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The Risk Management System

Implementing The Prevention Step of the Risk Management Process

EPA and many state agencies are now asking "How do we move beyond mere compliance with environmental standards and create a system that consistently delivers better results?" EPA has realized that many environmental problems transcend media boundaries, and solutions may require cross-media approaches. In response to this situation, many companies are considering replacing the pollutant or regulation-specific approach of the past with a more comprehensive "systems approach" in the future.

Assessment

Knowing the *site's operations and activities* are essential parts of any risk management system. Certain operations, such as large combustion sources, wastewater treatment systems, and hazardous waste management activities, typically will trigger significant regulatory requirements including permitting, reporting and recordkeeping. Understanding site-specific issues will equip the environmental, health and safety (EHS) professional to search for future opportunities to reduce EHS risks and to reduce compliance requirements.

Taking a systems approach

Webster's Dictionary defines the word *system* as a regularly interacting or interdependent group of items forming a unified whole. By taking a systems approach to your environmental risks, a firm can manage its threats in a proactive, coordinated, cost-effective and prioritized way. A number of elements are essential to the development and implementation of a sound environmental risk management system, including:

- Assessment
- Regulatory Compliance
- Program Improvements
- Training & Development
- Administration
- Monitoring

Quantifying the chemicals used or stored onsite is one of the most critical elements of a risk management system. This data will be used to address compliance with applicable EHS requirements such as the OSHA Hazard Communication Standard, Process Safety Management (PSM) standards, EPA's Emergency Planning and Community Right-to-Know (EPCRA) and Risk Management Plan (RMP) regulations.

Establishing chemical pathways for a facility is another important element in a risk management system. The movement of chemicals into different media, i.e. air, water, solids, or soil, is an important consideration throughout the spectrum of environmental regulations. Sometimes referred to as "mass balancing," calculations of the movement of chemicals into the environment are required by EPA, states, and local environmental authorities under SARA Title III Toxic Release Inventory submittal and the Clean Air Act's Title V operating permit program.

System - a regularly interacting group of items forming a unified whole.

- Webster's Dictionary

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Outside the Box

Managing Probabilities



Joe Zupan, P.E.
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Your job is “probably” about to become more interesting. As described in our feature article, during the past few years the focus in environmental, health and safety has been shifting from a “compliance” model (e.g., prescriptive EPA thresholds and limits) to a “systems” model (e.g. the international ISO 14001 environmental standard). This can present some significant challenges as we move from a world of “black and white” to one with many “shades of grey.” Put another way, we’re moving from a regulatory climate of dealing with absolutes to one of managing probabilities.

In previous issues of *Currents*, we’ve defined “risk” as “the probability of an adverse outcome,” whether that outcome is an injury, a regulatory compliance action or a lawsuit. We’ve also tried to illustrate how EH&S managers are becoming *de facto* “risk managers” with respect to these types of risks.

As an EHS professional who has made extensive use of probabilistic techniques in risk assessment, it is my observation that a truly adverse event such as an accident is the result of a number of factors, each one of which might be described by a probability distribution. Typically, no one factor can be singled out as the sole cause of such an accident. Rather, a low-probability event happens as a result of several factors, which combine with an unfortunate result.

Consider the following scenario: A worker is not required to operate a piece of equipment 98 percent of the time, and 98 percent of all workers have been adequately trained on that piece of equipment, and workers wear appropriate personal protective equipment 98 percent of the time, and if the equipment is not under pressure 98 percent of the time, and mechanical safety devices are 98 percent reliable, that all sounds “pretty

safe” or risk-free, doesn’t it? Not if the overall risk were to be appropriately derived as the product of each of those safety factors, yielding only a 90 percent factor of safety. Put another way, would you want to tell an employee to perform a task if there is “only” a 1 in 10 chance of him being seriously injured?

In the real world, the factors detailed above would have varying probability distributions and relative weights, but the principle is clear – appropriately managing the probability of each of the key factors of risk can be an effective tool for use in preventing “adverse outcomes!” An EHS manager that understands the probabilities of various outcomes with respect to each key risk factor is best prepared to manage risk.

