

Organizational Issues and System Failures

Factors that Compromise Critical Infrastructure Risk Management



BP Horizon Gulf Oil Spill



Teton Dam Failure on First Filling



Space Shuttle Challenger

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Risk Management

“*Risk Management* refers to the process by which an organization identifies and analyzes threats, examines alternatives, and accepts or mitigates those threats.

An *organization’s maturity* in the area of risk management is indicated by the priority, pro-active thought and serious effort it allocates to this process.” (CPUC Independent Review Panel, “Report of the Independent Review Panel San Bruno Explosion,” 2011)

Catastrophes & Failures of Engineered Systems



1986 Explosion of the Space Shuttle Challenger Just After Launch

LOTTERY, PAGE A2
Volume 263
Number 33
\$2.00

Boston Sunday Globe

February 2, 2003

THE WEATHER
Today: Cloudy, with light rain today, windy, 36°
Tomorrow: Breezy, cloudy, 40°
Friday: Partly cloudy, 42°
Full Report: Page D12

Space shuttle Columbia lost on reentry; 7 astronauts dead



A fiery trail streaked across the sky as the space shuttle Columbia broke apart yesterday over Texas. An amateur photographer captured this image from his backyard in Tyler.

“Within weeks after the beginning the official investigation, the Columbia Accident Investigation Board began noting additional strong parallels between Columbia and Challenger. Comparing their investigative data on the organization cause of Columbia with those of Challenger, the CAIB systematically looked for similarities and differences, but found few differences. The CAIB concluded that NASA’s second accident resulted from an organization system failure, pointing out that the systemic cause of Challenger had not been fixed.” (System Effects: On Slipper Slopes, repeating Negative Patterns, and Learning from Mistake?, D.Vaughn, 2005)

San Bruno Gas Pipeline Explosion



September 9, 2010 6:11pm
8 lives lost, 38 homes destroyed, 70
damaged

“When we met with the top utility management, the Panel found them to be committed to operational improvement.

..... the management team ***did not mention system safety as a goal*** in its operational improvement drive.

Ironically, the utility management described its vision to be ‘the leading utility in the United States.’ Management experts point out; however, ***inspirational goals must also be grounded in reality***. In other words, leadership must have a realistic view of the current state in order to set goals which will mobilize the workforce to improvement.

We think this ***failing is a product of the culture of the company – a culture whose rhetoric does*** not match its practices.” (CPUC Independent Review Panel, June 2011)

Organizational Issues

The origins and causes of a major structural failure must be sought in the organizational and societal preconditions.

Pidgeon, N. (2012). "Complex Organizational Failures Culture, High Reliability, and Lessons from Fukushima", *The Bridge, Linking Engineering and Society*, National Academy of Sciences, Vol. 42, No. 3.





Agenda

- First Presentation
- Short Moment to Stretch
- Second Presentation
- Q&A for the Speakers
- Reception – 3rd Floor of Y2E2 (on the terrace)

Note: The presentations will be available at npdp.stanford.edu

Our Speakers

Mr. Nathan J. Snorteland

Director, Risk Management Center
U.S. Army Corps of Engineers
Denver, CO

Honorable Robert L. Sumwalt

Board Member
National Transportation Safety Board
Washington, D.C.