WORKBOOK 6.1: UNDESIRABLE CONSEQUENCES OF CRITICAL ASSET LOSS ANALYSIS

Purpose: To provide an example of how to complete an undesirable consequences of critical asset loss analysis

Introduction

Using a water treatment facility as an example, you will see how to complete the undesirable consequences of critical asset loss analysis. This addendum presents the steps involved in prioritizing the assets of a given facility.

Identification of Critical Assets

Refer to *Table 1: Asset Protection Decision Matrix — Critical Asset Identification*. The first column of the table provides space for you to list all critical assets identified for a given critical infrastructure facility. Recall that you practiced this task earlier in this module.

To get started, assume that you have already identified the critical assets of the water treatment facility as follows:

- **People:** chemists and engineers
- **Information:** detailed diagram of national water system
- **Processes:** computer automation to manage water treatment processes
- **Equipment:** water treatment machinery

Table 1: Asset Protection Decision Matrix — Critical Asset Identification

Critical Infrastructure: Water Facility — Water Treatment Plant			
Critical Assets	**Undesirable Consequences of Critical Asset Loss**	**Levels of Undesirable Consequences of Critical Asset Loss**	**Probability of Occurrence of Undesirable Events**
People: Chemists and engineers			
Information: Detailed diagram of national water system			

Critical Infrastructure: Water Facility — Water Treatment Plant			
Critical Assets	**Undesirable Consequences of Critical Asset Loss**	**Levels of Undesirable Consequences of Critical Asset Loss**	**Probability of Occurrence of Undesirable Events**
Processes: Computer automation for water treatment processes			
Equipment: Water treatment machinery			

Step 1: Specify Undesirable Consequences of Critical Asset Loss

Consider the following possibilities for the water treatment plant:

- If a terrorist explosion destroyed the water treatment plant, the undesirable consequence of loss for the engineers and chemists (people assets) might be loss of life.
- If terrorist intelligence operatives gained access to the diagram of a national water system (information asset), a consequence of loss could be possible damage to national security.
- If a terrorist bomb exploded in the plant's control room that houses computers programmed to automate water treatment (processes asset), one of the undesirable consequences of loss would be interruption of critical utility services.
- If terrorists breach and sabotage water treatment machinery with a toxic substance (equipment asset), an undesirable consequence of loss would be environmental damage due to release of a hazardous material.

As an example, *Table 2: Asset Protection Decision Matrix — Undesirable Consequences* shows water treatment plant undesirable consequences for each of the four categories. Note, only one critical asset from each of the four categories of assets is shown in Table 2.

When using this table to conduct your own undesirable consequences of loss analysis, you should enter all critical assets for each category in this first column. For example, in the **People** category, you might identify security force personnel as other critical assets. In the **Information** category, you might identify sensitive or classified documents as additional critical assets.

Table 2: Asset Protection Decision Matrix — Undesirable Consequences

Critical Infrastructure: Water Facility — Water Treatment Plant			
Critical Asset	**Undesirable Consequences of Critical Asset Loss**	**Levels of Undesirable Consequences of Critical Asset Loss**	**Probability of Occurrence of Undesirable Events**
People: Chemists and engineers	Loss of life (due to terrorist bombing of the plant)		
Information: Detailed diagram of national water system	Damage to national security (theft of diagram by terrorist intelligence operatives for future attack planning)		
Processes: Computer automation for water treatment processes	Interruption of critical utility services (due to terrorist bomb in the control room) Note: immediate backup system available		
Equipment: Water treatment machinery	Environmental damage from release of hazardous chemical (due to terrorist sabotage)		

Step 2: Determine Levels of Undesirable Consequences of Critical Asset Loss

Refer to *Table 3: Asset Protection Decision Matrix — Determine Levels of Undesirable Consequences.* Notice that although the consequences of loss shown in the third column are all clearly undesirable:

- Loss of life takes on a higher level of significance, when compared to interruption of critical utility services.
- This is especially true if there is an immediate backup system available.
- Interruption of critical water services in this example is a low level of undesirable consequence of loss because an immediate backup system is available.
- If a backup system were not available, the level of undesirable consequence of loss would be medium or high.

In addition, damage to national security, although an undesirable consequence of loss, may take on a different level of significance (high, medium, low), when compared to contamination of the water supply from a hazardous material infused in the water treatment machinery. Assigning levels to the undesirable consequences of the loss involves comparing all consequences of loss levels to each other.

Table 3: Asset Protection Decision Matrix — Determine Levels of Undesirable Consequences

Critical Infrastructure: Water Facility — Water Treatment Plant			
Critical Asset	**Undesirable Consequences of Critical Asset Loss**	**Levels of Undesirable Consequences of Critical Asset Loss**	**Probability of Occurrence of Undesirable Events**
People: Chemists and engineers	Loss of life (due to terrorist bombing of the plant)	High	
Information: Detailed diagram of national water system	Damage to national security (theft of diagram by terrorist intelligence operatives for future attack planning)	Medium	
Processes: Computer automation for water treatment processes	Interruption of critical utility services (due to terrorist bomb in the control room) Note: immediate backup system available	Low	
Equipment: Water treatment machinery	Environmental damage from release of hazardous chemical (due to terrorist sabotage)	High	

Step 3: Determine Probability of Occurrence of Undesirable Events

As an example, the hypothetical probability levels of occurrence for each of the assets appear in *Table 4: Asset Protection Decision Matrix Process — Probability of Occurrence*. The threat analysis information listed in parentheses in the fourth column of the table will be covered in *Module 10: Analyzing the Threat*. Once you are able to determine probability of occurrence of a terrorist attack for each identified asset, you will be able to enter the probability level in the last column.

Table 4: Asset Protection Decision Matrix — Probability of Occurrence

Critical Infrastructure: Water Facility — Water Treatment Plant			
Critical Asset	**Undesirable Consequences of Critical Asset Loss**	**Levels of Undesirable Consequences of Critical Asset Loss**	**Probability of Occurrence of Undesirable Events**
People: Chemists and engineers	Loss of life (due to terrorist bombing of the plant)	High	High (loss of life due to terrorist bomb explosion)
Information: Detailed diagram of national water system	Damage to national security (theft of diagram by terrorist intelligence operatives for future attack planning)	Medium	Low (because theft of information has not occurred at this type of facility in the past)
Processes: Computer automation for water treatment processes	Interruption of critical utility services (due to terrorist bomb in the control room) Note: immediate backup system available	Low	High (due to terrorist bomb explosion)
Equipment: Water treatment machinery	Environmental damage from release of hazardous chemical (due to terrorist sabotage)	High	Medium (has not occurred at any facility within our country, but has occurred within the region)

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