Appendix A: Survey I

ORC Worldwide
Industrial Hygiene Program Study

ORC has been awarded a contract by the American Industrial Hygiene Association to conduct a research study to determine the value that the industrial hygiene/occupational hygiene profession (IH) brings to the business world. Currently there are limited data demonstrating the relationship between comprehensive IH programs and improvements in worker health and positive business results. Where such data exist, they are most often focused on employee safety/accident prevention and not the prevention of short-term and long-term illnesses through the improvement of working conditions and process design that IH professionals address. Because of this data gap IH professionals have a difficult task of proving that investments in related staffing and programs can contribute to business value and success.

The greatest asset of ORC is its member companies and their willingness and desire to share information to advance both their individual business interests and the overall profession of occupational safety and health.

For Phase I of the research project ORC is using the attached survey to get a broad measure of the types of IH programs that companies have developed and manage. The survey will gather data on company demographics and IH program elements while seeking to understand what, if any, outcome data have been captured by companies. This survey is designed to learn in broad terms the amount of outcome data that companies have collected and how accessible those data are for use in correlating the relationship between IH program elements and business outcomes.

Companies that have comprehensive IH management systems and robust outcome data will be invited to participate in a more detailed Phase II study which will seek develop a strategy to calculate the value of IH investments. Please note, this survey is solely on IH rather than safety. Therefore, so far as possible, please base your responses on your IH programs and their associated costs and benefits.

ORC asks that you complete the attached IH screening survey by COB January 5, 2007. The data received in Phase I of the study will be summarized, blinded and made available to participants. Also, please indicate on the survey form if your organization would specifically be interested in participating in the Phase II study. Thank you for your willingness to participate in this important project for the industrial hygiene/occupational hygiene profession. Please address any questions you may have to Steve Newell, Dee Woodhull or Scott Madar at 202-293-2980.

Appendix A: Survey I

Value of Industrial Hygiene/Occupational Hygiene Programs Survey

Note: In completing this survey, we ask you to provide data for your corporation as a whole and for your "best" site/operation. When selecting a "best site", please select a site/operation that is:

1. One of your best sites/operations in terms of IH-related management systems, compliance, and innovation
2. Is most likely to have data on employee health status and business outcomes that have been influenced by IH programs

Section I – Site Identification, Demographics and Organization

1. Company:
2. Contact Name:
3. Contact Phone Number
4. Contact E-mail Address

5. Staffing and Facilities:
    a. Total Number of Global Employees
        i. Total number of Manufacturing/Operations employees
        ii. Total number of Sales and/or Service employees
        iii. Total number of Corporate or Division staff employees
        iv. Total number of R&D employees
    b. Total Number of Global Manufacturing/Operations, Sales, Administrative, and R&D Sites
        v. Manufacturing/Operations
        vi. Sales and/or Service
        vii. Administrative
        viii. R&D

6. Industry Sector:
    a. Company primary NAICS code(s). Please list up to five.

    b. Best IH Program Site NAICS code(s).

.

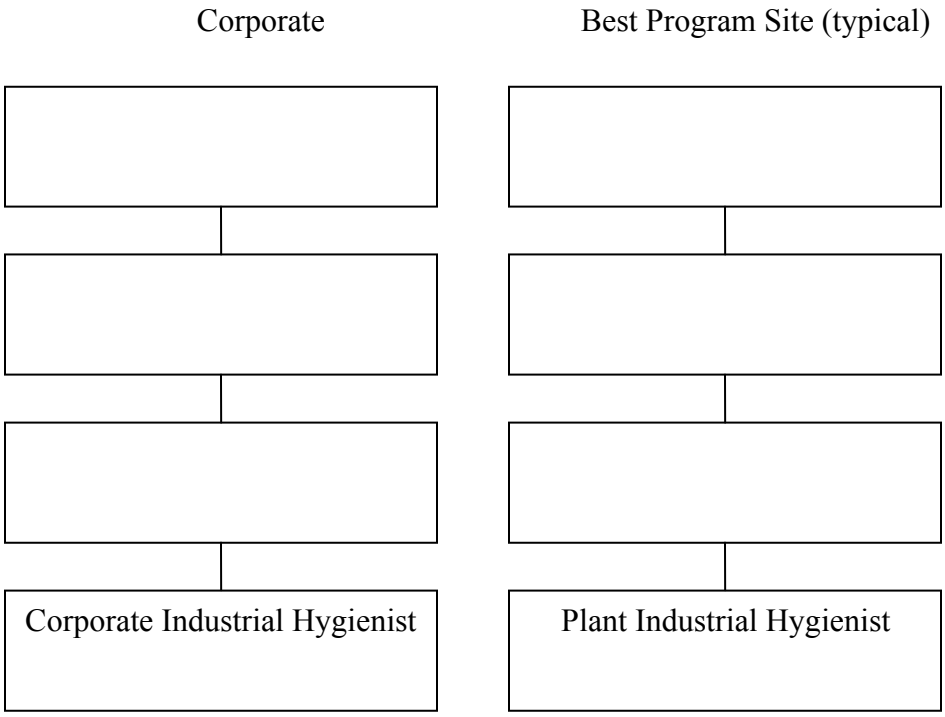
7. Organization:
    a. Number of Industrial Hygienists (Global FTEs)
        i. Corporate _____ # Certified _____
        ii. Best IH Program Site _____ # Certified _____

        Note: Certified in the practice of IH in the country they are employed and not necessarily by the ABIH

Appendix A: Survey I

b. Industrial Hygiene Reporting Structure – three reporting levels

Example



c. Is there a functional or reporting relationship between IH resources at the site level to IH resources at the Corporate level?

Functional □ Reporting □ Both □

Appendix A: Survey I

Section II – IH Management Systems and Program Elements

8. IH Management Systems – Please check off the IH/OH management system elements used by your corporation and by your "best IH program site:"

IH Management System	Best Practice Site	Corporation
i. IH Policy	y/n	y/n
ii. Leadership responsibility and authority		
iii. Employee participation		
iv. Planning		
v. Hazard identification, assessment, and control		
vi. Incident investigation		
vii. Design review and management of change		
viii. Purchasing review		
ix. Contractor IH policy		
x. Emergency preparedness		
xi. Education, training, awareness, and competence		
xii. Communication		
xiii. Records management		
xiv. Auditing		
xv. Management review		

9. Does your company engage in any of the following recognized management systems or processes: (please circle all that apply)

    a. Six Sigma
    b. Lean
    c. Malcolm Baldrige Award
    d. ISO 9000
    e. ISO 14001
    f. OHSAS 18001
    g. ANSI Z-10
    h. OSHA VPP
    i. Others (please specify)

Appendix A: Survey I

10. **IH Program Element Evaluation**

IH Program Element Evaluation					
IH Program Element	**What percentage of total program time is spent on this area? (%)**	**Have cost or improvement studies been conducted on this program? (Yes or no)**	**What are the program goals? (Check all that apply)**		
			Compliance	**Loss Avoidance**	**Excellence**
Risk Assessment					
Chemical Exposure monitoring					
Noise Assessment					
Ergonomics					
Ionizing and/or non-ionizing radiation					
Risk Prioritization					
Risk Control					
Risk Elimination					
Substitution of less hazardous materials operations, processes, or equipment					
Engineering Controls					
Warnings					
Administrative Controls					
Respiratory Protection					
Other Personal Protective Equipment					
Other					

Appendix A: Survey I

11. Has your company implemented a comprehensive Industrial Hygiene Exposure Monitoring Strategy?

12. Does your company maintain a Health Monitoring System database with the following capabilities (yes or no): (Again – what is the definition of a health monitoring system?

13. Is this the Employee Periodic Medical Surveillance Program?) If yes, then does the HMS include the following:

    a. Comprehensive health surveillance data on exposed employees Y/N
    b. Comprehensive health surveillance data on all employees Y/N
    c. Comprehensive industrial hygiene exposure data for all employee exposure groups Y/N
    d. Linkage to complete employee personal information Y/N
    e. Generation of specific data elements on specific employee groups Y/N
    f. Generation of specific data elements on IH exposure groups Y/N
    g. Generation of specific data elements on medical surveillance outcomes Y/N

14. Has your company conducted health studies using the Health Monitoring System? Y/N

Appendix A: Survey I

15. Please describe the metrics that are used to gauge progress in the key IH program areas indicated at your best site and at the corporate level.

