Creating a Culture for Safety in Owner/Operator Agencies

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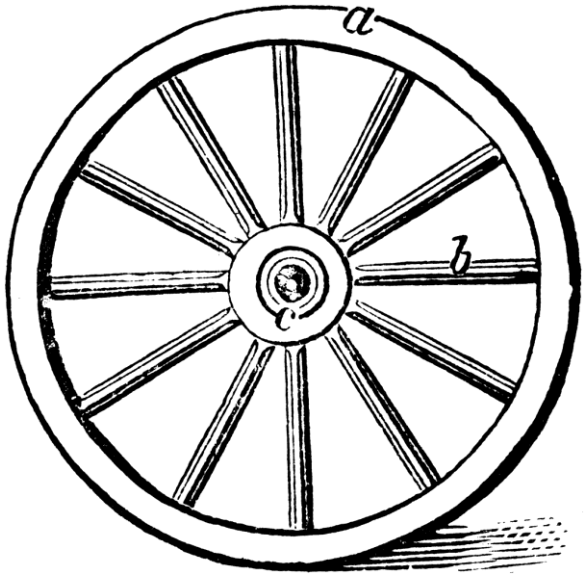
Owner/Operator agencies

- These agencies have dual responsibilities for conducting high risk activities and regulating those same activities
- They fulfill non-economic national and societal needs; mission is different than private entities
- Typically these are conglomerations of Federal and contractor organizations containing a variety of cultures

The dual responsibilities as owner and regulator, the importance of mission, and the organizational structure all complicate efforts to create and sustain culture for safety

DOE as a virtual organization

- The Secretary is the hub, setting objectives, distributing resources, and governing the organization
- DOE's field offices are the spokes, managing segments of the organization to satisfy assigned objectives
- Contractors form the rim, providing services according to field office and contractual obligations



Virtual organizations

In private industry, virtual organizations tend to be unstable due to inherent conflicts of interest

- Conflicts arise because service providers compete for resources but must cooperate to meet objectives
- Hub's economic power holds organization together
- The hub's ability to govern depends on its dominance

DOE's control is constrained; it does not have complete authority over goals, budget, costs, or organization

"[NASA's] structure … blocked effective communication of technical problems. Signals were overlooked, people were silenced, and useful information and dissenting views on technical issues did not surface at higher levels." (CAIB)

Culture for safety

What does a culture for safety *not* look like? IAEA found recurring conditions at plants with significant problems:

- lack of management leadership, involvement, and oversight
- unstable budgets and/or competing priorities
- dysfunctional lines of communication
- inadequate understanding of the risks
- failure to recognize significance of precursor events
- failure to encourage or listen to differing professional opinions

"NASA had conflicting goals of cost, schedule, and safety. Safety lost out as the mandates of an 'operational system' increased the schedule pressure." (CAIB)

External influences

- Senior agency leaders are political appointees, often chosen from outside and tasked to change agency
- Senior agency leaders' time in office is usually limited
- Operating contracts and contractor leaders change often
- Budget and mission set by Administration and Congress
- State and public interaction occurs at all levels

"NASA's political and budgetary situation remained the same in principle as it had been since the inception of the Shuttle Program. … Policy constraints affected the Shuttle Program's organization culture, its structure, and the structure of the safety system. The three combined to keep NASA on its slippery slope toward *Challenger* and *Columbia*." (CAIB)

Shifting responsibilities

Frequent changes in policies often shift safety functions and responsibilities between contractors and agency

- These shifts typically coincide with other organizational changes
- Receiving organizations are not always prepared to assume new safety responsibilities
- Agency not able to consistently, independently monitor status of contractors' safety performance

"NASA structure changed as roles and responsibilities were transferred to contractors, which increased the dependence on the private sector for safety functions and risk assessment while simultaneously reducing the in-house capability to spot safety issues." (CAIB)

Workforce motivations

Various levels of organization have different motivations

- Diversity of missions precludes overall alignment
- Loyalties are often to "the institution," not organization
- Facilities and capabilities are viewed as unique and irreplaceable
- Linking safety to productivity is not a strong incentive

"NASA's culture of bureaucratic accountability emphasized chain of command, procedure, following the rules, and going by the book. While rules and procedures were essential for coordination, they had an unintended but negative effect. Allegiance to hierarchy and procedure had replaced deference to NASA engineers' technical expertise." (CAIB)

Perception of risk

Risk perceptions can vary across organizational levels:

