

# Selling Safety to Management

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When I graduated from college, I became enamored with safety and health and thought, “Wow, I get to make my employer’s workplace safe!” Well, very quickly, I found out how complex my responsibilities were. I came to the realization that safety involved not only engineering design and management, but also marketing and business. I was required not only to write, implement and maintain safety and health programs but also to manage people, activities and tasks so that they got done in an orderly fashion that is on schedule and budget.

I was in the midst of a dilemma. All I wanted to do was safety and health, however, I was now placed in a position that required me to market and manage even before I was given the go-ahead to engineer for safety and health. Unfortunately, the only selling I was really good at was selling myself. After all, I was the candidate selected after the interview process, so now I had to research and think about why the company needed to manage safety and health programs. This was not an easy task. As a professional, I know all the reasons why a good company needs safety and health management systems, but my dilemma is how to convince an unschooled person to accept the monetary costs of these systems.

Once I understood why I was hired in the first place, I changed my plan of attack. I was not hired because my company was altruistic about providing an environment where employees did not get hurt. I was not hired because my company was enamored with safety. I was hired because it makes good business sense. I was hired to reduce the costs of workers’ compensation, the medical costs resulting from injuries and the costs of potential OSHA citations. From this assessment, it is easy to see why safety has been labeled a cost center.

Employers are in business to do one thing—make money. If they do not make money, they will not stay in business. Once safety and health professionals come to grips with this reality, it will make the road to successful safety and health planning much easier. I have used the following to sell safety and health based on sound financial principles.

## **Keys to Selling Safety & Health to Management**

Through the years, I have discovered several tried-and-true principles for selling safety and health to management. These principles are not for the faint-hearted. Carrying out these principles requires mettle, strategy and perseverance. In some

instances, attempting to carry out these principles may, in fact, cost you your job. However, if your employer is truly committed to safety and health, you will be successful. The keys that I have identified to successfully selling safety and health to management include securing top management commitment, commitment on your part as the safety and health manager, your personality traits as the safety and health manager, using the standards to your advantage in budgeting, using engineering/financial principles and using legal precedence.

## **Top Management Commitment**

No matter what is implemented in the workplace, nothing will succeed without top management commitment. You may say that this is too strong a statement to make about management. Look at the 1910.119, Process Safety Management, ISO 9000 (Quality) and ISO 14000 (Environmental) standards. Without top management commitment, no company will successfully implement these programs. This lack of commitment usually results in lip service and feigned commitment. Ways to secure strong top management commitment are detailed below.

**Flow Up vs. Flow Down.** When you must sell from the bottom up (e.g., plant manager to vice president to president) or flow up, success is limited. Superiors have the option to agree, disagree, table for an unlimited amount of time or kill your proposals. On the other hand, when you have the opportunity to sell from the top down (e.g., president to vice president to plant manager) or flow down, success is almost guaranteed. The reason is simple—once the company president is sold on your ideas, the choice is removed from all subordinate management. The results of getting the company president’s ear are that you only need to sell your ideas once and you remove the roadblocks to implementation.

**Management Backing for All Programs.** This is slightly different from monetarily backing all safety and health programs. This refers to buy-in from a participation standpoint. If management participates in the development of your safety and health programs, they are more likely to support you than oppose you. Shared ownership exists between you and management, which ensures a greater probability for success. In the end, it is not your program that is implemented, it is our program that is implemented. This also means that everything you do as a safety and health professional does not always cost money. After all, they hired you to do safety and health, not just buy safety equipment. By the way, safety equipment in the field does not always mean safety is embedded in the company culture.

**Using the Organization to Your Advantage.** During my life as a safety and health professional, I hope to never be accused of insubordination. However, when I obtain an unacceptable response to a request, I let that person know that I plan to take it to the next level. I do this until I obtain an acceptable response, if necessary from the company president. When I request to spend money on safety items and someone tells me, “No, you cannot do that,” for no apparent reason or with inadequate justification, I tell that person that I will go to the next level of their management and make the same request. I do this until I get an acceptable answer.

**Run Until Someone Jerks the Leash.** Act like you know what you are doing and do what you think is right until someone tells you that it is not your job. This really boils down to initiative. Take the initiative to get things done. Do not wait for someone to tell you that you can or cannot do something, just press on taking care of business. Cyrus H.K. Curtis once said, “There are two kinds of people who never amount to much, those who cannot do what they are told and those who can do nothing else.” Try not to be one of those people. I have found that if you act like you are in charge, have a commanding presence and know what you are doing, others will listen and follow, especially in an emergency.

