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PROVING THE VALUE OF SAFETY

JUSTIFICATION AND ROI OF SAFETY PROGRAMS
AND MACHINE SAFETY INVESTMENTS

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Safety Programs

Each year, six million workers suffer from non-fatal workplace injuries, resulting in an annual cost of more than $125 billion to United States businesses[1] . Outside the primary objective of reducing injuries to people or property, proving the value of a safety system is an ongoing challenge for safety professionals and risk managers[2]. Many find it difficult to financially justify discretionary investments in safety-related assets and training intended to reduce work-related injuries and insurance premiums.

Compare this to something from everyday life: investing in automobile insurance. Predicting future automobile accidents is difficult, and insuring against them may seem a frivolous expenditure for people who consider themselves safe drivers. However, it is necessary to think of the other people on the road who impact their risk of an automobile accident; insurance protects drivers not only from themselves, but also from others.

Like driving, personnel in a manufacturing facility have to monitor their own safety. They must also be aware of how they are affected by the at-risk behaviors of co-workers. With noise, numerous machines and a handful of people on the plant floor, one mistake can result in a serious incident that can cause personal injury and wreak havoc on production. Much like automobile insurance, investing in safety is based on a "what if." What if something happens and there are inadequate safety measures in place? What if something happens and they are in place? What if nothing happens?

With drivers, most accidents still result in body shop repair and medical visits. However, the cost of these repairs and consultations is greatly reduced with an up-front investment in insurance. Safety investments work in a very similar way. With an up-front investment in safety programs and safeguarding systems, the financial and employee impact of incidents that occur in the facility can be significantly diminished.

Although it is difficult to prove that incidents will happen in the future, management and financial representatives of the company need to be aware of the consequences of an ineffective safety solution. By understanding the elements of risk management and the methodology of a safety investment analysis, safety engineers or risk management professionals can present the financial justification to help make operations safer and reduce both workplace injuries and insurance costs.

Integrating a safety solution to manage risk is a process that is best employed via up-front teamwork between operations and risk management, such as risk managers, safety professionals and claim analysts. In addition, it is important to understand risk and the different types of risk that exist on a plant floor. Risk awareness often leads to better decisions that can reduce soft costs. By providing an easy-to-be-safe environment for operators with safety solutions that are designed into the machine and focus on complete machine life-cycle requirements, companies are able to reduce indirect costs. In this white paper, we will highlight key elements of effective risk management and safety programs, review workers' compensation premium plans and the risks that affect them, discuss the implications on workers compensation' insurance premiums, and provide ideas to measure potential savings that can be found in proactive safety investments.

[1] *http://www.osha.gov/OshDoc/data_General_Facts/jobsafetyandhealth-factsheet.pdf*

[2] *Usually a corporate staff person, in finance, is responsible for managing the business insurance program.*

Risk Management

Risk management is a two-step process that identifies and analyzes uncertainty in decision-making. It consists of determining risks that exist in an equipment investment and managing those risks in a way best-suited to achieve investment objectives. For managers and financial professionals investing in safety, proving the benefit of the safety investment is difficult since it could prevent injury and avoid costs for a company. Using the risk management process, professionals can determine the level of safety investment that meets their needs and would provide the best result for their situation.

Safety Programs

Safety programs help mitigate risks that could injure people and impair a firm's operations and finances by stopping production, in turn affecting revenue and/or earnings. Whether developed internally or externally by consultants or insurers, these programs provide a solution to help companies better manage their insurance premiums, encourage better business practices through a more environmentally-safe facility, improve protection for plant-floor workers, as well as providing a safer work environment for all employees.

There are several types of safety programs in manufacturing:

- Occupational safety and health, such as employee training and education to avoid injury
- Product safety or safety warnings for proper use, maintenance and repair of machinery and equipment
- Machine safety and safeguarding, including physical safeguarding, safeguarding controls and safe work procedures such as lockout/tagout (LOTO)
- Environmental safety, like programs to avoid air or ground contamination
- Property and equipment safety or protection of that capital investment, such as installing an automated sprinkler system

Whether the safety program impacts people, the work environment or facility condition, the overall objective is to reduce incidents and create a combination of programs and expertise to reduce risk of loss, as well as the costs associated with risk[3]. In recent years, an increased focus on corporate governance stemming from the Sarbanes-Oxley Act in 2002 has led senior management and boards of directors to expand their mission statement to include expectations of an effective commitment to safety. Some institutional investors have established safety as a component of their assessment of an investment's performance[4].

Because of the lean manufacturing movement and the ever-expanding global market, manufacturers continue to increase the level of automation, decrease on-site inventories and rely more on outsourcing. These elements, essential to lowering costs and maintaining affordable prices for buyers, may threaten a company's success.

