CENTER FOR Hydrogen SAFETY
Connecting a Global Community

Safety Culture Spotlight

Communication Failure—Management Of Change

- Process Hazards Analysis identifies required system change
- Failure to communicate system change results in unnecessary expenditures
- Lack of organization integration

BACKGROUND

A plant producing an ingestible product from non-hazardous raw materials ruined a significant quantity of product by accidentally contaminating the product with facility wastewater. The error was detected while the product was still in the warehouse, so no customer was harmed, but if not caught many people could have been injured.

The process was implemented in equipment originally built for another process. The process tank had an overflow line that discharged to the facility sewer below the water level, which helped minimize odors related to the old process.

Because the new process used vacuum charging of raw materials, the Management Of Change process and the Process Hazards Analysis identified the overflow line needed to be removed. The minimal modification was performed via a simple maintenance work order.

WHAT HAPPENED

After the process had been running for some time, the plant engineering department conducted an equipment audit and noticed the overflow line, which was still shown on the Piping & Instrumentation Diagrams, was missing. Over a weekend shutdown, they brought in contractors to replace the line. On Monday morning, the operator noticed immediately that the line had been replaced. He halted production until the line could be removed again by maintenance. Several months later, Engineering reinstalled the line again, and the operator again noticed it and had it removed. Unfortunately, the third time the line was reinstalled, there was a new operator who did not recognize the change. When he pulled vacuum to charge the raw materials, he also siphoned wastewater into the tank. Due to the height of the overflow line, the amount of wastewater siphoned in was minor compared to the raw materials, so several batches were contaminated before the problem was detected.

The problem caused the loss of the business, and the Engineering manager suddenly retired. No formal incident investigation was conducted, but if it had been, what culture gaps might have been found?

This was not a process safety incident as we typically define it, but was the type of potentially high consequence low frequency type event that process safety prevents. What caused the significant gap in open and frank communication between operations, maintenance, and engineering, which undoubtedly extended to traditional process safety situations in the plant?

SAFETY CULTURE FOCUS

- ✓ Strong leadership promotes integration of safety among all organizations.
- ✓ Open, timely and effective communication between organizations is critical to safe operations.
- ✓ Mutual trust is fostered by a questioning environment and frequent communications.

****Only 26% of those surveyed indicated communication was a strength in their organization.****

IMPROVING HYDROGEN SAFETY CULTURE

LEARNING OPPORTUNITIES FROM OTHER'S EXPERIENCES

"Safety culture is how the organization behaves…
…when no one is watching."

Safety Culture Framework

- Safety is everyone's responsibility
- Strong leadership support
- Integrated into all activities
- Open, timely, effective communications
- Questioning/learning environment
- Mutual trust
- Continuous improvement

What are the benefits?

- ✓ Eliminates common weaknesses identified as contributing factors to catastrophic events.
- ✓ Promotes trust in the hydrogen energy industry's ability to deliver safe, reliable, quality products and services.
- ✓ Supports a sustainable legacy for companies and the hydrogen industry.
- ✓ Fosters efficiency and productivity in the workplace.

Resources

- ✓ For further information and resources on safety culture, see: https://www.aiche.org/ccps/safety-culture-what-stake
- ✓ For further case studies on safety culture, see: https://h2tools.org

Keywords: weak, poor, minimum, regulations, flammable, chemical, checklists, compliance