IH Program Element	**Describe IH *leading* metrics in use (Best Site; Corporate)**	**Describe IH *trailing* metrics in use (Best Site; Corporate)**
i. Risk Assessment		
ii. Chemical Exposure monitoring		
iii. Noise Assessment		
iv. Ergonomics		
v. Ionizing and/or non-ionizing radiation		
vi. **Risk Prioritization**		
vii. Risk Control		
viii. Risk Elimination		
ix. Substitution of less hazardous materials operations, processes, or equipment		
x. Engineering Controls		
xi. Warnings		
xii. Administrative Controls		
xiii. Respiratory Protection		
xiv. Other Personal Protective Equipment		
xv. Other		

Appendix A: Survey I

Section III – IH Related Cost and Outcome Data

16. Cost related outcome data. For each statement below, please input the letter corresponding to the appropriate statement

    a. The data exist and are releasable for study with strict confidentiality and blinded
    b. Data exist and are not releasable for study, or
    c. The data do not exist

	Best Site	Corporate
a. Annual IH program costs	a, b or c	a, b or c
b. By IH program element		
c. Workers' Compensation Loss Data		
d. Other occupational health related losses – skin diseases, respiratory diseases, diseases from toxic exposures, diseases from physical agents		
e. Non-occupational health-related losses		
f. Health and environmental remediation costs		
g. Long-term occupational health liability costs		

17. Health and exposure-related outcome data. For each statement below, please input the letter corresponding to the appropriate statement

    a. The data exists and are releasable for study with strict confidentiality and blinded, or
    b. The data exist but are not releasable.
    c. The data do not exist

	Best Site	Corporate
a. Employee Exposure Monitoring Data	a, b or c	a, b or c
b. Medical surveillance data		
c. Health monitoring data		
d. Workplace injury and illness data (OSHA, first aid)		

18. Human Resources Outcome Data and Costs. For each statement below, please input the letter corresponding to the appropriate statement

    a. The data exists and is releasable for study with strict confidentiality and blinded, or
    b. The data does not exist but is not releasable for use in the IH value study.
    c. The data does not exist

	Best Site	Corporate
a. Absenteeism Data	a, b or c	a, b or c
b. Hiring Costs – Full-time and replacement workers		
c. Hiring Costs – Part-time and temporary replacement workers		
c. Business and Financial Metrics – Production & Material Costs		
d. Business and Financial Metrics – Payroll and labor costs		

e. Business and Financial Metrics – Cost of poor quality/other quality metrics
f. Business and Financial Metrics – The value of process improvements associated with IH Programs
g. Business and Financial Metrics – Productivity improvements associated with improving IH processes
h. Business and Financial Metrics -

19. Legal Metrics and Costs

	Best Site	Corporate
a. (OSHA) Compliance Citations	a, b or c	a, b or c
b. Type and Costs of Legal Judgments		
c. Type and Costs of Legal Settlements		
d. IH Related Sarbanes-Oxley disclosures		

3. IH Business Case Analysis

a. Has your company conducted business case analysis for IH projects and/or programs? (Yes or no)

b. If so, what types of projects/programs were included in the analyses?
_____

c. What financial metrics were used as part of the analysis?

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d. Was the business case presented to management? (Yes or no)

e. If so, at what levels (check all that apply)

i. Board of Directors
ii. Senior Executive management (corporate)
iii. Middle management (business unit)
iv. First-line management (plant or field)
v. Supervisory

f. Describe the level of effectiveness of the business case in producing the expected results:

Appendix A: Survey I

Section IV – Phase II Study Participation

My company is interested in further participating in Phase II of the Value of the IH Profession Study:

Yes: ☐ No ☐ .

Interested companies will be contacted by an ORC Consultant by mid-December.

Thank for your participation in Phase I of the Value of the IH Profession Project.

Appendix B: List of Companies Responding to Survey I

1. Barr Laboratories, Inc.
2. Baxter Healthcare Corporation
3. BP America Inc.
4. Cabot
5. CITGO Petroleum Corporation
6. Colgate-Palmolive Company
7. Comcast Corporation
8. Consolidated Edison Company of NY
9. Constellation Energy
10. Corning Incorporated
11. Dade Behring Inc.
12. DaimlerChrysler Corporation
13. Disneyland Resort
14. Dow Chemical Company, The
15. Eastman Chemical Company
16. Eaton Corporation
17. Edwards Lifesciences LLC
18. Eli Lilly and Company
19. Entergy Services Inc.
20. Exxon Mobil
21. Ford Motor Company
22. Genentech, Inc.
23. General Motors Corporation
24. GlaxoSmithKline
25. Goodrich
26. Harris Corporation
27. Henkel Corporation
28. Hercules Incorporated
29. Hospira
30. Ingersoll-Rand Company
31. International Paper Company
32. International Truck and Engine Corporation
33. ITT Industries, Inc.
34. Lawrence Livermore National Laboratory
35. Mars Incorporated
36. Phelps Dodge Corporation
37. Philip Morris, USA
38. Praxair, Inc.
39. Saint-Gobain Containers
40. Sunoco, Inc.
41. Textron, Inc.
42. The Hershey Company
43. TRW Automotive
44. Tyco Healthcare-Mallinckrodt Division
45. United Technologies Corporation
46. Verizon

Appendix C: Participating Companies

1. Altairnano
2. Barr Laboratories, Inc.
3. BASF
4. BP America Inc.
5. Consolidated Edison Company of NY
6. DaimlerChrysler
7. Dow Chemical Company
8. E. I. DuPont de Nemours & Company, Inc.
9. Eastman Chemical Company
10. Eaton Corporation
11. Eli Lilly and Company
12. Exxon Mobil
13. General Motors Corporation
14. GlaxoSmithKline
15. Hospira
16. International Paper Company
17. International Truck and Engine Corporation
18. Pfizer, Inc.
19. Praxair, Inc.
20. Textron, Inc.
21. United Technologies Corporation
22. Verizon

Appendix D: Industrial Hygiene Metrics

Risk Assessment Metrics

Leading - Best IH Program Site	Trailing.-. Best IH Program Site
% Risk Assessment complete Audits scores Field time Web-based compliance training Qualitative Exposure Assessment (QEA) Process Hazard Analyses completed vs. scheduled Risk Priority Number (RPN) IH Assessments to corporate Sampling plan completed Job Hazard Analysis Development Design reviews for new processes & facilities Management system scores	Injury reduction % Overexposure Reviews & assessments % Chemicals assessed vs. scheduled DART Fleet accident rate QEA MM Audit scores Survey results Worker Comp. cases & issues
Leading – Corporate	**Trailing - Corporate**
% Risk Assessment completed vs. scheduled % complete sampling plan Inspections/observations Web-based compliance training QEA Project Hazard Assessments completed Risk Priority Rating Job Hazard Assessments (JHAs) Internal & external audit results QEA before installation Corrective/preventative actions completed on time SOP's updated	OSHA injury & illness rates Injury reduction Health-related incidents % overexposure % of chemical exposures to be assessed DART Fleet accident rate QEA Monitoring Module Investigations to root cause Finding tracked to complete Accident trending Number of samples below OEL, Action Level Ergonomic reviews Testing upon installation & use

Chemical Exposure Monitoring Metrics

Leading - Best IH Program Site	Trailing.-. Best IH Program Site
Data collection Execution of Annual Sampling Plan QEA Exposure Risk Priority Number (RPN) Change management performance Chemical inventory Completion of planned studies (%) Hazardous Material Control Program implementation Annual notifications Process change notifications Exposure Assessments completed IAQ levels w/acceptable ratings (%)	Track symptoms reported OSHA Injury/Illness rates Sampling due to complaints QEA Occupational illnesses Report turnaround time Histogram of exposure judgments Number of samples below OEL, Action Level Number of samples exceeding OEL, Action Level Auditing of programs based on incident review Reduction in employees exposed % assessments complete Testing on installation & use
Leading – Corporate	**Trailing - Corporate**
Audits Observation Collaboration PELs QEA Exposure Risk Priority Number Change management performance Chemical inventory Monitoring results % Completion of planned studies Hazardous material control program implementation % completion of exposure monitoring plan Exposure levels against ACGIH IAQ levels w/acceptable ranges	Assessments OSHA injury & illness rates % Monitoring completed QEA Occupational illnesses Report turnaround time Histogram of exposure judgments # of samples that exceed the AL Survey results Auditing of effectiveness of programs based on incident review Reduction in number of exposed employees % qualitative and/or quantitative assessments completed Testing on installation & use

