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Mitigating Technological Disasters Caused by Natural Disasters

T. Fleming, CSP, Independent Consultant and S. Penny,Author and Engineer
Independent Management and Strategy Consultant, Author

Industrialized nations and many third world countries have become dependent, almost addicted, on technology, relying not only upon sophisticated science and engineering, but upon mundane forms of technological advances as well.

Experience has shown that the fabric of today's societies will crumble when critical technologies fail. Large natural disasters can disrupt a region's technology infrastructure and produce collateral chaos and suffering. Casualties and damage will rise as the time to repair and restore necessary technology increases.

This paper points out risks associated with technological interruptions, and suggest planning and preparatory activities to minimize disruptions and increase the likelihood of rapid recovery.

Key Points in the Paper:

Today's advanced industrial nations are skating on the thin ice of ever-increasing risk: the disruption of the supporting technologies required for their very existence as advanced societies. Sometimes the risk is in the technology itself.

This risk is not just to the sophisticated components of society's infrastructure, but more and more of its mundane dependencies as well. Indeed, many third world countries will be adversely affected by technological failures induced by natural and man-made disasters, even though they themselves may not be directly dependant on complex technology.

What are these risks? The past year offered a number of examples of technological breakdowns from natural disasters and the disarray that resulted.

December, 2004: **Indian Ocean basin:** For lack of a relatively inexpensive tsunami warning system that had been proposed by seismologists in Australia in recent years, hundreds of thousands around the Indian Ocean perished. But to make matters worse, local technological infrastructures were destroyed. Power, phone, water and sanitation, medical facilities, and transportation were all gone. The people had nothing on which to rebuild, and there were no plans in place to quickly re-establish vital supply lines and communications infrastructure.

August: **New Orleans, LA.:** Even with several days of warnings, people placed their faith in an old levee system that had never been truly tested as Katrina raced ashore for a glancing blow at New Orleans. The levee technology failed. Other problems were uncovered by the hurricane. Only sporadic communications was possible between police, fire, and other emergency workers around New Orleans because so few had supported the initiative to put all the first responders on the same radio frequencies.

September: **Worldwide:** Even before Katrina arrived, the price of oil rose in response, reaching over $70/bbl as the extent of the hurricane damage was evaluated. Our dependence on fuel was so ingrained that much of the US industrial machine paused, and queues formed once again at fueling stations. People in California wondered why their fuel costs should rise just because a hurricane had hit Louisiana. They finally began to understand the impact of globalization, another form of technology.

October: **Pakistan, India, Afghanistan:** A 7.6 magnitude, considered long-overdue by seismologists, wracked the mountains of northern Pakistan. Aftershocks and landslides added to the misery, killing over 87,000 people. Roads, houses made with sawn lumber, kerosene for cooking, and many other technological wonders had been lost and during the hard winter that followed, the insufficient relief could not save many of the survivors.

December: **Atlantic:** Tropical Storm Zeta was the 27th named storm in the Atlantic this year, breaking the record of named Atlantic storms since record taking began. Some say that the technology of burning fossil fuels is partly to blame for this rash of storms; in any case, the earth is faced with growing warmth and more storms that will disrupt other parts of technology on which the whole human species now depends.

Can the risks of technological dependency be lowered? Yes, among other things it requires the recognition of from where the risks come, better planning and preparatory activities to mitigate the risks, positioning to increase our abilities of rapid recovery, and adopting a rational philosophy of redundancy.

About the authors:

D. Trent Fleming, CSP

Fleming has served as an advisor to banks on matters of technology and strategy for more than 20 years. He has substantial experience in the selection, implementation, and management of complex technology, to include development of contingency plans and disaster recovery plans. Few, if any other industry deals with more regulations than the does the US Banking industry, and Fleming's experience in developing plans is enhanced by the intense regulatory scrutiny that requires annual updates and tests of such plans. Fleming is widely recognized as an expert in many areas of banking technology, and is a frequent speaker to state and national banking associations, as well as serving on the faculty of several graduate schools of banking at prominent Universities throughout the United States. He holds a B.S. in Economics and Finance from Christian Brothers University in Memphis, Tennessee, and the designation of Certified Systems Professional from the Institute for the Certification of Computer Professionals. Fleming is also a licensed amateur radio operator, and has worked extensively in relief and recovery efforts with American Red Cross, Civil Defense, Skywarn, and ARES/RACES groups.

Sam Penny

Penny is a retired entrepreneur with experience in engineering physics, software systems development, and geophysics. Studying science, writing, and traveling are his current avocations. He travels around the USA and Canada in a recreational vehicle investigating the land, writing, and doing research for his writing projects.

Penny has published numerous magazine articles and two books, *Memphis 7.9* and *Broken River*, part of a series of stories about what life would be like around the USA should a duplicate of the December 16, 1811, earthquake strike in today's world. Based upon scientific analysis of government seismic and census data, he has concluded the disaster that results could be ten times worse than that produced by Hurricane Katrina, with tens of thousands dead, hundreds of thousands injured, millions homeless, and 10% of the nation's industrial capacity destroyed. He calls his series *The 7.9 Scenario*.

Penny earned a BS degree in Engineering Physics at the University of Oklahoma and completed his MS in Physics at University of Illinois before spending his working life around the San Francisco Bay Area, beginning in 1960 at the University of California Lawrence Radiation Laboratory in Berkeley working for Nobel laureate Dr. Luis Alvarez. In 1970, he and three partners formed a successful startup software and electronics company, and he remained associated with that company until his retirement as VP of Engineering in 1998.