If your intentions are honorable, superiors, subordinates and co-workers will understand. This may also mean taking on more responsibility, including emergency response, industrial hygiene, and U.S. Department of Transportation compliance. You must be willing to take on more responsibility, not just delegate.

**Champion Safety & Health to be Placed High on the Organization Chart.** If safety and health are buried in the organization chart, this signifies a lack of commitment. On the other hand, if safety and health are placed in a position to report directly to the company president, this is a sure sign of a strong commitment to safety and health. Champion safety and health to be placed high on the organization chart to allow the flow-down rather than the flow-up approach.

**Allow Top Management Visibility into Your Activities.** No one will know how well you are doing if you do not tell them. Do not rely on the grapevine or on superiors telling others how well you are doing. Advertise your department and its successes. Advertise how you overcame adversity and persevered. If you have a safety and health newsletter, send it to all superiors. Include in it any reduction in incident rates, what activities you are undertaking and success stories. This will assist in pushing those who may oppose you to ultimately support you. No one wants to be part of a

losing team, but everyone wants to be on a winning team. Also, if you publish any articles in trade journals and magazines, send a complimentary copy to superiors in your company. This rule also applies to any time your face or name appears in the publication. If you can, ensure that your company’s name also appears in the publication when your name is referenced.

This visibility is a two-way street. Invite upper management to see how you are spending your budgeted safety and health dollars. Show them that you are fiduciarily responsible.

For example, let’s say you are approved \$10,000 to spend on firefighting equipment. Get as many vendors to bid on providing the equipment. Turn it into a competition. As a result, you may be able to spend \$8,000 and get \$10,000 worth of firefighting equipment. If you do, write a letter to superiors, up to and including the company president. This illustrates your fiduciary responsibility as well as your business savvy. This visibility also means that you spend your budgeted dollar only on what was itemized in your budget. If you are caught misappropriating funds, it will most likely be your last opportunity in that position.

### **Safety & Health Manager’s Commitment**

It is difficult, at best, to sell safety and health if you are not committed to the position. Following is a description of things that illustrate the safety and health manager’s commitment.

**Do Not Ask Anyone to Do Anything You Would not Do Yourself.** If you are not willing to show up at 2:00 AM to investigate an incident or to respond to an emergency, do not expect anyone else to respond in kind. The fact that you cared to show up at 2:00 AM indicates that you are willing to give of yourself to support plant personnel. This illustrates that you care about the people in the plant at all hours of the day and night. If people see that you are willing to give of yourself and that your heart is in what you do, it becomes easier to sell safety and health. It has been said that people do not care how much you know until they know how much you care. We are in a caring profession. If you do not care about people, find another profession.

**Job vs. Career.** How do you treat your employment? Is it a job or is it a career? Vast differences exist between the two. A job is something where you show up everyday with no expectations or aspirations for future growth and development. A career is something you plan with a vision. What you do today is a measured step to get you someplace in the future. This also refers to dedication. You must be dedicated to your career and not mind going the extra mile. You are

patient, waiting for others to take note of your accomplishments. Our generation sometimes appears to be too fixated on the been there, done that instantaneous success of life. Success takes time. Some of those overnight successes take five, 10, maybe even 15 years of dedication. This has a tremendous impact on how well you can sell safety and health to management. If you treat your employment like a job, good luck selling safety and health. If you treat your employment like a career, your enthusiasm and vision will rub off on others, and they will want to either follow you or get out of your way.

**Leadership.** Leadership is the key to selling safety and health to management. This is how you earn respect. When I first started in the plant, several people accused me of trying to personally degrease the entire plant with the front of my shirt. This illustrated my desire to learn the plant as they have learned it. I was willing to get dirty like everyone else, rather than manage safety and health from an office. I therefore earned respect by being willing to get my hands dirty. The world is sorely lacking for true leaders, and when one comes along, people gladly follow someone who is willing to lead.

**Act Like Top Management.** This is like dressing for success. It has been said that you should dress for the job you want, not for the job you have. The same is true in management. Act like you are part of top management. The converse is also true, if you never act like top management, you will never be like top management. This includes properly conducting yourself in staff meetings and in the field, using financial principles to sell safety and health, gathering all facts before crucial meetings and attending to detail. Acting like top management has a positive impact on selling safety and health to management. You are acting like one of them, not just like an employee.

