Chapter 19

Measuring ROI in Safety Leadership

Global Engineering and Construction Company

by Jack J. Phillips

This case study shows the power of a safety leadership program for project safety leaders on construction sites. These are large construction sites and the safety project leader is a full-time safety and health professional. Responding to disappointing safety performance, a thorough needs analysis was conducted, yielding a variety of actions that needed to be taken through the project safety leaders. These managers are responsible for safety for their large projects. They need to take leadership actions to improve a variety of measures. This program involved a two-day workshop with action plans to drive business performance measures. Each participant selected three measures to improve, using the content of the program and the detailed action planning process provided. The results are very impressive, underscoring the benefit of having an action plan built into the program and the power of the program's focus on results.

BACKGROUND

Global Engineering and Construction Company (GEC) designs and builds large commercial projects such as chemical plants, paper mills, and municipal water systems. The company employs 35,000 full-time associates. In addition, another 200 to 1,500 contract workers are involved during each

This case was prepared to serve as a basis for discussion rather than to illustrate either effective or ineffective administrative and management practices. The authors, dates, places, names and organizations may have been disguised at the request of the author or organization.

project's peak construction phases. During a typical year, contract workers account for another 100,000 at construction sites. Safety is always a critical matter at GEC and usually commands much management attention.

From a corporate perspective, safety is managed by a safety and health team composed of specialists and managers who report to the director of environment, health, and safety (EHS). Each project has at least one person responsible for safety who functions as a project safety leader.

The Need

During the previous two years, safety performance has deteriorated or remained flat at unacceptable levels. Because of this disappointing and sometimes erratic safety performance, the chief operating officer (COO) asked the EHS director to explore the causes of the unacceptable performance and to offer a remedy. The department reviewed the safety records, safety procedures, and safety administration, searching for common threads of causality. Questionnaires were sent to all the project safety leaders at each site, and a select group of safety leaders were interviewed in an attempt to pinpoint what could be done to improve safety. From this initial needs assessment, the following conclusions were made:

1. There is still a lack of knowledge about the different tools and techniques available for the project safety leaders to use to improve safety performance.
2. There is clear evidence that project safety leaders are not operating on a proactive basis, but merely reacting to events and issues as they happen.
3. Routine safety meetings need more content, better planning, and improved coordination.
4. Project safety leaders need to use available tools for investigation, causation analysis, and corrective action.

With this in mind, the EHS Team recommended a two-day safety leadership workshop for all the project safety leaders. This workshop would focus on the gaps defined in the needs assessment and would provide the motivation, knowledge, skills, and tools to improve safety performance.

The program was designed for project safety leaders, who usually had the title of safety manager, safety engineer, or safety superintendent. The

program focused on safety leadership, safety planning, safety inspections and audits, safety meetings, accident investigation, safety policies and procedures, safety standards, and safety problem solving. The objectives for the program are listed in Table 19-1.

Table 19-1. Objectives for Safety Management Program

Level	Measurement Focus
1. Reaction	Obtain favorable reaction to program and materials on: • Need for program • Relevance to project • Importance to project success Identify planned actions.
2. Learning	After attending this program, participants should be able to: • Establish safety audits. • Provide feedback and motivate employees. • Investigate accidents. • Solve safety problems.
3. Application and Implementation	• Use knowledge, skills, and tools routinely in appropriate situations. • Complete all steps of action plan.
4. Business Impact	• Improve at least three safety and health measures.
5. Return on Investment	20%

These topics were fully explored in a two-day safety leadership program. Safety leaders (the participants) were expected to improve the safety performance of their individual construction projects. The safety performance measures used in the company were also reviewed and discussed in the workshop. This particular program would be expensive, because it would be necessary for all the project safety leaders to travel, and they would miss two days of work while participating in the program. The COO wanted to make sure that this was the right solution and that it represented a good investment. He asked for success measures that would show how safety performance has improved. Ideally, he wanted to see the ROI for conducting this particular program.

Business Alignment

The program facilitator asked participants to provide limited needs assessment data before attending the program. Participants were asked to review the safety performance of their projects and identify at least three

safety measures that, if improved, should enhance safety performance. Each measure selected should be important and have the possibility of being improved using the topics covered in the safety management program. Some possible business impact measures include disabling injury rate, accident severity rate, first aid treatments, OSHA citations, OSHA penalties, property accidents, hazardous material incidents, or near misses. Each participant could have different measures, but it is important to avoid selecting measures that cannot be enhanced through the team's efforts and the content covered in the program.

