A PRIMER ON PROCESS IMPROVEMENT
With an Emphasis on Applications for the EHS Management

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Many experts feel that EHS management will move itself from a regulatory-driven past to a future (i.e., the so called "third wave") that focuses their attention on stakeholder interests and the pursuit of what these same experts refer to as either sustainable development or corporate social responsibility. The path will be a difficult one even for the thought leaders. It is a fact that most major management initiatives fail in the first three years, usually from poor implementation. The programs that last beyond this point are driven down through the organization by top management involvement. Some of these programs are not well implemented at the local level. The many EHS lapses at the BP refinery in Texas City, Texas, are evidence of corporate programs with poor implementation at the local facility level. The EHS managers in the local facilities need to pay attention at how to best implement mandated programs that are carefully aligned with the corporate vision or to meet the interests of their industry (e.g., Responsible Care® in the chemical industry) or local community interests. It is the same difficult learning curve that corporate officials have been struggling with. Having recently completing a book, *Making the Business Case for EHS*, I would like to present a few lessons that are tucked between the lines. This may help create a discussion that will move EHS management away from prescriptive "best practices" and success stories, to a place where each company uses bottom-up knowledge and strategic planning for building business value while increasing competitive positioning.

Lesson 1 EHS Needs to Communicate Using Quality Management as the Principal Language

Quality management (a.k.a., process improvement) is the *language* shared by most management initiatives. It is a language that few EHS managers know well! If EHS wants its initiatives to be seen as a value-added activities (i.e., not just as a costs), they will have to start making the business case for these efforts. This is the main theme of the book. Eight *tactics* are proposed to help the EHS manager communicate more effectively with employees, top management and a host of other interested parties (i.e., customers, suppliers, investors, banks, insurance companies, NGO's, community groups and regulators). Each of these tactics uses quality management tools that are complementary to all management initiatives (e.g., Lean, Six Sigma, ISO 9000, ISO 14001, OHSAS 18001, and operational excellence programs). Tactic 6 shows how to

involve top management, employees and other interested parties to drive the *true* performance of the EHS program and the facility.

Business Value Principle #5 (see Chapter 2, pages 12-13) touts the importance of using quality management as the common improvement language for all of these programs. **Business Value Principle #6** (see Chapter 2, pages 13-14) stresses the involvement of employees in a bottom-up involvement program.

There is a supplemental reading[1] that might help better illustrate this "lesson."

Lesson 2 Hierarchical Process Mapping is the Foundation for All Process Improvement

All process improvement is based on a clear understanding of the production processes. ISO 9000-2000 requires that each facility using this quality management standard take a *process view* for all that they do. Often instead of taking a process view, EHS focuses instead on *problems* and *wastes*. ISO 14001 and OHSAS 18001 stress operational controls and training to "prevent" problems. A properly directed focus on the process would ask the question, "How can I change the process to avoid the problem or waste?" **not**, "How do I *control* the problem or waste so that it does not create a regulatory issue?" There are companies that have integrated ISO 14001, OHSAS 18001, and ISO 9000 into a single management system. There are other companies that have used the OSHA VPP program in place of OHSAS 18001 in such an integrated management system. These programs are more effective and will cost less to operate. Using the other tactics and the lessons presented below, the EHS management can begin to make the business case to the facility management and ultimately the corporate office.

Business Value Principle #1 (See Chapter 2, pages 8-9) states that you need to know your company's processes. Hierarchical process mapping is an excellent tool to help you gain this knowledge. A supplemental reading is available to make a case for this assertion[2].

Business Value Principle #2 (See Chapter 2, pages 9-10) demonstrates that *systems thinking* is needed in order for process improvement to sustain itself. Since "everything is connected to everything else" in the process, companies often solve a problem only to have it create problems elsewhere. Many pollution prevention best practices simply shifted the problem to a health and safety issue. Once this was realized, the programs were de-emphasized in the company because they failed to recognize the importance of systems thinking.

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[1] "Merging Pollution Prevention into Quality." *Environ. Quality Mgmt*. **11 (3)** 85-90, 2002.
[2] "Understanding Processes with Hierarchical Process Mapping." *Environ. Quality Mgmt*. **15 (2)** In Press 2005.