**Confidence vs. Arrogance.** Many professionals in all fields hide their incompetence behind their arrogance. Once their veil of arrogance is pierced, their true abilities (or inabilities) show through. I am often skeptical of professionals who act so arrogant that they give the perception of knowing everything. I am referring to humility. There is no reason for pride if you are comfortable in your abilities. It is often said that strength that knows it is strength is weakness whereas weakness that knows it is weakness is strength. Knowing what you cannot do humbles us in light of what we can do.

However, humility and meekness should not be confused with weakness. You must also understand that humility is a journey, not a destination. Once you know you have humility, you have just lost it. If you act like a leader, it will definitely

make it easier to sell safety and health to management.

**Credentials and Memberships.** Credentials and professional memberships illustrate commitment to the field of safety and health. Credentials are not easy to come by and require extra work. Those who have put forth the effort to get them are investing in their career and future. We are quickly approaching a world where no credentials equals no job. If you do not have credentials, it is imperative to be a member of a professional society, which also illustrates commitment to safety and health. If you have credentials and are connected with a professional society, people will know you are committed to your profession.

**Personality Traits of a Safety & Health Manager**  
Your personality traits as a safety and health manager include how you like to be treated, how you treat other people, how you treat those who work for you and how you treat those for whom you work. Further, as safety and health manager, you are held to a higher standard. You must exhibit character far above the rules. If those around you see that you do not obey the rules, they will not obey the rules either.

**Vision.** Strong safety and health managers convey a vision of the future. They are the catalyst that defines the organization's mission and potential and enlist others in attaining such missions. Many people are in search of a leader who has a plan. A five-year plan is recommended with updates on an annual basis. If it is not updated at least annually, it becomes a useless piece of paper. This vision must be conveyed to all superiors and the workforce so that everyone knows a direction and goal are in place.

**Consistency.** Consistency revolves around expectancy or the expectation that a particular cause always generates the same effect. Further, whatever you do for one person you should do under similar repeated circumstances.

**Just and Fair.** Similar to consistency, no one gets treated differently, rather all are treated justly and fairly. No one gets a break because of who they are, where they are located or who they know.

**Separation from the Workforce.** Safety and health managers will never be "buddies" with the workforce. A separation must exist to properly implement safety and health in the field. Safety and health managers are often the least liked because they make people do things they do not want to do so that they cannot hurt themselves.

**Truthful.** You must be truthful or you risk undermining your program. For example, when conducting incident investiga-

tions, do not attempt to hide the facts or blame others unless it is clear the incident was a result of a deliberate act. The same is true when reporting information to superiors. This follows with character and integrity. Without being truthful, one cannot have character or integrity. It has been said that the true measure of a person's integrity is what s/he does when no one is looking.

**Lead by Example.** A safety and health manager must talk the talk and walk the walk. Employees judge your behavior according to their perception of right and wrong. As safety and health manager, you must perform far enough above the rules that it is clear you are obeying the rules.

### Identify Costs

Before you can determine what safety items should be purchased, the current safety equipment and budget should be analyzed. Included in this review are the current costs for safety equipment in use, such as safety glasses, prescription safety glasses, goggles, rubber and other boots, rubber and other gloves, acid suits, flame-resistant clothing, hardhats, hearing protection, emergency medical equipment, etc. Current budget items also include the cost for capital equipment, such as sprinkler systems, firefighting equipment, training courses, upgrades identified from insurance audits, etc.

Once you have identified your safety expenditures, try to determine a more efficient way to spend your budget dollars. For example, some employers use contractors to maintain first-aid cabinets at a monthly cost. By mail-ordering the medical supplies and stocking the first-aid cabinets yourself (which will increase your visibility), this cost can be minimized.

### Illustrate Control of Costs

When you treat your department like a business, your desire to control costs will be apparent. When you have a monetary budget, it is always a good idea to plan to finish the project on schedule and under budget. Also let upper management know that you were able to return some of the allocated funds. If you do not market yourself, nobody else will.

Another way to visibly illustrate cost control is to include non-capital expenditure items in your safety budgeting. Items that include little or no financial support could include working with engineers to help design a safety interlock or a machine guard or conducting field evaluations yourself rather than budgeting extra manpower expense. Coupling an extensive safety budget with such clearly beneficial low-cost actions may help your department avoid being labeled as wasteful or indulgent.