[3] *Cost of risk is defined as the sum of insurance premiums, claims within a deductible, claims administration fees, risk management department costs (salary, travel, fringe benefits, etc.), and other related costs (state fees, assessments, consultants, for example).*

[4] *http://www.calstrs.com/INVESTMENTS/cginvestresponse.aspx*

Risk Management

Safety Programs continued

An unplanned interruption can threaten a company's supply chain because of the decreasing amounts of raw materials readily available on the plant floor. These limited resources affect productivity levels and operation costs and threaten the overall health of a company as lower levels of inventory put manufacturers at increased risk for losing revenue each time a production line goes down. Effective safety programs can be implemented to help minimize this risk so manufacturers can better protect their supply chains.

Machine Safety Programs

Machine safety programs are typically comprised of risk analysis, risk mitigation measures, and training and supervision tied to work procedures. The process of risk analysis — including risk identification (also referred to as hazard identification) and estimation — coupled with the definition of any required risk mitigating protective measures, is commonly referred to as a risk assessment and is becoming a best practice for effective machine safety programs.

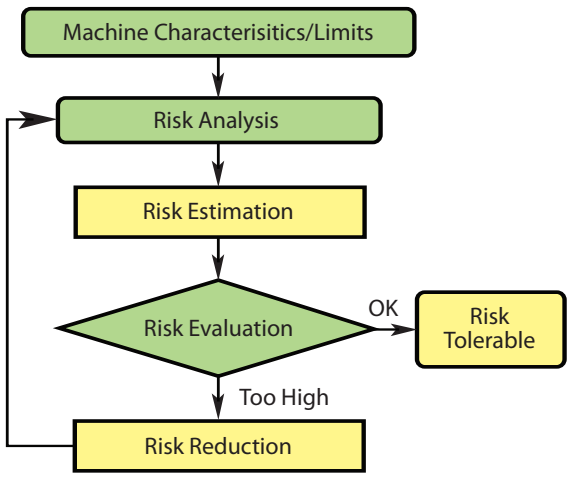


Figure 1 – Typical Risk Assessment Process

As demonstrated in Figure 1, effective risk analysis is a crucial first step in risk management and involves measuring two quantities of risk: the magnitude of the potential loss and the probability that loss will occur. An effective risk identification process analyzes employee activities and the risks that they have through defined work practices, or that they could bring to the facility due to limited training or experience. Risk analysis should also identify risks inherent to workers, plant equipment or the environment through potential environmental exposure or limited safety protection measures in the event of improper installation or failures of the equipment. The magnitude of potential loss is reviewed from the most severe scenario, resulting in a fatality and machine downtime, to the most positive scenario, resulting in at-risk behavior and lower production levels. From there, the probability of a given loss occurring is calculated.

Risk Management

Machine Safety Programs continued

While one of the most important activities in the risk management process, the act of risk analysis can be difficult to quantify and evaluate because it deals with variables and probabilities that are often difficult to define. However, with detailed and proactive risk analysis, companies have a much clearer picture of the risks throughout their plant and can define strategies to address those risks within a comprehensive machine safety program. Recently, the definition of formal risk assessment processes, which covers risk identification, risk quantification and risk mitigation, has been added to many international and regional standards, including IEC61508, IEC61511 and IEC62061. Risk assessment processes defined within these standards typically take a life cycle approach in clarifying how to implement an effective process to identify machinery related risks, as well as quantify the level of risk in terms of severity, frequency of exposure and probability of avoidance. The result is a quantified level of risk that must be decreased via protective measures.

Once the risks are fully defined and clearly understood, they must be designed out or mitigated to the greatest extent possible. Risk mitigation measures are necessary in order to physically improve the machine to prevent personal injury or property damage. Risk mitigation can be accomplished through a variety of activities, as demonstrated in Figure 2 below. One effective mean is to use safeguarding equipment such as installing physical guards or safeguarding control products, such as light curtains, safety relays and cable pull switches to reduce risk to employees.