Business Value Principle #3 (See Chapter 2, pages 10-11) reminds the reader that prevention is more effective than control. ISO 14001 actually defines "the prevention of pollution" as including the pollution control systems! OHSAS 18001 likewise focuses the management system on the operational controls and training. A hierarchical process map will point out the source of the problem and provide an opportunity to change the process as a means for preventing the problem both for environmental aspects and for occupational health and safety hazards; i.e., true source prevention.

Business Value Principle #4 (See Chapter 2, pages 11 – 12) addresses the need to focus on the process. This helps people to reflect on the fact that changing the process itself may be a way to prevent the problems. People that do not focus on the process tend to view problems and wastes. Addressing these issues separately will provoke the Business **Value Principle #2** that everything is connected to everything else and **Business Value #3** that true prevention (i.e., changing the process to eliminate the problem or waste) is always more effective than operational controls.

Tactic 1 (EHS Integration and Process Improvement Tools) begins with a description of hierarchical process mapping. This is the foundation upon which all process improvement is based. Process mapping is critical to success in lean and six sigma programs. It is the only way that visual work information of the proper level of detail can be used by the people involved in specific projects. These programs often rely on less detailed, higher level flow diagrams or block diagrams. More on this in Lesson 3!

Lesson 3 Improve the Implementation of All Process Improvement Programs

Management has initiated a number of top-down initiatives that are specifically designed to help to improve processes. These initiatives include *lean production* and *six sigma* programs. The literature clearly shows that these programs have more than a 50% failure rate in the first three years[3]. Failure is generally attributed to poor implementation. You could have predicted this. Management consultants point out that programs that are most successful are those with a very strong "top-down" implementation by a determined top manager. While this might be true to a certain point, the same results could be obtained by having the program implementers use the quality management tools that are presented in **Tactic 1** (EHS Integration and Process Improvement Tools) of the book. These tools will permit a strong "bottom-up" component to the program. With a higher level of employee involvement, there will be better communication between workers and management. This should help improve the implementation and lower the high failure rate. Tough leaders can lose interest or lose their position. There is no promise that the program will continue once their attention turns elsewhere.

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[3] Arthur, Jay. "Seduce Them With Success." *Quality Progress*, September 2005, 36 – 40.

3

Lean programs do not generally use the tools in Tactic 1 in a systematic fashion and all the time. A kaizen event rarely has written action plans in place and distributed before the work begins. The same can be said of 5S, SMED, poka-yoke and all of the other programmatic elements in lean. Six Sigma programs use a systematic program known as DMAIC. However, the gate keepers of the program, the black belts and master black belts, can choose any quality management tool that they desire. Often these practitioners are unaware that they must develop a certain level of skill in order to use the quality management tools effectively. Both lean and six sigma do not use hierarchical process mapping. Instead, these programs look at a process at a less detailed level and usually fail to see the systems links. By solving the problem, they unwittingly create other problems (see **Business Value Principle #2** – Everything is Connected to Everything Else).

It is important that the EHS manager makes certain that environment, health and safety concerns are included in the process improvement programs and that, to the extent possible, the communication between EHS and the program managers be conducted with the previous two lessons in mind.

Business Value Principle #7 (See Chapter 2, pages 14 - 15) directs you to thoroughly integrate EHS into all business programs. It is easier to do this if all the programs are using the same quality management tools. Instead of keeping the EHS efforts separate, projects can have lean and six sigma people involved. EHS people can be included in lean and six sigma projects.
Business Value Principle #5 (See Chapter 2, Pages 12 – 13) states that by having everyone working with the same visual and interactive quality management tools this integration is much easier to effect.

There is a supplemental reading[4] that explains how the Systems Approach can be used within lean production and six sigma programs.