The feature article points to the use of a Risk Management System in preventing problems. Having a rigorous system in place to help discipline our focus as EHS managers can be a very useful tool in managing the probabilities of these key factors, and thereby in managing our risk. If we “divide and conquer” the factors that contribute to risk, even if we overlook some factors (which is nearly inevitable), we’ve at least provided ourselves with the best margin of safety possible. In the simplistic example above, suppose all the factors listed above conspired against us EXCEPT that our employees wear appropriate personal protective equipment 100% of the time. Then, the 1-in-10 accident becomes a near-miss, or more accurately, a “complete miss” (OK, maybe you can call it a “near-hit!”).

The time is here to try out this systems-based approach for managing your probabilities and, thereby, your risks!

- Joe Zupan, P.E.
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Zephyr is a professional services firm providing consulting, training and software to the industrial, commercial and public sectors. The firm’s major areas of practice focus on environmental permitting, compliance and corrective action, incident management, occupational health and safety, risk assessments, ISO 14001 implementation, audits and regulatory tracking.

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Regulatory Compliance

Maintaining up-to-date copies of federal, state, and local regulations is essential. The risk management professional must also determine which of these regulations apply to the facility. Site activities and SIC classification will dictate regulatory applicability. Information about chemicals used at the site, the potential for pollution, operating conditions, and management practices will be used to define compliance requirements.

While moving toward compliance with the applicable regulations, it is also a worthwhile exercise to *determine which regulations do not apply, and to document the determination*. For example, if the facility is not a listed SIC or other category requiring storm water permitting, and chemicals used or stored at the site do not have the potential to come into contact with precipitation, a storm water permit is not required. However, specific operating conditions or management practices may still be required to maintain this exemption.

Program Improvements

The risk professional should *identify areas that need improvement*. Auditing the facility's current level of compliance with the applicable regulations is the next logical step. The outcome of an audit is typically a list of issues or areas that need to be addressed or corrected. Most reviews of this nature will rank each finding by risk priority, such as an ISO 14001-defined environmental impact that poses a risk to human health or environment.

Based on a ranking of priority or concern the risk professional should *develop a timeline for achieving and maintaining compliance* or for achieving "beyond compliance" risk management objectives. The risk professional should define the resources (personnel and expenses) and equipment (capital purchases) required to achieve the timeline's targeted compliance dates. This progressive approach reduces liability, demonstrates a higher degree of environmental stewardship, and puts EHS issues and resource needs at a level that is equivalent to other business activities.

Training & Development

Once system needs are defined and finalized, *they can best be addressed by training managers and affected employees*. The risk management professional should communicate expectations at three levels. First, management awareness training can be useful to make officers and managers aware of the regulatory requirements and their personal responsibilities under the law. Such training will allow management to become familiar with the demands the applicable regula-

tions will have on staffing and budgets and will help ensure a continuous process for compliance.

Second, broad-based environmental program training will serve to communicate the expectations of the company, as reflected in its own corporate standards or operating guidance, as well as in applicable federal, state, and local regulatory requirements.

Third, there is a need for program-specific training under regulations that specify content and/or frequency. Various training programs can be consolidated to minimize business interruptions and to allow the employee to develop an understanding of the regulatory inter-relationships.



Administration

It is important for the risk management professional to *develop and maintain record keeping systems and methods* to keep documents organized and "ready for inspection". A useful tool for managing deadlines is a "tickler" system, which provides an early warning prompt for compliance issues. Such a system allows for designated lead times to collect data for SARA Title III, air permit compliance demonstrations, annual wastewater monitoring reports, and other submissions.

Monitoring

After a site has defined its standards using corporate operating guidance and applicable regulations, has communicated the environmental and safety program through training, and has developed a record keeping system, it is appropriate to periodically *monitor the ongoing level of conformance*. In addition, the facility should stay aware of new requirements by using support mechanisms that will provide updates to existing and developing regulations. This information may be available through corporate support services, consultant services, and regulatory briefings by agencies or trade groups.