### Use the Standards to Your Advantage in Budgeting

Once you have identified your costs and you have shown that you are controlling these costs, the next step in safety planning is to tie the budgeted items to an applicable standard. Standards are established for every industry sector by agencies, such as OSHA, EPA, ANSI, NFPA, NEC, UL and NEMA. Industry-specific standards are also required for the petrochemical industry, such as American Petroleum Institute (API), Chemical Manufacturers Association (CMA), Synthetic Organic Chemical Manufacturers Association (SOCMA) and the American Institute of Chemical Engineers (AIChE). The aerospace industry uses military standards, such as MIL-STD-882, MIL-STD-1574, MIL-STD-454, Air Force Regulations (AFRs) and Air Force Occupational Safety and Health (AFOSH) standards.

The standards spell out almost everything required to make facilities safe. Compliance with these standards are the reason that many safety and health managers are hired. Use them!

In summary, to budget responsibly, you must first identify costs. Find out where money is spent. Is it wasted? Is it accomplishing your goals? Are you getting the best value for you dollar?

Once you have answered these questions, take action to illustrate cost control. Illustrate your fiduciary responsibility. This may include changing vendors, rescheduling calibrations for instruments, etc. The bottom line is to do as much as possible with your budget dollar without sacrificing the value you are receiving.

Lastly, tie budget items to compliance standards. Show that everything you do is directly linked to compliance. If upper management elects not to approve them, remind them of the specific compliance reference for that item. Make managers with fiduciary power accountable for their decisions: provide a sign-off list that physically requires top management to sign or initial for every budgeted safety item whether to spend the money or to accept the risk of not spending it. Below is an example for Level A hazmat suits.

#### Example:

**Budget Item 6.** Level A Hazmat Suits for Emergency Response Team (ERT): \$2,360.00  
(OSHA 29 CFR 1910.120(H)&(c)(5)  
Tychem 10000 Level A Suits (4 @ \$500.00) = \$ 2,000.00  
Training Suits (4 @ \$90.00) = \$360.00

In the case of a hazardous chemical spill, company policy is to have a minimum of two ERT members respond and two to stand by as backup. The Level A suits provide the minimum requirements for responding to such an emergency. Use of training suits provides ERT members the opportunity to become familiar with the chemical suits prior to an incident and to minimize panic in an emergency situation. Each ERT member should be trained in these suits and in self-contained breathing apparatuses (SCBAs).

Implement as Stated Above:

Concur: HR \_\_\_ Date \_\_\_ MGR \_\_\_ Date \_\_\_ PRES \_\_\_  
Date \_\_\_

Accept Risk of Criticality 2, Freq 2 = 2:

Concur: HR \_\_\_ Date \_\_\_ MGR \_\_\_ Date \_\_\_ PRES \_\_\_  
Date \_\_\_

Also provide an appendix with the referenced standards. To aid in selling, highlight the particular references to illustrate exactly where the standard supports your proposal.

### **1910.120 Hazardous Waste Operations and Emergency Response**

(a) Scope, application and definitions.

(iii) Voluntary cleanup operations at sites recognized by federal, state, local or other governmental bodies as uncontrolled hazardous waste sites;

(iv) Operations involving hazardous waste that are conducted at treatment, storage, disposal (TSD) facilities regulated by 40 CFR Parts 264 and 265 pursuant to RCRA; or by agencies under agreement with EPA to implement RCRA regulations; and

(v) Emergency response operations for releases of, or substantial threats of releases of, hazardous substances without regard to the location of the hazard.

(2) Application. (i) All requirements of Part 1910 and Part 1926 of Title 29 of the Code of Federal Regulations apply pursuant to their terms to hazardous waste and emergency response operations whether covered by this section or not. If there is a conflict or overlap, the provision more protective of employee safety and health shall apply without regard to 29 CFR 1910.5(c)(1).

(ii) Hazardous substance cleanup operations within the scope of paragraphs (a)(1)(i) through (a)(1)(iii) of this section must comply with all paragraphs of this section except paragraphs (p) and (q).

(b) Safety and health program.

Note to (b): Safety and health programs developed and implemented to meet other federal, state or local regulations are considered acceptable in meeting this requirement if they cover or are modified to cover the topics required in this

paragraph. An additional or separate safety and health program is not required by this paragraph.

(1) General. (i) Employers shall develop and implement a written safety and health program for their employees involved in hazardous waste operations. The program shall be designed to identify, evaluate and control safety and health hazards and provide for emergency response for hazardous waste operations.

