Measurement for Environmental Effectiveness

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Most major businesses spend more than two percent of sales on environmental, health, and safety (EHS) performance. *Yet,* remarkably, most of them measure that performance only to the extent required by regulation. Worse, at a time when increasing accountability means rising risk, the measures they do take don't give their line managers the information they need to do their jobs.

Furthermore, the lack of appropriate measures undercuts the aggressive stance many companies have taken toward EHS management. Their policy statements declare their commitment to meeting the needs of their stakeholders by achieving high levels of performance, even exceeding regulatory requirements. But they fail to translate that commitment into action. As Bill Blackburn, Baxter Healthcare Corporation's vice president of corporate environmental affairs, points out, „Policy without measurement is a trophy policy... like a moose head, it impresses visitors, but it's dead."

Effective measurement systems can help breathe life into ambitious corporate goals. One key to achieving such systems, as we have learned through our work with leading companies, is to ensure that environmental measures give line managers what they need to carry out their responsibilities. Very often, measures are designed by staff groups to make their oversight function easier to fulfill. Such measures rarely meet the needs of line managers, who bear the principal responsibility for driving results. If measurements are not useful to line managers, improvement is next to impossible.

Fortunately, in many cases the same measures can meet the needs of both corporate staff and the line organization. For example, in designing a system to measure overall corporate progress in pollution prevention, Polaroid was careful to ensure that the measurements went to plant managers promptly and in a format they could use. As a result, Polaroid has dramatically reduced the waste and pollution generated by its facilities.

Another key to achieving effective EHS measurement systems is establishing relevant in-process measures. Currently, most performance measures are end-of-process measures, which track results. Examples include accident and injury statistics, quantities of waste generated and released, compliance audit results, and energy use. Such measures often satisfy – at least partially – stakeholder demands for performance information.

The problem with end-of-process measures is that the information they contain arrives too late. It's impossible to influence performance results after the fact. To improve performance, line managers need ways to measure the effectiveness of what they're doing while they're doing it. In-process measures provide this tool. For example, a measure of the effectiveness of training can help address deficiencies before they lead to costly mistakes. Such in-process measures tend to be qualitative rather than quantitative, and to require judgment. Effective measurement programs use both end-of-process and in-process measures.

To carry out their responsibility for environmental, health, and safety performance, line managers need ten measures – seven end-of-process and three in-process. These ten measures are listed in Exhibit 1 and discussed below.

Stakeholder Satisfaction

The goal of every enterprise is to meet its stakeholders' needs. Therefore, the most critical environmental, health, and safety measure (albeit the one least often obtained) is stakeholder satisfaction. But few companies actually ask their customers, shareholders, employees, or communities what their needs are with respect to EHS performance. As a result, companies end up measuring things their stakeholders don't care about – or failing to measure things critical to stakeholder satisfaction. Tracking dollars donated to environmental charities or numbers of trees planted during Earth Day makes managers feel good, but may be misdirected if local communities really want to know what health risks are associated with the company's emissions.

Meeting stakeholders' needs often means improving key business processes. Rather than grappling with those processes, many companies measure only what is required by regulation. They are gambling with the confidence their stakeholders have placed in them.

Companies can usefully survey their customers, employees, owners, suppliers, distributors, communities, etc., to learn how satisfied these stakeholders are with the company's performance in meeting their needs. For example, Polaroid surveyed the communities in which five of its plants are located to determine whether its environmental communication efforts met their needs. The surveys indicated that Polaroid's annual environmental report did not address the specific issues of concern to these stakeholders. As a result, Polaroid began publishing environmental newsletters targeted to the communication needs of each community. Exhibit 2 shows typical stakeholder EHS needs.

Exhibit 1

Ten Key Measures for Line Managers

End-of-Process Measures

• Stakeholder satisfaction

• Compliance

• Incidents/accidents

• Pollution

• Impact

• Energy use

• Cost

In-Process Measures

• Program implementation

• Specific leading indicators

• Rate of improvement

Compliance

Failure to comply with regulations can result in significant financial penalties or jail sentences. Measures of compliance can show whether there has been improvement over time and can reveal areas where improvement is needed. Typical compliance measures include:

• Number of times pollution levels exceed permitted limits (number of events and events as a percentage of measurements taken)

• Number of releases of hazardous materials to the environment in quantities reportable to a regulatory agency (and quantities of each material released)

• Number of workplace exposures to chemicals and physical agents in excess of permissible exposure limits (and exposures as a percentage of measurements taken)

Exhibit 2

Typical Stakeholder Environmental, Health, and Safety Needs

Stakeholder Group	EHS Needs
Owners	No acceptable risks or liabilities
	Capitalize on competitive environmental opportunities
Customers	Product hazard information
	Environmentally responsible products
Community	Safe and healthy environment
	Openness to risk concerns
Employees	Safe and healthy workplace
	Pride in company

• Compliance audit findings (number of findings, rating of facilities)

• Regulatory actions (notices of violation, fines/penalties)

Incidents/Accidents

The number and severity of incidents and accidents, as well as the cost associated with such events, can point to improvement opportunities. Measures can include lost time and recordable injuries (actual number and number normalized by hours worked), property damage incidents, episodic (unplanned) chemical releases, and „near misses." Although most companies have been measuring incident and accident rates for some time, all but a few have overlooked the usefulness of measuring near misses. For example, after emphasizing measurement of near misses, GE Plastics found that as the number of near misses increased, the number of accidents and incidents decreased. This phenomenon shows that as employee attention was directed at the importance of previously unmeasured near misses, the resulting enhanced awareness led to safer workplaces.