As the participants register for the program, they are reminded to complete the action plan. This requirement is presented as an integral part of the program, not as an add-on data collection tool, because action planning is necessary to show actual improvements generated from the program.

Why Evaluate This Program?

Although the COO had suggested the ROI calculation, the EHS director was convinced that this program would add value and he wanted to show top executives that investments in safety and health had high payoffs. The safety team decided at the outset to collect and present improvement data to the C-suite, so the evaluation and action plan steps were built into the program. This decision was based on three issues:

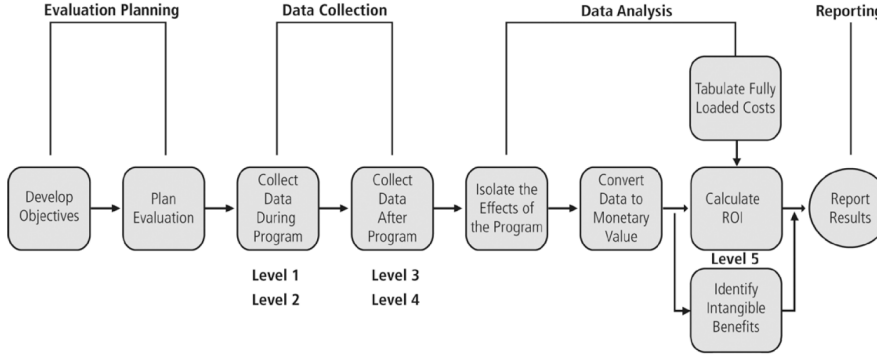
- This program is designed to add value at the construction-project level and the outcome is expressed in project level measures that are well known and respected by the management team. The evaluation should show the actual monetary value of improvement.
- The application data enable the team to make improvements and adjustments.
- The data also help the team gain respect for the program from the operating executives and project managers.

The ROI Process

The safety and health team staff used a comprehensive evaluation process to develop the ROI. The ROI Methodology generates six types of data: reaction, learning, application and implementation, business impact, ROI, and intangible measures.

To determine the contribution the program makes to the changes in business impact measures, a technique to isolate the effects of the program was also included in the process. Figure 19-1 shows the ROI process model used. Data collection plans and an ROI analysis plan were developed before data collection actually began. Four levels of data were collected, which represents the first four types of data listed above, and the process also included techniques to convert data to monetary value. The ROI is calculated by comparing the monetary benefits with the cost of the program. The intangible measures, the sixth type of data, are those impact measures not usually converted to monetary value, such as job satisfaction and image. This comprehensive model allows the organization to follow a consistent standardized approach each time it is applied to evaluate safety programs.

Figure 19-1. ROI Methodology ™ Process Model



PLANNING FOR EVALUATION

Planning for the evaluation is critical to save time and improve the quality and quantity of data collection. It also provides an opportunity to clarify expectations and responsibilities and shows the client group—in this case, the senior operating team—exactly how this program is evaluated. Two documents are created: the data collection plan and the ROI analysis plan.

Data Collection Plan

Figure 19-2 shows the data collection plan for this program. Program objectives are detailed along the five levels of evaluation, which represent the first five types of data collected. As the figure illustrates, the typical reaction and learning data are collected at the end of the program by the facilitator. Learning objectives focus on the major areas of the program.

Figure 19-2. Data Collection Plan

Level	Broad Program Objective(s)	Measures	Data Collection Method/ Instruments	Data Sources	Timing	Responsibilities
1	**REACTION** • Obtain favorable reaction to program and materials on – Need for program – Relevance to project – Importance to project success • Identify planned actions	• Average rating of 4 out of 5 on feedback items • 100% submit planned actions	• Standard questionnaire	• Participant	• End of program	• Facilitator
2	**LEARNING** After attending this session, participants should be able to: • Establish safety audits • Provide feedback and motivate employees • Investigate accidents • Solve safety problems • Follow procedures and standards • Counsel problem employees • Conduct safety meetings	• Achieve an average of 4 on a 5-point scale	• Questionnaire	• Participant	• End of program	• Facilitator

Figure 19-2. Data Collection Plan *(continued)*

Level	Broad Program Objective(s)	Measures	Data Collection Method/ Instruments	Data Sources	Timing	Responsibilities
3	**APPLICATION/IMPLEMENTATION** • Use knowledge, skills, and tools in appropriate situations • Complete all steps of action plan	• Ratings on questions (4 of 5) • The number of steps completed on action plan	• Questionnaire • Action plan	• Participant • Participant	• Two months after program • Three months after program	• Safety and health team
4	**BUSINESS IMPACT** • Improve three safety and health measures	• Varies	• Action plan	• Participant	• Three months after program	• Safety and health team
5	**ROI** 20%	Comments: Several techniques will be used to secure commitment to provide data on the questionnaire and action plan.				

