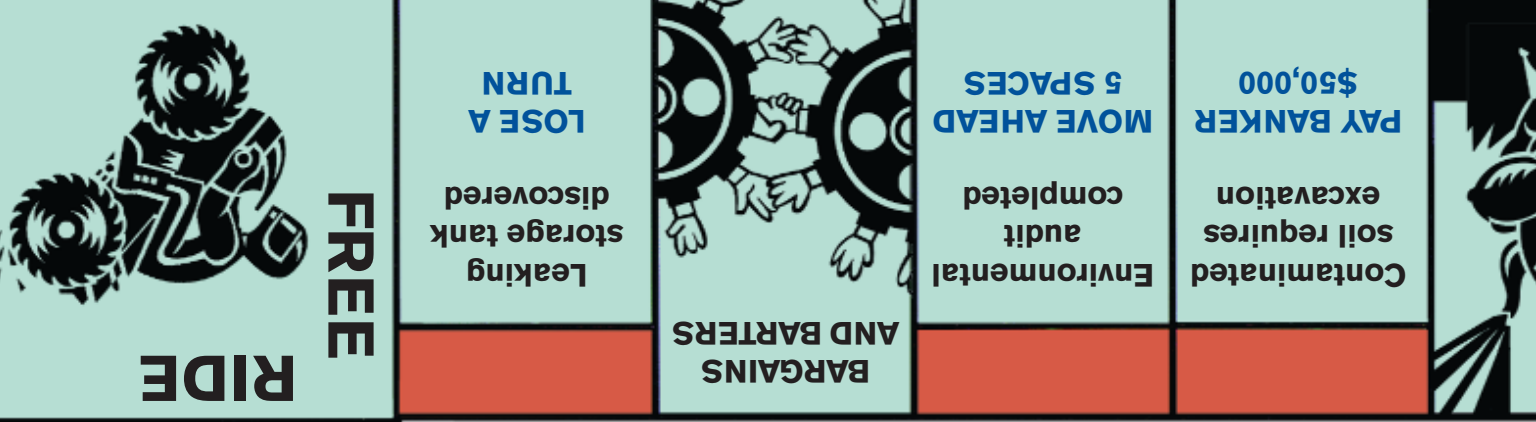