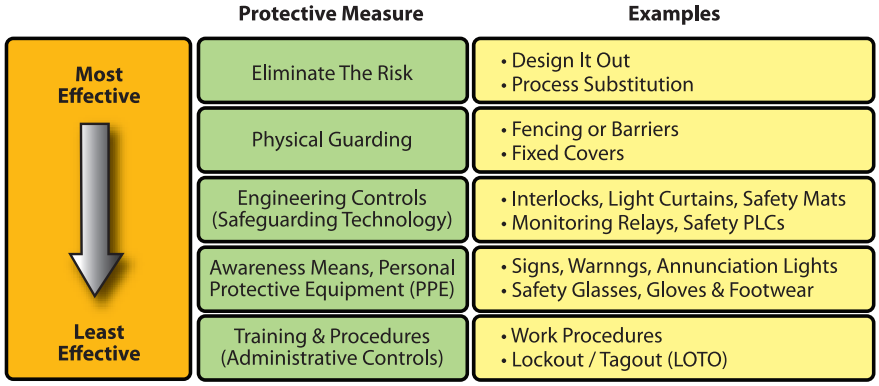


Figure 2 – Hierarchy of Protective Measures

Using a formal risk assessment process also provides the benefit of documenting how the risks have been reduced or designed out via safeguarding solutions or other protective measures. The use and documentation of the risk assessment process is a critical tool for companies to show their due diligence and good engineering practices in providing a safe work environment. By effectively implementing and documenting the process, the resulting protective measures, and training programs, a company can potentially lower risks of litigation should an incident occur.

After implementing and documenting the process, it is important to provide the appropriate training and supervision. It is crucial to that operators understand the safety measures, including usage of personal protective equipment. Operators must be trained

Risk Management

Machine Safety Programs continued

to effectively operate the machines and safely perform their work tasks. This also includes the clear definition of their work tasks and processes versus those tasks that are to be implemented by more specialized trained support and maintenance personnel.

A comprehensive machine safety program can help improve plant-floor operations and productivity across the board. In order to facilitate the multifaceted life cycle of machine safety, it is important to link risk analysis, risk mitigation and training/supervision together in evaluating the effectiveness of the machine safety program. It is important that all personnel who might be on the plant floor benefit from the safety measures and training available to protect them.

This is easier said than done. Often times, due to budget and time constraints, reviewing machine risks and providing safety measures for only the particularly dangerous or new machines in a facility is all that a safety engineer can justify. These attitudes are the result of either not having a proactive risk management strategy or not having a comprehensive machine safety program that is based on the full value of the investment in safety.

With new machines, it is important to consider that manufacturers can incur more costs and overall risk when OEMs do not understand their safety needs and expectations. Manufacturers should work with OEMs to cover risk identification and risk mitigation measures during the design phase of the machine. This creates a safer machine, and it is much less expensive to design and implement safety solutions up front. Adding protective safety measures to the machine after development takes extensive (and costly) mechanical, electrical and software changes. The resulting safety measures may not be as productive or effective as those that were designed into the machine operation. Unfortunately, workers may attempt to bypass add-on safety protective measures because they make workers' tasks more difficult instead of easier-to-be-safe, resulting in a higher risk of injury.

Many times, safety protective measures may not have been considered in the decision-making process to acquire the production equipment. In those cases, the safety manager may implement a more intense training and supervision program to reduce the risk of loss. By including a safety professional with engineering and operations personnel in the decision-making process, the group can define and evaluate safety-related, risk mitigation measures of new or existing equipment. This helps manufacturers reduce unnecessary injuries and production interruption.

When assessing whether new safety production equipment is installed properly and provides an adequate level of risk reduction, it is important to ask the following questions:

- If we buy or modify this machine or the process, what are the existing risks or what new risks are created?
- How do we mitigate these risks?
- What products, services and/or training are available to help?
- Could safety/risks compromise or reduce the operational efficiency gained by the new equipment or process? If so, what corrective actions are appropriate?
- Are the existing safeguards applied in a way that provides an appropriate level of risk reduction while optimizing production efficiency?
- If purchasing a new piece of equipment, is the safety system consistent with existing equipment in the facility?

Risk Management

Machine Safety Programs continued

Providing physical improvements to machines is often inadequately addressed. In many cases, they are only addressed after someone is injured as a result of the machine's failure, and even then it is only to prevent other employee injuries. If the machine was designed to include safety as part of its system, the incident may have been avoided, removing additional costs to workers' compensation claims and insurance premiums.

A Look at Workers' Compensation

There are several methods to reduce the risk of employee injuries, from scissor lifts that reduce material handling to ergonomic exercises that reduce repetitive motion. Machine safety is one of the most beneficial programs because it proactively prevents injuries from occurring. The connection between safety and workers' compensation premiums is essential in understanding the role of claim experience. Safety investments can make a difference in improving claim experience and a model may help justify that investment.

Types of Workers' Compensation Policies

Nearly all states[5] require employers to procure workers' compensation insurance from either the state workers' compensation department or an insurance company. With a variety of insurance rating plans, employers can choose the proper strategy that reflects its claim experience, providing the ability to financially assume losses, and commitment to reduce the cost and frequency of injuries.

The types of workers' compensation plans vary from a fixed cost to a variable cost plan. In a fixed cost plan, the premium does not vary regardless of loss experienced during the policy year. Whether the company reports one claim or 70 claims, it will pay the same rate. With the variable cost plan, the premium fluctuates with claim experience. Therefore, a company that reports 70 claims will pay more than a company reporting only one.