Radiation Metrics

Leading - Corporate	Trailing - Corporate
Audits/observations NRC Exposure Guidelines QEA Number of scheduled activities completed on time Program Assessment completions Site surveys Training/awareness Radiation safety & dosimeter monitoring	Assessments OSHA injury & illness rates QEA Dosimetry records Incidents or Notices of Violation for ionizing radiation Inspection result – non issue Evaluation of leaks based on incident reviews Investigate radiation concerns
Leading – Best IH Program Site	**Trailing - Best IH Program Site**
Checklist completed Inspections/observations QEA completion Completed wipe tests/required Number of scheduled activities completed on time Audit findings Assessment completion Training/awareness for employees Pre-estimation	OSHA injury & illness rates recordkeeping/OSHA QEA Dosimetry records Readings below PEL, TLV Incidents or Notices of Violation for ionizing radiation Evaluation of exposures on dosimetry badges Evaluation of leaks based on incident reviews Number of sources identified Geiger counter survey when installing equipment

Risk Prioritization Metrics

Leading - Corporate	Trailing - Corporate
Planning Hazard & Risk Assessment (HRA) rankings QEA Risk analyses Matrix of health effects & exposure risk Air sampling plan completion Aspects & impacts risk mapping Management meetings to identify risk mitigation Reduction in incidents Mgmt system audit score	Assessments OSHA injury & illness rates Sampling plan completion QEA Audit performance Failure to achieve injury & illness reduction Hazard and risk ratings
Leading – Best IH Program Site	**Trailing - Best IH Program Site**
Completion of annual action plans Compliance tasks in compliance mgt system Planning All jobs w/ risk prioritization reviewed w/employees QEA Annual risk review/prioritization Matrix of health effects & exposure risk Air sampling plan completion Engineer out risks Management meetings to ID how risks are mitigated Reduction in incidents	Action item closure OSHA Injury & illness rates QEA Top 3 injury & illness reduction Actions based on incidents Failure to achieve injury & illness reduction Hazard & risk ratings

Risk Control Metrics

Leading – Corporate	Trailing - Corporate
% Overexposed Planning Communications Engineering Controls & Cost Workplace Exposure Improvement Score (WEIS) Air sample plan completion Response time to open items Implementation of risk minimization programs Reduction of incidents Controls implementation before exposure Management system audit score	% overexposed OSHA injury & illness rates % samples above 50% OEL where control actions taken Audit performance Completion of open items Response to incidents causing injury or Damage Controls implemented due to exposure
Leading - Best IH Program Site	**Trailing - Best IH Program Site**
% Overexposed Planning/training Training/communications Workplace exposure improvement index/score [WEIS] Air sample plan completion Implementation of risk minimization programs Reduction in incidents	Work order system to correct issues % overexposed Assessments OSHA injury & illness rates Audit performance Response to incidents causing injury or Damage Audits Key Performance Indicators (KPIs) IH program implementation

Risk Elimination Metrics

Leading – Best IH Program Site	Trailing - Best IH Program Site
Planning Number & type of exposure control projects Design review, supplier & equipment buyoff Chemical Reviews Job Hazard Analysis Ops mtgs. Safety incident log	OSHA injury & illness rates Time to complete resolution Exposure – related illness Histogram of exposure judgments Incident reviews Cost determination & reduction surveys
Leading - Corporate	**Trailing - Corporate**
Planning Workplace Exposure Improvement Score (WEIS) Number & type of exposure control projects Design review, supplier and equip. buyoff Hazards eliminated in design process	Assessments OSHA injury & illness rates Time to complete resolution Injury & I1lness Trending Histogram of exposure judgments Incident reviews

Hazard Substitution Metrics

Leading – Best IH Program Site	Trailing - Best IH Program Site
Planning Workplace Exposure Improvement Score (WEIS) Hazardous Material Control program implementation Evaluations prior to process change Formal chemical reviews	OSHA injury & illness rates Time to complete resolution Exposure-related illnesses/complaints Reduced purchase of hazardous materials Formal chem. review Number of raw materials in use
Leading - Corporate	**Trailing - Corporate**
Planning Hazard comparison Hazardous Material Control program implementation Material reviews prior to use	Assessments OSHA injury & illness rates Time to complete resolution Injury & I1lness Trending Reduced purchase of hazardous materials Trends in Inspection Results

Engineering Control Metrics

Leading - Best IH Program Site	Trailing.-. Best IH Program Site
Completion of recommended controls Resurvey areas where controls added Planning Life safety systems, installation of engineering controls WEIS Process changes against process change evaluations Reduction in exposure potential Ventilation surveys performed/required Preventative maintenance for effectiveness Design review, supplier & equipment buy-off Number of planning documents reviewed & formalized	OSHA injury & illness rates Time to complete resolution Exposure-related illnesses/complaints Actions based on incidents Number of follow-ups after the fact
Leading – Corporate	**Trailing - Corporate**
Planning Auditing WEIS Design review; supplier & equipment buy-off Action register Life safety systems—installation of engineering controls prior to tool installs Engineering controls in design stage Reduction in exposure potential	Assessments OSHA injury & illness rates Time to complete resolution Exposure related illnesses/complaints Actions based on incidents Engineering controls due to exposure Number of follow-ups after the fact Cost determination & reduction surveys

Warnings Metrics

Leading - Best IH Program Site	Trailing.-. Best IH Program Site
Planning Training Inspections Observations Workplace Exposure Improvement Score (WEIS) Training completed vs. required Design review; supplier & equipment buy-off Audit results Determination of hazard warnings during planning of tool installations, hazard communication & fabrication operations training	OSHA injury & illness rates Time to complete resolutions Actions based on incident reviews
Leading – Corporate	**Trailing - Corporate**
Planning Auditing Workplace Exposure Improvement Score (WEIS) Design review; supplier & equipment buy-off Warnings in place at start of operations	Assessments OSHA injury & illness rates Time to complete resolutions Actions based on incident reviews Warnings implemented due to exposure Cost determination & reduction surveys

Administrative Control Metrics

Leading - Best IH Program Site	Trailing.-. Best IH Program Site
WEIS Design reviews Pre-planning Design to make controls unnecessary Reduction in exposure potential	OSHA injury & illness rates Time to complete resolutions Exposure – related illnesses/complaints Incident reviews
Leading – Corporate	**Trailing - Corporate**
Design review Pre-planning Design to make controls unnecessary Reduction in exp. pot.	OSHA injury & illness rates Time to complete resolutions Compliance Incident reviews Controls implemented due to exposures Cost determination & reduction surveys

Respiratory Protection Metrics

Leading - Best IH Program Site	Trailing.-. Best IH Program Site
Annual survey Track fit tests Planning Training Inspections Observations WEIS Fit tests performed vs. required Hazardous Material Control Program implementation Frequent monitoring of Action Level PPE elimination Percent using respiratory protection Review of PPE matrix	OSHA injury & illness rates Time to complete resolutions Exposure – related illnesses/complaints Number of respiratory protection equipment wearers Pulmonary Function Tests Incident review to determine program effectiveness Employees turned away at crib
Leading – Corporate	**Trailing - Corporate**
Planning Auditing WEIS Hazardous material control program implementation Audit Monitoring requirements, training, etc. Review of PPE matrix Annual survey	Assessments OSHA injury & illness rates Time to complete resolution Compliance Incident review to determine program effectiveness Exposures where respiratory protection required Cost determination & reduction surveys Number of respirator users % training completed % users validated

Other PPE Metrics

Leading - Best IH Program Site	Trailing.-. Best IH Program Site
Standard Threshold Shifts for hearing protection control Planning Training Inspections Observations WEIS Hazardous Material Control Program implementation Failure of protective measures - determined by audits PPE Elimination % using PPE matrix & review of PPE needed	OSHA injury & illness rates Time to complete resolution Exposure – related illnesses/complaints Medical testing Compliance Incident review to determine program effectiveness % PPE Assessments completed
Leading – Corporate	**Trailing - Corporate**
Planning Auditing WEIS Hazardous Material Control Program implementation Audits PPE matrix & review of PPE needed PPE requirements established before exposure	Assessments OSHA injury & illness rates Time to complete resolution Compliance Incident review to determine program effectiveness PPE requirements implemented due to exposure Cost determination & reduction surveys

Other IH Metrics

Leading - Best IH Program Site	Trailing.-. Best IH Program Site
Management involvement meetings Training completion Wellness – interventions & Health Risk Assessments (HRAs) Number of findings tracked to closure Management systems score	
Leading – Corporate	**Trailing - Corporate**
Wellness – interventions & Health Risk Assessments (HRAs) Internal health & safety audit scores Audits performed vs. scheduled Time to closure Overdue recommendations Management systems score	DART TRIR Reduce the number of samples that are > 50% of OEL

Appendix E.
Past Experience Using Selected Strategy Elements in ROHSEI

Case Study Validation 1: MSDS Software Case

The ROHSEI case study determined the value of implementing MSDS software for the purpose of authoring, maintaining and distributing MSDSs in the work place. There were three possible scenarios:

1. Industry accepted software run internally
2. Federal sector software run internally
3. Outsourced solution

The MSDS program incorporated six elements with defined costs for each step. The value of an MSDS program includes the financial benefits associated with reduction of risk and improvement of the business process. Incorporating these elements enabled a full accounting of how the investment in running an internal MSDS program could improve the business process.