Through application objectives, participants focus on two primary broad areas. The first is to use the knowledge, skills, and tools routinely in appropriate situations, and the second is to complete all steps on their action plans. A follow-up questionnaire was selected to measure the use of knowledge, skills, and tools. This was planned for two months after the program. For the second area, action plan data are provided to show the actual improvement in the safety measures planned.

Business impact objectives vary with the individual, as each project safety leader identifies at least three safety and health measures needing improvement. These are detailed on the action plan and serve as the basic principal document for the safety and health team to tabulate the overall improvement. The ROI objective is 20 percent, which was higher than the ROI target for capital expenditures at GEC.

ROI Analysis Plan

The ROI analysis plan, which appears in Figure 19-3, shows how data are analyzed and reported. Safety performance data form the basis for the rest of the analysis. The effects of the program were isolated using estimations from the safety project leader. The method to convert data to monetary values relied on three techniques: standard values (when they are available), expert input, and participant's estimates. Most of the costs of safety measures were readily available. Cost categories represent a fully loaded profile of program costs, including direct and indirect costs; anticipated intangibles are detailed and the communication audiences for the results are outlined. The ROI analysis plan represents the approach to process business impact data to develop the ROI analysis and capture the intangible data. Collectively, these two planning documents outline the approach for evaluating this program.

ACTION PLANNING: A KEY TO ROI ANALYSIS

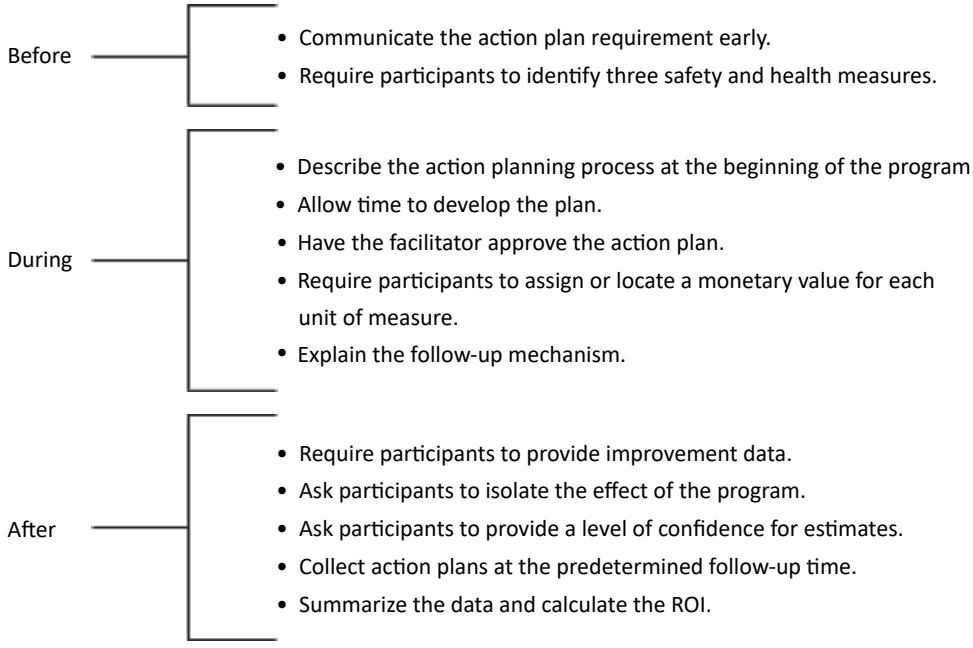
Figure 19-4 shows the sequence of activities as the action planning process is introduced to participants and reinforced throughout the program. The requirement for the action plan is communicated prior to the program along with the request for needs assessment information.