(ii) The written safety and health program shall incorporate the following:

(A) An organizational structure;

(B) A comprehensive workplan;

(C) A site-specific safety and health plan, which need not repeat the employer's standard operating procedures required in paragraph (b)(1)(ii)(F) of this section;

(D) The safety and health training program.

(5) Personal protective equipment (PPE) shall be provided and used during initial site entry in accordance with the following requirements:

(i) Based upon the results of the preliminary site evaluation, an ensemble of PPE shall be selected and used during initial site entry, which will provide protection to a level of exposure below permissible exposure limits and published exposure levels for known or suspected hazardous substances and health hazards and which will provide protection against other known and suspected hazards identified during the preliminary site evaluation. If there is no permissible exposure limit or published exposure level, the employer may use other published studies and information as a guide to appropriate PPE.

### **Use Engineering & Financial Principles**

Did you ever wonder why the CEO's or the comptroller's eyes glazed over when you talked about incident rates and EMRs? The same reason why your eyes glazed over when they talked about return on investment and equivalent uniform annual cost (EUAC). You must speak the same language to be understood. To communicate with financial planners, you must learn to speak the language that upper management understands—dollars and cents. You must cogently persuade upper management to separate money from their corporate wallets. To do this, you must illustrate why spending money now will save money later. Engineering economy principles, such as present worth, future worth, depreciation, rate of return, replacement, retirement and cost-benefit analysis are understood by engineers and financial planners.

Use analyses that illustrate reduction in your workers' compensation experience modifier as a result in incident rate reduction (or increase for not spending the money). Also, the use of insurance audits and reports that reveal the need to

upgrade or provide additional equipment can help justify expenditures.

**Present Worth.** The present worth of an asset is the sum of all discounted expected future cash inflows minus the sum of all cash outflows and discounted expected future cash outflows. This means that the value of a machine, a chemical plant or an improvement in a process, is the sum of all money you expect to make or save over the life of the asset minus present and future costs associated with that asset with everything adjusted for inflation so that current monetary value is accurately reflected. Present worth is an easy check for the feasibility of a project. Projects with negative net present worths can be easily identified and eliminated in favor of those projects with better return potentials.

The formula for present worth is:

$$P = (A(1+i)^n - 1) / (i(1+i)^n)$$

where

P = sum of money at the present time

i = interest rate for a given interest period

A = payment or receipts at the end of an interest period in a series of n equal payments or receipts

This is a function of:

- Initial cost or investment
- Cash outflows, such as maintenance costs, time payments and the cost of:
  - Safety program implementation (e.g., confined space, lockout/tagout, etc.)
  - Equipment (e.g., fire extinguishers, fire protection, etc.)
  - Training
  - New employees (e.g., safety professionals, industrial hygienists, etc.)
- Cash inflows, such as cost savings or payments for goods and services and expected:
  - Workers' compensation and insurance savings
  - Decrease in overtime, productivity, turnover, training costs, etc.
  - Decrease in legal liabilities, legal fees, settlements
  - Decrease in OSHA citations
  - Increase in good will (e.g., company reputation, union negotiating, etc.)
- Salvage value of the asset
- Adjustment for inflation (discounting)

**Future Worth.** The future worth of an asset is the current value of the asset plus the compound interest thereon. This value is also a good check for the project's feasibility. It can

be discounted to present worth to compare the value of a product or project with the investment necessary to create it. If the value is less than the investment required, the project should be terminated in favor of more profitable projects.

The formula for future worth is:

$$P = (A(1+i)^n - 1) / i$$

where

F = future worth of a present sum of money after n interest

periods, or the future worth of a series of equal payments

i = interest rate for a given interest period

A = a payment or receipts at the end of an interest period in a series of n equal payments or receipts

This is a function of:

- Initial value of investment
- Interest rates (compounding), which are composed of:
  - True cost of borrowing money (2-3%)
  - Risk of investment/project (junk bonds versus AAA bonds)
  - Rate of inflation (currently around 3-6% annually depending on whom you talk to)

**Depreciation.** Depreciation is the process of allocating, in a systematic and rational manner, the expense of an asset to each period benefited by the asset. This entails that the cost of the asset is divided up, spread across and charged against the accounting periods of its estimated lifetime. This allows companies to charge the expenses associated with an asset against the profits it generates during the periods in which it is used. Many methods are used to calculate depreciation, such as sum of year digits, declining balance, group and composite depreciation and straight line. For the purpose of the example used, we will focus on straight line depreciation.