Lesson 4 Integrate Process Improvement Programs

This is an important lesson – something that will truly add value to the business. In most companies, initiatives that address process improvement are operated in what many people call '*silos*.' Initiative program managers are rewarded on the success of their program and the ability to meet predetermined goals. Why would one program cooperate with another program, or worse yet, why would they want to be integrated? In their mind, this would confuse the entire recognition and reward performance system. The management consultants boldly claim that you need to bust these silos! However, there

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[4] "Lean Six Sigma and the Systems Approach: Management Initiatives for Process Improvement." *Environ. Quality Mgmt*., **13** (2), 85 – 95, 2003.

will be a lot of resistance to this. It is possible to use **Tactic 1** (EHS Integration and Process Improvement Tools) to get everyone on the same page. The employee process improvement projects need to report to a management oversight committee for approval and review. You can put the silo manager from each of the management initiatives on this management oversight committee. At first they will pay most of their attention on the projects that create results that are recognized within their silo. After a few meetings, they find out that by helping another silo manager succeed, they can also get some of the credit. Before long, they are looking for opportunities to help projects succeed so they can get yet more credit. Perhaps this is more characteristic of human behavior than trying to destroy their silos. However, it is counterintuitive in the minds of most facility managers.

The only significant problem in this integration effort is the statement from the lean and six sigma people that "We are already using quality management tools!" This is what is referred to as a "killer phrase." This means that their initial impulse is not to want to participate. However, when some of the more curious people in these programs begin to see how these visual and interactive tools that are being used (see **Tactic 1**) and learn how much the employees like to use them, they ask if they can be involved both in the projects and ultimately in the management oversight committee. This is a gradual process that will take a few rounds of project implementations to have better participation of these programs and the resultant communication and cooperation between them. Some companies have brought in management consultants to integrate lean and six sigma into a new program called "lean six sigma." This seems to be the new rage. However, this transition can be made internally by using **Tactic 1**. It has been recognized that most lean programs tend to ignore environmental wastes in their efforts ("The environmental manager will take care of that!"). By having the EHS manager on the lean team and by using the process focus of Tactic 1, these wastes can be addresses within the work instead of being managed after the lean event has been completed.

Business Value Principle #7 (See Chapter 2, pages 14 - 15) will show you some of the important connections between the various process improvement initiatives that are being implemented at the facility level. By easing into this integration of these efforts, you will learn that there are many more connections. The new integrated management oversight committee will find these and exploit them to keep the various initiatives operating. At least now they will operate together, not separately.
Business Value Principle #8 (See Chapter 2, pages 15 - 24) will come into play to help make the business case for this integration effort. Lessons 5 and 6 will address this issue.

5

Lesson 5 Align the Integrated Programs with the Business Vision, Mission, and Core Values

Many initiative programs begin by creating a new policy statement that conveys a sense of vision, mission and core values to the effort. There has not been a lot of attention paid to aligning these programs with the organization's overall vision, mission and core values. It is amazing how many EHS directors do not know the core values of the company. Of course, they know where to find them. However, they do not embody them in everything that they do. Instead, they boldly state that EHS is NOT a core value. It would almost be artificial to make it a core value even though some companies have done so. It is EHS activity that is supposed to contribute to the core values. When you look hard at this situation, there are usually many ways where EHS is currently contributing and is integrated to some level. Part of the strategic planning effort needs to be spent figuring out how the EHS activity can be changed to contribute to all of the other core values. Now you will have a program that truly has the interest of top management! This is a key part of speaking the language of management; i.e., making the business case for EHS management.

Tactic 5 (Associating EHS with Value Drivers) helps the EHS manager to align EHS activities with recognized benefits to the business Being able to state these benefits are crucial to implementing the program highlighted in this book. You will note that every action plan created in Tactic 1 has a list of benefits provided at the top of the plan. **Tactic 7** (Scoring EHS Program Results) helps you to begin the process of aligning your programs. In Step 2, you have to prepare a description of how your facility or corporate organization operates within it organizational environment and the relationships that exist in the organization. The organizational environment includes the culture which is guided by the purpose, vision, mission and core values. In Step 3, you look at the organization's key business results and see how the EHS program is contributing to these results. It is not sufficient to keep the EHS results separate from the key business results – managers are more interested in the business results.

Lesson 6 Link All Program Results to Financial Results

Top managers want to have everything related to the financial results of the organization. EHS has been a little slow to relate all of its programs to financial results. A significant portion of the tactics is dedicated to this point. Some EHS managers need a good background on the role that financial results play in their organization. I recommend a very basic book, "The Ten Day MBA[5]" to help them understand how accounting,

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[5] Silbiger, Steven. *Ten Day MBA*, Quill William Morrow, New York, 1999.