Figure 19-3. ROI Analysis Plan

Program: Safety Management Program **Responsibility:** _____ **Date:** _____

Data Items (Usually Level 4)	Methods for Isolating the Effects of the Program/ Process	Methods of Converting Data to Monetary Values	Cost Categories	Intangible Benefits	Communication Targets for Final Report	Other Influences/ Issues During Application	Comments
• Three safety and health measures identified by project safety leader	• Participant estimation	• Standard values • Expert input • (Safety team) • Participant estimation	• Needs assessment • Program development • Program materials • Travel and lodging • Facilitation and coordination • Participant salaries plus benefits while in the program • Extra project expenses related to program • Evaluation	• Job engagement • Job satisfaction • Stress • Image • Brand	• Construction project general manager • Participants • Director, environment, health and safety • Corporate safety and health team • Operating executives • Senior VP human resources		
Client Signature: _____ Date: _____							

Figure 19-4. Sequence of Activities for Action Planning



Teaching and Explaining the Plan

On the first day of the program, the facilitator described the action planning process in a 15-minute discussion. The guidelines for developing action plans were presented using the SMART (specific, measurable, achievable, realistic, and time-based) requirements. The participants were given five blank action plans (three of which they needed to complete). The facilitator also presented examples to illustrate what a complete action plan should look like. This discussion reinforced the need for action plans and the importance of the tool to participants.

Developing the Plan

At the end of the second day, the booklets were completed in a session that lasted about 90 minutes. Participants worked in teams to complete three action plans, which took 20 to 30 minutes each. Figure 19-5 shows a blank action plan. During the session, participants completed the top portion of the action plan; they listed the action steps in the left column and parts

Figure 19-5. Action Plan Form

Name:_____ Facilitator Signature:_____ Follow-Up Date: _____

Objective:_____ Evaluation Period:_____ To: _____ Improvement Measure:_____

Current Performance:_____ Target Performance: _____

Action Steps	Analysis
1._____ _____ 2._____ _____ 3._____ _____ 4._____ _____ 5._____ _____ 6._____ _____ 7._____ _____ 8._____ 9._____ Comments: _____ _____ _____	A. What is the unit of measure? _____ B. What is the value (cost) of one unit? $ _____ C. How did you arrive at this value? _____ D. How much did the measure change during the evaluation period? (monthly value) _____ E. What other factors could have caused the improvement? 1. _____ 2. _____ 3. _____ F. What percent of this change was actually caused by this program? _____% G. What level of confidence do you place on the above information? (100%=Certainty and 0%=No Confidence)_____% H. How many months to project completion? _____ Other benefits and consequences_____

A, B, and C in the right column. The remainder of the form was completed during a three-month follow up. A facilitator monitored the session and several operations executives were present. Involving operations executives not only keeps participants focused on the task, it usually leaves executives impressed with the program and the quality of the action planning process.

The action plan could focus on any specific steps, as long as the steps are consistent with the program's content and are related to the safety and health improvement measures. The most important part of developing the plan is to convert the measure to a monetary value (B and C). Three approaches were offered to the participants. First, standard values, which are values already known to the project safety leaders, are used if they are available. In this case, standard values were available for most of the EHS measures because the safety and health team had previously assigned a cost to particular measures for use in controlling costs and developing an appreciation for their impact. If a standard value was not available, the participants were encouraged to use expert input, such as from a corporate safety and health team member who may know the value of a particular item. The program facilitator encouraged participants to call the expert and include the given value in the action plan. If a standard value or expert input was not available, participants were asked to estimate the cost or value using the knowledge and resources available to them. It was important to require this value to be developed during the program.

ROI FORECAST WITH REACTION DATA

At the end of the two-day leadership program, participants completed a customized questionnaire to evaluate the safety leadership program. Participants were asked to provide a one-year estimated monetary value of their planned actions, explaining the basis for and placing a confidence level on their estimates. Table 19-2 presents these data. Data were supplied by 19 of the 25 participants. The estimated cost of the program, including participants' salaries for the time devoted to the project, was $120,000.

The monetary values of the planned improvements were extremely high, reflecting the participants' optimism and enthusiasm. As a first step in the analysis, extreme data items were omitted (one of the guiding principles of the ROI Methodology). Data such as millions, unlimited, and $4 million were discarded, and each remaining value was multiplied by the confidence value and totaled. This adjustment is a way to reduce highly subjective estimates.