Summary

In summary, as EHS professionals begin to view their area of responsibility from a risk perspective, it is important they approach their program needs systematically, as if they were performing any other business activity that could enhance or detract from the financial success of the company. By examining the risks associated with new technology, operations, and markets, companies can reduce their chances of failure, beat the competition and increase their profits.

- Wesley Box
Zephyr Environmental Corporation

News Briefs

Courts Strike Down Periodic Monitoring

On April 14, 2000, the U.S. Court of Appeals for the DC Circuit prohibited the implementation of the EPA's *Periodic Monitoring Guidance* in most circumstances. The guidance, which had been issued with virtually no public input, would have placed very costly monitoring requirements on most industrial air pollution sources. In a sternly-worded opinion (*Appalachian Power Company et al v. EPA*), the Court found that EPA had, in effect, amended its rules without complying with required rulemaking procedures. The Court went on to say, "State permitting authorities therefore may not, on the basis of EPA's guidance (or 40 C.F.R. 70.6(a)(3)(i)(B)), require in permits that a regulated source conduct more frequent monitoring of its emissions than that provided in the applicable State or federal standard, unless that standard requires no periodic testing, specifies no frequency, or requires only a one-time test." As of this time, EPA apparently does not plan to appeal the decision. For more information, contact Julian Levy at jlevy@zephyrenv.com.

EPA Revises Audit Policy

Effective May 11, 2000, EPA revised its audit policy to encourage regulated entities to voluntarily discover, promptly disclose, and expeditiously correct violations of federal environmental requirements. Incentives for self-policing, discovery, disclosure, and correction and prevention of violations include reduction or elimination of civil penalties and removal of the threat of criminal prosecution of the disclosing entity. The revised policy was developed with extensive input from the Department of Justice, state regulatory bodies, public interest groups, and the regulated community. For more information, contact Jeanne Yturri at (512) 329-5544 or jyturri@zephyrenv.com.

Sunset Commission Issues Findings on TNRCC

The TNRCC serves a vital mission and should be authorized to implement the state's environmental laws for the next 12 years, according to the staff of the Sunset Advisory Commission. The Sunset Commission's 159-page report also urges that changes be made in the regulatory and financing structures of

the state's environmental agency - for example, by moving to a regulatory structure that places more emphasis on performance incentives, regulatory flexibility, and innovation. The Commission's opinion is that this implementation of its recommendation would better address persistent environmental problems such as air pollution and emerging issues such as nonpoint source pollution (runoff) into rivers and lakes. For more information, contact Celeste Wiley at (512) 329-5544 or cwiley@zephyrenv.com.

TRRP Update

With input from industry, the Railroad Commission of Texas and other stakeholders, the TNRCC is currently developing guidance for complying with the newly-promulgated Texas Risk Reduction Program (TRRP) rule. It is currently anticipated that more than forty guidance documents and forms will be developed to assist the regulated community with rule compliance. Guidance documents and forms currently available from the TNRCC include *TRRP -1* (introduction to TRRP), *TRRP-2* (applicability and grandfathering), *TRRP-4* (comparison of TRRP and previous risk reduction rules), and *TRRP-27* (dealing with total petroleum hydrocarbon mixtures). For more information, contact Joe Zupan at 512-329-5544 or jzupan@zephyrenv.com.

