Canada Energy Regulator
Régie de l'énergie du Canada

A Regulatory Priority for Safety Culture

Regulators, like companies, are working to strengthen the oil and gas safety system. We make sure regulated companies have an established management system and are aware and understand potential vulnerabilities in the system, such as those related to safety culture. This article describes the concept of safety culture and research findings that demonstrate its importance to regulators.

What is safety culture?

Safety culture is defined as the attitudes, values, norms and beliefs, which a particular group of people shares with respect to risk and safety.[1] Culture influences what people see, hear, feel, and say. Most importantly, it influences the decisions and actions (behaviours) of people in an organization. These behaviours drive safety[2] outcomes and performance.

What does the research tell us about safety culture?

A study of investigations into recent major accidents in the North American energy industry illustrates the role that a poor safety culture can play in creating conditions that detract from safety and environmental protection in high hazard environments (see table 1). The consequences of these events were catastrophic. The findings demonstrate that:

- A poor safety culture undermines the integrity of defenses put in place to protect people and the environment.
- When an organization establishes and maintains a positive safety culture:
  - What the company says it will do in its policies, processes, and procedures is clearly aligned with what it actually does in practice.
  - It scrutinizes every decision to ensure that risk is considered and managed appropriately. It also sets performance measures that provide feedback on the organization's current state in order to identify areas of weakness.
  - Leaders demonstrate that safety is their overriding value and priority and every employee feels empowered and recognized for making decisions that strengthen operational safety.
  - Everyone is aware of known hazards, remains vigilant to new threats, and feels encouraged to report hazards, including instances where they have committed an error and introduced a threat themselves.
  - The organization continually learns from its own and others' experiences in order to improve safety and environmental protection.

For more information on safety culture, visit the CER's Safety Culture Learning Portal at **www.cer-rec.gc.ca**.

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[1] Mearns, K., Flin, R., Gordon, R. & Fleming, M. (1998). Measuring safety culture in the offshore oil industry. Work and Stress, 12(3), 238-254.

[2] "Safety" includes safety of workers and the public, process safety, operational safety, facility integrity, security and environmental protection.

Table 1 – Review of major accident inquiry reports[3]

Name, location, and date	Contributing factors	Underlying cultural causes[4]	Consequences
Ocean Ranger North Atlantic (1982)	Design factors, lack of safety management systems (lack of training, lack of proper emergency procedures, manuals, and technical information).	• Tolerance of inadequate systems	• 84 fatalities (no survivors)
BP City Texas, U.S. (2005)	Cost-cutting, ineffective oversight of BP's major accident prevention programs, reliance on low personal injury rate as a safety indicator, deficiencies in mechanical integrity program, "check the box" mentality, lack of a reporting and learning culture, safety rewards focused on improving personal safety metrics and worker behaviors rather than process safety and management safety systems, ineffective assessment of changes that could impact process safety.	• Normalization of deviance • Tolerance of inadequate systems • Complacency	• 15 fatalities and 180 injuries • Facility and environmental damage
Enbridge Spill, Kalamazoo River, Marshall Michigan (2010)	Company had deficient integrity management procedures, inadequate training of control center personnel, insufficient public awareness and education.	• Tolerance of inadequate systems	• About 20,000 barrels of crude oil released • Residents self-evacuated from their houses • Environmental damage
BP Macondo Well Deepwater Horizon, Gulf of Mexico (2010)	Systemic failures in risk management, missed warning signals, poor communication, general lack of appreciation for the risks involved, lack of understanding of barriers in place to prevent a major accident, failures of management.	• Production pressure • Tolerance of inadequate systems • Complacency • Normalization of deviance	• About 4 million barrels of released hydrocarbons • 11 fatalities and 17 injured • Severe environmental damage

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[3] Table adapted from Fleming, M. & Scott N. (2012) Cultural disasters: Learning from yesterday to be safe tomorrow. *Oil and Gas Facilities*, Vol 1, No 3 (June). Society of Petroleum Engineers. Houston, Texas.

[4] See CER Statement on Safety Culture for definition of various cultural causes (http://www.cer-rec.gc.ca/sftnvrnmnt/sftycltr/sttmntsftcltr/index-eng.html).

Name, location, and date	Contributing factors	Underlying cultural causes[4]	Consequences
Pacific Oil and Gas *San Bruno*, California (2010)	Inadequate quality assurance and quality control; deficient and ineffective integrity management program, lack of either automatic shutoff valves or remote control valves; flawed emergency response procedures	• Tolerance of inadequate systems • Complacency • Normalization of deviance	• About 47.6 million standard cubic feet of natural gas released • 8 fatalities and numerous injuries • Resulting fire destroyed 38 homes and damaged 70