The case study used "Design and Engineering Personnel Time" to calculate total operating costs within the data element "design and engineering" in the quantitative tool.

The case study used "EHS Personnel Time" to calculate what would be considered the total operating costs within the data element "IH and safety staff time spent on managing the risk" and within the data element "process/steps/motion" in the quantitative tool.

The case study used "EHS Supplies" to calculate total operating costs within the data element "IH Supplies" and "Maintenance costs" in the quantitative tool.

The case study used "Operational Personnel Time" to calculate total operating costs within the data element "Operational Personnel Time" in the quantitative tool.

The case study used "Training" to calculate total operating costs within the data elements "training and meetings" in the quantitative tool.

The company used "Vendors, Consultants and Contract Labor" to calculate total operating costs within the data elements "Vendors, Consultants and Contract Labor" in the quantitative tool.

The MSDS software case study indicated:

The users had access to the data.
The users understood the elements.
The users understood the elements over time.
Different users understood the elements.
The users were able to calculate the value associated with the various project scenarios.

Case Study Validation 2: Integrated Health

The ROHSEI case study determined the value of implementing onsite occupational health clinics at every site for the purpose of decreasing off-site doctors' office visits and reducing the cost of medical management of Workers' Compensation and Short-Term Disability cases. The investment was intended to increase the overall productivity of employees and improve overall health.

The integrated health program incorporated three elements with defined costs for each step. The value of an integrated health program includes the financial benefits associated with reduction of risk, improvement of the business process and improved employee health. The incorporation of these elements enabled a full accounting of how investment in an internal integrated health care management program could improve the business process.

The case study used "Medical Costs and Insurance" to calculate the total cost of occupational illnesses and injuries within the data element "Average medical costs of occupational injury/illness cases associated with the hazard(s)" in the quantitative tool. Reduction in these costs was equated to improved employee health.

The case study used "Other Personnel Time" to calculate total operating costs within the data element "other personnel time spent on managing the risk" in the quantitative tool.

The case study used "Operational Personnel Time" to calculate the total operating costs within the data element "operational Personnel Time" in the quantitative tool..

The company used "Vendors, Consultants and Contract Labor" to calculate total operating costs within the data elements "Vendors, Consultants and Contract Labor" in the quantitative tool.

The Integrated Health case study indicated:

The users had access to the data.
The users understood the elements.
The users understood the elements over time.
Different users understood the elements.
The users were able to calculate the value associated with the various project scenarios.

Case Study Validation 3: Noise Reduction

The ROHSEI case study determined the value of investment in engineering controls to reduce noise levels. By installing line braces and reinforcement structures, the company was able to minimize vibration and ultimately reduce noise levels. The noise reduction program incorporated 18 elements with defined costs for each step. The value of a noise reduction program includes the financial benefits associated with reduction of risk, improvement of the business process and improved employee health. The incorporation of these elements enabled a full accounting of the costs of investment in risk reduction and the resulting improvement in the business process to be included as part of the value calculation. The company took into account the following elements in the ROHSEI analysis:

1. Business Interruption Insurance
2. Design and Engineering Personnel Time
3. EHS Personnel Time
4. EHS Supplies
5. Emergency Response
6. Fines and Penalties
7. Legal Fees, Workers Comp & Settlements
8. Loss of Raw Materials, Product
9. Material Recovery
10. Material Substitution
11. Medical Costs and Insurance
12. Noise Reduction- Lost Sales
13. Operational Personnel Time
14. Operations and Maintenance
15. Other Personnel Time
16. Production Downtime
17. Property Damage Insurance
18. Vendors, Consultants and Contract Labor

The case study used "EHS Personnel Time" to calculate total operating costs within the data elements "IH and safety staff time spent on managing the risk" and "process/steps/motion" in the quantitative tool.

The case study used "Design and Engineering Personnel Time" to calculate total operating costs within the data element "design and engineering" in the quantitative tool.

The case study used "Legal Fees, Workers' Compensation & Settlements" to calculate what would be considered the total non-medical costs of incidents within the data element "Internal and external legal fees, workers' compensation and settlements" in the quantitative tool.

The case study used "Medical Costs and Insurance" to calculate total cost of occupational illnesses and injuries within the data element "Average medical costs of occupational injury/illness cases associated with the hazard(s)" in the quantitative tool.

The Noise Reduction case study indicated:

The users had access to the data.
The users understood the elements.
The users understood the elements over time.
Different users understood the elements.
The users were able to calculate the value associated with the various project scenarios.

Case Study Validation 4: In-House Versus Contract Manufacturing

The ROHSEI case study examined the costs associated with two scenarios of manufacturing a new product in house versus using a contract manufacturer. The material to be manufactured had significant toxicity and would require specialized handling at either an internal or contract facility. The three scenarios considered were:

1. Manufacture in-house with PPE for operator protection
2. Manufacture in-house with engineering controls for operator protection
3. Manufacture at a third party contract manufacturing location

The analysis utilized seven elements to define the costs and benefits associated with each of the scenarios.

To manufacture in house, specialized equipment was required to be purchased and installed in order to contain the hazardous product and ensure an adequate level of employee protection. "Equipment Purchase" was the parameter used to account for the cost of the equipment. The company also captured the "Equipment Installation" to account for the cost of preparing the equipment for operation.

Once the equipment was ready for operation the company would conduct manufacturing trials where product was manufactured in the new process and validated as meeting acceptable quality standards. The cost of conducting the validation trials with its associated labor and material impacts was captured as "Internal Manufacturing Runs".

Manufacturing conducted at a third party location would also require validation trials for which the company would be financially responsible. These costs were captured in the parameter "3rd Party Manufacturing Runs".

The company also accounted for the additional cost of "Personal Protective Equipment" under the scenario that allowed for in-house manufacturing but with a less contained process, thus allowing higher levels of airborne exposure to employees.

In the contract manufacturing scenario the intermediate product would be manufactured off-site but would be shipped back to the owner for further processing. The company captured these costs as "Shipping" expenses.

The in-house versus contracting case study indicated:

The user had or was able to develop or collect the data.
The user understood or was able to create the data elements.
The user understood the elements during the course of the study.
Different project team participants understood the elements.
The project team was able to calculate the value associated with the various project scenarios.

Case Study Validation 5: Need for Machine Replacement

The ROHSEI case evaluated the options associated with keeping, repairing or purchasing a type of production equipment. The study looked at the cost of the options but also considered the potential reduction in injuries associated with the existing equipment as a potential benefit associated with the final decision. Three scenarios were considered:

1. Continue to use the existing machines
2. Upgrade the existing equipment
3. Purchase new replacement equipment

The company identified the "Average Incident Cost" associated with accidents which had occurred on or around the existing equipment. They also estimated the potential reduction in the number of incidents associated with each of the three scenarios.

The new machines require fewer employees to operate the equipment and the company captured the associated employee costs as "Direct Labor". Likewise each equipment scenario requires additional levels of maintenance and other support which the company calculated as "Indirect Labor".

The reliability and maintainability of the equipment also varies by scenario. The case study used "Production Downtime" to capture the costs associated with the product activity that was lost due to the equipment being unavailable due to maintenance and repair.

The equipment in each scenario had differing rates of generating scrap. The case study used "Scrap Costs" to capture the cost of the amount of wasted product from the machines in each scenario.

Because of the accidents that have occurred on the equipment, the company has had to resort to using "Temporary Labor" to replace injured workers.

The Machine Replacement case study indicated:

The users had access or were able to obtain or develop the necessary data.
The users understood the data elements.
The users understood the elements over time.
The different members of the protect team understood the elements.
The users were able to calculate the value of the elements associated with the various project scenarios..

Case Study Validation 6: Personal Protective Equipment versus Containment

The ROHSEI case study determined the value of using alternative means of containment compared to the use of personal protective equipment. There were three possible scenarios evaluated to ensure employee protection:

1. Continue the use of Personal Protective Equipment
2. Invest in a Flexible Containment System
3. Invest in Local Exhaust Ventilation

The company identified the elimination of the "Cost of Personal Protective Equipment" as a potential benefit of investment in engineering controls. The investment would result in both an improved business process and a reduced level of risk.