Two types of variable cost plans include deductible and retrospective plans, which are estimated premiums paid by employers based on projected claim amounts. There are also self-insured and guaranteed cost plans, as shown in Table 1. The principal difference among these plans is the immediacy of how and when claim experience impacts premium and cash flow. Guaranteed cost plans are favorably impacted by safety programs prior to policy inception, whereas loss-sensitive plans are affected during the policy inception. The third plan is similar to a deductible policy except the self-insured employer need not procure a typical workers' compensation policy.

Each company should evaluate these options and identify the plan that best matches their needs.

[5] Texas, New Jersey, South Carolina and Massachusetts may permit an employer to "opt" out of the requirement to purchase workers' compensation, although the employer must meet satisfactory financial requirements. However, the employer may lose its common law defenses of contributory negligence, assumption of risk, and negligence of another employee. Therefore, your legal and risk management departments should weigh the financial and legal consequences of such a decision.

A Look at Workers' Compensation

Type of Plan	Explanation	Impact of Safety on Premium
Guaranteed cost	Premium paid at policy inception and is fixed for the duration of the policy period (based on payroll and employee classification).	Safety programs that favorably impact claims experience prior to policy inception may reduce premiums.
Loss Sensitive • Retrospective Plans • Deductible Plans	Estimated premium paid at policy inception (based on projected claims amounts and other expenses); premium adjusted using actual claims six months after policy expires and annually thereafter until insurer closes all claims.	Safety programs that favorably impact claims experience during the policy inception may reduce premiums. Fewer claims improve cash flow and have favorable impact on income statement.
Self-insured	Employer submits application to state to request exemption from procuring a WC policy and retain cost of claims directly; employer retains third party to manage claims.	Favorable as employer pays claims (or reimburses a third party claim administrator) based on actual paid amounts. Safety programs reduce claim costs.

*Note: Claim experience will ultimately affect each type of plan in one way or another.

*Table 1 Types of Workers' Compensation Rating Plans**

Workers' compensation programs have an effect on the timing of cash flow, directly influencing the company's financial success. Reduced claim frequency and severity is related to deductible and self-insured plans, so companies realize the financial consequences sooner with a faster impact on cash flow. Guaranteed cost, loss sensitive and self-insured plans, listed in order of slowest to fastest impact on cash flow, tailor the workers' compensation program benefits for the company — enabling them to choose the best possible option financing workers' compensation insurance.

Workers' Compensation Premiums

The largest component of a company's risk is usually the workers' compensation premium. Four major drivers of this premium are payroll, employee job classifications, facility location and claim experience. Reducing the frequency and severity of employee claims is likely the primary means to minimize a premium. Figure 3 illustrates several factors that can affect claim experience, including the immediate and contributing causes that determine claim frequency and severity.

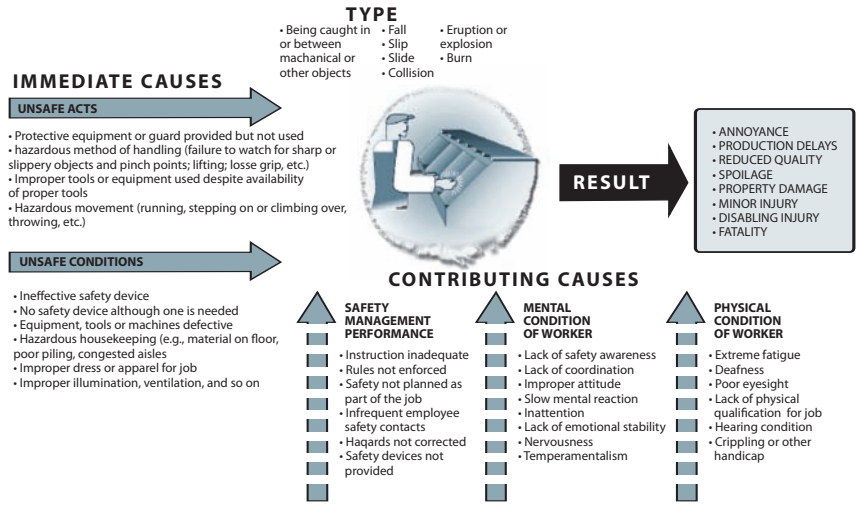


Figure 3 - Structure of Accidents

Workers' Compensation Claim Studies

In nearly 100 years of workers' compensation programs in the United States, many companies have developed studies that illustrate the severity of a claim, which range from "at risk" behaviors to fatalities. In doing this, they have established the likelihood of different behaviors occurring in their facility. There is a greater chance of "at risk" behaviors occurring compared to a fatality.

