

ENHANCING THE NATION'S RESPONSE TO PUBLIC WATER SUPPLY CATASTROPHES

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ABSTRACT

The US emerged from the events of 9/11/2001 with a realization that catastrophes originate from malice as well as natural disasters and accidents. Public water systems in the US are vulnerable to such malice. The virtue of many utility systems is reliability and efficiency derived from being networked. Networked systems include electricity, computers, gas, telecommunications and water. Networks provide flexibility and resiliency when unplanned disruptions occur. Interruption of one supply source is routinely handled by redirection of supply from alternative sources. While there are conceptually common elements, networked systems can have major dissimilarities in qualitative and quantitative respects. Electricity and telecommunications are important. Water is critical. The delivery systems and characteristic of all three can be compromised. However the differences between a “virus” that infects your computer and one that attacks your person are potentially life and death. Ironically, the characteristics that make water systems efficient and reliable make them vulnerable to malicious intent. Even the smallest water distribution network provides practically unlimited opportunity for purposeful, compromising acts.

9/11 precipitated calls for review and revamping of security institutions and infrastructure. Developments since then include numerous computer and walk-through simulations of attacks and system compromises to boost preparedness. Billions have been spent, and public awareness is improved. Has anything been accomplished? Not much if recent reports on security at airports and power plants are accurate.

Our water supply systems are vulnerable—and realistically will continue to be as long as creative, purposeful and malicious agents exist. Technological and structural measures to enhance security may have value and should be considered. However, we argue that technology, structural measures and simulations, however sophisticated, are inadequate if we seek real and robust security. Such security can only be realized through hands-on experience in adverse, catastrophic conditions. Such conditions exist in many developing countries. They confront severe shortages of potable water, water-borne diseases, and life-threatening breaches of public water supplies with troublesome regularity. We advocate establishment of a civilian water security corp. This program will focus on development and maintenance of a large body of water security experts, with expertise gained through formal training and extensive practical experience in globally dispersed crisis situations. Exposure to adverse physical conditions, inherently uncontrolled situations, and experience in decision-making under urgent, stressful conditions are the most obvious benefits of this approach. In crises there will be tangible and intangible differences in the effectiveness of the seasoned decision-maker and that of one trained in hypothetical and controlled situations.

We examine the relative benefits and merits of an experiential approach to enhanced water security. In addition to fundamental capabilities, we consider the public health and humanity benefits stemming from aiding people confronting real tragedy. While humanitarian, such efforts are opportunities to enhance and expand response capabilities to increasingly probable domestic catastrophes. We review recent water catastrophes, highlighting possibilities and approaches to enhance domestic readiness for such events irrespective of origin.