6

finance, quantitative analysis and economics is at the very heart of what top management does every day.

Tactic 2 (An EHS Cost/Benefit Model) shows how each action plan prepared in **Tactic 1** is tracked by the costs and benefits of the project. Management information systems can be used to track the costs and benefits to increase the level of trust that the top managers will have in the financial results.

Tactic 3 (Aligning EHS Activities with Activity-Based Management) shows how to use the activity accounting sheets prepared in Tactic 1 (EHS Integration and Process Improvement Tools) to get a handle on the EHS activities that contribute the most to the cost of the process being evaluated. In other words, what are the 20% of the work steps that create 80% of the cost of EHS compliance? These work steps are great candidates for a "Compliance Through Prevention" program. Can the process be changed in such a way that the work step no longer triggers the need for environment or health and safety compliance? The design improvement will make the process more robust and will eliminate some activities that have contributed to the cost of compliance.

Tactic 4 (Valuing Intangible EHS Benefits Using Real Options) helps you do what most other reports say you cannot do – put a value on the intangible benefits that EHS activities contribute to the organization. This tactic presents a logical and proven means of doing this. Your financial people will be familiar with the methods. While they might not be willing to acknowledge the full value, it is likely that they will discount the outcome and provide some financial credit for many of the most important risk management services that you provide to the company.

Tactic 8 (Performance Scorecard) is a popular tool for linking project and program results to financial results. Take a look at Figure 1 (page 95) to see how each category of EHS results (selected with the help of Tactic 7) should be carefully linked with financial and market results. If you take the results required for participation in the Global Reporting Initiative, the scorecard would be very crowded and few of the results (indicators) in the bottom level could be related to the top level. The scorecard forces you to carefully select the results that are tracked for management's attention. These results are likely to be different than the ones that are currently being tracked.

Business Value Principle #8 (See Chapter 2, pages 15 - 24) provides an overview on how the EHS manager needs to translate all process improvements into financial terms. This is a very important principle to master if you want to make the business case for EHS management.

Lesson 7 Create an Integrated Strategic Plan

EHS managers often feel that they do not have time to prepare strategic plans. At best their plans are tactical or short term in nature - usually reacting to problems in the

7

company's operations. Using the *Systems Approach*, strategic planning becomes much easier to do. Hierarchical process mapping and the linked accounting sheets prepared in **Tactic 1**, allow the company to select opportunities to improve the process. A supplementary reprint[6] is available to read on this topic.

Lesson 8 Score the Integrated Program's Results

Results are very important in any program. EHS is no exception! In most "management by objectives" (i.e., top-down) programs, people are evaluated on the results that they produce. One problem with results is that there are too many of them for management and other stakeholders to follow or make sense of. Consultants have created indices and indicators to try to combine the results. But the number is still too great! The Global Reporting Initiative (GRI) is a voluntary program to help create consistency in how companies report progress in their sustainable development program. They require that the company report on approximately 50 indicators and suggest an additional 50 for consideration in the report. Something that GRI does not want you to know is that there is a proven method for scoring results that allows you to have a single "grade" for your EHS program. As a matter of fact, all programs can be rolled up into a single grade for the entire business enterprise. Although scoring of results is used in more than 70 countries, this model is generally not used by EHS managers. It makes a lot of sense. In college, each course graded you on the basis of quizzes, examinations, semester papers and the ever present classroom participation. At the end of the course, you received one grade. Furthermore, when you graduated from college, you had a single score for your efforts – a grade point average.

Tactic 7 (Scoring EHS Program Results) walks you through the scoring of each of your EHS results or indicators. Often you have indicators that are necessary to track for regulatory purpose but add little to making the business case for EHS. You will not include these indicators in your performance scorecard (**Tactic 8**) that you share with top management. You can present a single number for the results of the entire EHS program results that can be tracked and trended. It will become the measure of continual improvement in your ISO and OHSAS management systems. All management initiative program results can be scored using this tactic. The score of the integrated programs can be scored and directly compared to the score of the program working separately. It is true that people do not like scores as a rule. However, these scores are used to make important business decisions about the programs results and signify the need to make changes in the program to help increase the score. You can use the scoring internally to drive the improvements in your programs' results. This in turn will help you make a better business case for EHS.