H.W. Heinrich's classic safety pyramid[7], (Figure 4) developed in 1931, is now considered the foremost illustration of types of employee injuries. Since then, many corporations have developed their own studies. In 2003, ConocoPhillips Marine conducted a study (Figure 5) demonstrating a large difference in the ratio of serious accidents and near misses.

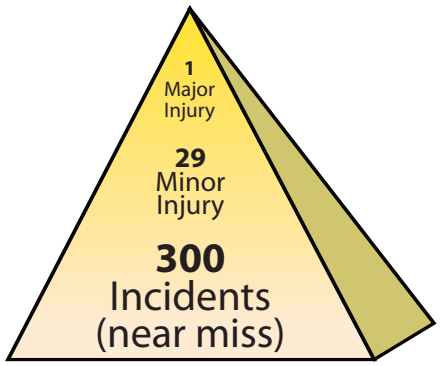


Figure 4 - Safety Pyramid Developed by H. W. Heinrich (1931)

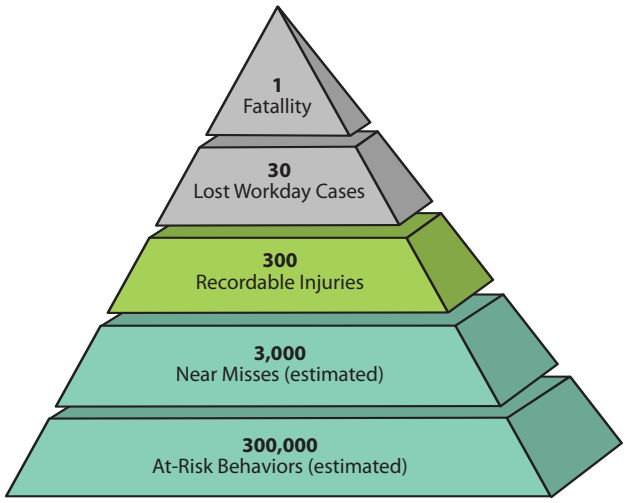


Figure 5 - ConocoPhillips Marine Safety Pyramid (April 2003) [8]

[7] *Heinrich, H. W., Industrial Accident Prevention, 4th Edition. New York: McGraw-Hill Book Company, Inc., 1959.*

[8] *http://www.socp.org/archive/03-02-04/3-2-04Presentation/1*

Workers' Compensation Claim Studies

There is always a large variation between the most serious and no claim incident, as shown in both pyramids. In the ConocoPhillips Marine safety pyramid, for every single fatality there are at least 300,000 at-risk behaviors, defined as activities that are not consistent with safety programs, training and components on machinery. These behaviors may include bypassing safety components on machinery or eliminating a safety step in the production process that slows down the operator. With effective machine safeguarding and training, at-risk behaviors and near misses can be diminished. This also reduces the chance of the fatality occurring, since there is a lower frequency of at-risk behaviors. The variation can be explained by distance or time – for example, the injury was missed by one second or by one inch. Machine safety can make a material difference in widening the variation, favorably impacting frequency and severity of claims and, therefore, workers' compensation premiums.

Indirect Costs

Because of their measurable financial impact, claims and insurance premiums are considered direct costs associated with employee injuries. Indirect costs of injuries are implicit to their financial and operational impact, and usually do not have a set rate assigned to them. Indirect costs usually cannot be directly determined on the company's income statement, like insurance premiums. Other indirect costs can include: overtime to offset loss of employee or additional time to make up production; management/ supervisory time to investigate and manage claims; damage to reputation; poor employee morale; and strained labor relations.

Even though indirect costs are not hard costs, the impact of indirect costs should not be underestimated. Liberty Mutual's 2001 Survey revealed that these indirect costs are three to five times the direct costs. Because of this, Liberty Mutual compares these costs to an iceberg : the direct costs are at the tip and are easy to see, but indirect costs, which are more expensive and encapsulate a wide variety of issues, are difficult to assess. Even though the upfront costs of safety may appear to be expensive, in the long run, safety investments not only increase safety in the workplace, but also lower the risk of indirect costs that pose more harm to a company's financial performance.

Measuring Potential Savings

When calculating return on investment or internal rate of return, it is important to incorporate expected reduced claim frequency and severity from machine safety components. However, there are also intangibles that need to be included. The labor union or company workforce may have certain expectations, separate from those of the company. It is imperative to understand that safety and training measures can help improve morale and productivity. Because of this, it is necessary to first evaluate how a safety investment may favorably impact a workers' compensation claim experience.

