

Presidents' Distinguished Lecture Series in Engineering, Science, and Medicine

"Lessons Learned from the Deepwater Horizon Disaster and Oil Spill"

**Dr. David Daniel, NAE
President, University of Texas at Dallas**

Introduction By: TTU Chancellor Robert Duncan

Abstract

Dr. Daniel served on the National Academy of Engineering panel that investigated the causes for the explosion in April 2010, and oil leak from the Deepwater Horizon drilling rig in the Gulf of Mexico.

In this talk, he presents his views about the causes for the disaster and lessons learned. The well closure process was plagued by a number of poor engineering decisions. The design of the light-weight, nitrogen-gas-enriched cement plug was a challenge in itself and yet the cement was placed even though no test results were available to verify strength. After the cement plug was poured, a negative pressure test was performed to verify the integrity of the well. The test yielded, at best, ambiguous results. The decision was then made to proceed with well completion by pumping out drilling mud and replacing the mud with seawater, but measurements of inflow and outflow of mud from the well were not taken, eliminating the opportunity to see early signs of a blowout about to happen. After the blowout, the blowout preventer activated but failed to seal the well. The blowout preventer was neither designed nor tested for operation under emergency conditions such as those at Deepwater Horizon.

The NAE report concluded that the actions, policies and procedures of the corporations involved did not provide an effective systems safety approach commensurate with the risks. The lack of a strong safety culture resulting from a deficient overall systems approach to safety is evident in the multiple flawed decisions that led to the blowout.

The lessons learned are sobering for all industries that entail risk of catastrophic accidents or events. Certain low-probability, high-impact activities require special vigilance to ensure that decision makers do not get lulled into a false sense of security and remain focused on safety as the top priority.

Bio

David E. Daniel earned bachelor's, master's, and PhD. Degrees in engineering from UT-Austin. He was faculty at UT-Austin from 1980 to 1996. In 1996, he moved to the University of Illinois, Champagne-Urbana, first heading the Department of Civil and Environmental Engineering and then as Dean of Engineering before being appointed UT Dallas' President in 2005. His research focused on prevention of ground-water contamination and clean-up of contaminated land and groundwater. He was awarded by the American Society of Civil Engineers (ASCE) its highest prize for research papers (Norman Medal) and twice its second highest prize (Croes Medal). He was awarded the ASCE President's Award, Geotechnical Hero's Award, and the OPAL Award for Education. In 2000, he was elected to the National Academy of Engineering. From 2005 through 2008, he served as Chair of ASCE's External Review Panel which studied the failure of New Orleans' levees during Hurricane Katrina and recommended strategies for rebuilding the levee system. He also served on NAE panel that investigated the causes for the explosion, fire, and oil spill from Deepwater Horizon in the Gulf of Mexico. During his term as President of UT Dallas, its annual research expenditures have tripled to \$100 million. His successful advocacy for State funding to support more national research universities earned him a Finalist award for Texan of the Year by the *Dallas Morning News*.



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