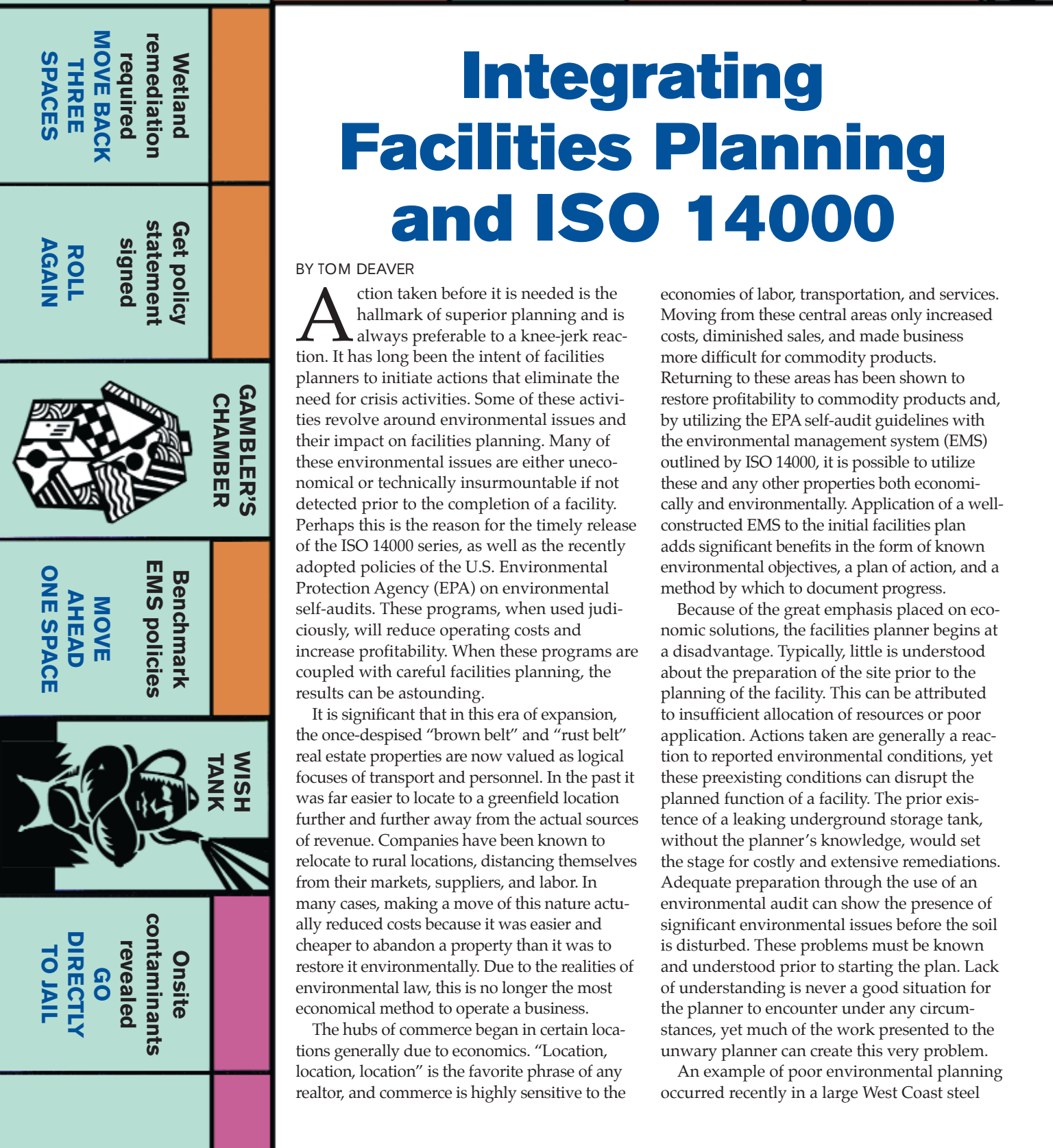