The company risk manager or safety professional should be the historian for detailed employee injury and claim information. Although a five-year history is ideal, three years is also sufficient. When reviewing this information, it is important to identify claims that

Measuring Potential Savings

reasonably would have been avoided if a safety investment was in place[11]. These claims will be useful in an internal audit or other finance function to justify assumptions. The finance department may require a capital project to exceed a certain threshold; for instance, 20 percent internal rate of return or three-year payback. They may also have developed a model that any investment should or must use.

Methodology of a Safety Investment Analysis

To calculate the expected return on a safety investment using a cash flow approach, there are several steps to consider:

Step 1: Obtain a three- or five-year loss claim report. Sorted by fiscal year, this report should identify the number of claims and total incurred amounts[12] . This document will be used to identify claims that would have been avoided had the safety investment been made.

Step 2: Develop losses to estimated ultimate accounts. Some claims will remain open because of ongoing medical treatment or other reasons. Although your loss experience will vary, generally it is expected that most claims increase in value over time. In insurance parlance, "ultimate" means final paid value, which may require several years to realize[13].

To obtain the ultimate value, actuaries apply a loss development factor to each insurance policy year's claims' total incurred amounts. The loss development factors can vary because of the state workers' compensation benefits, medical costs, age, type of injury, etc.

Step 3: Calculate loss rate. Production volume data or work hours in the area for the same time periods as the claim information can be provided by the operations department in the company. Divide ultimate amounts from Step 2 by production volume or work hours to calculate the loss rate for each year. A rate that incorporates work hours or production volume is often a better safety performance indicator. Therefore, the average loss should be calculated as well.

Step 4: Apply trended or average loss rate to projected volume for future years. The operations or planning departments will have estimates of projected volume for future years. By applying the trended or average loss rate to the projected volume, it is possible to find the projected claims for future years and costs presumed to be avoided with the implementation of safety investment projects.

Step 5: Calculate impact on cash flow. Some claims will not close for a period of time. However, it is still important to analyze the effect of these claims on a company's cash flow. The benefit of lengthy claims is that they are realized over the duration of the claim, meaning the liquidation of a claim will occur over a period of years.

[11] Your company may also track "near misses." You may argue that these could have resulted in a claim but for a difference of inches or seconds, or both! This indicates exposure to risk and you may want to consider this element.

[12] Total incurred amount is the workers' compensation insurer's estimate as to the claim's value.

[13] Most employers will establish an accrual on the balance sheet for unpaid workers' compensation claims and related insurance plan costs and expenses. The accrual basis and claim estimation procedures may vary.

Methodology of a Safety Investment Analysis

The National Council on Compensation Insurance's 2004 Annual Statistical Bulletin provides the following liquidation rates:

- Year 1 – 23 percent
- Year 2 – 28 percent
- Year 3 – 14 percent
- Year 4 – 8 percent
- Year 5 – 4 percent
- Years 6 through 15 – 23 percent

There is some variability of these rates[14], based on the nature of injury, part of body and location. The improved cash flows can be weighed against the cost of the safety investment.

Step 6: Include indirect cost estimate. It is difficult to include soft costs in the investment analysis, but they are important in determining the total benefit of the safety investment. Indirect costs will outline what incidents do to production levels and what expenses may be incurred from injuries on the job, further justifying the investment of safety on the plant floor.