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[6] "Selecting Opportunities to Improve Your Processes." *Environ. Quality Mgmt*., **14** (1), 83 – 89, 2004.

Systems Approach   Pojasek & Associates

Lesson 9 Score the Integrated Program's True Performance

Managers of process improvement initiatives and the EHS function consider *results* to measure the 'performance" of their programs. They often refer to their EHS results as 'performance results.' Actually, *results* are the *outcome* of the performance, but do not measure performance per se. To measure *true* performance, one has to turn to the Malcolm Baldrige Performance Award Program. Participation in the award program is based on six true performance criteria and, separately, on results as the seventh criterion. An organization does not need to participate in the award program to use these criteria. In fact, many companies use the Baldrige model criteria to internally gauge their true performance. They do so because it has been independently determined that companies that use these criteria outperform financially the companies that do not use the criteria. In other words, the use of this scoring system will help make the business case for any program that uses it. As in the case of "Lesson 8," EHS managers just do not seem to know about this proven method. If they do know about it, there are a number of misconceptions on how it could be used to improve the true performance of their program. A close examination of the criteria show that these are behaviors that, when improved, will contribute substantially to the true performance of the program. "But you want to score them!" This is the big shock. "My college days are behind me now. I don't want to be scored anymore!" This feeling is understandable. However, they are being constantly graded in the human resources performance evaluation systems. Coca-Cola offers a good compromise for this feeling. They simply do not require their system members to report their performance scores to Atlanta. This has the secondary impact of not providing an unintended incentive to inflate the scores. Instead, each business unit is required to develop a strategic plan based on its findings, to report this to Atlanta, and to integrate it into its business plans. This way EHS and the other elements of the Coca-Cola corporate citizenship program are embedded into the company's operations.

Tactic 6 (Scoring *True* Performance) presents a simple way of using the Baldrige model to score the true performance of the EHS program. The categories represented by each criterion should provide a diagnostic of what needs to be improved. Tactic 1 can be used to create action plans to obtain improvement in the areas where the true performance score is low. It is important to know that the true performance criteria are scored differently and separately from the results criterion even though in practice there are strong links between them. ISO 9000 requires a demonstration of continual improvement while both ISO 14001 and OHSAS 18001 only require a 'commitment" to continual improvement. This is a huge difference that needs to be reconciled when these programs are integrated (see Lesson 4). This tactic will help integrate these programs and bring a much stronger sense of quality management to the EHS program.

Lesson 10 Transparently Report EHS Performance to All Interested Parties

Nothing drives a program more than having to transparently report to the world the "good, the bad and the ugly!" Each year, process improvement reaches a crescendo as the yearly report writing commences. Everyone wants to tell a good story! The Systems Approach breaks this cycle by helping the EHS program plan for their success. Each year, action plans are prepared (Tactic 1) that will help set the targets and objectives for that year – instead of the other way around! If your company is not reporting in a broadcast sense, it is probably answering more and more queries for information from your insurance companies, your investors, your banks and other outside interests and stakeholders. Using the eight tactics in the book help you generate the documentation that can be more easily assembled to prepare a report on EHS performance. As you will see from reading this primer, there is a long road to navigate before you get to this point. But for those of you that are currently issuing EHS, sustainable development or social responsibility reports, the tactics can help you improve the ability of stakeholders to understand what you are reporting as well as helping you improve the transparency of the reports. There is a saying, "Failing to plan is planning to fail!" The Systems Approach helps you plan your EHS program and seek to integrate it into the business. It is implemented with employee-prepared action plans that have been approved by management. All results are reported in financial terms and the results and true performance are measured, tracked and trended. Once you get to this point, it is easy to take the next step and report your results to the stakeholders.

Postscript

I hope that this primer will help you navigate through Chapters 2 and 3 of my book, *Making the Business Case for EHS*. These lessons are what I relied on when I wrote the book. Please let me know about the resistance that you may encounter as you seek to implement these business value principles and tactics. Perhaps I will prepare additional primers and/or publications to address these issues. I look forward to hearing from you.