The formula for straight line depreciation is:

$$D = P - SV / n$$

where

D = annual depreciation

SV = salvage values of the asset

n = expected depreciable life of the asset

This is a function of:

- Cost of the asset
- Estimated lifetime of the asset
- Salvage value (if any) of the asset
- Method of depreciation used (straight line, accelerated cost recovery standard, etc.)

**Rate of Return.** The rate of return is a measure that allows comparison between two different alternatives. It is a function of the ratio of the present value of the net income generated over time by the asset divided by the cost of the asset, usually expressed as a percentage. In other words, the amount of money generated by two alternative projects is translated into something resembling an interest rate. In this manner, the company can choose which project will yield the highest return for its money. Many companies also have a minimum attractive rate of return, which is the lowest rate of return acceptable before a project will even be considered.

The formula for rate of return is:

$$R = P_i - P_o / P_o$$

where

R = rate of return

$P_i$  = net present value of all expected inflows

$P_o$  = net present value of all expected outflows

The rate of return is a function of:

- Initial cost of the asset(s)
- Expected cash outflows includes the cost of:
  - Safety program implementation (e.g., confined space, lockout/tagout, etc.)
  - Equipment (e.g., fire extinguishers, fire protection, etc.)
  - Training
  - New employees (e.g., safety professionals, industrial hygienists, etc.)
  - Maintenance
  - Repairs
- Cash inflows, such as cost savings or payments for goods and services and expected:
  - Workers' compensation and insurance savings
  - Decrease in overtime, productivity, turnover, training costs, etc.
  - Decrease in legal liabilities, legal fees, settlements
  - Decrease in OSHA citations
  - Increase in good will (e.g., company reputation, union negotiating, etc.)
- Salvage value (if any) of the asset
- Discount rate used by the company, such as:
  - Minimum acceptable rate of return or
  - Cost of capital (company's borrowing costs) or
  - Rate of inflation

**Replacement Analysis.** Replacement analysis provides an economic comparison of two asset choices, a defender (the current assets) versus a challenger (asset being considered for purchase). It is usually used when determining

whether or not to replace an existing asset with a new or more efficient one or when comparing different options of procuring equipment, such as buying or leasing. The costs and expenses associated with the assets are converted into an EUAC. This determines how much expense will be associated with a given asset in one year's time, thus providing a uniform benchmark for comparison. Once EUAC has been determined, all the company must do is choose the lowest cost option.

For example, the formulas below can be used to determine which is more feasible, buying or leasing a particular asset. Here the defender formula is used to perform the purchase option, and the challenger formula is used to calculate the lease option.

The formula for the defender is:

$$EUAC_d = P - SV + AOC$$

where

P = purchase cost of the asset

SV = salvage value of the asset

AOC = annual operating cost

The formula for the challenger is:

$$EUAC_c = L + AOC$$

where

L = lease cost of the asset

AOC = annual operating cost

This is a function of:

- Initial cost of the asset
- Salvage value (if any) of the asset
- Annual operating cost
- Lease cost

**Retirement Analysis.** Retirement analysis is the method used to find the lowest EUAC of an asset based on the number of years it will be used. This method of analysis allows the company to decide the most economical length of time to use an asset. With this information, the company can decide when to replace the asset or assign a length of time during which the asset can be most economically used as a factor in a replacement analysis. This allows the replacement analysis to be conducted more accurately.

The formula for the defender is:

$$EUAC_d = P - SV + AOC$$

where

P = purchase cost of the asset

SV = salvage value of the asset

AOC = annual operating cost

This is a function of:

- Initial cost of the asset
- Salvage value (if any) of the asset
- Annual operating cost

**Cost-Benefit Analysis.** Cost-benefit analysis is a method used to analyze the effects of making a change in a process. Typically, cash flows of present procedures are compared against predicted cash flows incurred under the change. The advantage of using the cost-benefit analysis is the ability to monetize costs of intangibles (e.g., good will, reputation of a company, the cost of a life, cost of future injuries, decreased turnover, decreased training, etc.). Estimates used must be accompanied by realistic, conservative accounting assumptions. Without realistic assumptions to force the solution to the worst-case scenario, errors could occur which invalidate the estimate basis.

This is a function of:

- Decrease in legal liabilities, legal fees, settlements
- Decrease in OSHA citations
- Increase in good will (e.g., company reputation, union negotiating, etc.)