Congress Proposes Cost Benefit Analysis in Air Quality Rulemaking

Senator George Voinovich of Ohio has introduced a bill, titled the Air Quality Improvement Act of 2000, that would require EPA to consider costs and benefits before revising or adopting new air quality standards. Among other things, the bill would require EPA to base any scientific or technical conclusions on (1) the best available, peer-reviewed science and supporting studies conducted in accordance with sound and objective scientific practices; (2) data collected by accepted methods or the best available methods; and (3) data that have been made publicly available. Proponents of the bill point to EPA's failure to consider costs and benefits in the promulgation of its most recent standards for PM10 and ozone. Environmentalists, however, criticize the proposal as a significant threat to the federal Clean Air Act. On April 5, the bill was referred to the Senate Committee on Environment and Public Works. For more information, contact

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EPA Publishes Draft Handbook of Groundwater Policies for RCRA Corrective Action

TNRCC Overhauls Vehicle and NO_x Rules for BPA and DFW Ozone Nonattainment Areas

TNRCC Proposes Revisions to the NO_x Rules for Houston Galveston Area

EPA Says Case-by-Case MACT Applies to Gas Turbines

EPA Revises Air Quality Modeling Guidance

ASTM Revises Environmental Site Assessment Standards

TNRCC Recommends Clean Air Strategies for Austin, San Antonio, and Longview-Tyler-Marshall Areas

David Cabe at (512) 329-5544 or dcabe@zephyrenv.com.

OSHA to Begin Accepting Complaints Online

The Occupational Safety and Health Administration has announced that workers can now use the Internet to file complaints about workplace safety and health hazards. OSHA Administrator Charles Jeffress says the move was prompted by the growing number of Americans who have Internet access and their willingness to conduct business electronically. According to Jeffress,

"The Workers' Page," which is available at www.osha.gov, will be an on-line resource that provides employees an electronic option for filing formal complaints. Previously, employees had to either call or write OSHA to report workplace hazards. For more information, contact Brad Watson at (512) 329-5544 or bwatson@zephyrenv.com.

EPA Publishes Draft Handbook of Groundwater Policies for RCRA Corrective Action

In April, EPA published new draft guidance in the form of a *Handbook of Groundwater Policies for RCRA Corrective Action*. While the *Handbook* is primarily directed at facilities subject to RCRA corrective action requirements, it also provides guidance for general groundwater protection and assists state regulatory agencies in the implementation of the States' groundwater protection programs. The *Handbook* addresses risk-based groundwater protection and cleanup, including such subjects as groundwater use designation, cleanup objectives and remedial action goals, remediation time frames, and technical impracticability. For additional information, contact Mike Portnoy at (713) 977-8787 or mportnoy@zephyrenv.com.

TNRCC Overhauls Vehicle and NO_x Rules for BPA and DFW Ozone Nonattainment Areas

On April 19, 2000 the TNRCC adopted major revisions to its mobile source and NO_x rules (Chapters 114 and 117) as part of the state's implementation plan (SIP) for reducing ozone levels in the Beaumont/Port Arthur (BPA) and the Dallas/Forth Worth (DFW) areas. These rules include more restrictive NO_x emission limits for electric utility boilers, industrial boilers, and industrial process heaters; use of low emissions fuels; a variety of transportation-related controls; reductions in emissions from off-road vehicles; and limitations on early morning use of heavy equipment in construction activities. In reaction to the proposed rules for the DFW area, landfill operators and several electric utility and Portland Cement companies have filed suit against the TNRCC in state and federal courts. For more information call David Cabe at (512) 329-5544 or dcabe@zephyrenv.com.

TNRCC Proposes Revisions to the NO_x Rules for Houston / Galveston Area

TNRCC plans to publish proposed revisions to the SIP in order to bring the eight county Houston/Galveston area into attainment with

the federal ozone standard. NO_x emission reductions will be required from all sources (point, off-road, and on-road), with a target reduction of 90 percent from industrial furnaces, utility boilers, and gas turbines (including grandfathered sources). In addition, a NO_x emission reduction of 50-percent is proposed for utilities and a 30-percent reduction is proposed for grandfathered sources in counties east of I-35 and outside of the HGA non-attainment area. Vehicle and transportation-related portions of the rules will be similar to those adopted for the DFW area and will include shifts in construction schedules, use of reformulated gasoline, controls on diesel engines, and more stringent emission standards for recreational vehicles. Adoption of the revised rules is projected for December 2000, with implementation of controls during the period 2002 to 2007. For more information, call Bill Stark at (713) 977-8787 or bstark@zephyrenv.com.