As part of the analysis of possible process changes, alternative methods of managing dust associated with potent compounds were evaluated. The parameters "Continuous Liner" and "Standard Drum Bag" were associated with operational steps in the various scenarios which described improvements in the business process.

By considering alternatives to the current operation, the study showed it would be possible to eliminate or significantly reduce the parameter "Cleaning Labor" which would result in an improvement in the business process.

A parameter "Flexible Enclosure" described the cost of the equipment associated with one scenario. It was designed to improve the business process.

The company identified that additional "Maintenance" was required by the containment projects. This cost was incorporated into the overall calculation of the investment required to implement the alternative.

The personal protective equipment versus containment case study indicated:

The users had access or could acquire the data.
The users understood the data elements.
The users understood the data elements over time.
Different users on the project team understood the elements.
The project team was able to calculate the value contributed by the data elements.

Case Study Validation 7: Tyvek Recycling

The ROHSEI case study determined the value of recycling the company's Tyvek suits and booties after use rather than outsourcing their destruction through incineration.

The Tyvek Recycling program incorporated two new elements with defined costs for each step. The value of a Tyvek recycling program includes the financial benefits associated with reduction of risk and improvement of the business process.

The case study used "Recycling" to calculate total operating costs within the data element "waste collection, disposal and recycling cost" in the quantitative tool.

The case study used "Waste Disposal" to calculate total operating costs within the data elements "Environmental Emissions" or "Hazardous waste management and treatment costs" or "waste collection, disposal and recycling costs" in the quantitative tool.

The Tyvek Recycling case study indicated:

The users had access to the data.
The users understood the elements.
The users understood the elements over time.
Different users understood the elements.
The users were able to calculate the value associated with the various project scenarios.

Case Study Validation 8: Pharmaceutical Handling

The ROHSEI case study determined the value of installing material handling equipment in a pharmacy for the purpose of reducing the number of injuries and increasing productivity.

The Material Handling Program incorporated six elements with defined costs for each step. The value of a Material Handling Program includes the financial benefits associated with reduction of risk and improvement of the business process. The incorporation of these elements enabled a full accounting of the effect of investment in risk reduction on operating costs and the resulting improvement in the business process to be included as part of the value calculation.

The case study used "Legal Fees, Workers' Compensation & Settlements" to calculate the total non-medical costs of incidents within the data element "Internal and external legal fees, workers' compensation and settlements" in the quantitative tool.

The company used "EHS Personnel Time" to calculate what would be considered the total operating costs within the data element "IH and safety staff time spent on managing the risk" and within the data element "process/steps/motion" in the quantitative tool.

The company used "Lost Work (Sick) Time" to calculate total non-medical cost of incidents within the data element "Labor" in the quantitative tool.

The company used "Medical Costs and Insurance" to calculate total cost of occupational illnesses and injuries within the data element "Average medical costs of occupational injury/illness cases associated with the hazard(s)" in the quantitative tool.

The company used "Production Downtime" to calculate total operating costs within the data elements "Delay Time" in the quantitative tool.

The company used "Productivity" to calculate total operating costs within the data elements "Process Flow" in the quantitative tool. The incorporation of these elements showed how the business process could be improved with installation of material handling equipment.

The Pharmaceutical Handling case study indicated:

The users had access to the data.
The users understood the elements.
The users understood the elements over time.
Different users understood the elements.
The users were able to calculate the value associated with the various project scenarios.

Case Study Validation 9: Emergency Spill Team

The ROHSEI case study determined the value of outsourcing labor rather than keeping an in-house team for the purpose of improving the company's spill response within their manufacturing operations and laboratory activities. There were three possible scenarios:

1) Reducing the team to eight employees to cover the day shift only.
2) Reducing the team to four employees (a minimum of two employees required and two back-ups).
3) Outsourcing.

The analysis for the first two scenarios was completed in two ways - with in-house labor and outsourced labor.

The Emergency Spill Team Program incorporated eight elements with defined costs for each step. The value of the program includes the financial benefits associated with reduction of risk and improvement of the business process.

The case study used "Spill Response Labor" and "Payment for Spill Response" to calculate total non-medical cost of incidents within the data element "emergency response" in the quantitative tool. .

The case study used "Hydrostatic Testing" to calculate total operating costs within the data elements "Operations and Maintenance Costs" and "Cost of ongoing preventive maintenance for IH purposes" in the quantitative tool.

The case study used "SCBA Air Switch Out" and "Spill Equipment Supplies" to calculate total operating costs within the data element "IH Supplies" and "Maintenance costs" in the quantitative tool.

The case study used "Medical Exam" to calculate total operating costs within the data element "Medical Surveillance Costs" in the quantitative tool.

The case study used "Training" to calculate total operating costs within the data elements "training and meetings" in the quantitative tool.

The MSDS Software case study indicated:

The users had access to the data.
The users understood the elements.
The users understood the elements over time.
Different users understood the elements.
The users were able to calculate the value associated with the various project scenarios.

Case Study Validation 10: Bottled Water

The ROHSEI case study determined the value of implementing a program for bottling water for emergency use in a shipyard for the purpose of reducing costs associated with purchasing bottled water. There were three possible scenarios:

1. Purchase bottled water
2. Bottle company water in building
3. Bottle company water in trailer

The Bottled Water Program incorporated seven elements with defined costs for each step. The value of the program includes the financial benefits associated with reduction of risk and improvement of the business process.

The company used “Bottled Water” to calculate total non-medical cost of incidents within the data element “Loss of Raw Materials or Product” in the quantitative tool.

The company used “Bottling Materials” and “Packaging Supplies” to calculate total operating costs within the data element “Maintenance Costs” in the quantitative tool.

The company used “Sanitation Supplies” to calculate total operating costs within the data element “IH Supplies” and “Maintenance costs” in the quantitative tool.

The company used “Trailer Rent” and “Trailer Setup” to calculate total capital costs within the data element “Equipment” in the quantitative tool..

The company used “Utilities and Piping” to calculate what would be considered the total capital costs within the data elements “Installation” in the quantitative tool.

The Bottled Water case study indicated:

The users had access to the data.
The users understood the elements.
The users understood the elements over time.
Different users understood the elements.
The users were able to calculate the value associated with the various project scenarios.

Table E-1. AIHA Value of the Profession Data Element Analysis Matrix.

AIHA Value of the Profession Data Element Analysis Matrix						
QUANTITATIVE ELEMENTS	**DATA ELEMENTS**					
CASE STUDY: COMPANY B	**Health**	**Risk Management**				
Data Element Criterion	Total Cost of Occupational Illnesses or Injuries	Total Capital Costs	Total Operating Costs	Total Medical Surveillance Costs	Total Other Costs Related to the Current Method of Managing the Risks	Total Non-Medical Costs of Incidents
1. Is the element the right one for the model?	Company B would have incorporated the element by number/type and costs. However, there were no costs associated with occupational illnesses documented in this case study.	Company B incorporated the element by equipment costs.	Company B incorporated the element by expressing the changes in various sub-elements. For example, operational (non-IH) personnel costs included training and IH assessment were eliminated during and after the intervention.	Company B did not use this element for the analysis.	Company B did not use this element for the analysis.	Company B did not use this element for the analysis.
2. Are its key sub elements listed correctly?	Company B found no costs associated with occupational illnesses, therefore no costs were documented in this case study.	Company B considered these costs to be one time charges for implementing the IH intervention.	Company B was able to distinguish between operational (Non-IH) time, IH safety staff time, other time, and consultant time. They were then able to show the differences between these sub-categories before, during and after the intervention.	Company B did not use this element for the analysis.	Company B did not use this element for the analysis.	Company B did not use this element for the analysis.
3. Is it correctly named? Will the users know what it means?	Cannot be determined.	Company B was able to determine the type of cost data necessary for the element.	Company B was able to determine the type of cost data necessary for the element, according to time spent within operational (Non-IH) time, IH safety staff time, other time, and consultant time.	Company B did not use this element for the analysis.	Company B did not use this element for the analysis.	Company B did not use this element for the analysis.
4. Is it adequately defined, so that consistent answers will be given by different users?	Cannot be determined.	Company B provided capital costs incurred during the intervention.	Company B provided operating cost data based on time spent within the various sub-elements. The sub-elements do not allow for double-counting, providing a consistent basis for data collection. Each category is defined so users will know what costs to include and exclude.	Company B did not use this element for the analysis.	Company B did not use this element for the analysis.	Company B did not use this element for the analysis.
5. Will it be consistently interpreted over time?	Cannot be determined.	Company B only provided capital costs incurred during the intervention. However, they may have considered these costs to be the same type of elements and sub-elements that would be needed for other types of retrospective and prospective analysis.	Company B considered operating costs to include the same type of elements and sub-elements that would be needed for retrospective and prospective analysis.	Company B did not use this element for the analysis.	Company B did not use this element for the analysis.	Company B did not use this element for the analysis.