# Integrating Facilities Planning and ISO 14000

BY TOM DEAVER

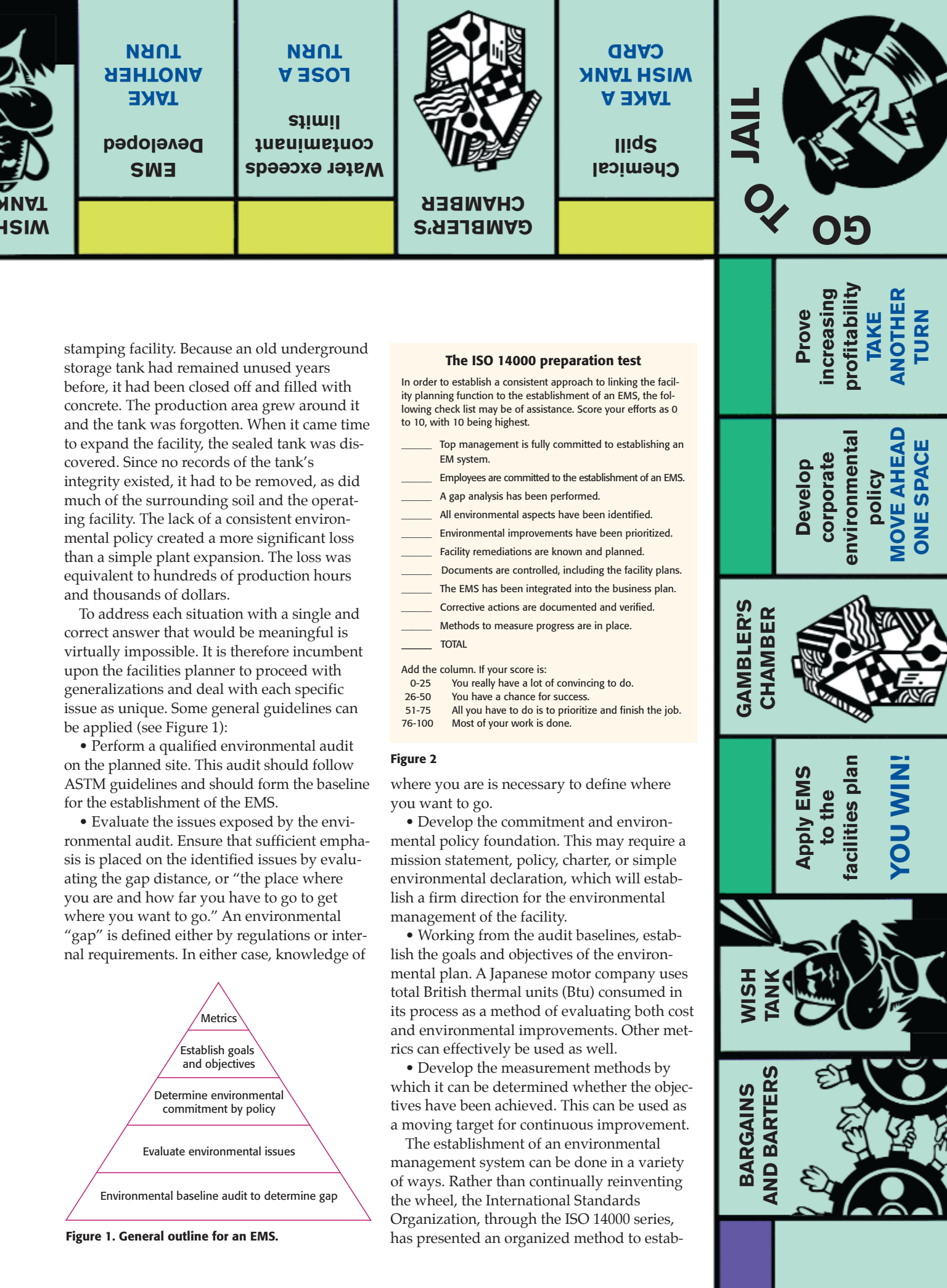
Action taken before it is needed is the hallmark of superior planning and is always preferable to a knee-jerk reaction. It has long been the intent of facilities planners to initiate actions that eliminate the need for crisis activities. Some of these activities revolve around environmental issues and their impact on facilities planning. Many of these environmental issues are either uneconomical or technically insurmountable if not detected prior to the completion of a facility. Perhaps this is the reason for the timely release of the ISO 14000 series, as well as the recently adopted policies of the U.S. Environmental Protection Agency (EPA) on environmental self-audits. These programs, when used judiciously, will reduce operating costs and increase profitability. When these programs are coupled with careful facilities planning, the results can be astounding.

It is significant that in this era of expansion, the once-despised "brown belt" and "rust belt" real estate properties are now valued as logical focuses of transport and personnel. In the past it was far easier to locate to a greenfield location further and further away from the actual sources of revenue. Companies have been known to relocate to rural locations, distancing themselves from their markets, suppliers, and labor. In many cases, making a move of this nature actually reduced costs because it was easier and cheaper to abandon a property than it was to restore it environmentally. Due to the realities of environmental law, this is no longer the most economical method to operate a business.

The hubs of commerce began in certain locations generally due to economics. "Location, location, location" is the favorite phrase of any realtor, and commerce is highly sensitive to the economies of labor, transportation, and services. Moving from these central areas only increased costs, diminished sales, and made business more difficult for commodity products. Returning to these areas has been shown to restore profitability to commodity products and, by utilizing the EPA self-audit guidelines with the environmental management system (EMS) outlined by ISO 14000, it is possible to utilize these and any other properties both economically and environmentally. Application of a well-constructed EMS to the initial facilities plan adds significant benefits in the form of known environmental objectives, a plan of action, and a method by which to document progress.