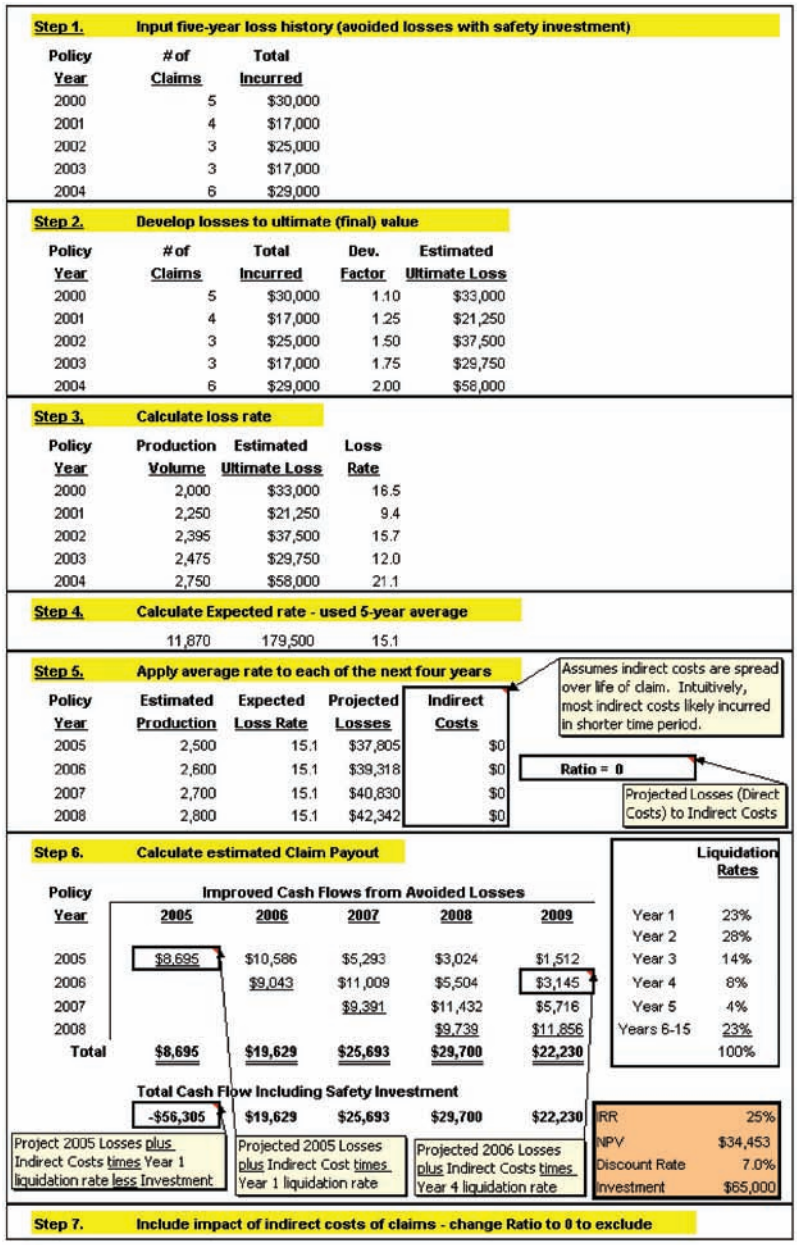
Figure 6 illustrates these six steps of the methodology of a safety investment as demonstrated. This simplified example shows that a $65,000 investment yields a 25 percent internal rate of return and a positive net present value (over $34,000), based on a seven percent discount rate. Modify this worksheet to show an indirect cost of twice the direct costs, and the internal rate of return climbs to 167 percent or a $305,000 net present value. In either case, this investment appears financially viable.

There are some caveats to keep in mind relative to this analysis:

- Assumes same types (struck by object, slips, etc.) of claims
- Assumes all claims avoided properly associated with the safety investment
- Uses standard loss development factors that may overstate or understate ultimate loss
- Trended or average loss rate may not be accurate
- Using average rate presumes no other changes to process or training
- Future production volume is subject to change based on actual business conditions
- Liquidation of claim payments may be higher or lower
- Cash flows exclude other expenses associated with claim payments. These include, but are not limited to, insurer and state expenses and fees. In many workers' compensation rating plans, this amount can vary from 10 to 25 percent of claim payments.

[14] *Liquidation rate is influenced by claim severity. However, for simplicity purposes, these rates should suffice.*

Methodology of a Safety Investment Analysis



Step 1. Input five-year loss history (avoided losses with safety investment)

Policy Year	# of Claims	Total Incurred
2000	5	$30,000
2001	4	$17,000
2002	3	$25,000
2003	3	$17,000
2004	6	$29,000

Step 2. Develop losses to ultimate (final) value

Policy Year	# of Claims	Total Incurred	Dev. Factor	Estimated Ultimate Loss
2000	5	$30,000	1.10	$33,000
2001	4	$17,000	1.25	$21,250
2002	3	$25,000	1.50	$37,500
2003	3	$17,000	1.75	$29,750
2004	6	$29,000	2.00	$58,000

Step 3. Calculate loss rate

Policy Year	Production Volume	Estimated Ultimate Loss	Loss Rate
2000	2,000	$33,000	16.5
2001	2,250	$21,250	9.4
2002	2,395	$37,500	15.7
2003	2,475	$29,750	12.0
2004	2,750	$58,000	21.1

Step 4. Calculate Expected rate - used 5-year average

	11,870	179,500	15.1

Step 5. Apply average rate to each of the next four years

Policy Year	Estimated Production	Expected Loss Rate	Projected Losses	Indirect Costs
2005	2,500	15.1	$37,805	$0
2006	2,600	15.1	$39,318	$0
2007	2,700	15.1	$40,830	$0
2008	2,800	15.1	$42,342	$0

Assumes indirect costs are spread over life of claim. Intuitively, most indirect costs likely incurred in shorter time period.