Table 19-2. Level 1 Data for ROI Forecast Calculations

Participant No.	Estimated Value ($)	Basis	Confidence Level	Adjusted Value ($)
1	80,000	Reduction in accidents	90%	72,000
2	91,200	OSHA reportable injuries, OSHA Fines	80%	72,960
3	55,000	Accident reduction	90%	49,500
4	10,000	First-aid visits/visits to doctor/DIR	70%	7,000
5	150,000	Reduction in lost-time injuries, OSHA Fines	95%	142,500
6	Millions	Total accident cost	100%	—
7	74,800	Workers' compensation, Injury	80%	59,840
8	7,500	OSHA citations, Accidents	75%	5,625
9	50,000	Reduction in accidents	75%	37,500
10	36,000	Workers' compensation (lost time)	80%	28,800
11	150,000	Reduction in total accident costs	90%	135,000
12	22,000	OSHA fines/accidents	70%	15,400
13	140,000	Accident reductions	80%	112,000
14	4 Million	Total cost of safety	95%	—
15	65,000	Total workers' compensation	50%	32,500
16	Unlimited	Accidents	100%	—
17	20,000	Accidents	95%	19,000
18	45,000	Injuries	90%	40,500
19	200,000	Lost-time injuries	80%	160,000
				Total: $990,125

The resulting tabulations yielded a total improvement of $990,125. The projected ROI, which was based on the feedback questionnaire, is:

$$\text{ROI} = \frac{\$990{,}125 - \$120{,}000}{\$120{,}000} \times 100 = 725\%$$

Although these projected values are subjective, the results were generated by project safety leaders (participants) who should be aware of what they could accomplish. The follow-up study will determine the true results delivered by the group.

Collecting this type of data focuses increased attention on project outcomes. This issue becomes clear to participants as they anticipate results and convert them to monetary values. This simple exercise is productive

because of the important message it sends to participants—they will understand that specific action is expected, which produces results. The data collection helps participants plan the implementation of what they are learning.

Because a follow-up evaluation of the program is planned, the post-project results will be compared with the ROI forecast. Comparisons of forecast and follow-up data are helpful. If there is a defined relationship between the two, the less expensive forecast may be substituted for the more expensive follow-up in the future.

IMPROVING RESPONSE RATES

Data were collected at Level 1 and 2 (Reaction and Learning) at the end of the two-day workshop. As expected, the facilitator was able to secure a 100 percent response rate directly from the participants. However, not everyone completed the forecast of results, with only 19 of the 25 providing data. A follow-up questionnaire, which was completed two months after the program, had an impressive response, with 22 out of the 25 providing data.

This response rate was achieved by taking on the following techniques:

1. The questionnaire was reviewed at the workshop, with the expectation that the data would be provided in two months.
2. The questionnaire was positioned as a tool for participants to see the progress they were making.
3. The questionnaire was designed for ease of response, with the expectation that it would take only about 20 minutes to complete.
4. The COO signed the memo to the participants, asking for the data and encouraging them to reflect over what they were actually doing as a result of this program. The participants were promised a summary of the questionnaire results, and were assured that actions would be taken to improve the program as a result of their comments.
5. Two follow-up reminders were provided: an email and a phone call directly from the facilitator.
6. Participants were given a new book on the importance of safety as an incentive for responding—this was an exchange, the questionnaire for the book.

Action plans were collected three months after the program, providing an opportunity for the participants to show the impact of their work. Because of their commitment and ownership of the data, a response rate of 92 percent

was achieved. The facilitators also used several techniques similar to those used with the questionnaire to obtain the action plans.

In summary, the data collection was extremely effective with high levels of commitment and participation by the individuals.

RESULTS

The safety and health team reported results in all six data categories developed by the ROI Methodology, beginning with reaction and moving through ROI and the intangibles. Here are the results in each category with additional explanations about how some of the data was processed.

Reaction and Learning

Reaction data, collected at the end of the program using a standard questionnaire, focused on issues such as relevance of and intention to use the content. The delivery and facilitation also are evaluated. Table 19-3 shows a summary of the reaction data with ratings. Learning improvement was measured at the end of the program using self-assessment. Table 19-4 shows the summary of the learning results. Although these measures are subjective, they provide an indication of improvements in learning.