AIHA Value of the Profession Data Element Analysis Matrix						
QUANTITATIVE ELEMENTS	**DATA ELEMENTS**					
CASE STUDY: COMPANY C	**Health**	**Risk Management**				
Data Element Criterion	Total Cost of Occupational Illnesses or Injuries	Total Capital Costs	Total Operating Costs	Total Medical Surveillance Costs	Total Other Costs Related to the Current Method of Managing the Risks	Total Non-Medical Costs of Incidents
1. Is the element the right one for the model?	Company C incorporated the element by costs associated with medical staff and facilities for medical screenings and IH monitoring/testing.	Company C incorporated the element by equipment and installation costs. Pre-intervention capital costs were higher than post-intervention capital costs.	Company C incorporated the element by expressing the changes in the various sub-elements. For example, pre-intervention costs included PPE, training, housekeeping, meetings and other IH personnel time.	Company C incorporated the element by addressing costs of medical staff, facilities, supplies and IH monitoring/testing.	Company C did not use this element for the analysis.	Company C did not use this element for the analysis.
2. Are its key sub elements listed correctly?	Company C considered number/type of illnessess however, data was not provided for further sub-elements. Medical costs were considered through processing and doctor's fees.	Company C considered these costs to be routine expenses for ventilation equipment and installation.	Company C was able to distinguish between operational (Non-IH) time, IH safety staff time, other time, IH supplies, and operations/maintenance. They were then able to show the differences between these sub-categories before, during and after the intervention.	This element is a sub-element itself under Total Operating Costs, but has been culled out to show its importance in the analysis. Therefore, the criteria question in not relevant.	Company C did not use this element for the analysis.	Company C did not use this element for the analysis.
3. Is it correctly named? Will the users know what it means?	Company C was able to determine the type of cost data that would belong within this element.	Company C was able to determine the type of cost data that would belong within this element.	Company C was able to determine the type of cost data necessary for the element, according to time spent within operational (Non-IH) time, IH safety staff time, other time, IH supplies and operations/maintenance.	Company C was able to determine the type of cost data necessary for the element.	Company C did not use this element for the analysis.	Company C did not use this element for the analysis.
4. Is it adequately defined, so that consistent answers will be given by different users?	Company C provided fact based (consistent) data of costs associated with medical staff and facilities for medical screenings and IH monitoring/testing.	Company C provided cost data specific to this intervention analysis. However, fact-based, consistent cost data would be used for other types of analysis as well.	Company C provided operating cost data based on time spent within the various sub-elements. The sub-elements do not allow for double-counting, providng a consistent basis for data collection. Each category is defined so users will know what costs to include and exclude.	Company C provided medical surveillance cost data based on operating costs.	Company C did not use this element for the analysis.	Company C did not use this element for the analysis.
5. Will it be consistently interpreted over time?	Company C considered the elements to be sufficient for collecting data on occupational illness costs neccessary for retrospective and prospective analysis.	Company C considered these costs to be the same type of elements and sub-elements that would be needed for retrospective and prospective analysis.	Company C considered operating costs to include the same type of elements and sub-elements that would be needed for retrospective and prospective analysis.	Company C considered medical surveillance costs to include the same type of elements that would be needed for retrospective and prospective analysis.	Company C did not use this element for the analysis.	Company C did not use this element for the analysis.

AIHA Value of the Profession Data Element Analysis Matrix						
QUANTITATIVE ELEMENTS	**DATA ELEMENTS**					
CASE STUDY: COMPANY D	**Health**	**Risk Management**				
Data Element Criterion	Total Cost of Occupational Illnesses or Injuries	Total Capital Costs	Total Operating Costs	Total Medical Surveillance Costs	Total Other Costs Related to the Current Method of Managing the Risks	Total Non-Medical Costs of Incidents
1. Is the element the right one for the model?	Company D incorporated the element by number/type of ergonomic illnesses.	Company D incorporated the element by equipment costs.	Company D incorporated the element by expressing the changes in various sub-elements. For example, pre-intervention costs included PPE, IH assessment, IH monitoring, IH recordkeeping, and IH supplies, which were reduced post- intervention.	Company D did not use this element for the analysis.	Company D did not use this element for the analysis.	Company D did not use this element for the analysis.
2. Are its key sub elements listed correctly?	Company D considered recordable ergo cases and costs per case.	Company D considered these costs to be routine expenses for the intervention.	Company D was able to distinguish between operational (Non-IH) time, IH safety staff time, and IH supplies. They were then able to show the differences between these sub-categories before and after the intervention	Company D did not use this element for the analysis.	Company D did not use this element for the analysis.	Company D did not use this element for the analysis.
3. Is it correctly named? Will the users know what it means?	Company D was able to determine the type of cost data belonging in this element based on average cost and number of illnesss.	Company D was able to determine the type of cost data necessary for the element.	Company D was able to determine the type of cost data necessary for the element, according to time spent within operational (Non-IH) time, IH safety staff time, and IH supplies	Company D did not use this element for the analysis.	Company D did not use this element for the analysis.	Company D did not use this element for the analysis.
4. Is it adequately defined, so that consistent answers will be given by different users?	Company D provided fact based (consistent) data of cost and number/type of illness.	Company D provided the same cost data for during and after the intervention.	Company D provided operating cost data based on time spent within the various sub-elements. The sub-elements do not allow for double-counting, providng a consistent basis for data collection. Each category is defined so users will know what costs to include and exclude	Company D did not use this element for the analysis.	Company D did not use this element for the analysis.	Company D did not use this element for the analysis.
5. Will it be consistently interpreted over time?	Company D considered the elements to be sufficient for collecting data on occupational illness costs neccessary for retrospective and prospective analysis.	Company D considered these costs to be the same type of elements and sub-elements that would be needed for retrospective and prospective analysis.	Company D considered operating costs to include the same type of elements and sub-elements that would be needed for retrospective and prospective analysis.	Company D did not use this element for the analysis.	Company D did not use this element for the analysis.	Company D did not use this element for the analysis.

AIHA Value of the Profession Data Element Analysis Matrix						
QUANTITATIVE ELEMENTS	**DATA ELEMENTS**					
CASE STUDY: COMPANY E	**Health**	**Risk Management**				
Data Element Criterion	Total Cost of Occupational Illnesses or Injuries	Total Capital Costs	Total Operating Costs	Total Medical Surveillance Costs	Total Other Costs Related to the Current Method of Managing the Risks	Total Non-Medical Costs of Incidents
1. Is the element the right one for the model?	Company E incorporated the element by number/type of illnesses and average costs of illnessess over 5 years.	Company E did not use this element for the analysis.	Company E incorporated the element by expressing the changes in the various sub-elements. For example, pre-intervention costs included monitoring, meeting, IH planning, design/engineering, maintenance/janitorial and operations/maintenance costs	Company E incorporated the element by addressing annual cost of medical staff, facilities, supplies and IH monitoring/testing.	Company E did not use this element for the analysis.	Company E did not use this element for the analysis.
2. Are its key sub elements listed correctly?	Company E considered number/type of illnesses, average costs and the cost of medical staff and facilities for screening and IH monitoring/testing.	Company E did not use this element for the analysis.	Company E was able to distinguish between operational (Non-IH) time, IH safety staff time, other time, IH supplies, and operations/maintenance. Company E was then able to show the differences between these sub-categories before, during and after the intervention	This element is a sub-element itself under Total Operating Costs, but has been culled out to show its importance in the analysis. Therefore, the criteria question in not relevant.	Company E did not use this element for the analysis.	Company E did not use this element for the analysis.
3. Is it correctly named? Will the users know what it means?	Company E was able to determine the type of cost data that would belong within this element.	Company E did not use this element for the analysis.	Company E was able to determine the type of cost data necessary for the element, according to time spent within operational (Non-IH) time, IH safety staff time, other time, IH supplies and operations/maintenance	Company E was able to determine the type of cost data necessary for the element.	Company E did not use this element for the analysis.	Company E did not use this element for the analysis.
4. Is it adequately defined, so that consistent answers will be given by different users?	Company E provided fact based (consistent) data of costs associated with number/type of illnesses and medical costs. Users will collect fact-based data.	Company E did not use this element for the analysis.	Company E provided operating cost data based on time spent within the various sub-elements. The sub-elements do not allow for double-counting, providng a consistent basis for data collection. Each category is defined so users will know what costs to include and exclude	Company E provided medical surveillance cost data based on operating costs.	Company E did not use this element for the analysis.	Company E did not use this element for the analysis.
5. Will it be consistently interpreted over time?	Company E considered the elements to be sufficient for collecting data on occupational illness costs neccessary for retrospective and prospective analysis.	Company E did not use this element for the analysis.	Company E considered operating costs to include the same type of elements and sub-elements that would be needed for retrospective and prospective analysis.	Company E considered medical surveillance costs to include the same type of elements that would be needed for retrospective and prospective analysis.	Company E did not use this element for the analysis.	Company E did not use this element for the analysis.