Because of the great emphasis placed on economic solutions, the facilities planner begins at a disadvantage. Typically, little is understood about the preparation of the site prior to the planning of the facility. This can be attributed to insufficient allocation of resources or poor application. Actions taken are generally a reaction to reported environmental conditions, yet these preexisting conditions can disrupt the planned function of a facility. The prior existence of a leaking underground storage tank, without the planner's knowledge, would set the stage for costly and extensive remediations. Adequate preparation through the use of an environmental audit can show the presence of significant environmental issues before the soil is disturbed. These problems must be known and understood prior to starting the plan. Lack of understanding is never a good situation for the planner to encounter under any circumstances, yet much of the work presented to the unwary planner can create this very problem.

An example of poor environmental planning occurred recently in a large West Coast steel




stamping facility. Because an old underground storage tank had remained unused years before, it had been closed off and filled with concrete. The production area grew around it and the tank was forgotten. When it came time to expand the facility, the sealed tank was discovered. Since no records of the tank's integrity existed, it had to be removed, as did much of the surrounding soil and the operating facility. The lack of a consistent environmental policy created a more significant loss than a simple plant expansion. The loss was equivalent to hundreds of production hours and thousands of dollars.

To address each situation with a single and correct answer that would be meaningful is virtually impossible. It is therefore incumbent upon the facilities planner to proceed with generalizations and deal with each specific issue as unique. Some general guidelines can be applied (see Figure 1):

- Perform a qualified environmental audit on the planned site. This audit should follow ASTM guidelines and should form the baseline for the establishment of the EMS.
- Evaluate the issues exposed by the environmental audit. Ensure that sufficient emphasis is placed on the identified issues by evaluating the gap distance, or "the place where you are and how far you have to go to get where you want to go." An environmental "gap" is defined either by regulations or internal requirements. In either case, knowledge of where you are is necessary to define where you want to go.
- Develop the commitment and environmental policy foundation. This may require a mission statement, policy, charter, or simple environmental declaration, which will establish a firm direction for the environmental management of the facility.
- Working from the audit baselines, establish the goals and objectives of the environmental plan. A Japanese motor company uses total British thermal units (Btu) consumed in its process as a method of evaluating both cost and environmental improvements. Other metrics can effectively be used as well.
- Develop the measurement methods by which it can be determined whether the objectives have been achieved. This can be used as a moving target for continuous improvement.

The establishment of an environmental management system can be done in a variety of ways. Rather than continually reinventing the wheel, the International Standards Organization, through the ISO 14000 series, has presented an organized method to estab-




**Figure 1. General outline for an EMS.**

**The ISO 14000 preparation test**

In order to establish a consistent approach to linking the facility planning function to the establishment of an EMS, the following check list may be of assistance. Score your efforts as 0 to 10, with 10 being highest.

_____ Top management is fully committed to establishing an EM system.
_____ Employees are committed to the establishment of an EMS.
_____ A gap analysis has been performed.
_____ All environmental aspects have been identified.
_____ Environmental improvements have been prioritized.
_____ Facility remediations are known and planned.
_____ Documents are controlled, including the facility plans.
_____ The EMS has been integrated into the business plan.
_____ Corrective actions are documented and verified.
_____ Methods to measure progress are in place.
_____ TOTAL

Add the column. If your score is:

| | |
|---|---|
| 0-25 | You really have a lot of convincing to do. |
| 26-50 | You have a chance for success. |
| 51-75 | All you have to do is to prioritize and finish the job. |
| 76-100 | Most of your work is done. |

**Figure 2**

**Figure 3. The continuous environmental improvement program.**

lish an EMS. This method consists of the following basic elements.

1. Policy—a statement of environmental direction that is acknowledged and adhered to by both senior management and the rank-and-file.
2. Planning—developing the plan to apply the policy.
3. Operation and implementation—coordinating the daily activities associated with application of the policy and ensuring that the planning objectives are achieved.
4. Checking and corrective action—auditing the activities to document that the plan is achieved. This also involves making and documenting all corrective actions.
5. Management review—senior management reviews the EMS activities regularly to ensure that all activities are appropriate.