Ratio = 0

Projected Losses (Direct Costs) to Indirect Costs

Step 6. Calculate estimated Claim Payout

Policy Year	Improved Cash Flows from Avoided Losses 2005	2006	2007	2008	2009
2005	$8,695	$10,586	$5,293	$3,024	$1,512
2006		$9,043	$11,009	$5,504	$3,145
2007			$9,391	$11,432	$5,716
2008				$9,739	$11,856
Total	$8,695	$19,629	$25,693	$29,700	$22,230

Liquidation Rates	
Year 1	23%
Year 2	28%
Year 3	14%
Year 4	8%
Year 5	4%
Years 6-15	23%
	100%

Total Cash Flow Including Safety Investment

-$56,305	$19,629	$25,693	$29,700	$22,230

IRR	25%
NPV	$34,453
Discount Rate	7.0%
Investment	$65,000

Project 2005 Losses plus Indirect Costs times Year 1 liquidation rate less Investment

Projected 2005 Losses plus Indirect Cost times Year 1 liquidation rate

Projected 2006 Losses plus Indirect Costs times Year 4 liquidation rate

Step 7. Include impact of indirect costs of claims - change Ratio to 0 to exclude

Figure 6 - Safety Investment Analysis Model

Recommendations

As demonstrated, it is essential to not only consider direct costs, but also the indirect costs when analyzing safety investments. With both of these cost elements included in calculating the value of safety investments, it is easy to see the significant, financial benefits of implementing a proactive safety program as an integral part of your lean manufacturing strategy.

Work with your safety and risk management departments. Not only are they great resources for information, but these professionals can add credibility to a safety investment analysis. During an internal audit or other assessment, a financial planning

Recommendations

analyst may require additional information to support assumptions and data. If a reference can be made to these departments, support of the investment, the plant or business unit is more likely to support the investment.

There are many elements to a safety program, which is why it is important to include company safety professionals in the decision-making process. They are familiar with the company's overall safety program. In order to ensure that the investment will bring the best possible return, it is essential that any new elements do not compromise the overall safety program, whether it's environmental, occupational safety or property loss control.

Develop a standard process for implementing risk assessments for machinery. Implement a machine safety program that has a proactive approach to evaluating hazards and risks, as well as defining risk mitigation protective measures. Ideally, the process would encompass a broad view of safety and productivity, with input from a variety of functional areas. It would also be documented to support the as-built standard of the machinery. The process should be based upon a company standard of published consensus standard – defined by OSHA as a company standard based upon established industry standards. Most importantly, the process needs to be implemented on a consistent basis for both new and existing equipment.

Develop a machine safety specification for OEM-purchased equipment and existing equipment modifications. This document, outlining the requirements to ensure a standardized approach to designing and building a safety system, helps companies maintain consistency and reduce risks. Adherence to machine safety specifications should reduce the chances that OEM equipment will lack required safety features, and reduce variation in both the components and the application of safeguarding equipment within the plant. Inconsistencies in using safeguarding products can cause issues for stocking and supporting the equipment. Inconsistencies in their application can make it difficult to guarantee the safeguarding products are used properly and easily maintained by factory personnel.

Ideally, company specifications make it easy for companies to establish and implement standards based on requirements for products machines they purchase and use from OEMs. It is not only important to have safe machines, but also for the safety products to meet safety-rated design standards, such as EN1088 or IEC 61508. By providing these requirements to OEMs, companies can help ensure that their plant floor complies with regulations, preventing unforeseen fines from OSHA or other organizations.

Leverage the lean manufacturing movement. A comprehensive, safety strategy utilizing standard processes, and well-designed and integrated machine safety systems can significantly improve productivity. For example, by reducing over-production, processing, inventory and motion, management can implement lean manufacturing principles while reducing risk and employee injuries. It is important to involve both production and staff employees, such as engineers, machine operators, financial personnel, upper management and designers. They can improve productivity and safety as it affects their everyday job.

Recommendations

Consider corporate governance issues. Senior management and the board of directors may insist that line management formally evaluate safety systems. They may need hard evidence of why investing in a safety program is essential to the health of the company. They will also want to understand how this affects the company's other facilities. Although savings and investment payoffs will vary by country because of the different legal and workers' compensation systems, the importance of safety remains unchanged. That is why it is important to consider what the safety needs are for foreign plants and their respective standards. Insurance policies and workers' compensation systems are different, so seek the expertise of a consultant or manufacturer for more information before making a decision.

Summary

With the implementation of safety programs, as well as an assessment of risk management within the facility, the costs associated with workplace incidents can be reduced. Avoiding occupational injuries remains one of the highest priorities for many employers, since its affects can increase production, support lean manufacturing goals and boost employee morale.

It is imperative to help management and financial professionals understand the importance of safety and the benefits of investing in safety programs and components. Through risk management programs, companies can effectively assess risk and establish their need for safety investments.

For More Information

Rockwell Automation machine safety engineers possess the risk assessment expertise to help you identify risk reduction opportunities that can result in fewer injuries, improved productivity and more satisfied employees.

For more information about risk assessment or machine safety, please visit http://www.rockwellautomation.com.

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