Table 19-3. Reaction Measurements

Topic	Rating
Need for the program	4.3
Relevance to construction project	4.5
Importance to project success	4.5
Delivery of the program	4.2
Facilitation of the program	4.2
Planned actions developed	100%
1= Unsatisfactory 5 = Exceptional	

Table 19-4. Learning Measurements

Topic	Rating
Establish safety audits	4.2
Provide feedback and motivation to employees	4.0
Investigate accidents	4.9
Follow safety procedures and standards	4.2
Counsel problem employees	3.9
Conduct safety meetings	4.8
1 = Cannot do this 5 = Can do this extremely well	

Application and Implementation

To determine the extent to which the knowledge, skills, and tools are actually being used and to check the progress of the action plan, a questionnaire was distributed two months following participation in the program. This two-page, user-friendly questionnaire evaluated the success of the program at the application level. Table 19-5 provides a summary of the results, which show progress in each of the areas and success using the content. The safety leaders also indicated that this program was affecting other safety measures beyond the three selected for action planning. Typical barriers of implementation they reported included lack of time, understaffing, changing culture, and pressures to get work done. The highest ranked enabler was support from the project general manager. This follow-up questionnaire gave project safety leaders an opportunity to briefly summarize progress with the action plan.

Table 19-5. Application Results

Success With:	Rating
1. Conducting safety audits	4.1
2. Providing feedback to employees	3.9
3. Investigating accidents	4.8
4. Solving safety problems	4.9
5. Following safety procedures and standards	4.7
6. Counseling problem employees	4.2
7. Conducting safety meetings	4.6
1= Unsuccessful 5 = Very Successful	

In essence, it served as a reminder to continue with the plan, as well as a process check to see if there were issues that should be explored.

Business Impact

Project safety leaders provided safety improvement data specific to their construction projects. Although the action plan contained some Level 3 application data (the left side of the form in Figure 19-6), the primary value of the action plan was business impact data obtained from the documents.

In the three-month follow up, participants were required to furnish the following items:

1. The actual change in the measure on a monthly basis (included in part D of the action plan). This value is used to develop an annual (first year) improvement.
2. A list of the other factors that could have caused the improvement (part E), which is the only feasible way to isolate the effects of the program. As they monitor the measures and observe their improvement, the project safety leaders probably see the other influences driving a particular measure.
3. The percent of improvement resulting from the application of the content from the safety management program (the action steps on the action plan). Each project safety leader was asked to be as accurate as possible with the estimate and express it as a percentage (part F).
4. The level of confidence in their allocation of the contribution to this program. This reflects the degree of error in the allocation and is included in part G on the action plan, using 100 percent for certainty and 0 percent for no confidence.
5. An estimate of the number of months to project completion. This allows for the calculation of the duration of the benefits.
6. Input on intangible measures observed or monitored during the three months that were directly linked to this program.
7. Additional comments, including explanations if necessary.

Figure 19-6 shows an example of a completed action plan. The example focuses directly on first-aid visits from participant number five. This participant was averaging 22 incidents per month, and the goal was to reduce it to 10. Specific action steps are indicated on the left side of the form. The average cost of a first-aid visit is $300, an amount that represents a standard value. The actual change on a monthly basis was 11 visits, which was slightly below the target. Three other factors contributed to the improvement. The participant estimated that 60 percent of the change was directly attributable to this program, and is 80 percent confident in this estimate. The confidence estimate frames a range of error for the 60 percent allocation, allowing for a possible 20 percent (plus or minus) adjustment in the estimate. To be conservative, it is adjusted to the low side, bringing the contribution rate of this program to a 48 percent reduction:

$$60\% \times 80\% = 48\%$$

Figure 19-6. Action Plan

Name: Roger Gerson Facilitator Signature:_____ Follow-Up Date: 1 July Objective: Reduce first-aid treatments
Evaluation Period: January To: April Improvement Measure: First-aid visits
Current Performance: 22 / Month Target Performance: 10 / Month

Action Steps	Analysis
1. Review first-aid records for each employee—look for trends and patterns. 2. Meet with team to discuss reasons for first-aid visits—using problem-solving skills. 3. Counsel with "problem employees" to correct habits and explore opportunities for improvement. 4. Conduct a brief meeting with an employee returning to work after a visit to first aid. 5. Provide recognition to employees who have perfect accident records. 6. Follow-up with each discussion and discuss improvement or lack of improvement and plan other action. 7. Monitor improvement and provide recognition when appropriate. Other Benefits: Greater Productivity Comments: The action plan kept me on track with this problem.	A. What is the unit of measure? One first-aid visit B. What is the value (cost) of one unit? $ 300 C. How did you arrive at this value? Standard Value D. How much did the measure change during the evaluation period? (monthly value) 11 E. What other factors could have caused the improvement? 1. Required OSHA training 2. Project leadership (General Manager) 3. Safety-first program for all employees F. What percent of this change was actually caused by this program? 60 % G. What level of confidence do you place on the above information? (100%=Certainty and 0%=No Confidence) 80 % How many months to project completion? 18 OPTIONAL: Calculate the value: (B x D x 12 x F x 9) 11 x 300 x 12 x 60% x 80% = $19,008