The presence of an EMS prior to beginning the facility plan is invaluable. However, the absence of any environmental planning can slow the planning function significantly. It is therefore incumbent upon the facility planner to ensure that due diligence is applied to the environmental aspect of planning. Under the joint-and-several liability terms of various environmental statutes, the planner can be held ultimately responsible for the environmental inadequacies of the completed plan. The use of an EMS can greatly reduce this personal and corporate liability.

In establishing a new environmental management system it may be necessary to convince management of the need for an EMS. Typically, an industrial engineer lacks the power to dictate policy to senior management. The IE knows what to do but generally lacks the authority to do it (see Figure 2). Perhaps a few suggestions are in order.

*Manage the manager*—Write the environmental policy statement and give it to your boss to approve. This takes a lot of courage since, if the policy is well done, your manager may take all the credit.

*Threaten and cajole*—Persuade senior management that it is in their best legal interest to establish an environmental policy. The threat of jail or worse is a real possibility if such policy is ignored. (Just remember the kid who cried "wolf" when you practice this approach.)

**Environmental Management System Change Record**

**Facility:** _____ **Element No.:** _____
**Organization:** _____ **Revision No.:** _____
**Location:** _____

**Element Description:** _____

Prepared by: _____ Approved by: _____
Date: _____ Date: _____
Title: _____ Title: _____
Signature: _____ Signature: _____

**Change Record:**

| Rev | Date | Description of Change | Approved by |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

| Significant Components | Objective | Target |
|---|---|---|
| | | |

**Action Plan:**

| Task | Responsible | Resources | Projected Start-up | Completion Date |
|---|---|---|---|---|
| | | | | |

**Figure 4. A format for documenting environmental program elements.**

*Benchmark and demonstrate*—Find the best EMS plans and policies and distribute them to management. Demontrate that increased sales and profits are possible by doing this.

Establishing an environmental policy is the first step in the development of an environmental management system. It is within the policy statement that the authority resides to complete the remainder of the system. ISO 14001, section 4.1, is clear on this issue—establishment of an environmental policy is the responsibility of top management and comes first in the scheme of things. Other aspects of section 4.1 indicate that the policy should be:

- appropriate to the activities of the facility,
- a commitment for continual improvement,
- a commitment for compliance to environmental regulations,
- a method to establish environmental targets, and
- a procedure to communicate the policy to both employees and the public.

The familiar plan-do-check-act (PDCA) cycle, as shown in Figure 3, is one way to establish an EMS. By entering the cycle through an environmental policy statement, the elements of the cycle become consistent and repeatable. If one item, such as an environmental audit, is completed without the prior work, it becomes considerably more difficult to ensure that any work will follow or that the audit findings will be acted upon. Without a policy and a plan for environmental management, any previous work done likely will be lost.

Documenting environmental remediations is very impor-

tant to an environmental management system. Not only is it important to identify the problem, it is crucial to the EMS process to plan the solution, perform the action, and document what was done. A simple form is shown in Figure 4 that illustrates one method used to document the environmental changes. Note that two signatures are required. ISO 14000 requires top management's responsibility for all significant changes. Obtaining the authority to complete the task is a critical milestone in establishing a viable environmental management system.

In conclusion, the blending of facility planning and an environmental management system can lead to significant savings both in remedial actions and future requirements. These savings would be reflected in faster project completion, reduced compliance problems, and cost avoidance as well as in significant generation of knowledge. The real issue is not whether this is important but how to convince the decisionmakers about the importance of them. There are three ways to justify the importance of an environmental management system:

- economic justification,
- application of self-interest, and
- concern for world improvement.

However, in the words of Albert the Alligator from the old "Pogo" comic strip, "We have met the enemy and he is us." It is possible to lead the way but have no one follow. IE

## For further reading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