Module 2: The Fundamental Tools of Risk Management

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Case Study: How to Handle the Risk Management of a Low-Frequency but Scary Risk Exposure: The Anthrax Scare

The date staring up from the desk calendar reads June 1, 2002, so why is the Capitol Hill office executive assistant opening Christmas cards? The anthrax scare after September 11, 2001, required these late actions. For six weeks after an anthrax-contaminated letter was received in Senate Majority Leader Tom Daschle's office, all Capitol Hill mail delivery was stopped. As startling as that sounds, mail delivery is of small concern to the many public and private entities that suffered loss due to the terrorism-related issues of anthrax. The biological agent scare, both real and imagined, created unique issues for businesses and insurers alike since it is the type of poison that kills very easily.

Who is responsible for the clean-up costs related to bioterrorism? Who is liable for the exposure to humans within the contaminated facility? Who covers the cost of a shutdown of a business for decontamination? What is a risk manager to do?

Senator Charles Grassley (R-Iowa), member of the Senate Finance Committee at the time, estimated that the clean-up project cost for the Hart Senate Office Building would exceed $23 million. Manhattan Eye, Ear, and Throat Hospital closed its doors in late October 2001 after a supply-room worker contracted and later died from pulmonary anthrax. The hospital—a small, thirty-bed facility—reopened November 6,2001, announcing that the anthrax scare closure had cost the facility an estimated $700,000 in revenue.

These examples illustrate the necessity of holistic risk management and the effective use of risk mapping to identify any possible risk, even those that may remotely affect the firm. Even if their companies aren't being directly targeted, risk managers must incorporate disaster management plans to deal with indirect atrocities that slow or abort the firms' operations. For example, an import/export business must protect against extended halts in overseas commercial air traffic. A mail-order-catalog retailer must protect against long-term mail delays. Evacuation of a workplace for employees due to mold infestation or biochemical exposure must now be added to disaster recovery plans that are part of loss-control programs. Risk managers take responsibility for such programs.

After a temporary closure, reopened facilities still give cause for concern. Staffers at the Hart Senate Office Building got the green light to return to work on January 22, 2002, after the anthrax remediation process was completed. Immediately, staffers began reporting illnesses. By March, 255 of the building's employees had

complained of symptoms that included headaches, rashes, and eye or throat irritation, possibly from the chemicals used to kill the anthrax. Was the decision to reopen the facility too hasty?

Sources: “U.S. Lawmakers Complain About Old Mail After Anthrax Scare.” Dow Jones Newswires, 8 May 2002; David Pilla, “Anthrax Scare Raises New Liability Issues for Insurers,” A.M. Best Newswire, October 16, 2001; Sheila R. Cherry, “Health Questions Linger at Hart,” Insight on the News, April 15, 2002, p.16; Cinda Becker, “N.Y. Hospital Reopens; Anthrax Scare Costs Facility $700,000,” Modern Healthcare, 12 November 2001, p. 8; Sheila R. Cherry, “Health Questions Linger at Hart,” Insight on the News, April 15, 2002, p. 16(2).

Case Study: Dana's Story

Dana, the risk manager at Energy Fitness Centers, identified the risks of workers' injury on the job and collected the statistics of claims and losses since 2003. Dana computed the frequency and severity using her own data in order to use the data in her risk map for one risk only. When we focus on one risk only, we work with the **risk management** matrix. This matrix provides alternative financial action to undertake for each frequency/severity combination (described later in this chapter). Dana's computations of the frequency and severity appear in Table 4.1 "Workers' Compensation Loss History of Energy Fitness Centers—Frequency and Severity". Forecasting, on the other hand, appears in Table 4.2 "Workers' Compensation Frequency and Severity of Energy Fitness Centers—Actual and Trended" and Figure 4.3 "Workers' Compensation Frequency and Severity of Energy Fitness Centers—Actual and Trended".
Forecasting involves projecting the frequency and severity of losses into the future based on current data and statistical assumptions.

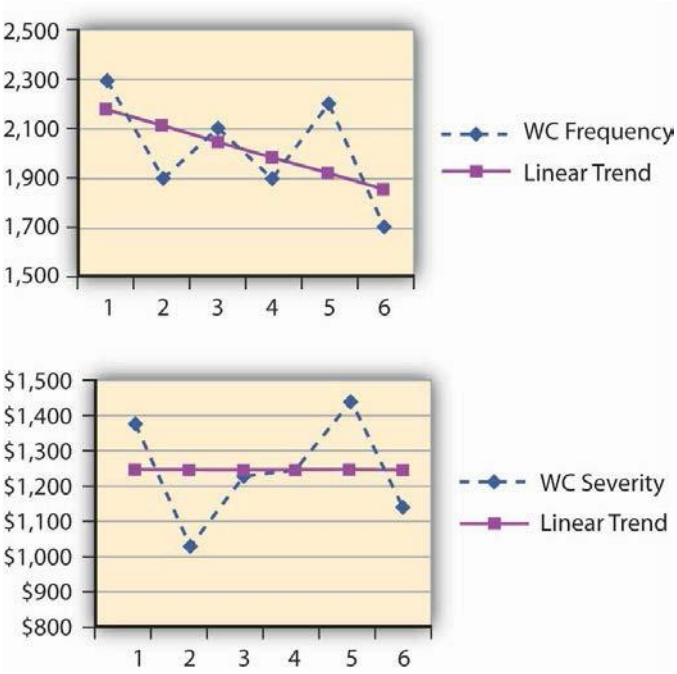
Table 4.1 Workers' Compensation Loss History of Energy Fitness Centers—Frequency and Severity