EPA Says Case-by-Case MACT Applies to Gas Turbines

On April 21, EPA issued a ruling clarifying that stationary combustion turbines which are major sources of hazardous air pollutants and which were constructed after June 29, 1998 are subject to case-by-case MACT determinations, Subpart B regardless of their configuration, end use, or location. Through this ruling, EPA has clarified that combustion turbines, whether simple or combined cycle, are not steam electric generators and, thus, not subject to the source-specific MACT standards applying to steam electric generators. However, those portions of combined cycle units that consist of duct burners and waste-heat recovery units (equipment used in generating steam) are subject to the source-specific MACT standard, as opposed to case-by-case MACT. With this ruling, EPA is also providing guidance related to available HAP emissions control technologies for combustion turbines. EPA's new posture will immediately affect combustion turbine electric generator power project developers and gas turbine vendors who have been working on the premise that case-by-case MACT does not apply. For more information call David Cabe at (512) 329-5544 or dcabe@zephyrenv.com.

EPA Revises Air Quality Modeling Guidance

The EPA finalized significant changes to the *Guideline on Air Quality Models* at its June Conference on Air Quality Modeling. Major changes include the addition of two new air quality models: AERMOD, which will replace the Industrial Source Complex (ISC) Model for

most applications, and CALPUFF, which simulates pollutant releases as a series of puffs. With these changes, AERMOD would become the model of choice for most regulatory applications, including modeling for complex terrain, while CALPUFF would be used to determine pollutant impacts on federal Class I areas. A revised ISC model, which incorporates the new PRIME building downwash algorithm, has also been recommended for use on a case-by-case basis. Finally, several obsolete models will be removed from the GAQM. For more information, contact Mark Fridel at (713) 977-8787 or mfridel@zephyrenv.com.

ASTM Revises Environmental Site Assessment Standards

In April, the American Society of Testing and Materials (ASTM) approved significant revisions to its Standard Practice for Environmental Site Assessments: Phase I Site Assessment Process and its Standard Practice for Environmental Site Assessments; Transaction Screen Process. These revisions include the introduction of the concept of business environmental risk, the introduction of wording to describe historical recognized environmental conditions versus (existing) recognized environmental conditions, the identification of supporting documentation for Phase I reports, and guidance in defining an "Environmental Professional." For more information contact Mary Barnwell at (713) 977-8787 or mbarnwell@zephyrenv.com.

TNRCC Recommends Clean Air Strategies for Austin, San Antonio, and Longview-Tyler-Marshall Areas

The TNRCC has recommended to Governor Bush that the Austin, San Antonio, and Longview-Tyler-Marshall areas receive "unclassifiable" designations with respect to compliance with the controversial eight-hour ozone standard. In response, the Governor has passed this recommendation on to EPA. The recommendation is due primarily to the uncertainty introduced by the federal Appeals Court ruling that the eight-hour ozone standard cannot be enforced. To retain the "unclassifiable" designation, TNRCC has proposed early ozone-fighting measures in advance of any that could be required under the federal Clean Air Act should the areas be declared in nonattainment of the eight-hour standard. For more information, contact Jerry Kung at (512) 329-5544 or jkung@zephyrenv.com.

On the Web

Zephyr has solutions for every aspect of your environmental, health and safety, and emergency response needs. We exist to help you identify, assess, control and reduce your environmental, health and safety risks. If you haven't been to our website, we invite you to take a look.



See for yourself.
Visit us at <http://www.zephyrenv.com>

Useful Information

TNRCC's Sunset Commission Findings
<http://www.tnrcc.state.tx.us>

ASTM Standards
<http://www.astm.org>

Special Announcement

Zephyr is pleased to announce that **Mr. Julian Levy has joined Zephyr as Vice President of East Coast Operations.** Mr. Levy will be opening Zephyr's newest office in Maryland. Stay tuned for more details!

We want to hear from you - send your comments online to
<http://www.zephyrenv.com/fr-comments.html>

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