The actual improvement value for this example can be calculated as follows:

11 visits x $300 per visit x 12 months = $39,600

The number of months to project completion is 18, making it appropriate to use the one-year rule for benefits. In the last three months of a project, most of the employees have left the job. Consequently, a project has to have at least 15 months remaining to use one year of data. Otherwise, an adjustment must be made. For example, a project with 14 months remaining would use 11 months of benefits instead of one year.

Table 19-6 shows the annual improvement values on the first measure only for the first 25 participants in this group. Similar tables are generated for the second and third measures. The values are adjusted by the contribution estimate and the confidence estimate. For participants, the $39,600 is adjusted by 60 percent and 80 percent to yield $19,008. This same adjustment is made for each of the values, with a total first-year adjusted value for the first measure of $320,309. The same process is followed for the second and third measures for the group, yielding totals of $162,310 and $57,320, respectively. The total benefit is $539,939.

Program Cost

Table 19-7 details the program costs reflecting a fully loaded cost profile. The estimated cost of the needs assessment ($5,000) is prorated over the life of the program, which will be with three sessions. The estimated program development cost ($7,500) is also prorated over the life of the program. The program materials and facilitators are direct costs, and the program also includes a book on safety management. Travel and lodging are estimates using an average for each participant. Facilitation and coordination costs were estimated, too. Time away from work represents lost opportunity and is calculated by multiplying two days by daily salary costs, adjusted for 40 percent employee benefits factor. The average hourly rate for these leaders is about $50. When adjusted for benefits, the rate is $70, which is $560 per day or $1,120 per participant for the two days. That brings the total to $28,000 for 25 participants, which is the second-largest cost item after travel. The cost for the evaluation was estimated. The total costs of $106,087 represent a very conservative approach to cost accumulation.

Table 19-6. Business Impact Data

Participant	Annualized Improvement ($ Values)	Measures	Other Factors	Contribution Estimate From Safety Project Leaders	Confidence Estimate	Adjusted $ Value
1	5,000	Medical treatment	2	40%	90%	23,400
2	5,500	Property damage	4	25%	70%	963
3	32,800	Disabling injuries	2	70%	60%	13,776
4	21,800	First aid	1	80%	80%	13,952
5	39,600	First aid	3	60%	80%	19,008
6	19,800	Disabling injuries	2	70%	90%	12,474
7	25,000	OSHA citations	3	30%	70%	5,250
8	23,000	Property damage	4	30%	40%	2,760
9	34,500	Medical treatment	1	75%	800%	20,700
10	50,000	Near miss	0	100%	100%	50,000
11	75,000	Disabling injury rate	2	45%	75%	23,313
12	42,350	Medical treatment	3	50%	75%	15,881
13	40,000	OSHA fine	4	25%	80%	8,000
					Total this page	**$209,477**

Table 19-6. Action Plan *(continued)*

Participant	Annualized Improvement ($ Values)	Measures	Other Factors	Contribution Estimate From Safety Project Leaders	Confidence Estimate	Adjusted $ Value
14	59,000	Disabling injuries	3	40%	85%	20,060
15	75,000	Disabling injuries	2	20%	90%	13,500
16	missing					
17	24,900	Hazmat violations	2	40%	70%	6,972
18	25,000	Property damage	5	20%	80%	4,000
19	missing					
20	39,000	OSHA citations	2	60%	95%	22,230
21	13,500	OSHA citations	2	70%	90%	850
22	15,000	First aid	0	100%	90%	13,500
23	1,000,000	Near miss	0	100%	100%	
24	54,000	Hazardous materials	3	60%	70%	22,680
25	22,000	Property damage	3	40%	80%	7,040

*Extreme data was omitted from this analysis.