Year	Number of WC Claims	WC Losses	Average Loss per Claim
2003	2,300	$3,124,560	$1,359
2004	1,900	$1,950,000	$1,026
2005	2,100	$2,525,000	$1,202
2006	1,900	$2,345,623	$1,235
2007	2,200	$2,560,200	$1,164
2008	1,700	$1,907,604	$1,122
Total	12,100	$14,412,987	
	Frequency for the whole period		Severity for the whole period
Mean	2,017	$2,402,165	$1,191
(See Chapter 2 "Risk Measurement and Metrics" for the computation)			

Table 4.2 Workers' Compensation Frequency and Severity of Energy Fitness Centers— Actual and Trended

	WC Frequency	Linear Trend Frequency	WC Average Claim	Linear Trend Severity
2003	2,300	2,181	$1,359	$1,225
2004	1,900	2,115	$1,026	$1,226
2005	2,100	2,050	$1,202	$1,227
2006	1,900	1,984	$1,235	$1,228
2007	2,200	1,918	$1,422	$1,229
2008	1,700	1,852	$1,122	$1,230
2009	Estimated	1,786.67	Estimated	$1,231.53

Figure 4.3 Workers' Compensation Frequency and Severity of Energy Fitness Centers—Actual and Trended



Dana installed various loss-control tools during the period under study. The result of the risk reduction investments appear to be paying off. Her analysis of the results indicated that the annual frequency trend has decreased (see the negative slope for the frequency in Figure 4.2 "Notable Notions Risk Map"). The company's success in decreasing loss severity doesn't appear in such dramatic terms. Nevertheless, Dana feels encouraged that her efforts helped level off the severity. The slope of the annual severity (losses per claim) trend line is 1.09 per year—and hence almost level as shown in the illustration in Figure 4.2 "Notable Notions Risk Map". (See the Section 4.6 "Appendix: Forecasting" to this chapter for explanation of the computation of the forecasting analysis.)

Capital Budgeting: Cost-Benefit Analysis for Loss-Control Efforts

With the ammunition of reducing the frequency of losses, Dana is planning to continue her loss-control efforts. Her next step is to convince management to invest in a new innovation in security belts for the employees. These belts have proven records of reducing the severity of WC claim in other facilities. In this example, we show her cost-benefit analysis—analysis that examines the cost of the belts and compares the expense to the expected reduction in losses or savings in premiums for insurance. If the benefit of cost reduction exceeds the expense for the belt, Dana will be able to prove her point. In terms of the actual analysis, she has to bring the future reduction in losses to today's value of the dollar by looking at the present value of the reduction in premiums. If the present value of premium savings is greater than the cost of the belts, we will have a positive net present value (NPV) and management will have a clear incentive to approve this loss-control expense.

With the help of her broker, Dana plans to show her managers that, by lowering the frequency and severity of losses, the workers' compensation rates for insurance can be lowered by as much as 20–25 percent. This 20–25 percent is actually a true savings or benefit for the cost-benefit analysis. Dana undertook to conduct **cash flow analysis** for purchasing the new innovative safety belts project. A cash flow analysis looks at the amount of cash that will be saved and brings it into today's present value. Table 4.3 "Net Present Value (NPV) of Workers' Compensation Premiums Savings for Energy Fitness Centers When Purchasing Innovative Safety Belts for $50,000" provides the decrease in premium anticipated when the belts are used as a loss-control technique.

The cash outlay required to purchase the innovative belts is $50,000 today. The savings in premiums for the next few years are expected to be $20,000 in the first year, $25,000 in the second year, and $30,000 in the third year. Dana would like to show her managers this premium savings over a three-year time horizon. Table 4.3 "Net Present Value (NPV) of Workers' Compensation Premiums Savings for Energy Fitness Centers When Purchasing Innovative Safety Belts for $50,000" shows the cash flow analysis that Dana used, using a 6 percent rate of return. For 6 percent, the NPV would be ($66,310 – 50,000) = $16,310. You are invited to calculate the NPV at different interest rates. Would the NPV be greater for 10 percent? (The student will find that it is lower, since the future value of a lower amount today grows faster at 10 percent than at 6 percent.)

Table 4.3 Net Present Value (NPV) of Workers' Compensation Premiums Savings for Energy Fitness Centers When Purchasing Innovative Safety Belts for $50,000

	Savings on Premiums	Present Value of $1 (at 6 percent)	Present Value of Premium Savings
End of Year	End of Year		
1	$20,000	0.943	$18,860
2	$25,000	0.890	$22,250
3	$30,000	0.840	$25,200
Total present value of all premium savings			$66,310
Net present value = $66,310 − $50,000 = $16,310 > 0			

Case Study: The Risk Management Decision—Return to the Example

Dana, the risk manager of Energy Fitness Centers, also uses a risk management matrix to decide whether or not to recommend any additional loss-control devices. Using the data in Table 4.3 "Net Present Value (NPV) of Workers' Compensation Premiums Savings for Energy Fitness Centers When Purchasing Innovative Safety Belts for $50,000" and Figure 4.3 "Workers' Compensation Frequency and Severity of Energy Fitness Centers—Actual and Trended", Dana compared the forecasted frequency and severity of the worker's compensation results to the data of her peer group that she obtained from the Risk and Insurance Management Society (RIMS) and her broker. In comparison, her loss frequency is higher than the median for similarly sized fitness centers. Yet, to her surprise, EFC's risk severity is lower than the median. Based on the risk management matrix she should suggest to management that they retain some risks and use loss control as she already had been doing. Her cost-benefit analysis from above helps reinforce her decision. Therefore, with both cost-benefits analysis and the method of managing the risk suggested by the matrix, she has enough ammunition to convince management to agree to buy the additional belts as a method to reduce the losses.