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Potential Vulnerability and Threats of Natural Disasters or Malicious Human Activity to the Water Supply Network: A Case Study of Chernivtsi, Ukraine

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Abstract. The potential vulnerability of the Chernivtsi water supply systems is analyzed in light of some basic shortcomings committed in the general planning, the poor realization of the project and some natural conditions imposing potential threats. Also the potential threat of intentional and unintentional human malicious activity is evaluated. Two potential strategies of mitigation are considered: the deep restructuring of the water supply system and some minor targeted steps aimed at the minimization of the threats. The latter option requires a smaller investment and promises quite reliable results in the short-term prospect.

Keywords. municipal water supply system, vulnerability/risk analysis, mitigation of potential terrorist threat

Introduction

Water supply infrastructure and food chains have suffered regularly from various terrorist attacks, natural disasters and malicious activities since very ancient times. Descriptions of water supply sources contamination during ancient wars or conflicts can be found even in the Bible (Exodus 7:14-25), when it refers to one of the Egyptian Plagues depicting the water of Nile turning into blood. This case can be interpreted as a poetic expression of the water disaster that made the water useless and undrinkable. Besides, the Bible also refers to finding a water well at Marah (Exodus 15:23-25), which was undrinkable because the water was 'bitter' (probably, contaminated?). It is interesting that using an unidentified tree, Moses removed this contamination and made the water 'sweet', i.e. drinkable.

Water supply objects are very appealing for potential malicious activity because they usually occupy significant land areas, which are quite hard to protect. Potential water/food contamination can affect many victims and cause serious devastation at the enemy's side. Comparatively simple and quite feasible actions can cause critical human casualties and/or financial, reputational and other losses. The long-term psychological effects of successful terrorist water contamination also should not be underestimated. Potentially, such kind of terrorist activity can be undertaken by various domestic and international terrorist groups with a wide range of motivation and by 'lone wolves', still with a very wide range of motivation.

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