AIHA Value of the Profession Data Element Analysis Matrix						
QUANTITATIVE ELEMENTS	**DATA ELEMENTS**					
CASE STUDY: COMPANY F	**Health**	**Risk Management**				
Data Element Criterion	Total Cost of Occupational Illnesses or Injuries	Total Capital Costs	Total Operating Costs	Total Medical Surveillance Costs	Total Other Costs Related to the Current Method of Managing the Risks	Total Non-Medical Costs of Incidents
1. Is the element the right one for the model?	Company F identied no specific illness related costs in the analysis	Yes - one Company F intervention requires capital investment	Yes- total operating cost is key parameter of developing total cost of the interventions	Element was populated in the case study	Company F did not identify any costs associated with this data element	Company F did not identify any costs associated with this data element
2. Are its key sub elements listed correctly?	Since Company F did not identify any illness costs sub-elements were not populated	Yes - sub-elements include various types of capital expenditures	Yes - sub-elements captured the various parameters that make up the total operating costs	Sub-elements provided information included in the study	Company F did not identify any costs associated with this data element	Company F did not identify any costs associated with this data element
3. Is it correctly named? Will the users know what it means?	Company F understood what the data element was intended to capture	Yes - readily understood by users. Basic financial language used by organizations	Yes -Company F IH's understood what was intended by the parameter	Yes - data element was properly named	Company F did not identify any costs associated with this data element	Company F did not identify any costs associated with this data element
4. Is it adequately defined, so that consistent answers will be given by different users?	There were no documented occupational illness cost	Adequately defined. Requires capital costs to be captured for each intervention considered	The sub-elements are defined and instructions assisted with getting consistant answers regarding the interventions	The data element was properly defined and consistent data was provided	Company F did not identify any costs associated with this data element	Company F did not identify any costs associated with this data element
5. Will it be consistently interpreted over time?	Users will have to make estimated of expected cases over time with and without intervention	Yes - consistent financial business language	Company F was able to develop data to conduct analysis of 5 year period.	Company F developed developed retrospective data and projected to several scenarios	Company F did not identify any costs associated with this data element	Company F did not identify any costs associated with this data element
6. Will it provide consistent data over time?	Unable to determine from this study	Yes - capital expenditure data will be consistently captured over time	Company F data appeared to be consistant over the period of the study	Company F was able to provide consistent data over time	Company F did not identify any costs associated with this data element	Company F did not identify any costs associated with this data element
7. Do companies have the data to support it?	Company F had data to show that there were reported lead based illnesses	Capital expenditure data is routinely developed in organizations	Company F was able to obtain suficient data to construct a retrospective analysis of the intervention options	Company F had the data to support actual and future costs	Company F did not identify any costs associated with this data element	Company F did not identify any costs associated with this data element
8. Will the IH be able to access the data?	Company F IH's would like have had access to documented illnesses data via Worker's Compensation information	Yes - IH's will likely be part of the data collection process	Company F IH's either had the data or were able to reconstruct the data from company records and personnel.	Company F IH's were able to access medical surveillance costs	Company F did not identify any costs associated with this data element	Company F did not identify any costs associated with this data element

AIHA Value of the Profession Data Element Analysis Matrix						
QUANTITATIVE ELEMENTS	**DATA ELEMENTS**					
CASE STUDY: COMPANY G	**Health**	**Risk Management**				
Data Element Criterion	Total Cost of Occupational Illnesses or Injuries	Total Capital Costs	Total Operating Costs	Total Medical Surveillance Costs	Total Other Costs Related to the Current Method of Managing the Risks	Total Non-Medical Costs of Incidents
1. Is the element the right one for the model?	There was a cost associated with experiencing both short term and long term hearing shifts	Capital costs were readily available	Operating costs reflect both costs incurred by operating staff and budgets as well as associated IH costs	The costs associated with audiometric testing and follow-up medical evaluations were included in this data element	This element collected data on fines and penalties which was important to the model	There were no non-medical incidents to judge effectiveness of data element
2. Are its key sub elements listed correctly?	Cost of incidents must be calculated separately from template and entered	All the costs that would be consider capital were properly collected	Data was available to populate the sub elements	Sub-elements are broadly stated	A significant cost item was included in the sub-elements	There were no non-medical incidents to judge effectiveness of data element
3. Is it correctly named? Will the users know what it means?	Company G understood what information was required	capital terms were well understood	The company understood what was required in the data element	Company G staff understood what was intended to be captured in this data element	Company G understood the costs associated with the fines and penalties element	There were no non-medical incidents to judge effectiveness of data element
4. Is it adequately defined, so that consistent answers will be given by different users?	Clearer definition is required since a range of costs could be considered	Definition were consistent across for both IH and Operation personnel	The instructions were adequate to consistently collect the data	The users understood what was required in this data element	Similar answers would have been provided across users and scenarios	There were no non-medical incidents to judge effectiveness of data element
5. Will it be consistently interpreted over time?	Yes - with proper instruction	The capital terms do not vary over time	The data element worked well for collecting data retrospectively over a several year period.	Costs for audiometric testing and follow-up will be consistently interpreted over time	The data associated with fines and penalties will be consistently interpreted over time	There were no non-medical incidents to judge effectiveness of data element
6. Will it provide consistent data over time?	Yes - with proper instruction	The capital cost data is consistent over time	The data was consistent over 3 scenarios that varied over time.	Consistent data was collected or estimated for the study	The data associated with fines and penalties will be consistently collected over time	There were no non-medical incidents to judge effectiveness of data element
7. Do companies have the data to support it?	Company had invoices from vendors to describe testing costs	Company G had adequate data to support capital costs used in study	Company G had some very good data to support the analysis. Other data which involved internal personnel time and costs had to be retrospectively constructed.	Company G had sufficient data to support this data element.	The company had very specific data on fines and penalties	There were no non-medical incidents to judge effectiveness of data element
8. Will the IH be able to access the data?	IH's managed the process and had access to data	IH staff input is required to develop the part of data and could access remainder through operations staff	The IH had access to the necessary data or was able to provide reasonable estimates	IH managed the data for the company and thus had full access	The IH was required to manage the data	There were no non-medical incidents to judge effectiveness of data element

AIHA Value of the Profession Data Element Analysis Matrix						
QUANTITATIVE ELEMENT	**DATA ELEMENTS**					
CASE STUDY: COMPANY H	**Health**	**Risk Management**				
Data Element Criterion	Total Cost of Occupational Illnesses or Injuries	Total Capital Costs	Total Operating Costs	Total Medical Surveillance Costs	Total Other Costs Related to the Current Method of Managing the Risks	Total Non-Medical Costs of Incidents
1. Is the element the right one for the model?	Company H did not identify any costs associated with the element.	Company H incorporated the element by containment equipment.	Company H incorporated the element by expressing the changes in various sub-elements. For example, pre-intervention costs included PPE, which were reduced post- intervention.	Company H did not identify any costs associated with the element.	Company H did not identify any costs associated with the element.	Company H did not identify any costs associated with the element.
2. Are its key sub elements listed correctly?	Company H did not identify any costs associated with the element.	Company H considered these costs to be routine expenses for containment.	Company H was able to distinguish between operational personnel time, PPE costs, EHS supply costs, and disposable bag costs. They were then able to show the differences between these sub-categories before, during and after the intervention.	Company H did not identify any costs associated with the element.	Company H did not identify any costs associated with the element.	Company H did not identify any costs associated with the element.
3. Is it correctly named? Will the users know what it means?	Company H did not identify any costs associated with the element.	Company H was able to determine the type of cost data necessary for the element.	Company H was able to determine the type of cost data necessary for the element.	Company H did not identify any costs associated with the element.	Company H did not identify any costs associated with the element.	Company H did not identify any costs associated with the element.
4. Is it adequately defined, so that consistent answers will be given by different users?	Company H did not identify any costs associated with the element.	Company H provided the same cost data for before and during the intervention.	Company H provided operating cost data based on various sub-elements. The sub-elements do not allow for double-counting, providng a consistent basis for data collection. Each category is defined so users will know what costs to include and exclude.	Company H did not identify any costs associated with the element.	Company H did not identify any costs associated with the element.	Company H did not identify any costs associated with the element.
5. Will it be consistently interpreted over time?	Company H did not identify any costs associated with the element.	Company H considered these costs to be the same type of elements that would be needed for retrospective and prospective analysis.	Company H considered operating costs to include the same type of elements and sub-elements that would be needed for retrospective and prospective analysis.	Company H did not identify any costs associated with the element.	Company H did not identify any costs associated with the element.	Company H did not identify any costs associated with the element.