Pollution

Virtually every environmental issue is related to the generation of pollution (i.e., waste). Companies that reduce pollution beyond what is required by regulation often discover that the returns on these efforts in the form of, among other things, reduced raw material and hazardous-waste-disposal costs far exceed the investment. For example, Dow Chemical Company estimates that it realizes a 50 percent return on investment from its pollution-prevention activities. To determine progress, of course, the company must measure and track its performance over time in a way that normalizes the amount of pollution relative to the volume of production.

The measure most commonly used in the United States is the one companies must undertake to satisfy the EPA's requirements for the Toxic Release Inventory (TRI). Through TRI, companies show quantities of pollution or waste released to air, water bodies, land, underground injection wells, publicly owned water treatment works, and other off-site locations. However, due to some drawbacks of TRI, some companies use additional measures that normalize results, differentiate among chemicals by relative toxicity, and capture the return on pollution-prevention efforts.

Impact

Fundamentally, pollution measures are only indirect indicators of the effects of the pollution on human health and the environment. Stakeholders, particularly the communities in which plants are located, are less interested in the quantities of pollution emitted than in whether the pollution will harm them. Measures of such impact can help address stakeholder concerns and identify areas for improvement. At Rohm and Haas's Delaware Valley plant, for example, the company measures the impact on community health of its air emissions (based on health exposure standards) and communicates this information to plant neighbors. Also, emerging international environmental management standards, such as the British Standards Institute's Environmental Management Standard (BS 7750), are requiring companies to evaluate the environmental effects posed by their activities.

Energy Use

The concept of sustainable development has refocused attention on measuring the use of nonrenewable natural resources, such as coal and oil. However, in addition to purely environmental considerations, it is obvious that there are also cost savings to be achieved by better management of energy use. Where energy is a raw material in a manufacturing process its use tends to be tracked quite closely. Where energy is treated more as a utility, its use tends to be less well tracked. A normalized measure of such energy use can show energy efficiency over time, as well as relative use of nonrenewable resources.

Cost

Two aspects of cost that are particularly useful to measure: return on investment and efficiency. Return on investment is a very important area for improvement in EHS performance. Much of this return takes the form of reduced cost. Companies typically track costs associated with capital equipment and associated operations; management expenses; remediation projects; EHS staff budgets; EHS research and development expenditures; and environmental contributions. However, most operating expenses associated with EHS management are not tracked as such. For example, much of the cost of hazardous materials management is tracked as general plant operations cost. If a facility replaced trichloroethylene with soapy water as a degreaser, it would be able to show only part of the return on this investment (i.e., lower raw material cost and lower hazardous waste disposal cost). The reduced training, personal protective equipment, and record-keeping costs would not be captured as part of the return. Incomplete measures can lead managers to make poor decisions.

Efficiency is a measure of the relative cost of achieving a given result. One facet of cost that is not particularly well measured today is the cost of EHS inefficiency, i.e., the difference between the cost of managing effectively to achieve the desired result in the first place and the actual cost of achieving that result the hard way, after the fact. Examples of such incremental costs include the expenses associated with cleanup of spills, workers'

compensation claims, involvement in Superfund actions, reduced productivity due to use of personal protective equipment, management time spent on community safety and environmental concerns following incidents, and the like. A measure of efficiency would help line managers assess the potential return on investment in improving the results.

Program Implementation

The extent to which management programs and processes intended to achieve EHS goals have been implemented is a key leading indicator of performance. Poor programs and processes lead to poor results. In addition, in some areas, particularly health management, there can be such a time lag between action (e.g., chemical exposure) and result that use of results to correct action is a meaningless activity.

An emerging trend is to measure program implementation against management standards. There are tools available to assist in this process. For example, the Chemical Manufacturing Association's Responsible Care Standards and the ICC International Chamber of Commerce's Business Charter for Sustainable Development Principles (as interpreted by the Global Environmental Management Initiative in its Environmental Self-Assessment Program) have criteria for evaluation of a company's program against how well it is implementing the standards. Some companies, such as Baxter Healthcare Corporation, have chosen to develop and measure against their own management standards, which incorporate many aspects of emerging industry standards.

Specific Leading Indicators

In cases where a particular aspect of performance plays a key role in determining results within a company, a specific leading indicator can focus attention where improvement is most needed. For example, training is a critical part of ensuring good EHS performance. A measure of the effectiveness of training can help address deficiencies before they cause problems. Similarly, the support of senior line management is key to ensuring that the organization achieves its desired environmental, health, and safety performance. One measure of support might be the percentage of time dedicated to EHS subjects in senior management meetings. Another indicator might be the percentage of capital projects or new product designs that had EHS staff involvement at their early stages.

Rate of Improvement

Continuous improvement isn't worth much if it moves at a glacial pace. For any business process, a measure of the rate of improvement can point to opportunities for improving the improvement process itself. It can also be a useful management tool in sparking productive internal competition in the improvement process. Though many companies regularly measure their rate of improvement in other areas, few have applied this tool to environmental management. We believe the rewards would be well worth the effort.

Conclusion

Once you have made relevant measurements, it's important to use them to improve performance and to communicate that performance to stakeholders. Companies that measure solely to satisfy regulatory obligations often neglect this vital follow-through. In doing so, they fail to take advantage of the power of measurement. Companies that measure the right things and make those measurements both available and useful to the right people – including particularly the line managers accountable for performance – will contain their EHS risks and discover valuable opportunities to gain competitive advantage.

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