For example, when Ford Motor Company performed a cost-benefit analysis to determine the benefits and cost relating to the fuel leakage associated with static rollover tests portion of the FMVSS 208 (Ford Pinto), Ford failed to make conservative accounting estimates of the worst-case scenario.

In 1970, Ford used \$200,000 as the cost of a life (provided by the National Highway Traffic Safety Administration (NHTSA)); the value was based almost entirely on deferred future earnings (DFE). At the time this decision was made, at least three different DFE-based figures ranging from \$200,000 to \$350,000 were used by as many different federal agencies. Willingness to pay (WTP) has since replaced DFE as the preferred method of assessing the value of life. Further, research has shown that various WTP studies have revealed a higher median value than the one used by Ford. On the basis of this research, the value of a life is greater than future earnings.

The Ford cost-benefit analysis presented a \$137 million cost and \$149 million benefit. In the formula, the number of deaths, the cost per vehicle to make the design change and the proportion of deaths to be attributed to small light vehicles were all subject to such dramatic change that the \$2.75 cost to \$1.00 benefit ratio achieved could have easily been changed so that the benefit exceeded the cost even if the value of life used was accepted and left unchanged.

Ford used the following formula:

**Benefits**

**Savings:** 180 burn deaths, 180 serious burn injuries, 2,100 burned vehicles

**Unit Cost:** \$200,000 per death, \$67,000 per injury, \$700 per vehicle

**Total Benefit:**  $((180 \times \$200,000) + (180 \times \$67,000) + (2,100 \times \$700)) = \$49.5 \text{ million}$

**Costs**

**Sales:** 11 million cars, 1.5 million light trucks

**Unit Cost:** \$11 per car, \$11 per truck

**Total Cost:**  $((11,000,000 \times \$11) + (1,500,000 \times \$11)) = \$137 \text{ million}$

The cost-benefit analysis Ford performed on crash-induced fuel tank leakage and fires presents a startling example of the imprecision of cost-benefit analysis as well as the strong possibility for manipulation of figures to achieve a desired result.

By using the high estimated death figure from the NHTSA, the benefit total would have been \$161.2 million, even if everything else would have been held constant. By using the low estimated death figure of \$5.08, the figure would have been \$63 million. If only small cars had been used rather than all automobiles and light trucks, the cost figures would have been lower still. Increasing the value of life would have further skewed the results. In retrospect, the design changes would have been made based on a conservative accounting estimate rather than a liberal estimate.

What is life worth today? Various federal regulatory agencies value life differently when determining the cost-benefit of a new rule, as follows:

<u>Agency</u>	<u>Value in Millions</u>
Consumer Product Safety Commission (CPSC)	\$2M
Environmental Protection Agency (EPA)	\$8M
Nuclear Regulatory Commission (NRC)	\$5M



Occupational Safety & Health Administration	\$3.5M
Office of Management & Budget	\$1M

The total cost to implement a new rule is divided by the number of lives expected to be saved as a result. For example, if a new rule is estimated to cost \$100 million to implement and is expected to save 20 lives, the rule is too expensive for CPSC, OSHA and OMB but acceptable for EPA and NRC. It seems that the federal government values life more than some workers value their own lives. If employees are killed while they deliberately violate safety rules, workers' compensation payments are nowhere near these amounts.

When conducting a cost-benefit analysis, one may choose to use a particular agency's numbers depending on what is justified. For example, if you are justifying on the basis of OSHA, you would use \$3.5M. On the basis of EPA, you would use \$8M for the cost of a life.

### Use Legal Precedence

Use newspaper and magazine articles on OSHA and EPA fines to your advantage. Ensure that your superiors receive a copy of such articles and of criminal liability information. Since we live in a litigious age, let them know what could happen if they do not act prudently.

### Conclusions

Remember, top management commitment equals program success. Use applicable safety and health standards as well as engineering workers' compensation and financial principles to sell your safety and health programs. Require sign-off for risk acceptance. You may even want to befriend someone in the accounting department. That person can make your life easier, especially when performing these calculations. In any event, do your homework and calculate the dollars and sense of your safety and health programs. Make it easy for your management to say yes and hard to say no.

Selling safety and health is difficult and is not for those who tend to quit too soon. In these days, when layoffs are abundant and fear-mongering is rampant, you must stem the tide and stand up for what is right and true. ■

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