignited, seriously burning the operator.

About 30 to 45 seconds after the initial release, the first of several explosions occurred.

The refinery’s safety officer was about 150 yards away when the release occurred. In an attempt to turn on a fire monitor to suppress escaping vapors, the officer advanced towards the release. He was caught in the fire and injured.”
IDENTIFYING A NEAR-MISS

FROM: Mogford J., Isomerization Unit Explosion Final Report, Fatal Accident Investigation Report, BP PLC., Texas City, TX, 2005

“The night shift did not report the faulty hard-wired high level alarm (LAH-5102) to the oncoming day shift either verbally or in the shift log”

“During the course of the investigation there were a number of (minor) fires within the site… The general reaction of the workforce to these fires appeared to be not to worry, as fires were a fact of life in the refinery”
IDENTIFYING A NEAR-MISS


“… loss of containment incidents at the Texas City refinery increased each year from 399 in 2002 to 493 in 2003 and peaked 607 in 2004”

“… most ISOM startups experienced high liquid levels in the splitter tower. Neither Amoco nor BP investigated these events”
IDENTIFYING A NEAR-MISS


“...Personnel were not encouraged to report safety problems and some feared retaliation for doing so. The lessons from incidents and near-misses, therefore, were generally not captured or acted upon”

According to the International Herald Tribune, the refinery has operated at about half its capacity since the ISOM incident for the following 2 years. The maximum production of the refinery is estimated to be 470,000 barrels of oil per day.
LESSONS NOT LEARNED


in September 1997 the “Abator Safety Review” performed by Griffith (plant builder) was distributed to all Griffith’s U.S. facilities; this report identified specifically human error and the lack of LEL monitoring at the oxidizer.

The recommendations were not implemented at the Vernon plant nor at the Ontario plant.
Vernon experienced an explosion with no injuries and minor damage in November 1997.

Ontario plant experienced a similar explosion in 2004 (7 years later) causing injuries to four employees and damage to the chamber, control room and building.

These events resulted in an important loss of production and capital expense.
REPORT ALL NEAR-MISSES

Nobody knows better about the existence of the problems than the workers who deal with them on a day to day basis. Many times these problems are near-misses and they are not reported. Why?

- Absence of a trusting environment
- Concerns about discipline or other retaliation
- Fear to be blamed.
- Fear that it will reflect poorly on performance/evaluation.
- Lack of process safety awareness
- Lack of knowledge about the hazards involved when operating outside the established process limits
DEFINE NEAR-MISSES

Define near-misses that need reporting

- Relief valves relieving
- Vent valves being opened
- Abnormal high temperatures or pressures
- Abnormal noise
- Loss of containment
- Fires
- Minor electric shocks, etc.

Good guidance found in the “Near-miss Management Project” of the Wharton Risk Management and Decision Processes Center

12 Apr 2013 Rice Global E & C Forum
NEAR-MISSES PROGRAM

Training: start with management and supervision functions

Encourage observation and near-miss reporting

Evaluation

Investigation

Communication of lessons learned

For PSM covered plants see OSHA 29CFR 1910.119 (m)
Remembering Frank E. Bird Jr.

- 600 Near-misses
- 30 Property Damage
- 10 Minor
- 1 Serious
CONCLUSIONS

• Investigation of most major incidents demonstrates that several precursors were overlooked prior to the event.

• Managers, supervisors and operators/employees are rational and they do the rational thing in their own mind. Lack of appropriate training and reinforced awareness leads to the failure identify and report near-miss events.

• For Management, Near-miss reporting and investigation is a low cost tool that can make the work environment safer and more profitable in all industries.

• Reporting near-misses and lessons learned as part of a system to achieve an injury free environment is not a new concept: it has been around for 40 years; it is time for all Management Systems to use it wisely.
Bow Tie
Questions?