

### Emergency Shutdown Authority Negated—Procedures

- Management failure to support stop work authority
- Investigations undermine emergency shutdown process
- Explosion causes personnel injuries and property damage

#### BACKGROUND

A high-risk facility had clearly written procedures giving on-duty operators the authority to initiate an emergency shutdown when the conditions warrant, without obtaining any other approval. A review of operator training materials showed this authority was clearly and explicitly stated.

Operators have stated in interviews the procedures were known and understood and confirmed the training was given as it appears.

#### WHAT HAPPENED

Despite this policy, an operator on duty in the control room did not initiate an emergency shutdown during a significant transient event in which the process pressure and temperature rose rapidly due to a runaway reaction. This incident resulted in a significant release of flammable materials and a vapor cloud explosion that resulted in injuries to personnel and significant property damage to the facility.

In the investigation that followed, the operator stated he did not feel comfortable taking Stop Work Authority (SWA) action and that a supervisor should have been there to make that call. When asked why he was not comfortable, the operator responded that over the years, when SWA was used, there had been a lot of second-guessing by investigators after the fact.

Further review showed the incident investigation reports described alternative actions that the operators could have taken in response to the indications they were receiving at the control board that would have abated the transient but kept the process running. Some reports also suggested disciplinary action, although none was taken.

When operators exercise SWA, it is certainly possible that options existed for them to bring the process under control. But under duress, it is hard to know if such an option exists or not, which is why SWA is so important. How can incident investigators address potential alternative actions without undermining SWA?

#### SAFETY CULTURE FOCUS

- ✓ Leadership must support employees implementing the safety policies and procedures in place.
- ✓ Effective and open communication between management and personnel can help address inconsistencies in the safety culture.
- ✓ Mutual trust is essential to establishing and maintaining a strong safety culture.

**\*\*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>