Total Annual Benefit for Second Measure is $162,310

Total Annual Benefit for Third Measure is $57,320

Total this page **$110,382**

Total First Measure **$320,309**

ROI Analysis

The total monetary benefits are calculated by adding the values of the three measures, which total $539,939. This leaves a benefits-cost ratio (BCR) and ROI as follows.

$$BCR = \frac{\$539,939}{\$128,067} = 4.22$$

$$ROI = \frac{(\$539,939 - \$128,067)}{\$128,067} \text{ X } 100 = 322\%$$

There is a significant difference between the actual ROI as compared to the forecasted ROI. The return is 54 percent less than the forecast, but this is expected because of the optimism experienced at the end of the workshop.

Table 19-7. Program Cost Summary

Needs Assessment (Prorated over three sessions)	$1,667
Program Development (Prorated over three sessions)	2,500
Program Materials–25 @ $100	2,500
Travel and Lodging–25 @ $2000	37,500
Facilitation and Coordination	50,000
Facilities and Refreshments – 2 days @ $700	1,400
Participants Salaries Plus Benefits	28,000
ROI Evaluation	4,500
Total	**$128,067**

Credibility of Data

This ROI value of more than 300 percent greatly exceeds the 20 percent target value. However, despite being extremely high, the ROI value was considered to be credible. This is because of the principles on which the study was based.

1. The data came directly from the participants.
2. The data could be audited to see if the changes were actually taking place.
3. To be conservative, only the first year of improvements was used.

With the changes reported in the action plans, there should be second and third-year values which were omitted from the calculation.

4. The monetary improvement was discounted to account for the effect of other influences. In essence, the participants only took credit for the part of the improvement related to the program.
5. The estimate of contribution was adjusted for error, which represents a discount, adding to the conservative approach.
6. The costs are fully loaded to include both direct and indirect costs.
7. The business impact does not include value obtained from using the skills to address other problems or to influence other measures. Only the values from three measures taken from the action planning projects were used in the analysis.

The ROI process develops convincing data connected directly to project construction costs. From the viewpoint of the chief financial officer, the data can be audited and monitored. It should be reflected as actual improvement at the project site.

Intangible Data

As a final part of the complete data profile, the intangible benefits were itemized. The participants provided input on intangible measures at two timeframes. The follow-up questionnaire provided an opportunity for participants to indicate intangible measures they perceived to represent a benefit directly linked to this program. In addition, the action plan provided an opportunity to add additional intangible benefits. Collectively, each of the following benefits was listed by at least five individuals:

- Improved productivity
- Improved teamwork
- Improved work quality
- Improved job satisfaction
- Improved job engagement
- Enhanced image
- Reduced stress.

To some executives, these intangible measures are just as important as the monetary payoff.

The Payoff: Balanced Data

This program drives six types of data items: satisfaction, learning, application, business impact, ROI, and intangible benefits. Collectively, these data provide a balanced, credible viewpoint of the success of the program.

Communication Strategy

Table 19-8 shows the strategy for communicating results from the study. All key stakeholders received the information. The communications were credible and convincing and the information helped build confidence in the program. The CEO and CFO were pleased with the results. The data given to employees, shareholders, and future participants were motivating and helped to bring more focus on safety.

Table 19-8. Communication Strategy

Timing	Communication Method	Target Audience
Within one month of follow-up	Executive briefing	Regional exectives CEO, CFO
Within one month of follow-up	Live briefing	Corporate and regional operation executives
Within one month of follow-up	Detailed impact study (125 pages)	Program participants Safety and health staff • Responsible for this program in some way • Involved in evaluation
Within one month of follow-up	Report of results (1 page)	Project general managers
Within two months	Article in project news	All employees
As needed	Report of results (1 page)	Future participants in similar safety programs
End of year	Paragraph in annual report	Shareholders

Lessons Learned

It was critical to build evaluation into the program, positioning the action plan as an application tool instead of a data collection tool. This approach helped secure commitment and ownership for the process. It also shifted much of the responsibility for evaluation to the participants as they collected important data, isolated the effects of the program on the data, and converted the data to monetary values—the three most critical steps

in the ROI process. The costs were easy to capture and the report was easily generated and sent to the various target audiences.

This approach had the additional advantage of evaluating a program in which a variety of measures were influenced. The improvements were integrated after they were converted to monetary value. Thus, the common value among measures was the monetary value, which represented the value of the improvement.

Questions for Discussion

1. Is this approach credible? Explain.
2. Is the ROI value realistic?
3. Were the differences in the ROI forecast and the actual revenue per inquiry expected? Explain.
4. How should the results be presented to the senior team?
5. How can the action planning process be positioned as an application tool?
6. What type of programs would be appropriate for this approach?