QUANTITATIVE ELEMENT	DATA ELEMENTS					
CASE STUDY: COMPANY I	**Health**	**Risk Management**				
Data Element Criterion	Total Cost of Occupational Illnesses or Injuries	Total Capital Costs	Total Operating Costs	Total Medical Surveillance Costs	Total Other Costs Related to the Current Method of Managing the Risks	Total Non-Medical Costs of Incidents
1. Is the element the right one for the model?	Company I incorporated the element by medical costs	Company I incorporated the element by equipment and installation	Company I incorporated the element by incorporating the operational personnel time costs.	Company I did not use this element for the analysis.	Company I did not use this element for the analysis.	Company I did not use this element for the analysis.
2. Are its key sub elements listed correctly?	Company I considered medical costs and Insurance costs together. Insurance is not listed as a sub-element.	Company I considered these costs to be a one time cost for purchasing and installing an automated baler.	Company I did not use the sub-elements for operational personnel time though they could have.	Company I did not use this element for the analysis.	Company I did not use this element for the analysis.	Company I did not use this element for the analysis.
3. Is it correctly named? Will the users know what it means?	Company I was able to determine the type of cost data belonging in this element except that insurance costs were also combined in this analysis.	Company I was able to determine the type of cost data necessary for the element.	Company I was able to determine the type of cost data necessary for the element.	Company I did not use this element for the analysis.	Company I did not use this element for the analysis.	Company I did not use this element for the analysis.
4. Is it adequately defined, so that consistent answers will be given by different users?	Company I provided fact based (consistent) data of medical costs.	Company I provided capital cost data associated with an IH intervention.	Company I provided operating cost data based on operations personnel time Each data element is defined so users will know what costs to include and exclude.	Company I did not use this element for the analysis.	Company I did not use this element for the analysis.	Company I did not use this element for the analysis.
5. Will it be consistently interpreted over time?	The element itself should be interpreted consistently over time except in this case where insurance was included as a sub-element.	Company I considered these costs to be the same type of elements and sub-elements that would be needed for retrospective and prospective analysis.	Company I considered operating costs to include the same type of elements that would be needed for retrospective and prospective analysis.	Company I did not use this element for the analysis.	Company I did not use this element for the analysis.	Company I did not use this element for the analysis.
6. Will it provide consistent data over time?	Occupational illness data can be calculated based on number of incidents times the average medical cost of incidents. However, this case included insurance costs as well.	Capital cost data may change over time depending on the nature of the process, business conditions and the needs of the company. The data element, however will consistently capture various types of capital costs.	Operating cost data may change over time depending on the nature of the process, business conditions and the needs of the company. The data element, however will be able to capture various types of operating costs.	Company I did not use this element for the analysis.	Company I did not use this element for the analysis.	Company I did not use this element for the analysis.
7. Do companies have the data to support it?	Company I recorded medical cost data for internal purposes.	Company I records capital cost data for internal purposes.	Company I records operating cost data for internal purposes. The operating costs will be variable for each analysis.	Company I did not use this element for the analysis.	Company I did not use this element for the analysis.	Company I did not use this element for the analysis.

AIHA Value of the Profession Data Element Analysis Matrix						
QUANTITATIVE ELEMENT	**DATA ELEMENTS**					
CASE STUDY: COMPANY J	**Health**	**Risk Management**				
Data Element Criterion	Total Cost of Occupational Illnesses or Injuries	Total Capital Costs	Total Operating Costs	Total Medical Surveillance Costs	Total Other Costs Related to the Current Method of Managing the Risks	Total Non-Medical Costs of Incidents
1. Is the element the right one for the model?	Company J did not use this element for the analysis.	Company J incorporated the element by equipment and installation for the project intervention.	Company J incorporated the element by expressing the changes in various sub-elements. Data was provided for PPE, housekeeping, other production down time issues within operational (non-IH) personnel time	Company J did not use this element for the analysis.	Company J did not use this element for the analysis.	Company J did not use this element for the analysis.
2. Are its key sub elements listed correctly?	Company J did not use this element for the analysis.	Company J considered these costs to be one time charges associated with implementating the IH intervention. They also were able to distinuish the sub-elements.	Company J was able to distinguish between operational (Non-IH) time, IH safety staff time, other time, and IH safety staff time. They were then able to show the differences between these sub-categories before, during and after the intervention	Company J did not use this element for the analysis.	Company J did not use this element for the analysis.	Company J did not use this element for the analysis.
3. Is it correctly named? Will the users know what it means?	Company J did not use this element for the analysis.	Company J was able to determine the type of cost data necessary for the element.	Company J was able to determine the type of cost data necessary for the element, according to time spent within operational (Non-IH) time, IH safety staff time, and other time.	Company J did not use this element for the analysis.	Company J did not use this element for the analysis.	Company J did not use this element for the analysis.
4. Is it adequately defined, so that consistent answers will be given by different users?	Company J did not use this element for the analysis.	Company J provided capital cost data for the intervention. The capital costs associated with the intervention are fact-based.	Company J provided operating cost data based on time spent within the various sub-elements. The sub-elements do not allow for double-counting, providng a consistent basis for data collection. Each category is defined so users will know what costs to include and exclude.	Company J did not use this element for the analysis.	Company J did not use this element for the analysis.	Company J did not use this element for the analysis.
5. Will it be consistently interpreted over time?	Company J did not use this element for the analysis.	Company J considered these costs to be the same type of elements that would be needed for completing a retrospective and prospective analysis.	Company J considered operating costs to include the same type of elements that would be needed for retrospective and prospective analysis.	Company J did not use this element for the analysis.	Company J did not use this element for the analysis.	Company J did not use this element for the analysis.

AIHA Value of the Profession Data Element Analysis Matrix						
QUANTITATIVE ELEMENT	**DATA ELEMENTS**					
CASE STUDY: COMPANY K	**Health**	**Risk Management**				
Data Element Criterion	Total Cost of Occupational Illnesses or Injuries	Total Capital Costs	Total Operating Costs	Total Medical Surveillance Costs	Total Other Costs Related to the Current Method of Managing the Risks	Total Non-Medical Costs of Incidents
1. Is the element the right one for the model?	Company K did not use this element for the analysis.	Company K did not use this element for the analysis.	Company K incorporated the element by expressing the changes in various sub-elements. Data was provided for PPE, housekeeping, IH monitoring and reviewing modifying production processes, materials or design to address IH concerns within operational (non-IH) personnel time.	Company K did not use this element for the analysis.	Company K did not use this element for the analysis.	Company K did not use this element for the analysis.
2. Are its key sub elements listed correctly?	Company K did not use this element for the analysis.	Company K did not use this element for the analysis.	Company K was able to distinguish between operational (Non-IH) time, IH safety staff time, and IH supplies. They were then able to show the differences between these sub-categories before, during and after the intervention.	Company K did not use this element for the analysis.	Company K did not use this element for the analysis.	Company K did not use this element for the analysis.
3. Is it correctly named? Will the users know what it means?	Company K did not use this element for the analysis.	Company K did not use this element for the analysis.	Company K was able to determine the type of cost data necessary for the element, according to time spent within operational (Non-IH) time, and IH safety staff time. IH supplies were also considered and included the appropriate response.	Company K did not use this element for the analysis.	Company K did not use this element for the analysis.	Company K did not use this element for the analysis.
4. Is it adequately defined, so that consistent answers will be given by different users?	Company K did not use this element for the analysis.	Company K did not use this element for the analysis.	Company K provided operating cost data based on time spent within the various sub-elements. The sub-elements do not allow for double-counting, providng a consistent basis for data collection. Each category is defined so users will know what costs to include and exclude.	Company K did not use this element for the analysis.	Company K did not use this element for the analysis.	Company K did not use this element for the analysis.
5. Will it be consistently interpreted over time?	Company K did not use this element for the analysis.	Company K did not use this element for the analysis.	Company K considered operating costs to include the same type of elements that would be needed for retrospective and prospective analysis.	Company K did not use this element for the analysis.	Company K did not use this element for the analysis.	Company K did not use this element for the analysis.