Still Vulnerable in 2011

TERROR ATTACKS ON INNOCENT PEOPLE HAVE CONTINUED AROUND THE WORLD SINCE 11 September 2001, but not on the scale of the 2001 attack on the United States, which claimed more than 2500 lives. That disaster made us realize our vulnerabilities in many sectors. When a critical industry, such as transportation, communications, energy, or water services, is disrupted in a disaster, it may also cause collateral damage to other services. For example, the 2003 Northeast blackout cut off power to 55 million people. This not only cut off electricity to homes and offices—trains stopped, water purification failed, cell phones went uncharged, and factories shut down. Clearly, attention needs to be paid to improving the resilience of the most critical infrastructure industries.

As a response to the 11 September attack, the National Academies mobilized scientific and technical talent to answer this question: How could technical knowledge make the nation less vulnerable to catastrophe? The Academies’ answer, Making the Nation Safer, was published in June of 2002.* Unfortunately, the critical infrastructure of the nation is still quite vulnerable, not only to terrorism but also to natural disasters and calamities caused by institutional mismanagement in industry and government. The private-sector firms that own and manage our infrastructure have difficulty estimating the likelihood and location of attacks, and they are unwilling to spend large sums on new technology to reduce unpredictable vulnerabilities if their competitors do not do the same. For example, the Academies identified extremely high-voltage transformers as highly vulnerable elements in the power grid. Lawrence Papay, an electric power expert for the 2002 report, warned in 2007 that “A well-planned terrorist attack would not occur at a . . . single transformer; rather it would be a multipoint attack. If such attacks were to occur in a country with a highly developed power grid, the power delivery capability of that country could be limited for months, if not years.”† Designs for emergency replacements were suggested in the Academies’ report, but they have not been adopted. Government must encourage, and perhaps subsidize, the adoption of such new technologies. This is not likely to happen without a higher level of trust among industry, government, and science.

Protection against toxic substances is also critical. For example, studies of trains carrying tons of toxic inhalants, such as chlorine, through highly populated cities have shown that a daytime terror attack or major accident could kill tens of thousands of people. The best long-term protection could come from research to find substitutes for liquid chlorine in industrial processes and incentives to colocate the production of toxic materials with their industrial users. Railroads would welcome this trend, but not the chemical industry. Congress did enact a law setting standards to make chemical plants safer, but that statute expires on 3 October 2011. In any case, the Department of Homeland Security has said it has no current intention of regulating the transport of toxic chemicals by rail.‡

Even if the threat of terrorist attacks should decline, a technical and economic transformation is needed to enhance the resilience of crucial infrastructure services. With climate change, natural disasters may become more serious and frequent. Equally important, the more efficient and competitive our economy becomes, the more firms cut costs, and the less resilient they become. The needed private-sector transformation will not happen without government-led policies to share the risks with industry and firms willing to accept the required regulations.

– Lewis M. Branscomb


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Editor's Summary

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