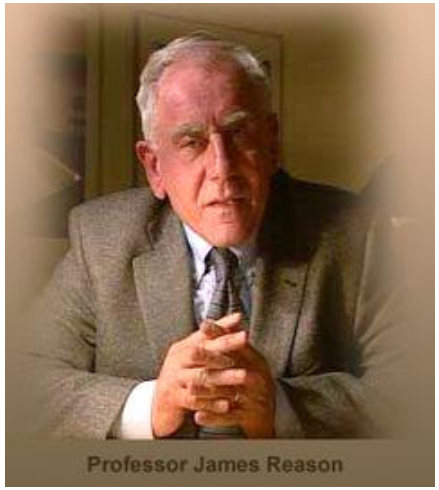
- Activities contain broad range of hazards and consequences
- Many risks are ill-defined and with significant uncertainty
- Competition for resources encourages misrepresentation of risks versus benefits
- Most activities are not risky, diluting overall risk profile

"The Shuttle Program's complex structure erected barriers to effective communication and its safety culture no longer asks enough hard questions about risk. … mistakes that were made on STS-107 are not isolated failures, but are indicative of systemic flaws that existed prior to the accident." (CAIB)

Consider this …

"Real progress on safety can be made by understanding how people create safety, and by understanding how … safety can break down in resource limited systems."

- Sidney Dekker



"Workplaces and organizations are easier to manage than the minds of individual workers. You cannot change the human condition, but you can change the conditions under which people work."

- James Reason

Three Observations

1. Safety performance is an organization's response to influences
2. Safety performance begins to erode in slow, incremental stages, but accelerates quickly; early detection is difficult
3. Observations of decision-making patterns can provide a measure of the health of the organization's culture

"Twice in NASA history, the agency embarked on a slippery slope that resulted in catastrophe. Each decision, taken by itself, seemed correct, routine, and indeed, insignificant and unremarkable. … In both pre-accident periods, events unfolded over a long time and in small increments rather than in sudden and dramatic occurrences." (CAIB)

What To Do?

Inherent instability of budgets and frequent changes in senior leadership disrupt long-term safety focus; consider:

1. ***Stability*** – create a more stable operating environment for high risk facilities and activities
2. ***Manage organizational change*** – ensure continuity of important safety-related responsibilities and functions
3. ***Countermeasures*** – strengthen checks and balances between safety and mission responsibilities
4. ***Safety Awareness*** – continually monitor health of cultures and safety programs and seek improvement

"Strategies must increase the clarity, strength, and presence of signals that challenge assumptions about risk." (CAIB)

Stability

Enhance stability in the workplace:

- Minimize changes to requirements, limit to addressing emerging safety issues or recognized weaknesses
- Insulate budget and management of high risk activities
- Determine costs of maintaining facilities in compliance, use as bottom line for budgets
- Improve understanding of technical basis for the work and its hazards
- Improve technical basis of requirements

"Throughout its history, NASA has consistently struggled to achieve viable safety programs and adjust them to the constraints and vagaries of changing budgets. Yet, … NASA's safety system has fallen short of the mark." (CAIB)

Managing change

Create an Organizational Change Management System:

- Provides continuity of safety-related responsibilities, capabilities, and functions during organizational change
- Organizational change is a non-delegable responsibility of management
- Successful change requires robust decision processes, valid data, and comprehensive problem formulation

"Changes in organizational structure should be made only with careful consideration … Changes that make the organization more complex may create new ways that it can fail." (CAIB)

Countermeasures

Develop effective safety countermeasures:

- Aggressively respond to emerging safety issues and concerns to correct meaningful deficiencies
- Increase independence of safety organizations; make them equal partners in high risk activities
- Prepare first-line and work supervisors to be role models
- Use succession and career planning to develop future leaders and senior managers

"[T]he practice of "buying" safety services establishes a relationship in which programs sustain the very livelihoods of the safety experts hired to oversee them. These idiosyncrasies of structure and funding preclude the safety organization from effectively providing independent safety analysis." (CAIB)

Safety Awareness

Improve safety awareness at all levels:

- Build worker and public confidence with openness and transparency of safety status
- Consider corrective action programs as safety functions
- Enhance technical oversight and add cultural attributes
- Ensure training programs address current workplace needs and respond to changes

"NASA's blind spot is it believes it has a strong safety culture. Program history shows that the loss of a truly independent, robust capability to protect the system's fundamental requirements and specifications inevitably compromised those requirements, and therefore increased risk." (CAIB)

Conclusions

Creating a culture for safety in DOE is complicated by its nature as an owner/operator agency and its structure as a virtual organization. DOE needs to consider ways to:

1. ***Increase Stability*** – create a more stable operating environment for high risk facilities and activities

2. ***Manage organizational change*** – ensure continuity of important safety-related responsibilities and functions

3. ***Improve Countermeasures*** – strengthen checks and balances between safety and mission responsibilities

4. ***Monitor Safety Awareness*** – continually monitor health of cultures and safety programs and seek improvement